Torres Rojas, Genara

From: Alison Baumann [abaumann@downtownny.com]
Sent: Wednesday, December 03, 2014 1:33 PM
To: Torres Rojas, Genara
Subject: WTC Transportation Hub EIS

Hi,
I am looking for the Final EIS for the World Trade Center Transportation Hub. Would you be able to send me a copy or direct me to where I can find it?
Thank for your help.

Sincerely,
Alie

Alison Baumann
Director of Research
The Alliance for Downtown New York
120 Broadway Suite 3340
New York, NY 10271
(212) 835-2780
abaumann@downtownny.com

THE PORT AUTHORITY OF NY & NJ

FOI Administrator

December 4, 2014

Ms. Alison Baumann
The Alliance for Downtown New York
120 Broadway, Suite 3340
New York, NY 10271

Re: Freedom of Information Reference No. 15535

Dear Ms. Baumann:

This is in response to your December 3, 2014 request, which has been processed under the Port Authority's Freedom of Information Code (the "Code", copy attached) for a copy of "the Final EIS for the World Trade Center Transportation Hub."

Material responsive to your request and available under the Code can be found on the Port Authority's website at http://www.panynj.gov/corporate-information/foi/15535-WTC-1.pdf. Paper copies of the available records are available upon request.

Please refer to the above FOI reference number in any future correspondence relating to your request.

Very truly yours,

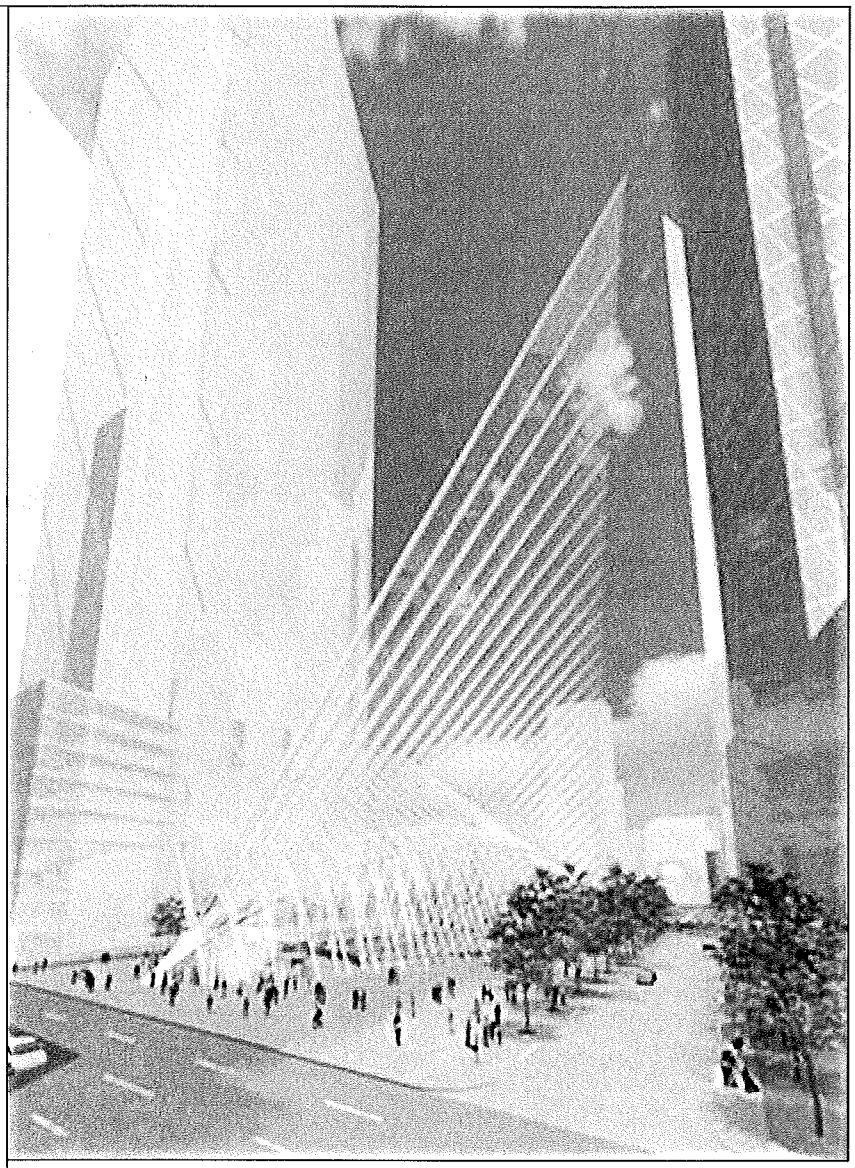
Daniel D. Duffy
FOI Administrator

Attachment

225 Park Avenue South, 17th FL
New York, NY 10003
T: 212 435 3642 F: 212 435 7555

PERMANENT WTC PATH TERMINAL

FINAL ENVIRONMENTAL IMPACT STATEMENT



VOLUME I

FINAL ENVIRONMENTAL IMPACT STATEMENT AND
SECTION 4(F) EVALUATION

United States Department of Transportation
Federal Transit Administration

THE PORT AUTHORITY OF NY & NJ

PATH

MAY 2005

PERMANENT WTC PATH TERMINAL

IN THE

BOROUGH OF MANHATTAN
NEW YORK COUNTY, NEW YORK

FINAL ENVIRONMENTAL IMPACT STATEMENT

PREPARED PURSUANT TO:

National Environmental Policy Act of 1969, §102 (42 U.S.C. §4332); Federal Transit Law (49 U.S.C. §5301(e), §5323(b) and §5324(b)); 49 U.S.C. §303 (formerly Department of Transportation Act of 1966, §4(f)); National Historic Preservation Act of 1966, §106 (16 U.S.C. §470f); Executive Order 11990 (Protection of Wetlands); Executive Order 11988 (Floodplain Management); Executive Order 12898 (Environmental Justice); and all applicable laws, regulations, orders, and guidelines.

by the

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL TRANSIT ADMINISTRATION

and the

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Bernard Cohen
Director, Lower Manhattan Recovery Office
Federal Transit Administration

5/2/05
Date of Approval

Anthony G. Cracchiolo
Director, Priority Capital Programs
The Port Authority of New York and New Jersey

5/2/05
Date of Approval

ABSTRACT

The Federal Transit Administration (FTA) and The Port Authority of New York and New Jersey (PANYNJ), have completed a Final Environmental Impact Statement (FEIS) and Section 4(f) Evaluation for the Permanent World Trade Center (WTC) PATH Terminal, a project involving the reconstruction of a permanent terminal at the WTC site in Lower Manhattan for the Port Authority Trans-Hudson (PATH) system. The Permanent WTC PATH Terminal is proposed to be a full service, regional transportation hub that would be coordinated with the existing and future transportation infrastructure, WTC site development, and the surrounding area. The project is needed to re-establish and enhance transportation facilities and infrastructure that existed at the WTC complex prior to September 11, 2001 and to ensure the long-term accessibility and economic vitality of Lower Manhattan.

The FEIS has been prepared pursuant to the National Environmental Policy Act (NEPA). The alternatives considered in the FEIS include a No Action Alternative, and a Preferred Alternative. The Preferred Alternative is carried forward for detailed evaluation in this FEIS after careful consideration of a range of alternatives as part of the planning for a Permanent WTC PATH Terminal and following public comments during the scoping process and public comment period for the DEIS. The analyses and impact assessments in the FEIS consider potential effects on transit service and transportation, land use and local planning, social and economic conditions, historic and archaeological resources, urban design and visual resources, air quality, noise and vibration, infrastructure and energy, contaminated materials, natural and water resources, coastal zone management, safety and security, and cumulative effects. Environmental Performance Commitments, preliminary sustainable design guidelines, and mitigation measures to reduce impacts, including stipulations set forth in the Project's Memorandum of Agreement pursuant to Section 106 of the National Historic Preservation Act are described in the document.

For additional information concerning this document, contact:

Bernard Cohen
Federal Transit Administration, Lower Manhattan Recovery Office
One Bowling Green, Room 436
New York, NY 10004
(212) 668-1770

Anthony Cracchiolo
The Port Authority of New York and New Jersey, Priority Capital Programs
115 Broadway, 10th Floor
New York, NY 10006
(212) 435-5599

Information concerning this document can be obtained from the project website: www.panynj.gov/pathrestoration.✱

Table of Contents

Volume I

Executive Summary **S-1**

1: Purpose and Need **1-1**

A. Introduction 1-1

B. Historical Overview 1-2

The PATH System 1-2

History of PATH Service to Lower Manhattan 1-3

The Hudson & Manhattan Terminal 1-3

The WTC PATH Terminal 1-4

Current PATH Service to Lower Manhattan 1-4

PATH Ridership 1-5

Pre-September 11, 2001 Regional Travel to Manhattan 1-5

Pre-September 11, 2001 PATH Ridership 1-7

The WTC Concourse 1-8

Current Planning Context 1-8

Lower Manhattan Recovery Projects 1-8

Other Downtown Projects 1-10

C. Problem Definition 1-10

Economic Recovery 1-10

Ridership Growth 1-11

Commuting to Lower Manhattan Without PATH 1-11

Trans-Hudson Ferries 1-12

Uptown PATH Lines 1-12

New Jersey Transit Commuter Rail 1-12

Limitations of Temporary PATH Service 1-13

D. Goals and Objectives 1-14

2: Project Alternatives **2-1**

A. Introduction 2-1

B. Alternatives Development Process 2-2

Locations Feasibility Analysis Framework 2-2

Alternatives for Further Study 2-11

No Action Alternative....2-11
Preferred Alternative....2-12
Alternatives Considered and Eliminated....2-16
PATH-6 Train Connection....2-16
Terminal With Liberty Plaza Connection Alternative....2-18
Design Options Considered and Eliminated....2-18
Stand-Alone Terminal....2-18
Route 9A Pedestrian Bridge....2-19
South Ventilation Structure....2-20
C. Analysis Framework....2-20
Assessment of Probable Impacts of the Project Alternatives....2-20
Assessment of Cumulative Effects....2-23

3: Construction Materials and Methods....3-1

A. Introduction....3-1
B. No Action Alternative....3-1
C. Preferred Alternative....3-1
Schedule....3-2
Construction Elements....3-3
North/South Temporary Access....3-3
East-West Concourse....3-3
Platform D, Arch Columns, and Temporary Underpinning....3-4
Permanent Platforms, Tracks, and Mezzanine....3-4
WTC PATH Transit Hall....3-5
Materials Delivery and Spoils Removal....3-5
Environmental Performance Commitments....3-5
D. Construction Analysis Framework....3-6
Critical Analysis Year (2006)....3-7
Description of Construction Elements....3-8

4: Land Use, Neighborhood Character, and Public Policy....4-1

A. Introduction....4-1
B. Methodology....4-1
Study Area and Subareas....4-1
C. Description of the Affected Environment....4-3
Pre-September 11, 2001 Baseline Conditions....4-3
Land Use and Neighborhood Character....4-3
Public Policy....4-8
Changes in the Affected Environment Since September 11, 2001....4-14
Land Use and Neighborhood Character....4-14

Public Policy 4-18
D. Probable Impacts of the Project Alternatives 4-19
Construction Period (2006) 4-19
Future Common to All Alternatives 4-19
No Action Alternative 4-21
Preferred Alternative 4-21
Opening Year (2009) 4-22
Future Common to All Alternatives 4-22
No Action Alternative 4-24
Preferred Alternative 4-25
Design Year (2025) 4-26
Future Common to All Alternatives 4-26
No Action Alternative 4-28
Preferred Alternative 4-28
E. Mitigation 4-29

5: Socioeconomic Conditions 5-1

A. Introduction 5-1
B. Methodology 5-1
Framework of Analyses 5-1
Baseline Conditions 5-1
Study Area Definitions 5-2
Population and Housing 5-2
Commercial Office Market 5-2
Commercial Retail Market 5-2
Employment 5-3
Data Sources 5-3
Population and Housing 5-3
Office 5-4
Retail 5-4
Employment 5-4
Environmental Justice 5-5
C. Description of the Affected Environment 5-5
Pre-September 11, 2001 Baseline Conditions 5-5
Population and Housing 5-5
Commercial Office Market 5-10
Commercial Retail Market 5-11
Employment 5-11
Changes in the Affected Environment Since September 11, 2001 5-13
Population and Housing 5-13
Commercial Office Market 5-14

Commercial Retail Market 5-16
Employment 5-17
D. Probable Impacts of the Project Alternatives 5-19
Construction Period (2006) 5-19
Future Common to All Alternatives 5-19
No Action Alternative 5-20
Preferred Alternative 5-20
Opening Year (2009) 5-22
Future Common to All Alternatives 5-22
No Action Alternative 5-24
Preferred Alternative 5-24
Design Year (2025) 5-25
Future Common to All Alternatives 5-25
No Action Alternative 5-26
Preferred Alternative 5-26
E. Mitigation 5-27

6: Cultural Resources 6-1

A. Introduction 6-1
B. Methodology 6-1
Regulatory Context 6-1
National Historic Preservation Act (Section 106) 6-1
Section 4(f) of the U.S. Department of Transportation Act 6-3
State Historic Preservation Act 6-3
New York City Landmarks Law 6-3
Area of Potential Effect 6-4
Archaeological Resources 6-4
Historic Resources 6-4
Assessment of Effects on Historic Resources 6-6
C. Description of the Affected Environment 6-6
Pre-September 11, 2001 Baseline Conditions 6-6
Archaeological Resources 6-6
Historic Resources 6-7
Changes in the Affected Environment Since September 11, 2001 6-8
Archaeological Resources 6-8
Historic Resources 6-10
D. Probable Impacts of the Project Alternatives 6-16
Construction Period (2006) 6-16
Future Common to All Alternatives 6-16
No Action Alternative 6-17
Preferred Alternative 6-17

Opening Year (2009) 6-21
Future Common to All Alternatives 6-21
No Action Alternative 6-21
Preferred Alternative 6-21
Design Year (2025) 6-23
Future Common to All Alternatives 6-23
No Action Alternative 6-23
Preferred Alternative 6-23
E. Mitigation 6-24
Project-Specific Commitments 6-24
WTC Site 6-24
Archaeological Treatment Plans 6-27
Construction Protection Plans 6-27
Environmental Performance Committments 6-28

7: Urban Design and Visual Resources 7-1

A. Introduction 7-1
B. Methodology 7-2
C. Description of the Affected Environment 7-2
Pre-September 11, 2001 Baseline Conditions 7-2
Project Site 7-2
Study Area 7-2
Changes in the Affected Environment Since September 11, 2001 7-5
Project Site 7-5
Study Area 7-6
D. Probable Impacts of the Project Alternatives 7-7
Construction Period (2006) 7-7
Future Common to All Alternatives 7-7
No Action Alternative 7-7
Preferred Alternative 7-7
Opening Year (2009) 7-8
Future Common to All Alternatives 7-8
No Action Alternative 7-8
Preferred Alternative 7-8
Design Year (2025) 7-10
Future Common to All Alternatives 7-10
No Action Alternative 7-10
Preferred Alternative 7-11
E. Mitigation 7-11

8: Transportation 8-1
A. Introduction 8-1
B. Analysis Framework for the Project Alternatives 8-1
No Action Alternative 8-1
Preferred Alternative 8-3
C. Evaluation of Probable Impacts of the Project Alternatives 8-3

Chapter 8, Section A: PATH 8A-1
A. Introduction 8A-1
B. Methodology 8A-2
C. Description of the Affected Environment 8A-2
Pre-September 11, 2001 Baseline Conditions 8A-2
Operations 8A-2
WTC PATH Terminal 8A-4
Ridership 8A-5
Changes in the Affected Environment Since September 11, 2001 ..... 8A-7
Changes in the PATH System 8A-7
Changes in PATH Ridership 8A-7
Effects on Other Transit Services 8A-8
Temporary WTC PATH Service 8A-8
D. Probable Impacts of the Project Alternatives 8A-9
Construction Period (2006) 8A-9
Future Common to All Alternatives 8A-9
No Action Alternative 8A-11
Preferred Alternative 8A-11
Opening Year (2009) 8A-11
Future Common to All Alternatives 8A-11
No Action Alternative 8A-12
Preferred Alternative 8A-12
Design Year (2025) 8A-15
Future Common to All Alternatives 8A-15
No Action Alternative 8A-15
Preferred Alternative 8A-16
E. Mitigation 8A-16

Chapter 8, Section B: Vehicular Traffic and Parking 8B-1
A. Introduction 8B-1
B. Methodology 8B-1
C. Description of the Affected Environment 8B-4
Pre-September 11, 2001 Baseline Conditions 8B-4

Street Network and Traffic Volumes 8B-4
Traffic Levels of Service 8B-5
Parking 8B-5
Changes in the Affected Environment Since September 11, 2001 ..... 8B-6
Street Network and Traffic Volumes 8B-6
Traffic Levels of Service 8B-7
Parking 8B-8
D. Probable Impacts of the Project Alternatives 8B-8
Construction Period (2006) 8B-9
Future Common to All Alternatives 8B-9
No Action Alternative 8B-9
Preferred Alternative 8B-10
Opening Year (2009) 8B-12
Future Common to All Alternatives 8B-12
No Action Alternative 8B-12
Preferred Alternative 8B-12
Design Year (2025) 8B-12
Future Common to All Alternatives 8B-12
No Action Alternative 8B-12
Preferred Alternative 8B-13
E. Mitigation 8B-14

Chapter 8, Section C: Transit 8C-1

A. Introduction 8C-1
B. Methodology 8C-2
C. Description of the Affected Environment 8C-2
Pre-September 11, 2001 Baseline Conditions 8C-2
NYCT Subway Service 8C-2
Local Bus Service 8C-3
Express Bus Service 8C-5
New Jersey Transit Commuter Rail 8C-7
Trans-Hudson Ferries 8C-7
Changes in the Affected Environment Since September 11, 2001 ..... 8C-7
NYCT Subway Service 8C-8
Uptown PATH Lines 8C-9
Local Bus Service 8C-10
Express Bus Service 8C-10
NJ Transit Commuter Rail 8C-12
Trans-Hudson Ferries 8C-12
D. Probable Impacts of the Project Alternatives 8C-15
Construction Period (2006) 8C-15

Future Common to All Alternatives 8C-15
No Action Alternative 8C-15
Preferred Alternative 8C-15
Opening Year (2009) 8C-16
Future Common to All Alternatives 8C-16
No Action Alternative 8C-17
Preferred Alternative 8C-17
Design Year (2025) 8C-17
Future Common to All Alternatives 8C-17
No Action Alternative 8C-18
Preferred Alternative 8C-19
E. Mitigation 8C-19

Chapter 8, Section D: Pedestrians 8D-1
A. Introduction 8D-1
B. Methodology 8D-2
C. Description of the Affected Environment 8D-3
Pre-September 11, 2001 Baseline Conditions 8D-3
Changes in the Affected Environment Since September 11, 2001 ..... 8D-6
D. Probable Impacts of the Project Alternatives 8D-8
Construction Period (2006) 8D-8
Future Common to All Alternatives 8D-8
No Action Alternative 8D-8
Preferred Alternative 8D-8
Opening Year (2009) 8D-10
Future Common to All Alternatives 8D-10
No Action Alternative 8D-10
Preferred Alternative 8D-10
Design Year (2025) 8D-15
Future Common to All Alternatives 8D-15
No Action Alternative 8D-15
Preferred Alternative 8D-16
E. Mitigation 8D-19
Construction Period (2006) 8D-20
Opening Year (2009) 8D-20
Design Year (2025) 8D-22

9: Air Quality 9-1
A. Introduction 9-1
B. Methodology 9-1

Pollutants for Analysis 9-1
Carbon Monoxide 9-2
Nitrogen Oxides and Ozone 9-2
Lead 9-2
Respirable Particulate Matter—PM_{10} and $PM_{2.5}$ 9-3
Sulfur Dioxide 9-3
Air Quality Standards 9-3
National and State Air Quality Standards 9-3
Interim Guidance Criteria Regarding $PM_{2.5}$ Impacts 9-4
State Implementation Plan (SIP) 9-6
Transportation Conformity 9-6
Microscale Air Quality Analysis Methodology 9-7
Overview 9-7
Analysis of On-Road Mobile Sources 9-8
Analysis of On-Site Construction Activity 9-10
Receptor Locations 9-12
Mesoscale Analysis of Emissions from Construction and Operation of the Project 9-13
Construction Period Emissions 9-13
Operational Period Emissions Reduction 9-13
C. Description of the Affected Environment 9-14
Pre–September 11, 2001 Baseline Conditions 9-14
Changes in the Affected Environment Since September 11, 2001 9-15
D. Probable Impacts of the Project Alternatives 9-18
Construction Period (2006) 9-18
Future Common to All Alternatives 9-18
No Action Alternative 9-18
Preferred Alternative 9-18
Opening Year (2009) 9-23
Future Common to All Alternatives 9-23
No Action Alternative 9-23
Preferred Alternative 9-23
Design Year (2025) 9-23
Future Common to All Alternatives 9-23
No Action Alternative 9-23
Preferred Alternative 9-24
E. Mitigation 9-24
Project-Specific Commitments 9-25
Ultra Low Sulfur Diesel Fuel (ULSD) 9-25
Electrification 9-25

Advanced Reduction Technologies 9-25
Newer Engines 9-26
Diesel Emission Mitigation (DEM) Plan 9-26
Dust Control Plan 9-26
Verification 9-26
Other Emissions Reduction Technologies 9-27
Mitigation Analysis 9-27

10: Noise and Vibration 10-1

A. Introduction 10-1
B. Methodology 10-1
Airborne Noise 10-1
Noise Prediction Methodology 10-3
Determination of Existing Noise Levels 10-3
Modeling to Predict Future Conditions for the Project Alternatives 10-5
Modeling to Predict Impacts from Construction Activities 10-5
Modeling to Predict Impacts from Train Operations 10-5
Vibration and Ground-Borne Noise 10-6
Impact Criteria 10-6
Construction Vibration Prediction Methodology 10-8
C. Description of the Affected Environment 10-8
D. Probable Impacts of the Project Alternatives 10-10
Construction Period (2006) 10-10
Future Common to All Alternatives 10-10
No Action Alternative 10-10
Preferred Alternative 10-10
Opening Year (2009) 10-13
Future Common to All Alternatives 10-13
No Action Alternative 10-14
Preferred Alternative 10-14
Design Year (2025) 10-15
Future Common to All Alternatives 10-15
No Action Alternative 10-15
Preferred Alternative 10-15
E. Mitigation 10-15
Project-Specific Commitments 10-15
Construction Period 10-15
Opening and Design Years 10-17
Environmental Performance Commitments 10-18

11: Infrastructure and Energy 11-1
A. Introduction 11-1
B. Methodology 11-1
C. Description of the Affected Environment 11-2
Pre-September 11, 2001 Baseline Conditions 11-2
Water Supply 11-2
Sanitary Sewage and Stormwater Disposal 11-3
Solid Waste 11-4
Energy 11-4
Changes in the Affected Environment Since September 11, 2001 11-4
Water Supply 11-4
Sanitary Sewage and Stormwater Disposal 11-5
Solid Waste 11-5
Energy 11-5
D. Probable Impacts of the Project Alternatives 11-5
Construction Period (2006) 11-5
Future Common to All Alternatives 11-5
No Action Alternative 11-6
Preferred Alternative 11-6
Opening Year (2009) 11-7
Future Common to All Alternatives 11-7
No Action Alternative 11-7
Preferred Alternative 11-8
Design Year (2025) 11-10
Future Common to All Alternatives 11-10
No Action Alternative 11-11
Preferred Alternative 11-11
E. Mitigation 11-12

12: Contaminated Materials 12-1
A. Introduction 12-1
B. Methodology 12-1
C. Description of the Affected Environment 12-2
Pre-September 11, 2001 Baseline Conditions 12-2
Geology and Landform 12-2
Historical Uses 12-4
Documented Environmental Contamination Issues 12-5
Hazardous Material Storage Areas 12-6
Changes in the Affected Environment Since September 11, 2001 12-6
D. Probable Impacts of the Project Alternatives 12-9

Construction Period (2006) 12-9
Future Common to All Alternatives 12-9
No Action Alternative 12-9
Preferred Alternative 12-10
Opening Year (2009) 12-12
Future Common to All Alternatives 12-12
No Action Alternative 12-12
Preferred Alternative 12-12
Design Year (2025) 12-12
Future Common to All Alternatives 12-12
No Action Alternative 12-13
Preferred Alternative 12-13
E. Mitigation 12-13

13: Natural and Water Resources 13-1

A. Introduction 13-1
B. Methodology 13-2
Data Sources 13-2
Regulatory Framework 13-2
Federal 13-2
State 13-4
C. Description of the Affected Environment 13-5
Pre-September 11, 2001 Baseline Conditions 13-5
Terrestrial Resources 13-5
Floodplains 13-6
Water Quality and Aquatic Resources 13-6
Essential Fish Habitat (EFH) 13-9
Endangered, Threatened, and Special Concern Species 13-9
Changes in the Affected Environment Since September 11, 2001 13-10
Terrestrial Resources 13-10
Floodplains 13-11
Water Quality and Aquatic Resources 13-11
Essential Fish Habitat (EFH) 13-12
Endangered, Threatened, and Special Concern Species 13-12
D. Probable Impacts of the Project Alternatives 13-12
Construction Period (2006) 13-12
Future Common to All Alternatives 13-12
No Action Alternative 13-15
Preferred Alternative 13-15
Opening Year (2009) 13-17
Future Common to All Alternatives 13-17

No Action Alternative 13-18
Preferred Alternative 13-19
Design Year (2025) 13-23
Future Common to All Alternatives 13-23
No Action Alternative 13-24
Preferred Alternative 13-24
E. Mitigation 13-25
Terrestrial Resources 13-25
Floodplains 13-26

14: Coastal Zone Management 14-1

A. Introduction 14-1
B. Methodology 14-1
C. Description of the Affected Environment 14-2
D. Probable Impacts of the Project Alternatives 14-2
No Action Alternative 14-2
Preferred Alternative 14-2
E. Mitigation 14-10

15: Cumulative Effects 15-1

A. Introduction 15-1
B. Methodology 15-2
Approach to Construction Period Effects 15-4
Data Development and Baseline Conditions 15-4
Impact Assessment 15-5
Cumulative Construction Analysis Framework 15-8
Mitigation 15-17
Approach to Opening Year (2009) and Design Year (2025) Effects 15-20
C. Probable Construction Period Effects 15-21
Access and Circulation 15-22
Vehicular Traffic 15-22
Pedestrian Circulation 15-24
Air Quality 15-25
Probable Impacts 15-27
Mitigation 15-31
Conditions With the Revised Schedules 15-34
Noise and Vibration 15-35
Probable Impacts 15-35
Mitigation 15-37
Conditions With the Revised Schedules 15-38

Cultural and Historic Resources....15-38
Probable Impacts....15-38
Mitigation....15-38
Conditions With the Revised Schedules....15-40
Economic Conditions....15-40
Probable Impacts....15-40
Mitigation....15-41
Conditions With the Revised Schedules....15-41
D. Probable Opening Year (2009) and Design Year (2025) Effects....15-41
No Action Alternative....15-42
Preferred Alternative....15-42

16: Commitment of Resources....16-1

A. Introduction....16-1
B. Irreversible and Irretrievable Commitment of Resources....16-1
C. Short-Term Uses Versus Long-Term Productivity....16-3
Short-Term Uses....16-4
Long-Term Productivity....16-4
Short-Term Uses Versus Long-Term Productivity....16-6
D. Cost and Funding....16-6

17: Safety and Security....17-1

A. Introduction....17-1
B. Construction Period (2006)....17-1
C. Opening Year (2009) and Design Year (2025)....17-2

18: Agency Coordination, Process, and Public Participation....18-1

A. Introduction....18-1
B. Public Involvement Program....18-1
Mailing List....18-1
Flyers....18-2
Mobile Public Information Centers....18-2
Newsletters....18-2
Website....18-2
C. Public Involvement Activities....18-2
Agency and Stakeholder Coordination....18-2
Federal Inter-Agency Review Team....18-2
Lower Manhattan Project Sponsors....18-3
Technical Advisory Committee....18-4
Other Agency/Stakeholder Outreach....18-4

Public Involvement Meetings 18-5
Public Scoping 18-5
Public Hearings on Draft Environmental Impact Statement 18-5
The Section 106 Process 18-6
D. Environmental and Regulatory Agencies 18-8
E. Laws, Permits, and Regulatory Requirements 18-9
Federal 18-9
State 18-11
F. FTA and PANYNJ Contacts 18-11

19: Public Comments on the DEIS and Responses 19-1
A. Introduction 19-1
B. List of Commenters 19-1
C. Comments and Responses 19-3
Purpose and Need 19-3
Project Alternatives 19-4
Construction Methods and Materials 19-15
Land Use, Neighborhood Character, and Public Policy 19-20
Socioeconomic Conditions 19-22
Cultural Resources 19-22
Urban Design and Visual Resources 19-37
Transportation 19-38
Air Quality 19-42
Noise and Vibration 19-47
Infrastructure and Energy 19-47
Contaminated Materials 19-49
Natural and Water Resources 19-50
Coastal Zone Management 19-52
Cumulative Effects 19-52
Commitment of Resources 19-56
Draft Section 4(f) Evaluation 19-56
Appendix B-2: Draft Finding of Effects 19-58

Section 4(f) Evaluation ..... 4(f)-1

References References-1
A. Bibliography References-1
B. Laws, Rules, and Regulations References-8
C. Supporting Documentation References-9

List of Agencies and Organizations **Agencies-1**

A. List of Notified Parties Agencies-1

B. Public Viewing Locations Agencies-11

List of Preparers **Preparers-1**

Glossary of Acronyms **Glossary-1**

Volume II

Appendix A: Land Use, Neighborhood Character, and Public Policy **A-1**

Appendix B: Cultural Resources **B-1**

B-1: Coordinated Determination of National Register Eligibility—World Trade Center Site, New York City, New York

B-2: Permanent WTC PATH Terminal Memorandum of Agreement

B-3: Phase 1A Archaeological Assessment: World Trade Center Property

B-4: Topic Intensive Archaeological Study: World Trade Center Property

B-5: Route 9A Reconstruction Project: Cultural Resources Summary Report

B-6: Programmatic Agreement among the United States Army Corps of Engineers, the New York State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Development of the Hudson River Park Along Manhattan's West Side in New York City, New York

B-7: Correspondence

Appendix C: Transportation **C-1**

C-1: PATH Ridership Estimates

C-2: Platform and Truck Planning Requirements

C-3: Vehicular Traffic and Parking

C-4: Pedestrians

C-5: Cumulative Construction Traffic

Appendix D Air Quality **D-1**

Appendix E: Noise and Vibration **E-1**

Appendix F: Contaminated Materials **F-1**

Appendix G: Natural and Water Resources **G-1**

Appendix H: Process, Agency Coordination, and Public Participation **H-1**

H-1: Response to Comments on Draft Scope

H-2: DEIS Public Hearing Transcripts
H-3: Written Comments on the DEIS
H-4: Section 106 Review Meeting Transcripts
H-5: Written Comments from Section 106 Consulting Parties

Appendix I: Construction Analysis and Management Framework I-1

I-1: Environmental Analysis Framework and Environmental Performance Commitments
I-2: Executive Order Establishing the Lower Manhattan Construction Command Center

List of Tables

1-1 PATH Stations and Connecting Transit Services 1-2

1-2 2000 Weekday Hub Bound Trips by Sector 1-6

1-3 2000 Weekday Hub Bound Trips by Mode of Travel for the New Jersey Sector 1-6

1-4 2000 Weekday Hub Bound Trips by PATH 1-6

1-5 Pre-September 11, 2001 Origins and Destinations of Riders at the WTC PATH Terminal 1-7

1-6 Pre-September 11, 2001 Off-Site Origins and Destinations of Riders at the WTC PATH Terminal 1-8

2-1 Locations Feasibility Planning Constraints 2-3

2-2 Locations Feasibility Planning Guidelines 2-4

2-3 Locations Feasibility Detailed Screening Analysis Results 2-9

2-4 Comparison of the WTC "Bathtub," Church Street, and "Hybrid" Locations 2-10

2-5 Project Cost 2-16

2-6 Environmental Performance Commitments 2-26

3-1 Element 1 – Summary of Off-Site Construction Activity 3-9

3-2 Element 1 – Summary of On-Site Construction Activity 3-10

3-3 Element 2 – Summary of Off-Site Construction Activity 3-10

3-4 Element 2 – Summary of On-Site Construction Activity 3-11

3-5 Element 3 – Summary of Off-Site Construction Activity 3-12

3-6 Element 3 – Summary of On-Site Construction Activity 3-12

3-7 Summary of Total Peak Daily Trucks (Elements 1 through 3) 3-13

4-1 Study Area Zoning 4-10

4-2 Zoning Districts By Subarea 4-10

4-3 Affected Buildings 4-14

5-1 Pre-September 11, 2001 Population Characteristics in Lower Manhattan (1990 and 2000) 5-6

5-2 Pre-September 11, 2001 Housing Characteristics in Lower Manhattan, (1990 and 2000) 5-8

5-3 Pre-September 11, 2001 Household and Income Characteristics in Lower Manhattan (1990 and 2000) 5-9

5-4 Pre-September 11, 2001 Manhattan Office Market Characteristics (Year-End 2000) 5-10

5-5 Pre-September 11, 2001 Lower Manhattan Office Inventory and Rents (2001) 5-10

5-6 Pre-September 11, 2001 Lower Manhattan Office Vacancy (2001) 5-11

5-7 Pre-September 11, 2001 Lower Manhattan Employment (2000) 5-12

5-8 Post September 11, 2001 Midtown Office Inventory and Rents (2003) 5-14

5-9 Post September 11, 2001 Manhattan Office Vacancy (2003) 5-14

5-10 Post September 11, 2001 Lower Manhattan Office Inventory and Rents (2003) 5-15

5-11 Post September 11, 2001 Lower Manhattan Office Vacancy (2003) 5-15

5-12 Post-September 11, 2001 Manhattan and New York City Private Sector Insured Employment (2002) 5-18

5-13 Post-September 11, 2001 Lower Manhattan Employment (2002) 5-19

5-14 Projected Housing, Population, and Employment in Lower Manhattan in the Construction Period (2006) 5-20

5-15 Employment and Fiscal Benefits from Construction of the Preferred Alternative 5-23

5-16 Projected Housing, Population, and Employment in Lower Manhattan in the Opening Year (2009) 5-23

5-17 Projected Housing, Population, and Employment in Lower Manhattan in the Design Year (2025) 5-25

5-18 Environmental Performance Commitments 5-27

6-1 Known Resources in the Area of Potential Effect 6-12

6-2 Environmental Performance Commitments 6-28

8-1 No Action Alternative: Diversion of WTC PATH Riders 8-2

8A-1 PATH Stations and Nearby Connecting Transit Services 8A-3

8A-2 Pre-September 11, 2001 PATH Train Operations 8A-4

8A-3 Average Weekday Ridership for Selected PATH Stations: 1992 to 1999 ..... 8A-5

8A-4 Pre-September 11, 2001 Origins and Destinations of Riders at the WTC PATH Terminal 8A-6

8A-5 Pre-September 11, 2001 Off-Site Origins and Destinations of Riders at the WTC PATH Terminal 8A-7

8A-6 PATH Ridership Forecast for WTC Service in the Opening Year (2009) 8A-12

8A-7 PATH Ridership Forecast for WTC Service in the Design Year (2025) 8A-15

8B-1 Pre-September 11, 2001 Conditions: Intersection Levels of Service 8B-6

8B-2 Comparison of Pre- and Post-September 11, 2001 Intersection Levels of Service 8B-8
8B-3 2006 No Action Alternative: Intersection Levels of Service 8B-9
8B-4 2006 No Action and Preferred Alternatives: AM Peak Hour Intersection Levels of Service 8B-10
8B-5 2006 No Action and Preferred Alternatives: Midday Peak Hour Intersection Levels of Service 8B-11
8B-6 2006 No Action and Preferred Alternatives: PM Peak Hour Intersection Levels of Service 8B-11
8B-7 2025 No Action Alternative: Projected Increase in AM Peak Hour Vehicle Trips from Diverted PATH Customers 8B-13
8B-8 Environmental Performance Commitments 8B-14
8C-1 Pre-September 11, 2001 (May 2001) Average Weekday Subway Turnstile Registration 8C-3
8C-2 Pre-September 11, 2001 (May 2001) Subway Line-Haul for WTC Area Stations 8C-4
8C-3 Pre-September 11, 2001 Average Weekday Local Bus Ridership 8C-5
8C-4 Pre-September 11, 2001 Average Weekday Express Bus Ridership 8C-6
8C-5 Pre-September 11, 2001 Trans-Hudson Ferry Routes to Lower Manhattan 8C-7
8C-6 Post-September 11, 2001 (May 2002) Average Weekday Subway Turnstile Registration 8C-8
8C-7 Post-September 11, 2001 (May 2002) Subway Line-Haul for WTC Area Stations 8C-9
8C-8 Pre- and Post-September 11, 2001 Average Weekday Local Bus Ridership 8C-10
8C-9 Pre- and Post-September 11, 2001 Average Weekday Express Bus Ridership 8C-11
8C-10 Comparison of Pre- and Post-September 11, 2001 (June 2002) Trans-Hudson Ferry Ridership to Lower Manhattan 8C-13
8C-11 Trans-Hudson Ferry Ridership With Temporary PATH Service (January 2004) 8C-14
8C-12 2025 No Action Alternative: Diversions to Public Transportation Without the Permanent WTC PATH Terminal 8C-18
8D-1 Pedestrian Level of Service Definitions 8D-4
8D-2 Pre-September 11, 2001 Pedestrian Level of Service 8D-5
8D-3 Post-September 11, 2001 Pedestrian Level of Service 8D-7
8D-4 2006 Construction Period Baseline Pedestrian Level of Service 8D-9
8D-5 2009 Opening Year Preferred Alternative: Pedestrian Level of Service 8D-11
8D-6 2025 Design Year Preferred Alternative: Pedestrian Level of Service 8D-17
8D-7 Pedestrian Impacts and Mitigation Measures 8D-21
9–1 Ambient Air Quality Standards 9-5

9–2 Measured Concentrations from the Nearest Air Quality Monitoring Stations.....9-15

9–3 Particulate Matter Concentrations for WTC Specific Monitors, 2001–2003.....9-17

9–4 2006 Construction Period: Maximum Predicted 8–Hour Average CO Concentrations.....9-19

9–5 2006 Highest Predicted Increase in Pollutant Concentrations from Construction of the Preferred Alternative.....9-19

9–6 2006 Highest Predicted Total Pollutant Concentrations During Construction of the Preferred Alternative.....9-21

9–7 Total Regional (Mesoscale) Direct and Indirect Emissions from Construction of the Preferred Alternative (Tons Per Year).....9-22

9–8 2025 Design Year No Action Alternative: Incremental Increase in Regional Pollutant Emissions Without the Permanent WTC PATH Terminal (Tons/Year).....9-24

9–9 Environmental Performance Commitments.....9-24

9–10 2006 Highest Predicted Increase in Pollutant Concentrations from Construction of the Preferred Alternative With Mitigation.....9-28

9–11 2006 Highest Predicted Total Pollutant Concentrations During Construction of the Preferred Alternative With Mitigation.....9-29

9–12 Total Emissions from Construction of the Preferred Alternative With Mitigation (Tons Per Year).....9-30

10-1 FTA Impact Criteria for Detailed Assessment of Airborne Construction Noise (in dBA).....10-2

10-2 FTA's Land Use Categories and Metrics for Operational Transit Noise Impact Criteria.....10-3

10-3 Noise Receptor Sites and Locations.....10-4

10-4 Typical Levels of Ground-Borne Vibration.....10-7

10-5 Ground-Borne Vibration and Noise Impact Criteria.....10-7

10-6 Post-September 11, 2001 Measured 24-Hour Noise Levels (in dBA).....10-9

10-7 Post-September 11, 2001 Measured 20-Minute Noise Levels (in dBA).....10-9

10-8 Measured 20-Minute Noise Levels for Parks in Lower Manhattan (in dBA).....10-10

10-9 Construction Equipment Noise Emission Levels (in dBA).....10-11

10-10 2006 Construction Period Noise Levels Without Mitigation for the Preferred Alternative (in dBA).....10-12

10-11 2006 Construction Period Vibration Levels vs. Distance from Source for the Preferred Alternative (in dBA).....10-13

10-12 Train Noise Impact Evaluation of the Preferred Alternative at the WTC Memorial Site...10-14

10-13 Vibration and Ground-Borne Noise Impact Evaluation of the Preferred Alternative at the WTC Memorial Site.....10-15

10-14 Summary of Noise Mitigation Measures 10-16
10-15 2006 Construction Period Noise Levels With Mitigation (in dBA) 10-16
10-16 Environmental Performance Commitments 10-18
13-1 World Trade Center Cooling Water Outfall Discharge Limitations 13-18
13-2 Bird Strike Data Compiled by NYCAS from May 2001 through December 2003 for Buildings in the Vicinity of the Project Site 13-21
15-1 Typical Construction Period Truck Trip Generation for Private Developments 15-15
15-2 Total Peak Daily Truck Trips Generated by Lower Manhattan Recovery Projects—Critical Analysis Year 15-16
15-3 2006 Construction Period: Summary of Peak Hour Adverse Impacts 15-23
15-4 Comparison of Cumulative Construction Period Level-of-Service 15-25
15-5 Critical Analysis Year: Maximum Predicted 8-Hour Average CO Concentrations .. 15-27
15–6 Highest Predicted Increase in Pollutant Concentrations from Cummulative Construction of the Lower Manhattan Recovery Projects in the Critical Analysis Year 15-28
15-7 Highest Predicted Total Pollutant Concentrations from Cumulative Construction of the Lower Manhattan Recovery Projects in the Critical Analysis Year 15-29
15–8 Total Mesoscale Direct and Indirect Emissions from Cumulative Construction of the Lower Manhattan Recovery Projects in the Critical Analysis Year 15-31
15–9 Highest Predicted Increase in Pollutant Concentrations from Cumulative Construction of the Lower Manhattan Recovery Projects With Mitigation in the Critical Analysis Year 15-33
15–10 Highest Predicted Total Pollutant Concentrations from Cumulative Construction of the Lower Manhattan Recovery Projects With Mitigation in the Critical Analysis Year 15-34
15-11 2006 Cumulative Construction Noise Impacts at Permanent WTC PATH Terminal Receptors (in dBA) 15-36
15-12 2006 Cumulative Noise Impacts At Other Nearby Receptors (in dBA) 15-36
15-13 Cumulative Effects to Known Historic Resources Within the Area of Potential Effect for the Permanent WTC PATH Terminal 15-39
16-1 Employment and Fiscal Benefits from Construction of the Preferred Alternative 16-2

List of Figures

		Following Page
1-1	PATH System	1-2
1-2	Pre-September 11, 2001 WTC PATH Terminal	1-4
1-3	Pre-September 11, 2001 Daily Boardings	1-8
2-1	Alternative Locations	2-4
2-2	Platform Level	2-12
2-3	Mezzanine Level	2-14
2-4a	Concourse Level (Main)	2-14
2-4b	Concourse Level (Balcony)	2-14
2-5	Street Level	2-14
3-1	Construction Schedule	3-2
3-2	Truck Routes	3-6
3-3	Elements 1-3	3-8
4-1	Land Use Study Area	4-2
4-2	Zoning Map	4-10
4-3	Existing Land Use (January 2004)	4-14
4-4	Parcels with Changes in Land Use Since September 11, 2001	4-14
5-1	Land Use Study Area	5-2
5-2	Lower Manhattan Office and Retail Market Subareas	5-2
5-3	Manhattan Office Submarkets	5-2
5-4	Retail Uses	5-24
6-1	Area of Potential Effect	6-4
6-2	Areas of Potential Archaeological Sensitivity	6-6
6-3	Known Historic Resources	6-14
6-4	Known Historic Resources	6-14
6-5	Known Historic Resources	6-16
7-1	Urban Design and Visual Resources Study Area	7-2
7-2	Urban Design and Visual Resources Pre-September 11, 2001 Conditions	7-2
7-3	Urban Design and Visual Resources Pre-September 11, 2001 Conditions	7-4
7-4	Urban Design and Visual Resources Post-September 11, 2001 (Current) Conditions	7-6
7-5	Urban Design and Visual Resources Post-September 11, 2001 (Current) Conditions	7-6
7-6	Urban Design and Visual Resources Post-September 11, 2001 (Current) Conditions	7-6
7-7	Proposed Terminal Design	7-10
7-8	Proposed Terminal Design	7-10
7-9	Proposed Winter Garden Entrance	7-10

7-10 Proposed Route 9A Vent 7-10
7-11 Proposed Route 9A Vent 7-10
8A-1 PATH System 8A-2
8A-2 Pre-September 11, 2001 Conditions Off-Site Destinations of AM Peak Hour PATH Riders 8A-6
8A-3 Pedestrian Connections 8A-14
8B-1 Traffic Analysis Locations 8B-2
8B-2 Peak Hourly Construction Period Truck Trips 8B-10
8C-1 Pre-September 11, 2001 Subway Station Locations 8C-2
8C-2 Pre-September 11, 2001 Local Bus Routes 8C-6
8C-3 Pre-September 11, 2001 Express Bus Routes 8C-6
8C-4 Post-September 11, 2001 Subway Station Locations 8C-6
8C-5 Post-September 11, 2001 Local Bus Routes 8C-10
8C-6 Post-September 11, 2001 NYCT and NYCDOT Subsidized Express Bus Routes 8C-10
8C-7 Post-September 11, 2001 (June 2003) Trans-Hudson Ferry Routes 8C-14
8D-1 Pedestrian Analysis Locations 8D-2
8D-2 Street-Level Access 8D-10
9-1 On-Site Model Source and Receptor Locations 9-12
9-2 Maximum Predicted Annual Average PM_{10} PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative 9-20
9-3 Maximum Predicted Annual Average PM_{10} PATH Construction Increment with Route 9A At-Grade Alternative 9-20
9-4 Maximum Predicted 24-Hour Average PM_{10} PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative 9-20
9-5 Maximum Predicted 24-Hour Average PM_{10} PATH Construction Increment with Route 9A At-Grade Alternative 9-20
9-6 Maximum Predicted Annual Average $PM_{2.5}$ PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative 9-20
9-7 Maximum Predicted Annual Average $PM_{2.5}$ PATH Construction Increment with Route 9A At-Grade Alternative 9-20
9-8 Maximum Predicted 24-Hour Average $PM_{2.5}$ PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative 9-20
9-9 Maximum Predicted 24-Hour Average $PM_{2.5}$ PATH Construction Increment with Route 9A At-Grade Alternative 9-20
9-10 Maximum Predicted Annual Average NO_2 PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative 9-20
9-11 Maximum Predicted Annual Average NO_2 PATH Construction Increment with Route 9A At-Grade Alternative 9-20
9-12 Maximum Predicted Annual Average PM_{10} PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative and Mitigation 9-28
9-13 Maximum Predicted Annual Average PM_{10} PATH Construction Increment with Route 9A At-Grade Alternative and Mitigation 9-28
9-14 Maximum Predicted 24-Hour Average PM_{10} PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative and Mitigation 9-28

9-15 Maximum Predicted 24-Hour Average PM_{10} PATH Construction Increment with Route 9A At-Grade Alternative and Mitigation 9-28
9-16 Maximum Predicted Annual Average $PM_{2.5}$ PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative and Mitigation 9-28
9-17 Maximum Predicted Annual Average $PM_{2.5}$ PATH Construction Increment with Route 9A At-Grade Alternative and Mitigation 9-28
9-18 Maximum Predicted 24-Hour Average $PM_{2.5}$ PATH Construction Increment with Route 9A Short Bypass Alternative and Mitigation 9-28
9-19 Maximum Predicted 24-Hour Average $PM_{2.5}$ PATH Construction Increment with Route 9A At-Grade Alternative and Mitigation 9-28
9-20 Maximum Predicted Annual Average NO_2 PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative and Mitigation 9-28
9-21 Maximum Predicted Annual Average NO_2 PATH Construction Increment with Route 9A At-Grade Alternative and Mitigation 9-28
10-1 FTA Noise Impact Criteria for Transit Projects 10-2
10-2 Noise Receptor Locations and FTA Land Use Categories 10-4
13-1 Austin J. Tobin Plaza Pre-September 11, 2001 13-6
13-2 Floodplains 13-6
14-1 Coastal Zone Boundary 14-2
15-1 Lower Manhattan Projects Planned for Construction in the Critical Analysis Year 15-2
15-2 Truck Access Routes for the Lower Manhattan Recovery Projects 15-16
15-3 Cumulative Peak Hourly Construction Period Truck Trips 15-22
15-4 Maximum Predicted Annual Average PM_{10} Construction Increment Cumulative with Route 9A Short Bypass Tunnel Alternative 15-28
15-5 Maximum Predicted Annual Average PM_{10} Construction Increment Cumulative with Route 9A At-Grade Alternative 15-28
15-6 Maximum Predicted 24-Hour Average PM_{10} Construction Increment Cumulative with Route 9A Short Bypass Tunnel Alternative 15-28
15-7 Maximum Predicted 24-Hour Average PM_{10} Construction Increment Cumulative with Route 9A At-Grade Alternative 15-28
15-8 Maximum Predicted Annual Average $PM_{2.5}$ Construction Increment Cumulative with Route 9A Short Bypass Tunnel Alternative 15-28
15-9 Maximum Predicted Annual Average $PM_{2.5}$ Construction Increment Cumulative with Route 9A At-Grade Alternative 15-28
15-10 Maximum Predicted 24-Hour Average $PM_{2.5}$ Construction Increment Cumulative with Route 9A Short Bypass Tunnel Alternative 15-28
15-11 Maximum Predicted 24-Hour Average $PM_{2.5}$ Construction Increment Cumulative with Route 9A At-Grade Alternative 15-28
15-12 Maximum Predicted Annual Average NO_2 Construction Increment Cumulative with Route 9A Short Bypass Tunnel Alternative 15-28
15-13 Maximum Predicted Annual Average NO_2 Construction Increment Cumulative with Route 9A At-Grade Alternative 15-28
15-14 Maximum Predicted Annual Average PM_{10} Construction Increment Cumulative with Route 9A Short Bypass Tunnel Alternative and Mitigation 15-32

15-15 Maximum Predicted Annual Average PM_{10} Construction Increment Cumulative with Route 9A At-Grade Alternative and Mitigation 15-32
15-16 Maximum Predicted 24-Hour Average PM_{10} Construction Increment Cumulative with Route 9A Short Bypass Tunnel Alternative and Mitigation 15-32
15-17 Maximum Predicted 24-Hour Average PM_{10} Construction Increment Cumulative with Route 9A At-Grade Alternative and Mitigation 15-32
15-18 Maximum Predicted Annual Average $PM_{2.5}$ Construction Increment Cumulative with Route 9A Short Bypass Tunnel Alternative and Mitigation 15-32
15-19 Maximum Predicted Annual Average $PM_{2.5}$ Construction Increment Cumulative with Route 9A At-Grade Alternative and Mitigation 15-32
15-20 Maximum Predicted 24-Hour Average $PM_{2.5}$ Construction Increment Cumulative with Route 9A Short Bypass Tunnel Alternative and Mitigation 15-32
15-21 Maximum Predicted 24-Hour Average $PM_{2.5}$ Construction Increment Cumulative with Route 9A At-Grade Alternative and Mitigation 15-32
15-22 Maximum Predicted Annual Average NO_2 Construction Increment Cumulative with Route 9A Short Bypass Tunnel Alternative and Mitigation 15-32
15-23 Maximum Predicted Annual Average NO_2 Construction Increment Cumulative with Route 9A At-Grade Alternative and Mitigation 15-32
15-24 Cumulative Noise Receptor Locations and FTA Land Use Categories 15-36
15-25 Known or Potential Historic Resources and Potential Vibration Areas from Cumulative Construction Activities 15-38
4(f)-1 Area of Potential Effect ..... 4(f)-2
4(f)-2 Remaining Remnants and Structures on the WTC Site ..... 4(f)-4
4(f)-3 Avoidance Alternatives ..... 4(f)-6
4(f)-4 Areas of Potential Archaeological Sensitivity ..... 4(f)-16

✳

A. INTRODUCTION

The Port Authority of New York and New Jersey (PANYNJ), a municipal corporate instrumentality and political subdivision of the States of New York and New Jersey, is proposing to undertake, in cooperation with the United States Department of Transportation (USDOT), through the Federal Transit Administration (FTA), a project involving the reconstruction of a permanent terminal at the World Trade Center (WTC) site in Lower Manhattan for the Port Authority Trans-Hudson (PATH) system. The Permanent WTC PATH Terminal is proposed to be a full service, regional transportation hub that would be coordinated with the existing and future transportation infrastructure, WTC site development, and the surrounding area. The project is needed to re-establish and enhance transportation facilities and infrastructure that existed at the WTC complex prior to September 11, 2001 and to ensure the long-term accessibility and economic vitality of Lower Manhattan.

The Project would be funded as part of the Federal government's $4.55 billion Lower Manhattan Transportation Recovery Effort, which was committed to New York City following the terrorist attacks of September 11, 2001. The FTA will be the federal lead agency for the environmental review of this project to be undertaken in cooperation with PANYNJ. As such, this Environmental Impact Statement (EIS) is being prepared in accordance with the National Environmental Policy Act (NEPA; 42 USC §§4321 et seq.) of 1969 and the applicable regulations implementing NEPA as set forth in 23 CFR Part 771, 40 CFR Parts 1500-1508, and 49 CFR Part 622. This EIS is also being prepared in accordance with Section 106 of the National Historic Preservation Act (NHPA; 16 USC §470(a)) of 1966 and Section 4(f) of the USDOT Act of 1966 (49 USC §303) and other environmental laws and regulations.

B. PURPOSE AND NEED

Trans-Hudson transit service between New Jersey and New York has long been an integral part of the Lower Manhattan transportation system. Prior to the terrorist attacks of September 11, 2001, the WTC PATH Terminal served some 67,000 daily boardings and was the gateway to Lower Manhattan for most commuters from west of the Hudson River. However, the attacks resulted in extensive damage to the PATH system including the destruction of its WTC Terminal. As a result, the system lost a significant portion of its capacity to serve commuters throughout the New York and New Jersey region and mass transit access to Lower Manhattan was severely hindered.

PATH is an electrified, heavy-rail transit system with a total of 13 stations in New York and New Jersey. It is a wholly-owned subsidiary corporation of PANYNJ and is recognized as a commuter rail system under the oversight of the U.S. Department of Transportation, Federal Railroad Administration (FRA).

The WTC PATH Terminal, which opened in 1971, was located beneath the WTC's office and retail space, in the portion of the site referred to as the "bathtub." Its platform level contained three 10-car platforms and five tracks. Trains entered the station from New Jersey via the south Hudson River tunnel (Tunnel F) and exited to New Jersey via the north tunnel (Tunnel E). Thus, the platform level formed the loop in the PATH system allowing trains to enter and leave Manhattan without changing the location of the train's engineer or conductor. As a result, trains could have a short dwell time at the Terminal.

A mezzanine was located above the platforms, housing vertical circulation, fare equipment, and accessory retail and food stalls. The retail concourse, known as PATH Square, provided for all-weather connections between PATH, the office buildings on the WTC site, the World Financial Center, New York City Transit (MTA/NYCT) subways, and street level.

The WTC PATH Terminal and a seven-car PATH train were destroyed as a result of the terrorist attacks of September 11, 2001. Tunnels E and F under the Hudson River were flooded, and PATH's Exchange Place Station in Jersey City, New Jersey, was damaged and rendered inoperable because the track configuration would not allow trains to turn around before entering the Hudson River tunnels.

PANYNJ began construction of a temporary PATH station at the WTC site in July 2002, shortly after control of the site was returned by the City to PANYNJ. The station opened on November 23, 2003. It is located in the WTC "bathtub" and has five tracks and three 8-car platforms. Street level access is through a single entry/exit at the intersection of Fulton and Church Streets. There are also direct connections to two MTA/NYCT subway stations.

Although the temporary WTC PATH station allows for service to Lower Manhattan, it does not fully restore the pedestrian connections or the capacity that existed before September 11, 2001.

PROBLEM IDENTIFICATION

ECONOMIC RECOVERY

Transportation links have been critical to the commercial development of Lower Manhattan. Service between New Jersey and New York has been integral to the movement of employees to and from their Lower Manhattan offices. More recently, employment centers have emerged in Jersey City and Newark. These businesses depend on PATH to deliver workers from New York City and other points east of the Hudson River. Furthermore, several major businesses have located facilities in both Lower Manhattan and Jersey City, allowing for office expansion while maintaining a close connection between company functions on both sides of the River.

A successful economic redevelopment of Lower Manhattan requires the replacement and enhancement of transportation facilities that were lost or damaged on September 11, 2001. Some 15 percent of Lower Manhattan's workforce lived in New Jersey prior to September 11, 2001 and the WTC PATH Terminal was the busiest of downtown's transit stations. Although other currently planned transportation projects would improve access to and from Lower Manhattan for those commuting to and from New Jersey, none offers the direct and high-capacity linkage that can be served by PATH and the proposed Permanent WTC PATH Terminal.

In a survey of 25 executives of major employers located in Lower Manhattan, a Permanent WTC PATH Terminal was identified as "extremely" important to the future economic health of Lower Manhattan (Alliance for Downtown New York, Inc., April 2003). If such a facility were not provided, the full potential of Lower Manhattan's revitalization may never be realized.

RIDERSHIP GROWTH

Lower Manhattan is a vital component of the New York economy. It is second only to Midtown Manhattan in terms of gross floor area of office space, and it is a growing residential neighborhood and retail destination.

Prior to September 11, 2001, businesses in the area south of Canal Street employed more than 388,000 workers. Approximately 15 percent of Lower Manhattan's workforce commuted from west of the Hudson River and transit was their predominant mode of travel. The physical loss of office and commercial space on September 11, 2001, coupled with a general economic downturn, resulted in a reduction of 80,000 jobs in Lower Manhattan. Most of the office space damaged or destroyed on September 11, 2001 will be replaced by 2015. In addition, a memorial, cultural facilities, and retail space will be constructed on the WTC site that will attract visitors in addition to the anticipated return of office workers.

It is estimated that PATH's daily ridership at the WTC would be 175,000 by 2025, which would exceed the capacity of the temporary station. Therefore, without a permanent terminal, the PATH system cannot adequately support the planned redevelopment of the WTC and the overall revitalization of Lower Manhattan.

COMMUTING TO LOWER MANHATTAN WITHOUT PATH

Immediately following September 11, 2001, commuters formerly using the PATH WTC lines were forced to seek other routes or modes of travel to reach destinations in Lower Manhattan. As a result, there were significant ridership increases on Trans-Hudson ferries, uptown PATH lines, and NJ Transit commuter rail. Although these modes have enabled commuters to reach Lower Manhattan, they do not have the capacity or the flexibility to serve as a long-term alternative to a Permanent WTC PATH Terminal.

Although ferries have served as an important interim mode of travel for Lower Manhattan's commuters, they would not serve long-term travel needs between New Jersey and Lower Manhattan. Ferries have a much lower capacity than heavy-rail. While the location of ferry terminals may be convenient for those who work along Water Street and at the World Financial Center, others must walk much farther to reach interior destinations than was required with PATH service. Furthermore, most ferry passengers must transfer to one or more additional modes within New Jersey during their commute. During heavy rain storms or when the waters of the Hudson are icy, the ability to maintain ferry service is constrained.

Following the destruction of the WTC PATH Terminal on September 11, 2001, ridership at PATH's Christopher and 9th Street Stations doubled during peak periods. Both the Christopher and 9th Street Stations have a limited capacity. To immediately address these problems, PANYNJ had to limit station access during certain hours. Although upgrades are planned for these stations, they will not have adequate capacity to support general PATH system growth if a Permanent WTC PATH Terminal is not constructed.

Following the terrorist attacks, ridership on NJ Transit commuter rail increased by approximately 30 percent, requiring additional trains on its routes serving New York's Pennsylvania (Penn) Station, precluding certain service enhancements planned for that system. For example, the full opening of the Secaucus Transfer, which provides a link between the Northeast Corridor line serving Penn Station, and the Main and Bergen County lines that serve Hoboken, was delayed until temporary PATH service was restored. Furthermore, NJ Transit and Amtrak share the rail lines that traverse the Hudson River between New Jersey and Lower

Manhattan and service is limited by the capacity of the single rail tunnel. Thus, if permanent PATH service is not restored to Lower Manhattan, there may not be additional capacity to support passengers that would be diverted to commuter rail, thereby reducing the utility of the Secaucus Transfer and potentially limiting options for future system improvements.

LIMITATIONS OF TEMPORARY PATH SERVICE

To expedite the restoration of PATH service to Lower Manhattan, PANYNJ designed and built, on a fast-track basis, a temporary station. The temporary station was a commitment to restore the facilities damaged by the terrorist attacks and it was determined to be a catalyst to restore and redevelop Lower Manhattan by providing commuter service from west of the Hudson River. To ensure the speedy restoration of PATH service, the temporary station was constructed in essentially the same location as the pre-September 11, 2001 Terminal. This allowed PANYNJ to reuse certain infrastructure elements including the 1 and 9 underpass, portions of the retail concourse, and the MTA/NYCT subway station connections that remained on the WTC site. Furthermore, design documents could be advanced more quickly since track and platform configurations and other station elements could be constructed based on pre-September 11, 2001 plans. However, to achieve this commitment within two years after the attacks, PANYNJ compromised certain elements of the pre-September 11, 2001 Terminal with regard to operational capacity, service amenities, and pedestrian connections.

Because PANYNJ could use as-built plans from the pre-September 11, 2001 Terminal to design and construct the temporary station, extensive survey work was not needed. Designers could lock in the station and track configuration both horizontally and vertically. As such, steel detailing could be expedited and steel sizing accelerated. Since it was intended as a temporary station, platforms were designed to be removed and not integral to the platform walls; interior drainage was less than desired since only the outer bay of the station has interior drains; and, roof insulation was minimal since it is an outdoor facility open to the elements.

The temporary station has 8-car platforms as compared to the 10-car platforms that were part of the pre-September 11, 2001 Terminal, resulting in 20 percent less operational capacity. Prior to September 11, 2001, PANYNJ was studying the extension of stations along its Newark-WTC route to provide for 10-car train service. These improvements were in response to ridership levels that were reaching maximum capacity on this route during peak periods.

Some of the infrastructure elements within the station have a limited service life. The vertical elements, while ADA-compliant, do not provide a sufficient level of service to accommodate future demand. Escalators from the platform to the mezzanine level and from mezzanine level to the MTA/NYCT 1 and 9 subway line underpass were not provided. The station's design does not allow for new construction above, as planned for the WTC redevelopment, nor can it easily support connections to future buildings on the WTC site or other off-site destinations.

To expedite service restoration, the temporary station's tracks and platforms are located outdoors in the WTC "bathtub." Weather protection is provided, but the station is not fully enclosed and is not climate-controlled. Local radiant heating is provided in waiting areas, but many portions of the station complex are not heated during winter months or cooled during summer months.

The temporary station includes security and fire protection equipment, but advanced passenger amenities are not provided. The station is ADA-compliant, but its configuration requires four separate elevator rides to reach street level. Emergency exits are provided, but they lead

passengers either to Church Street or to the WTC bathtub area with access to the street via the temporary access ramp and a temporary stairway to West Street.

Because construction of the WTC site is ongoing, pedestrian access to the temporary station is limited as compared to the pre-September 11, 2001 Terminal. All patrons enter and exit at street level near the intersection of Church and Fulton Streets at the eastern boundary of the WTC site. Thus, patrons traveling to the World Financial Center must double-back along Vesey or Liberty Street. The temporary station has connections to MTA/NYCT's E, R, and W lines, but access to 1 and 9 subway line is not available because MTA/NYCT's Cortlandt Street Station has not yet reopened. As such, two fewer subways are served compared to pre-September 11, 2001 conditions.

CURRENT PLANNING CONTEXT

Since September 11, 2001, several projects have been planned that are independent of the Permanent WTC PATH Terminal but that also aim to redevelop and revitalize Lower Manhattan. Presently, four environmental reviews have been prepared under NEPA independent of this EIS as follows:

- World Trade Center Memorial and Redevelopment Plan: The U.S. Department of Housing and Urban Development (HUD) and the Lower Manhattan Development Corporation (LMDC) have prepared an EIS for the redevelopment of the WTC site, which includes a memorial and memorial-related improvements, commercial, retail, and hotel space; museum and cultural facilities; new open space; new street configurations; and certain infrastructure improvements at the WTC site and adjacent parcels. HUD and LMDC published a Final Generic Environmental Impact Statement for the World Trade Center Memorial and Redevelopment Plan in April 2004, and a Record of Decision was issued in May 2004.

- Fulton Street Transit Center (FSTC): FTA and the Metropolitan Transportation Authority (MTA) have prepared an EIS for the Fulton Street Transit Center project, which would rehabilitate, reconfigure, and enhance the multilevel complex of subway stations serving nine different lines in the area of Fulton Street and Broadway. The facility's proposed Dey Street concourse would connect with the MTA/NYCT subway station at Cortlandt Street (R and W lines), the WTC site, and the Permanent WTC PATH Terminal. FTA and MTA published a Final Environmental Impact Statement for the FSTC in October 2004 and a ROD was issued in November 2004.

- Route 9A Project: The U.S. Department of Transportation, Federal Highway Administration (FHWA) and the New York State Department of Transportation (NYSDOT) are considering alternatives for the reconstruction of Route 9A south of Chambers Street. This project would include at-grade improvements or a below-grade bypass for vehicular through traffic. A supplemental EIS is currently being prepared for this project. FHWA and NYSDOT published a Draft Supplemental Environmental Impact Statement for the Route 9A Project in May 2004. FHWA has not yet formally determined a Preferred Alternative for the Route 9A project. The State of New York has recently indicated a preference for the Route 9A At-Grade Alternative. A FEIS on this project is expected to be published in late spring or summer 2005 and select a preferred alternative. This FEIS addresses environmental impacts of the range of alternatives identified in the Route 9A DEIS.

- South Ferry Terminal: FTA and MTA are preparing an Environmental Assessment for the reconstruction of the South Ferry Terminal on the 1 and 9 line. This project would increase

both the capacity of the Terminal and the 1 and 9 line during peak periods. FTA and MTA published an Environmental Assessment for the South Ferry Terminal in May 2004 and a Finding of No Significant Impact was issued in August 2004.

Before September 11, 2001, several projects were planned downtown that are still under study. These include residential development projects and commercial buildings at Battery Park City and within the Washington Street Urban Renewal Area, open space and cultural institutions, and modest commercial development. Following September 11, 2001, federal, state, and local initiatives have been implemented to encourage private development in Lower Manhattan. These programs provide funds for commercial and residential and encourage the construction of community facilities, open space, and infrastructure in support of the area's redevelopment and recovery.

Although these projects would rehabilitate transportation facilities and would support an economic recovery for the area, none of them offers a high-capacity link between New Jersey and Lower Manhattan.

PROJECT GOALS

The Permanent WTC PATH Terminal would be a full-service, regional transportation hub that would be coordinated with existing and future transportation infrastructure, WTC site development, and the surrounding area. The project is needed to re-establish and enhance transportation facilities and infrastructure that existed at the WTC complex prior to September 11, 2001 and to ensure the long-term accessibility and economic vitality of Lower Manhattan. To that end, the selected project alternative must successfully address four goals.

- Effectively restore long-term PATH service between New Jersey and Lower Manhattan;
- Establish an intermodal transportation facility in Lower Manhattan;
- Plan and construct a Terminal that would support the redevelopment of Lower Manhattan; and
- Minimize adverse impacts to the environment.

C. PROJECT ALTERNATIVES

Project Alternatives for a Permanent WTC PATH Terminal were identified as part of early planning studies conducted by the PANYNJ following the terrorist attacks and through the public scoping process for this EIS. After careful consideration of these options, three alternatives were carried forward for further study in the Draft EIS (DEIS) as follows:

- No Action Alternative;
- Terminal with Liberty Plaza Connection Alternative; and
- Terminal without Liberty Plaza Connection Alternative.

The planning and design of a Permanent WTC PATH Terminal is being closely coordinated with the other Lower Manhattan recovery efforts described above. In order to plan for potential changes in these independent projects that may require alterations to the construction and/or operation of the Permanent WTC PATH Terminal, the DEIS identified design options for the Terminal. These design options and their potential environmental effects were described in the DEIS.

Furthermore, under the guidance of various federal agencies, the sponsors of the Lower Manhattan recovery efforts have coordinated to develop Environmental Performance

Commitments (EPCs) and Green Design and Sustainability Guidelines to be incorporated as part of their individual projects. These measures aim at proactively addressing potential adverse effects to the environment in order to reduce the impacts to the local community and the region as a whole.

Following the public comment period on the DEIS, FTA and PANYNJ selected a Preferred Alternative for the Permanent WTC PATH Terminal. The selected alternative was the "Terminal without a Liberty Plaza Connection" with some modifications to reflect current planning for the WTC site as well as the design options that would be part of the Project.

ALTERNATIVES DEVELOPMENT PROCESS

LOCATIONS FEASIBILITY ANALYSIS

While planning for the restoration of temporary PATH service to Lower Manhattan, PANYNJ was concurrently planning for a permanent facility, including tracks, platforms, mezzanines, pedestrian concourses, and a terminal building on or near the WTC site. Not only did PANYNJ intend to restore the capacity and connectivity that existed within the pre-September 11, 2001 WTC PATH Terminal but also wished to enhance pedestrian connections through the site and adjacent properties and to create a world-class transportation hub for Lower Manhattan. To that end, PANYNJ conducted an analysis of alternatives for transit service between New Jersey and Lower Manhattan.

Although the WTC Terminal was destroyed and the Hudson River tunnels were damaged as a result of the terrorist attacks, much of the PATH system remained intact. Thus, PANYNJ made the early decision to preserve as much of the PATH system as possible as part of their long-term planning for service to Lower Manhattan. It was decided that future service to Lower Manhattan should use the existing Hudson River tunnels and their projections within the WTC site. Because an alternate mode of transit would not be compatible with the remainder of the system, it was also decided that future service should be heavy-rail with PATH's specifications. Furthermore, PANYNJ considered constraints on PATH's alignment from other infrastructure within Lower Manhattan. Given these constraints, the only reasonable alternatives would be alternate locations for a Lower Manhattan PATH terminal.

Once PANYNJ identified that restoration of PATH was the only reasonable alternative for transit service between New Jersey and Lower Manhattan, they began planning for a location for the facility. To facilitate this process, planning guidelines were developed to further refine the Project's goals and objectives that were identified above. These planning guidelines allowed location options to be closely compared in order to weigh the benefits and potential shortcomings. Ultimately, a successful terminal location would not only restore service but would provide for enhancements as compared to the pre-September 11, 2001 facility. These planning guidelines were as follows:

- Create a World-Class, Transportation Facility;
- Support the Redevelopment of Lower Manhattan;
- Provide for Improved Pedestrian Connections;
- Provide for Advanced Security;
- Enhance Pre-September 11, 2001 PATH Operations;
- Support 10-Car PATH Trains, in order to support ridership growth;
- Minimize Impacts to Temporary PATH Service during Construction;

- Minimize Impacts to the Local Environment during Construction; and
- Minimize Construction Cost and Duration.

PANYNJ initially identified four sites of an appropriate size and configuration for a permanent PATH terminal. These locations are shown in Figure S-1 and are described below.

- Location 1, WTC "Bathtub" would restore service in the location of the pre-September 11, 2001 station by overbuilding the tracks, platforms, and mezzanines atop the temporary PATH station.
- Location 2, Church Street, would be a new facility in the approximate location of the former H&M Terminal.
- Location 3, Broadway-Nassau would be a new facility located east of the WTC site under Dey Street and beneath the FSTC.
- Location 4, Vesey Street, would be a new facility located on the northern portion of the WTC "Bathtub" along Vesey Street.

After careful consideration of these sites, it was determined that the construction at Locations 3 and 4 would result in long-term disruption of temporary PATH service. Furthermore, Location 3 would reduce the operating capacity of the PATH system and may require acquisition and/or demolition of existing buildings. Because these locations would not meet the Project's goals and objectives, they were considered seriously flawed and were not carried forward.

Location 1 (WTC "Bathtub") and Location 2 (Church Street) were evaluated more closely to determine their comparative benefits and faults. It was determined that Location 1 would be less expensive with a shorter construction duration than Location 2, and it would allow for more flexibility in the redevelopment of the WTC site. However, Location 2 would have closer proximity to many of Lower Manhattan's major destinations and transportation facilities and would have superior operations as compared to Location 1.

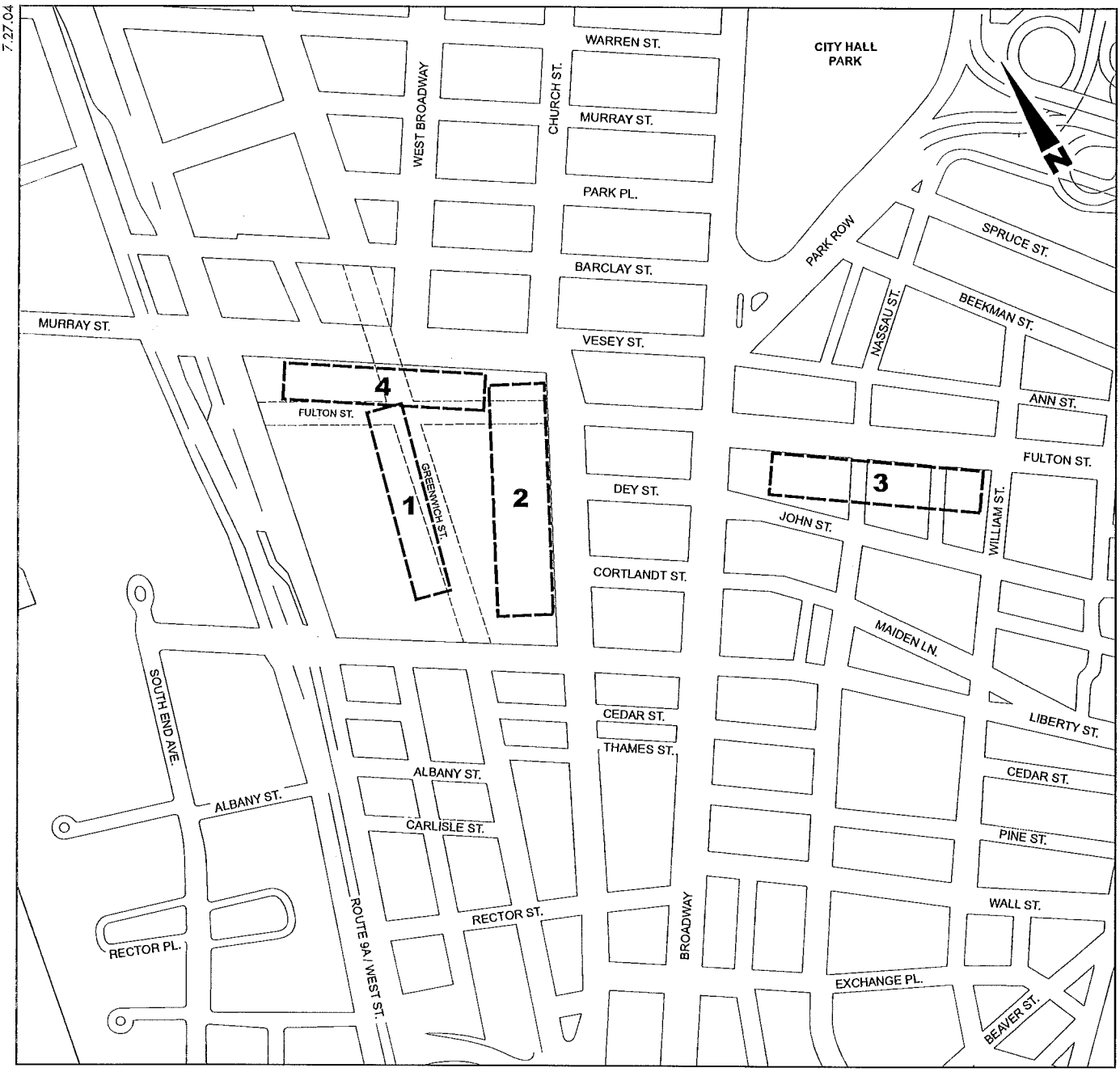
In recognition of the respective benefits of both Locations 1 and 2, PANYNJ worked to develop a plan that would combine the flexibility for overall site redevelopment with superior pedestrian connections and operations. As the master plan for the WTC site was advanced, the Permanent WTC PATH Terminal plan was revised to combine elements of both Locations 1 and 2. Under the "hybrid" option, the PATH tracks, platforms, mezzanine, and portions of its pedestrian concourses would be located in the WTC "Bathtub". The remaining portions of the pedestrian concourses and the terminal building would be located on the eastern portion of the WTC site along Church Street. Because this option balanced goals of the WTC site redevelopment with superior PATH operations, it was carried forward for further consideration in this EIS.

ALTERNATIVES CONSIDERED AND ELIMINATED

PATH-6 Train Connection

During the scoping process, public interest groups and local elected officials suggested an alternative that would connect the PATH system with MTA/NYCT's 6 line. PANYNJ considered their proposal and determined that a number of critical engineering and design issues would need to be resolved to make this alternative feasible which would likely delay the completion of this project, result in substantial alterations to existing and planned transportation infrastructure in Lower Manhattan, and have potential short- and long-term adverse impacts on

7.27.04



1 Alternative Location and Reference Number

Proposed New Street (To be Constructed by Others)

PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure S -1
Alternative Locations

historic resources. Due to these constraints, this alternative was not considered to reasonably meet the goals and objectives and was, therefore, not carried forward for further consideration.

Terminal with Liberty Plaza Connection Alternative

The DEIS considered a Terminal with a Liberty Plaza Connection Alternative. Generally, the Terminal with a Liberty Plaza Connection Alternative would result in the same facility as described below for the Preferred Alternative. However, it would include an additional pedestrian connection under Church Street between the WTC site and Liberty Plaza Park. The analysis presented in the DEIS showed that the Terminal with a Liberty Plaza Connection Alternative would result in vibration impacts on a greater number of historic structures, would result in temporary lane closures and pedestrian diversions on Church Street, and would have increased emissions and noise levels during construction as compared to the Preferred Alternative. In the long term, the Terminal with a Liberty Plaza Connection would divert pedestrians from street-level to a sub-grade concourse, which could detract from local businesses, and it would reduce the availability of open space within Liberty Plaza Park.

During the public review process for the DEIS, public officials and concerned citizens stated that the Liberty Plaza Connection would adversely impact community character. A public goal for the rebuilding of Lower Manhattan has been to revive its retail and to ensure its longevity as a 24-hour community. Citizens and agency officials believed that the diversion of pedestrians from street-level to the underpass would detract from this goal. Upon further consideration, PANYNJ decided to eliminate the Liberty Plaza Connection as part of the Preferred Alternative.

DESIGN OPTIONS CONSIDERED AND ELIMINATED

The DEIS presented options for the design of certain components of the Permanent WTC PATH Terminal. As planning has advanced, certain components of the project have been finalized such that design options could be dropped from further consideration. The following describes the options previously presented and the outcome of the design process that has occurred since publication of the DEIS.

Stand-Alone Terminal

The construction of the Preferred Alternative would be closely coordinated with the construction of elements of the WTC Memorial and Redevelopment Plan. However, a Stand-Alone Terminal option was developed to determine the design and cost implications absent elements of the WTC Memorial and Redevelopment Plan. However, a Record of Decision was issued for the *WTC Memorial and Redevelopment Plan, Generic Environmental Impact Statement*, in May 2004 and LMDC has been developing plans for the Memorial and uses on the eastern portion of the WTC site. PANYNJ has been working closely with LMDC to coordinate the subgrade infrastructure to ensure that the construction of the Preferred Alternative would not preclude future uses on the WTC site. As such, the Permanent WTC PATH Terminal would be coordinated with elements of the WTC Memorial and Redevelopment Plan. However, given that WTC site development plans may be delayed or may change over time, PANYNJ may advance certain components of the Terminal as integrated and others as stand-alone. This Final EIS (FEIS) generally considers the benefits and impacts of an integrated Terminal; however, where Permanent WTC PATH Terminal elements may be stand-alone to advance its design and construction, the potential environmental effects are noted.

Route 9A Pedestrian Bridge

The design of the Permanent WTC PATH Terminal's connection to the World Financial Center must be coordinated with the selected alternative for the Route 9A Project. As described in the DEIS for the Permanent WTC PATH Terminal, PANYNJ considered a pedestrian bridge over Route 9A as an alternative to a subgrade concourse in the event that the relocation of utilities beneath Route 9A would not be undertaken by NYSDOT. However, since publication of the DEIS, PANYNJ has determined that a subgrade concourse could be constructed at a lower elevation, which would avoid utility relocation regardless of the selected alternative for the Route 9A Project. As such, the Route 9A pedestrian bridge has been eliminated from further consideration as part of this FEIS.

South Ventilation Structure

The DEIS identified two options for the location of the Terminal's south ventilation structure—Route 9A median and Deutsche Bank. Under the Deutsche Bank option, PANYNJ would construct the ventilation system within the new office tower planned for the former location of Deutsche Bank. The vent would be at a minimum height of 40-feet above ground and would likely be constructed within a mechanical level of the future building. Because of the proposed building's distance from the PATH tunnels, a vent structure at this location would not be collocated with emergency egress. Therefore, PANYNJ would need to provide for an emergency stairway with access from the planned plaza adjacent to the office tower or within the north or south sidewalk along Liberty Street. As such, this option would result in additional PATH structures and may increase the overall project cost. Subsequent to the publication of the DEIS, PANYNJ has selected the Route 9A option for the south vent as the Preferred Alternative.

NO ACTION ALTERNATIVE

Under the No Action Alternative, PANYNJ would retain temporary PATH service between New Jersey and Lower Manhattan until either 1) elements of the WTC Memorial and Redevelopment Plan would preclude operations, 2) the station would not safely accommodate passenger demand, or 3) the major elements of the station would exceed their useful service life. It is assumed that as redevelopment efforts occur in and around the WTC site, modifications to the physical characteristics and operation of the station would be required to maintain temporary PATH service to the extent possible. These modifications, which would not involve federal funding, may include the construction of additional egress locations, new ventilation structures, and minor modifications to passenger areas.

As future increases in ridership place demand beyond the temporary station's design capacity, PANYNJ would need to implement operational adjustments to safely accommodate passengers. Two options would be considered to extend temporary service beyond its design capacity—reduced service and peak hour restrictions. Reduced service would reduce congestion and allow the platforms to be cleared of passengers before the next train arrives. Restricted access would prohibit customers wishing to travel from Lower Manhattan to New Jersey in the morning peak period from using the system in order to accommodate a greater number of passengers traveling from New Jersey. These options may result in the diversion of PATH customers to other modes of travel to and from Lower Manhattan.

Under the No Action Alternative, construction activities associated with the WTC Memorial and Redevelopment Plan, the Fulton Street Transit Center, South Ferry Terminal, the Route 9A Project, and certain private developments would occur on or near the WTC site. As such, certain

modifications may be required to maintain temporary PATH service and to ensure the safety of PATH riders as construction occurs around and above the station complex. Further modifications may also be necessary to extend the station's service life, but such activities would be comparable to the ongoing station maintain that occurs throughout the PATH system. Thus, the potential impacts of the No Action Alternative during the construction period would be far fewer and much lesser in magnitude that would be associated with the other project alternatives.

For purposes of analysis, it is considered that the temporary WTC PATH station would continue to operate in 2009 under the No Action Alternative. However, given the constraints identified above, it is not considered feasible to operate the temporary station through 2025. Thus, at some point between 2009 and 2025, the temporary WTC PATH station would be closed and PATH service between New Jersey and Lower Manhattan would cease to exist.

PREFERRED ALTERNATIVE

A coordinated effort between PANYNJ and LMDC was undertaken to develop a master plan for the WTC site to program uses for above and sub-grade levels. This effort was necessary to identify and assess the multiple interfaces and coordination required to fully redevelop the site. The elements of the future WTC site, including the Permanent WTC PATH Terminal and the WTC Memorial and Redevelopment Plan, would be fully coordinated both in terms of their function and their construction. Close coordination between the individual parties responsible for site components would be essential to effectively construct and operate the site. In many cases, construction activities would be planned to support two or more elements of the overall master plan. Although these projects are being pursued independently, they will continue to be closely coordinated.

The Preferred Alternative would result in a new Permanent PATH Terminal on the WTC site. This alternative was developed through an evaluation of the benefits and constraints of two Terminal locations, WTC "Bathtub" and Church Street, and it combines an above-grade terminal building and sub-level pedestrian concourses on the eastern portion of the WTC site with additional pedestrian concourses, tracks, platforms, and a mezzanine on the western portion of the site (see Figure S-2).

PRELIMINARY DESIGN

The Preferred Alternative would have five levels—platform, mezzanine, concourse (main), concourse (balcony), and street-level.

The platform level would be located immediately west of MTA/NYCT's 1 and 9 train line and atop the concrete slab at the base of the WTC "Bathtub." The platforms and tracks would have a north-south orientation to complete a loop with the Hudson River tunnels, similar to the configuration of the temporary WTC PATH station. The Preferred Alternative would have four platforms (Platforms A through D) and 5 tracks (Tracks 1 through 5). The four platforms would be long enough to accommodate 10-car trains in accordance with PATH's long-range goal to increase the operational capacity of its system.

The mezzanine level would have a north-south orientation and would be located directly above the platform level. This level would house fare equipment, vertical circulation to the platforms and concourse level, and up to approximately 5,000 square feet of retail services, such as newsstands and food stalls. The mezzanine level would have two entrances/exits to the above concourse level. An east entrance/exit would direct passengers beneath MTA/NYCT's 1 and 9

line to the eastern portion of the WTC site. A west entrance/exit would direct passengers beneath Route 9A toward BPC and the World Financial Center.

The concourse consists of a main level and a balcony. The concourse's main level would connect to the mezzanine's east and west entrances/exits via escalators and elevators and would provide connections to offices and retail on the WTC site, FSTC's Dey Street Underpass, and the World Financial Center via a new underpass beneath Route 9A. The balcony level would provide connections to MTA/NYCT's Cortlandt Street (1 and 9), Cortlandt Street (R and W), and WTC (E) subway stations.

The street-level, terminal building, would be constructed on the eastern portion of the WTC site along Church Street near its intersections with Dey and Fulton Streets. It would provide access from Church Street and proposed elements of the WTC Memorial and Redevelopment Plan, including Greenwich Street and a public plaza. The building would also provide for natural light to the concourse level.

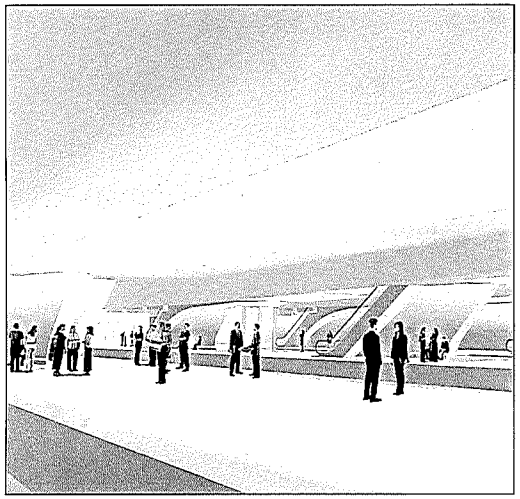
Prior to September 11, 2001, PATH had two ventilation structures within the median of Route 9A, which were used for both smoke evacuation and piston relief. These vent structures were located immediately above the PATH tunnels and contained evacuation stairs for emergency egress. As part of their program to enhance security within and around the WTC site, PANYNJ plans to reconstruct the ventilation structures to be 40 feet tall. Ideally, the future vents would serve the combined purpose of piston relief, smoke evacuation, and emergency egress. PANYNJ would construct the new ventilation structure in nearly the same location as before September 11, 2001.

NYSDOT is currently evaluating its plans for the reconstruction of Route 9A. Although PANYNJ prefers to locate the PATH vents in the future Route 9A median, it may be necessary to seek other locations (i.e., within the future Memorial Center or west of Route 9A) if NYSDOT cannot accommodate the vents as part of the ultimate design of the roadway. This FEIS identifies the Route 9A median as the Preferred Alternative for the ventilation structures. However, if the future plans for the Route 9A Project mandate an alternative location for the vents, FTA and PANYNJ would assess the alternative location through the appropriate NEPA process.

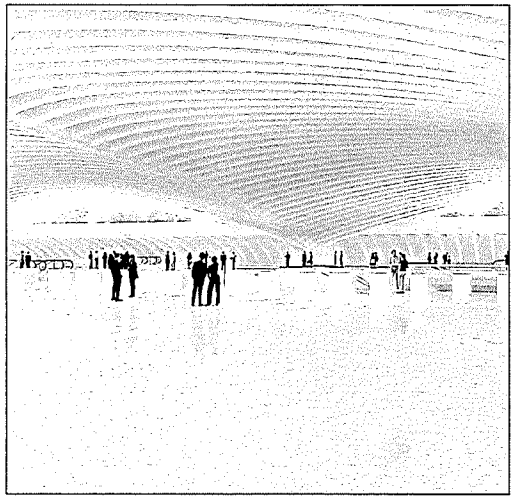
In addition to the emergency egress that would be provided via the vent structures, PANYNJ would construct emergency egress from the Terminal's track/platform and mezzanine levels. Egress stairways would be located near the north and south ends of the Terminal and would provide emergency access to Greenwich Street. The Permanent WTC PATH Terminal would share its emergency egress with the other facilities on the WTC site. PANYNJ plans to collocate one of these stairways within the proposed Performing Arts Center in the site's northwest quadrant and the other in the southwest quadrant within a museum or building that would be part of the WTC Memorial.

PANYNJ would reinforce the roof of the Terminal's east-west pedestrian concourse. The roof of the Terminal's east-west concourse would also serve as the road bed for the future extension of Fulton Street between Route 9A and Greenwich Street. The reinforced roof would consist of hardened, reinforced concrete to enhance the security of the east-west concourse below. The actual paving, landscaping, and opening of Fulton Street would be undertaken as a separate action.

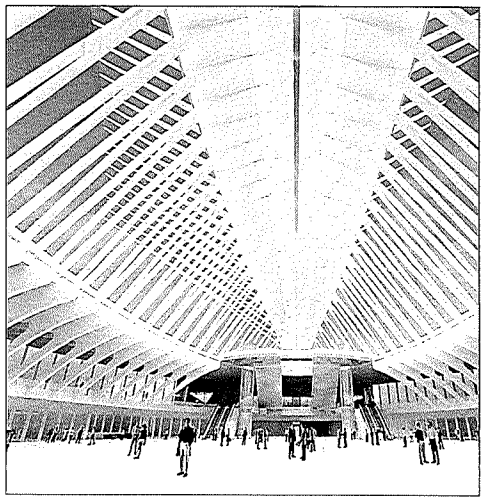
The Preferred Alternative includes funds for the reinforcement of the basement walls, which form the "bathtub" within the WTC site. This work is necessary to ensure the structural integrity



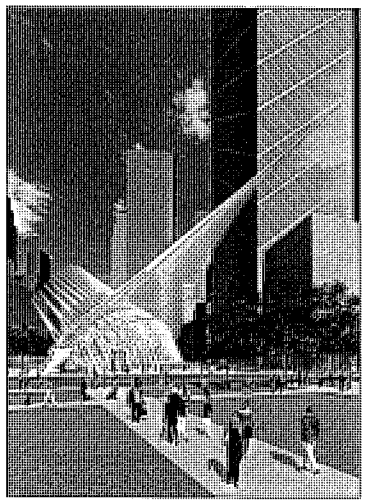
Platform Level



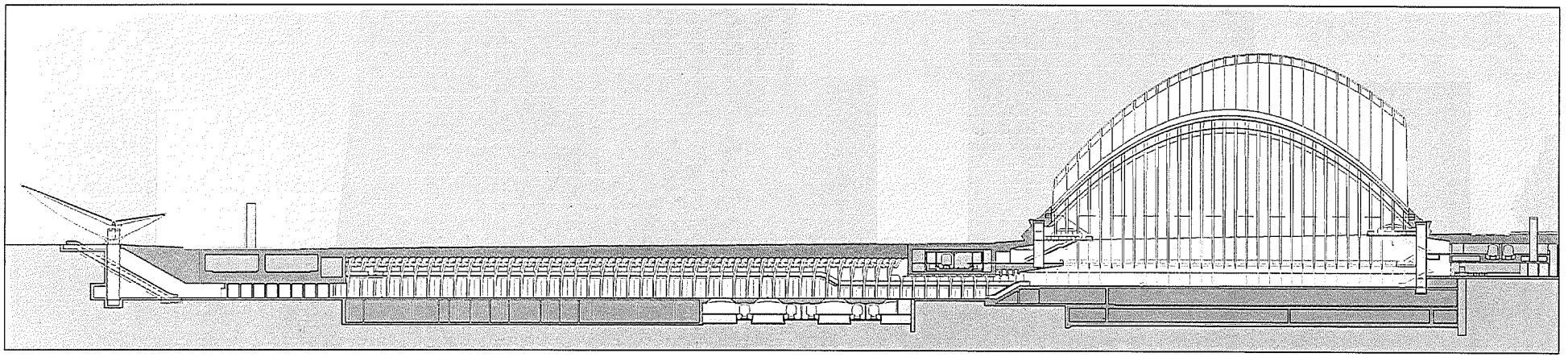
Mezzanine Level



Concourse Level



Street Level



Elevation

PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure S-2
Proposed Terminal Plan

of the walls and to support future redevelopment of the WTC site, including the Permanent WTC PATH Terminal. As part of the Permanent WTC PATH Terminal's construction, PANYNJ could reinforce the entire west bathtub wall except for portions that would remain visible as part of the WTC Memorial. PANYNJ would also reinforce portions of the east bathtub wall abutting MTA/NYCT's 1 and 9 line that were not previously reinforced. If other development on the WTC site does not move forward according to current schedules or plans, it may also be necessary to reinforce portions of the north bathtub wall east of Freedom Tower and portions of the south bathtub wall above the existing PATH substation.

Construction of the Terminal may also require the demolition and excavation of remaining structures within the eastern portion of the WTC site between MTA/NYCT's 1 and 9 line and Church Street, which includes all portions of the former H&M Terminal. This work would also support the future development of the site by others.

The DEIS noted that the removal of portions of the northwest remnant sub-grade structures on the WTC site may be undertaken as part of the Terminal's construction. However, subsequent to the publication of the DEIS, the removal of the northwest remnant sub-grade structures have been undertaken as an independent action pursuant to the stipulations of the Programmatic Agreement prepared for the WTC Memorial and Redevelopment Plan.

SUSTAINABLE DESIGN COMMITMENTS

As part of the construction and design of the Permanent WTC PATH Terminal, PANYNJ would implement Environmental Performance Commitments (EPCs). These EPCs were developed through a cooperative effort of the various project sponsors of the Lower Manhattan recovery effort. Divided into six resource areas, the EPCs are intended to reduce both short-term (construction) and long-term (operational) impacts to the environment. PANYNJ would implement the EPCs through specific actions identified in its public involvement and governmental entities coordination plan, construction environmental protection plan, design documents, and contracts. The specific EPCs and strategies for their implementation are described in Table S-5 and Section E below.

Per the guidance of the EPCs, the Terminal's design would incorporate sustainable/"green" design guidelines. PANYNJ is studying measures for the Terminal's initial design which are organized into six component areas: urban considerations, site, water, energy, materials, and indoor environment. These guidelines, which are consistent with industry standards, promote the use of techniques to reduce the demand for resources while promoting the capture and reuse of energy and materials, whenever possible. These measures would include the use of natural lighting, energy-efficient design, and renewable energy sources for heating and cooling.

One of the major sustainable/"green" design guidelines developed for the Permanent WTC PATH Terminal is the ability to use river water for cooling the Terminal's heating, ventilation, and air conditioning (HVAC) system. River water cooling was used prior to September 11, 2001 and its reuse is an economical and energy-efficient method to provide cooling for the components of the Permanent WTC PATH Terminal. The system's intakes, pumps, outfalls, and associated pipelines remain largely intact; river water provides lower supply temperature than other alternatives, resulting in greater energy efficiency; and river water cooling reduces the demand on the city's infrastructure. PANYNJ has filed an application with the New York State Department of Environmental Conservation to renew the State Pollution Discharge Elimination System (SPDES) permit for the WTC's river water cooling system. This application is being reviewed under an independent action.

CONSTRUCTION METHODS, SCHEDULE, AND COST

As shown in Figure S-3, the construction would begin in 2005. The Terminal would be completed in phases with an initial opening in 2009 and full completion in 2010.

The construction of the Permanent WTC PATH Terminal is comprised of five major elements as described below.

- North/South Temporary Access: Beginning in late 2005, PANYNJ would construct temporary access to the temporary WTC PATH station. Temporary access would be located on Vesey and/or Liberty Streets and would allow for the continued use of the temporary station as construction of the Permanent Terminal proceeds. The temporary access points would be maintained until the Terminal Hall and other street-level access can be provided. The duration for the construction of this element is 15 months.

- East-West Concourse: During this phase, PANYNJ would construct the east-west pedestrian connection through the WTC site and beneath Route 9A as well as the headhouse adjacent to the World Financial Center. If NYSDOT pursues a short-bypass alternative for the Route 9A Project, then they would construct the east-west concourse in tandem with their construction of the roadway tunnels. If NYSDOT pursues an at-grade alternative for Route 9A, then the east-west concourse would be constructed at nearly the same elevation by PANYNJ; however, the concourse would be mined with spoils removed from within the WTC site or from a shaft near the World Financial Center that would eventually provide the vertical connection between the concourse and the street-level headhouse. Following the completion of the east-west concourse through the WTC site, PANYNJ would harden its roof, which would eventually become the road bed of Fulton Street between Route 9A and Greenwich Street. The hardening of roof would involve the laying and reinforcement of high density concrete. Upon completion, the hardened road bed would serve as staging for the construction of Freedom Tower, which is being undertaken independent of the Preferred Alternative. The full duration for the east-west concourse construction is 36 months.

- Platform D, Arch Columns, and Temporary Underpinning: This element of construction involves the preparation work needed to maintain PATH operations as components of the Permanent Terminal are construction. It includes the laying of a temporary Track 6 and the permanent Platform D within the WTC "bathtub." The temporary track is needed to allow for continuous PATH operations as other tracks are reconfigured for use in the Permanent Terminal. Platform D provides access to trains using Track 6 and is, therefore, the first permanent platform to be constructed. Track 6 would be removed once PATH service can be fully restored on Tracks 1 through 5. During this phase of construction, the column supports for the Terminal's arches would be placed. Also, temporary underpinning of the 1 and 9 Line would be undertaken to support the later widening of the passageway between the mezzanine level and the concourse level. The total duration of this element is 20 months.

- Permanent Platforms, Tracks, and Mezzanine: This component of construction includes the major structural and finishing work for the platform and mezzanine levels of the Terminal. It includes placement of the structural arches, mezzanine construction, the underpinning of the 1 and 9 Line and construction of the passageway between the mezzanine and concourse levels, the lengthening and upgrade of Platforms A, B, and C, the completion of Platform D, and the construction of PATH's ventilation structures in the median of Route 9A. Grouting beneath the existing 1 and 9 subway tunnel would be performed from within this tunnel to protect the existing subway tunnel from the subsequent excavation work. Grouting is used in

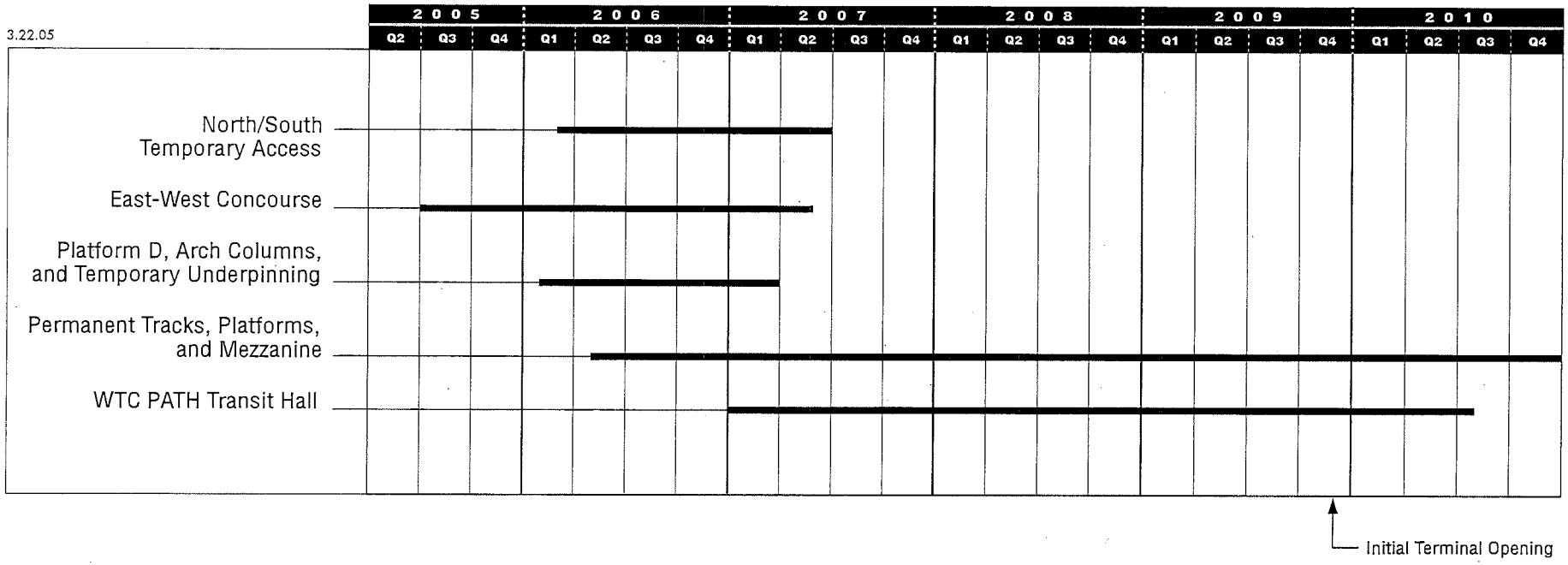


Figure S-3
Construction Schedule

soft soil to stabilize surrounding soils as a tunnel is excavated. In this case, a machine would be used to stabilize the surrounding soils by injecting cement or a similar material to form a hard tunnel shell. It would involve the use of compressed air operated drill rigs and grout pumps. Excavation and tunneling beneath the subway would occur from the west bathtub and proceed east. Tunneling would be accomplished via conventional mining techniques (e.g., shield with hand or mechanical excavation) and would require removal of existing piling supporting the subway tunnel and replacement with new piles/foundations. Spoils would be removed via the existing ramp to Liberty Street or by lifting to the surface with a crane and skip box. Demolition of temporary and construction of the permanent tracks, platforms, and mezzanine would occur alternating between northern and southern portions of track, platform, and mezzanines. To maintain train service and passenger safety and access, only one half (either the northern or southern half) of the platform would be demolished and converted, then the second half would follow. This stage of activity would continue until all tracks and platforms are converted. All work would occur within the west bathtub of the WTC site with access from the existing ramp from Liberty Street. No street closings are anticipated for this work to take place. The Terminal's two ventilation structures with emergency egress would be constructed within the median of Route 9A, and would also involve the installation of fans. The total duration for this phase of construction is 45 months.

- WTC PATH Transit Hall: This element consists of construction of the PATH terminal building, which includes the construction of all sub-grade and above-grade levels, the north-south pedestrian concourse, and the Terminal's mechanical and support systems. A preliminary estimate for the duration for the construction of the building area is 42 months, from late 2006 through early 2010. Lane closings on Church Street may be required for materials delivery and for the erection of pre-fabricated trusses and for the structural steel framing.

Construction workers and supervisors would arrive on site in personal vehicles or via mass transit. Limited parking would be available on-site and would primarily be used by supervisors arriving in light trucks. Heavy and light trucks would be present during demolition and construction stages throughout all elements; however, the number and type of trucks would vary between elements.

Generally, the hours of construction would be Monday through Saturday from 7 AM to 6 PM in one 10-hour shift. A 10-hour work shift was assumed not only for the construction of the Permanent WTC PATH Terminal but was also assumed for the analyses being prepared for the other Lower Manhattan recovery efforts. The proposed hours of construction are consistent with New York City construction guidelines and allow for a consistent basis to assess cumulative effects for the Lower Manhattan recovery efforts. However, in some cases, it may be necessary to conduct construction activities at night, particularly when temporary lane closures would be needed or to coordinate and stage activities for the daytime shift. These nighttime activities would be limited throughout the construction period and would have fewer staff than the daytime shift. These nighttime activities would be required to meet the New York City Noise Control Code (NYC Administrative Code Title 24 §201 et seq.), which does not allow for activities and equipment that would exceed specific noise criteria.

The vehicles, primarily trucks, needed to deliver materials for construction activities and remove demolition debris would be required to adhere to established site ingress and egress truck routes.

For access to the site, trucks arriving and departing would use Route 9A, Broadway, Liberty Street, Church Street, and Barclay Street.

The Preferred Alternative would cost $2.138 billion. A total of $1.750 billion would be funded by the FTA through the Lower Manhattan Transportation Recovery Effort. The remaining $388 million would be funded by PANYNJ through their capital improvements budget.

D. ANALYSIS FRAMEWORK

To assess the potential impacts of the Project Alternatives, this EIS considers three analysis years—construction period, opening year (2009), and design year (2025). Given the unique circumstances leading to the need for and implementation of the Project Alternatives, this EIS considers potential environmental impacts as they relate to two baseline conditions—pre-September 11, 2001 and post-September 11, 2001. Furthermore, a more detailed evaluation of potential cumulative effects was prepared than is typically undertaken.

BASELINE CONDITIONS

To fully investigate the potential impacts, this EIS considers two baseline conditions to formulate future scenarios for the Project Alternatives.

Pre-September 11, 2001 Baseline

The pre-September 11, 2001 baseline condition reflects the built environment in Lower Manhattan prior to the terrorist attacks. The pre-September 11, 2001 baseline is used for the evaluation of potential future long-term environmental impacts and for the preparation of appropriate mitigation measures.

Because the terrorist attacks resulted in drastic differences in the physical and social characteristics of Lower Manhattan, the current environment in Lower Manhattan does not reflect the level of activity that existed prior to September 11, 2001. The planned redevelopment of Lower Manhattan would result in the replacement of much of the real estate and infrastructure that was lost, resulting in increased trips to the area. However, it is anticipated that the environment in the vicinity of the Permanent WTC PATH Terminal could continue to support the level of activity that existed before September 11, 2001. Therefore, the quantified analysis of future impacts and mitigation is based on a theoretical comparison that assumes the terrorist attacks had not occurred, in order to evaluate the future condition when Lower Manhattan has truly recovered and continues to grow.

The pre-September 11, 2001 baseline condition precludes the federally sponsored redevelopment and recovery projects in Lower Manhattan since it is assumed that the terrorist attacks had not occurred. Therefore, the future conditions developed based on the pre-September 11, 2001 baseline does not include the following projects: WTC Memorial and Redevelopment Plan; Route 9A; Fulton Street Transit Center; and South Ferry Terminal.

However, other real estate development is assumed to have been constructed whether or not the terrorist attacks had occurred. These projects, therefore, are accounted for in the future conditions based on the pre-September 11, 2001 baseline.

Post-September 11, 2001 Baseline

The post-September 11, 2001 baseline condition reflects the current environment in Lower Manhattan. This scenario considers the loss of the WTC and transportation infrastructure as well as changes in employment and land use resulting from the terrorist attacks.

Because the revitalization of Lower Manhattan would take more than a decade, the post-September 11, 2001 baseline condition is used to project future conditions in the interim (construction period and opening year) analysis years presented in this EIS. It also considers the numerous projects planned for the redevelopment of Lower Manhattan, including the $4.55 billion transportation recovery projects. In addition, this scenario is applied to the design year conditions without PATH service under the No Action Alternative, since the other recovery efforts would be pursued independently.

CONSTRUCTION ANALYSIS FRAMEWORK

The DEIS presented a construction schedule and phasing plan developed in October 2003. This plan was prepared in a coordinated effort to support the assessment of cumulative effects for the Lower Manhattan recovery projects. The phasing plan presented in the DEIS consisted of 6 Elements as follows:

- Element 1: Permanent Tracks, Platform Conversion, Mezzanine, and Concourse Construction;
- Element 2: Tunnels under 1 and 9 Line;
- Element 3: Route 9A Connection;
- Element 4: Liberty Plaza Connection;
- Element 5: Excavation/Deconstruction of the temporary PATH station; and
- Element 6: PATH Terminal Building.

Since the Liberty Plaza Connection is not being proposed as part of the Preferred Alternative, Element 4 of the DEIS phasing plan has been eliminated in this FEIS. Furthermore, since publication of the DEIS, project engineering and design have progressed allowing for a more refined assessment of the construction schedule and phasing.

The analysis in the DEIS assumed construction would begin in the first quarter of 2005, but it is now anticipated to start in the third quarter of 2005. Furthermore, the DEIS analysis of construction impacts assumed a more fast-tracked approach with the majority of activities occurring in 2006. Based on current engineering data, design considerations, and coordination issues with other separate undertakings on the WTC site, the construction activities would be more evenly distributed through 2006, 2007, and 2008. Since the analysis in the DEIS was based on a higher level of activity than is currently proposed, the corresponding construction-related impacts are higher than what is now expected. Assumptions in the DEIS regarding construction scheduling and phasing have not been revised for the FEIS, as they represent the maximum predicted truck trip generation, noise levels, and pollutant concentrations that could possibly occur under the most aggressive construction schedule. Mitigation measures developed with respect to these maximum predicted levels would be even more effective under the currently proposed, less aggressive construction schedule.

This construction analysis framework in the DEIS considered the peak period of activity when four elements of the Terminal would be in simultaneous construction, including the Liberty

Plaza Connection. Elements 1, 2, and 3 of this framework were not changed for the quantified construction-period analysis presented in this FEIS; however, Element 4, the Liberty Plaza Connection, was dropped since it is no longer considered as part of the Preferred Alternative.

The following briefly describes the activities included in Elements 1, 2, and 3 of the construction analysis framework.

- Element 1, Permanent Tracks, Platform Conversion, Mezzanine and Concourse Construction, consists of three seven-month stages over a total duration of 21 months. In each stage, one existing platform/track section of the temporary WTC PATH station would be demolished and reconstructed with new mezzanine/concourse connections. All work would occur within the west bathtub of the WTC site with access from the existing ramp from Liberty Street. No street closings were anticipated for this work to take place.
- Element 2, Tunnels under 1 and 9 line, would involve the driving of the mezzanine and concourse tunnels under MTA/NYCT's 1 and 9 subway line beneath Greenwich Street. The work would take place from within the existing subway tunnel and from within the existing west bathtub. The work would involve underpinning the subway tunnel followed by the excavation and construction of the underpasses. Estimated duration of tunnel driving and construction is 20 months. Tunneling would be accomplished via conventional mining techniques (e.g., shield with hand or mechanical excavation). Over the 20-month period, construction activities including spoil removal, grout injection, underpinning, concrete pouring, and steel installation would occur. During this period, it may be necessary to occasionally suspend 1 and 9 train service through the construction zone during off-peak periods. This work would be coordinated with MTA/NYCT to minimize potential disruption to commuters.
- Element 3, Route 9A Connection, would include construction of the concourse under Route 9A, which would be constructed near the northwest corner of the site. Slurry wall construction and cut and cover excavation would be employed to cross Route 9A. The estimated duration was approximately 15 months. This work would be coordinated with NYSDOT's proposed reconstruction of Route 9A.

Table S-1 shows the on-site equipment requirements in the peak construction year for Elements 1, 2, and 3. Table S-2 presents the daily delivery trips for each of these elements.

The Preferred Alternative would generate 294 daily vehicle trips during construction. Of these, 236 trips would be delivery and service trucks traveling to and from the site, and a total of 58 daily trips would be construction workers arriving in their personal automobiles.

APPROACH TO CUMULATIVE EFFECTS

The Permanent WTC PATH Terminal is part of a larger redevelopment plan for Lower Manhattan that includes transportation and development projects being sponsored by both public and private groups. Although funded and planned separately, these projects would have a cumulative effect on the character and quality of Lower Manhattan and the region as a whole both during and after construction. To guide the Lower Manhattan project sponsors in their analysis of cumulative effects under NEPA, FTA prepared its *Approach to Cumulative Effects Analysis for the Lower Manhattan Recovery Effort* (July 2003). The approach described in FTA's guidance ensures consistency between the federally-sponsored projects through a coordinated set of analysis assumptions and methodologies for all of the transportation recovery

Table S-1
Construction Analysis Framework – Summary of On-Site Construction Equipment in the Critical Analysis Year

Equipment	Element 1	Element 2	Element 3	Total
Air Compressor for Impact Wrenches	2	0	0	2
Air Compressor for Pavement Breakers	1	0	0	1
Air Operated Grout Drills	0	2	3	5
Backhoe	0	0	1	1
Crawler Crane	1	1	1	3
Hi-Lift (forklift)	2	2	2	6
Hydraulic All-terrain Crane	1	0	0	1
Hydraulic Excavator with Hoe Ram	1	0	0	1
Hydraulic Excavator with Thumb	1	0	0	1
Impact Wrenches	20	0	0	20
Pavement Breakers	4	0	1	5
Welding Machines	2	1	2	5

Table S-2
Construction Analysis Framework – Summary of Peak Daily Off-Site Vehicle Trips in the Critical Analysis Year

Type	Element 1	Element 2	Element 3	Total
Heavy Trucks	132	22	20	174
Light Trucks	42	10	10	62
Private Vehicles	34	12	12	58
Total	208	44	42	294

projects. As individual projects advance through the NEPA process, the analysis and any identified impacts are incorporated into the documentation of later projects to ensure a consistent, up-to-date, and comprehensive evaluation of potential cumulative effects.

The study of cumulative impacts focuses on subject areas most prone to potential cumulative adverse effects. The federal partners and local project sponsors identified five areas with the highest potential for cumulative effects—access and circulation; air quality; noise and vibration; cultural and historic resources; and economic factors. The local project sponsors have coordinated amongst themselves and with federal agencies to develop consistent methodologies, assumptions, data sources, and impact criteria for the evaluation of impacts for the five cumulative effects subject areas. Furthermore, the project sponsors agreed to a consistent set of EPCs for these resource areas to be implemented as part of their projects in order to minimize or avert adverse impacts.

The cumulative effects analysis considers both the potential short-term (construction period) and long-term (operational period) beneficial and adverse impacts. For short-term, construction period assessment, the analysis explicitly considers the cumulative effects of the five federally-funded Lower Manhattan Recovery Projects—Permanent WTC PATH Terminal, WTC

Memorial and Redevelopment Plan, Fulton Street Transit Center, South Ferry Terminal, and the Route 9A Project (see Figure S-4). Other privately-funded initiatives were considered but were not explicitly modeled. These projects were either too small to influence the outcome or were considered as part of the baseline from which cumulative effects were projected.

Since publication of the DEIS, the construction schedules for the WTC Memorial and Redevelopment Plan and the Route 9A Project have been delayed by approximately one year, and as described above, the schedule for the Permanent WTC PATH Terminal is also changed. Although, the peak activity levels for these three projects is expected to be similar to the analysis presented in the DEIS, the actual peak period is more likely to occur in 2007 and/or 2008 rather than in 2006. The construction schedules for the South Ferry Terminal and the Fulton Street Transit Center are similar to those presented in the DEIS, meaning that activities for these projects would peak in 2006. Although the Fulton Street Transit Center and South Ferry Terminal projects would have less overlap with construction of the Permanent WTC PATH Terminal, the peak daily equipment and truck activities for these projects were not changed in this FEIS. Thus, the cumulative effects analysis presented herewith is a conservative baseline for the development of mitigation measures since a lower level of activity is more likely to occur in the peak construction year for the Permanent WTC PATH Terminal.

E. PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

ANALYSIS RESULTS

Summarized in this section are the findings of the environmental analyses performed for this FEIS. Analyses were performed to determine the potential for adverse and/or beneficial impacts in the following categories: land use, neighborhood character, and social conditions; economic conditions; visual and aesthetic considerations; historic resources; archeological resources; transportation; air quality; noise and vibration; energy; contaminated materials; water resources; wetland and terrestrial resources; and coastal zone management. Table S-3 provides a summary of the potential impacts during the construction period, while Table S-4 provides a summary of design year impacts. Where the potential for adverse impacts have been identified and mitigation measures are feasible, such measures are discussed below.

As described above, this EIS considers a 2009 opening year. The opening year analysis accounts for the continued operation of a temporary WTC PATH station, which is assumed to be closed by 2025. Furthermore, the redevelopment of the WTC site and the construction of several other private development projects in Lower Manhattan would not be fully completed in 2009 but would be achieved before 2025; therefore, there would be fewer trips to Lower Manhattan in the opening year than in the design year. Given these differences in the opening year and design year conditions, the 2009 analysis shows less pronounced benefits of a Permanent WTC PATH Terminal over the No Action condition than is reflected in 2025. However, in terms of the Terminal's potential impacts to cultural resources, noise and vibration, natural resources, and pedestrian circulation, the impacts in both 2009 and 2025 are nearly identical. Thus, the mitigation measures described below for the 2025 design year would also apply to the 2009 opening year.

MITIGATION

As described in Table S-3, the Preferred Alternative would result in impacts to cultural resources, vehicular traffic, air quality, noise and vibration, and contaminated materials during

3.31.05

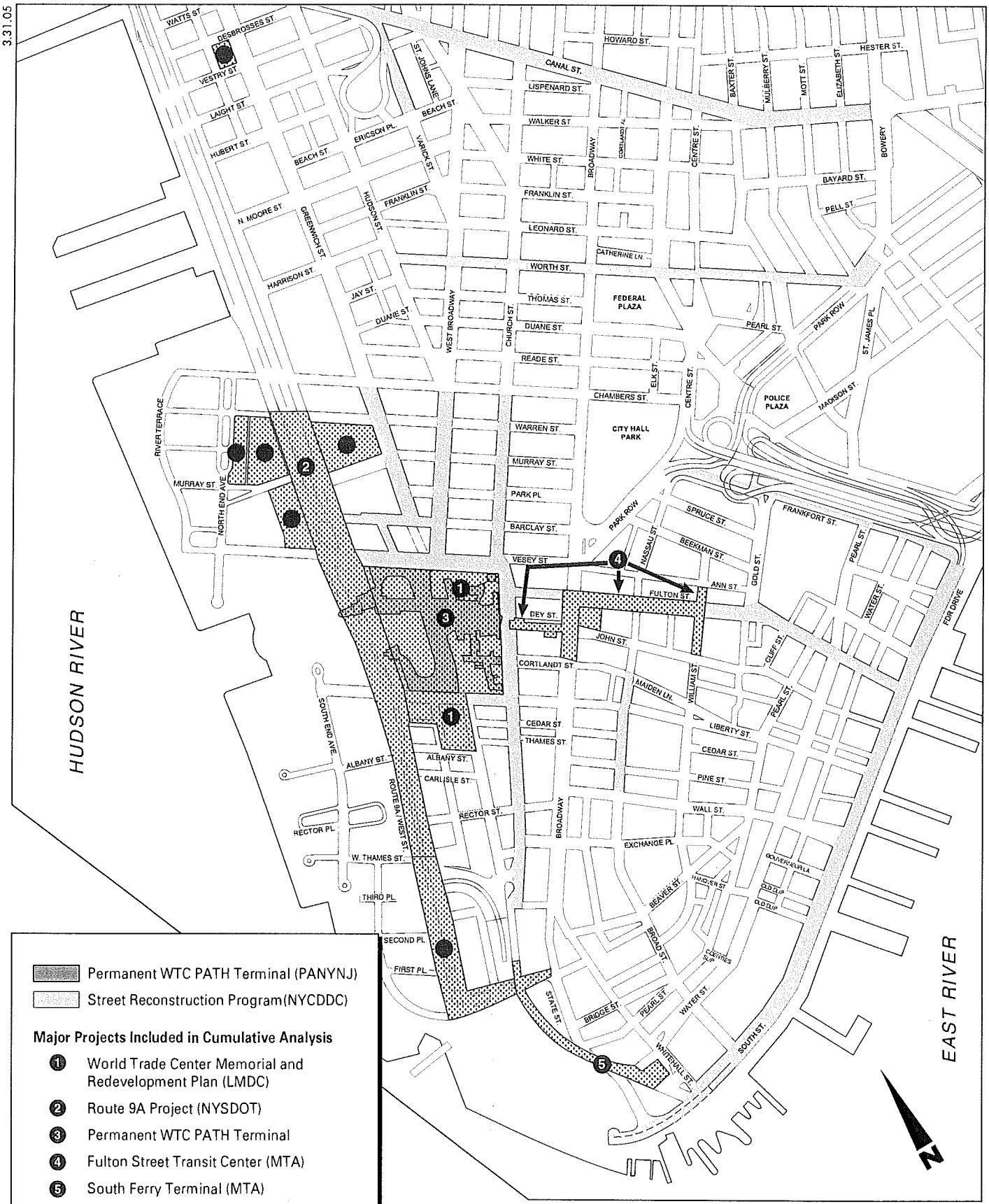


Figure S-4

Lower Manhattan Projects Planned for Construction in the Critical Analysis Year

the construction period. PANYNJ would implement Environmental Performance Commitments (EPCs) as part of the project to minimize or avoid adverse impacts during construction (see Appendix I). Although the EPCs would avert many of the adverse impacts identified in the FEIS, additional mitigation would be necessary. Table S-5 describes the EPCs and plans for their implementation, while the additional project-specific mitigation commitments are shown in Table S-6.

Generally, the Preferred Alternative would have greater environmental benefits than the No Action Alternative over the long-term, operational period. However, the analysis showed that the Preferred Alternative would result in adverse effects to cultural resources, on-street pedestrian circulation, noise and vibration, and natural resources (see Table S-4). Mitigation measures have been recommended to minimize these adverse impacts as shown in Table S-7.

The EPCs described in Table S-5 were developed through a coordinated effort of the Lower Manhattan project sponsors and are contained in a letter signed in September 2003 (see Appendix I). Throughout the DEIS and FEIS phases for the Permanent WTC PATH Terminal, the project sponsors developed and implemented a framework for construction coordination, which included several working groups to address issues that have been identified in the individual environmental documents and to further refine the EPCs. The sponsors established a Schedule Working Group, a Logistics Working Group, a Traffic Working Group, and a Standards Working Group. Through this coordinated approach to the evaluation of individual projects, the project sponsors strove to meet or exceed the EPCs and to investigate and remediate issues and concerns that could arise during the construction process.

Since the publication of the DEIS, Governor Pataki established, by way of an Executive Order, the Lower Manhattan Construction Command Center (see Appendix I). This entity will coordinate the construction of the Lower Manhattan Recovery Projects as well as any other construction projects in Lower Manhattan with a value in excess of $25 million through 2010. The Command Center will have an Executive Committee consisting of representatives from the various sponsoring agencies and other key state and local agencies. The Command Center and its Executive Committee will be managed by an Executive Director, who was appointed in February 2005.

As stated in the Executive Order, the functions of the Command Center will be:

- "Coordinating the work of the participants in the rebuilding process and ensuring that the construction in Lower Manhattan proceeds as scheduled by mediating conflicts in schedules and street and site access between construction projects, agencies, and the Lower Manhattan Community;"
- "Coordinating protocols, contract requirements and activities outside of individual project limits through planning on a daily basis throughout construction for government agencies, developers, construction managers, general contractors, and contractors;"

"Coordinating construction projects to minimize inconvenience for residents, workers, pedestrians, vehicles, and commuters;"

- "Ensuring that the Lower Manhattan area remains neat, clean and orderly throughout construction;"
- "Communicating with residents, businesses, and the general public through a communications director working with each agency's communications and public outreach

personnel; providing a central focus on issues critical to the local community and the construction industry, by coordinating initiatives, public outreach, and information;" and

- "Utilizing technology to facilitate coordination of projects."

Although the Command Center and the Lower Manhattan Construction Coordination Group will work to implement and enhance the EPCs for all of the Lower Manhattan Recovery Projects, PANYNJ will independently ensure that its EPCs are met. Coordination and circulation plans will accompany the Project's design documents, and the project's contract documents and construction specifications will include the EPCs and specific measures to monitor these commitments as construction moves forward.

Also, subsequent to publication of the DEIS, FTA and PANYNJ executed a Memorandum of Agreement (MOA) pursuant to Section 106 of the National Historic Preservation Act (see Appendix B). The MOA includes measures to avoid, minimize, or mitigate the Project's adverse impacts to historic properties both during and after construction. The MOA was developed through an extensive Section 106 consultation process that included the New York State Department of Parks, Recreation, and Historic Preservation; the U.S. Advisory Council on Historic Preservation; the New York City Landmarks Preservation Commission; and historic preservation, community, and public interest groups. The MOA establishes a process, which PANYNJ must follow as the Terminal's design moves forward. This process commits PANYNJ to incorporate certain remnants and structures on the WTC site into the Terminal's design to mitigate its adverse impacts and also includes stipulations to ensure ongoing coordination with the Section 106 consulting parties.

FTA will issue a ROD for the Permanent WTC PATH Terminal. The ROD will summarize the impacts of the Preferred Alternative and will include the mitigation commitments that would minimize or avoid these impacts. This would include the EPCs, the commitments set forth in the Project's Section 106 MOA, and all other mitigation measures identified in this FEIS.

SECTION 4(F) EVALUATION

Since the project is being funded by the FTA, an administration of the USDOT, it must comply with Section 4(f) of the USDOT Act of 1966. Under Section 4(f), the Secretary of Transportation is prohibited from approving any program or project that requires the "use" of 1) any publicly owned land in a public park, recreation area, or wildlife and waterfowl refuge of national state, or local significance, or 2) any land from a historic site of national, state, or local significance (collectively "Section 4(f) resources"), unless there is no feasible and prudent alternative to the use of such land and the project includes all possible planning to minimize harm to the resource.

With respect to the term "use", Section 4(f) considers three possible ways in which a project could involve a "use" of a resource:

- When land is permanently incorporated into a transportation facility;
- When there is a temporary occupancy of land that is adverse in terms of the statute's preservationist purpose; or,
- When there is a constructive use of land.

Constructive use occurs when the project does not directly incorporate land from a Section 4(f) resource, but the project's impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired.

Table S-3

Probable Impacts of the Project Alternatives—Construction Period

Resource Area		No Action Alternative	Preferred Alternative
Land Use, Neighborhood Character, and Public Policy		Under the No Action Alternative, any changes in land use and neighborhood character would be attributed to other independent actions. Because this alternative would not result in the coordinated construction of the Lower Manhattan Recovery Projects, it would be inconsistent with public policy initiatives.	Lane closures, trucking activities, and noise associated with construction may affect the quality of life for Lower Manhattan's employees, residents, and visitors; however, these disruptions would be temporary and no long-term effects to land use or neighborhood character would result.
Socioeconomic Conditions		The simultaneous construction of other independent transportation and development projects in Lower Manhattan, independent of the Project Alternatives, may have impacts to local residents and businesses. Temporary road closures, trucking activities, and construction noise may temporarily affect the quality of life for employees and residents in the vicinity of the WTC site. However, these construction activities are necessary to ensure the long-term vitality of Lower Manhattan; thus, this temporary adverse impact lends to long-term positive benefits for adjacent populations.	Construction of the Preferred Alternative would not result in residential or businesses displacement. The Maintenance and Protection of Traffic (MPT) plan would ensure that residents, employees, and visitors can access existing residences and businesses as well as the temporary WTC PATH station during the Preferred Alternative's construction. The Preferred Alternative's construction would yield a total of 19,965 person-years of employment and $3.86 billion in direct and indirect expenditures. The project would also generate nearly $50 million in tax revenues.
Cultural Resources	Historic Resources	The No Action Alternative would not directly alter or disturb historic resources within the area of potential affect. Thus, any changes to historic resources would be attributed to construction associated with other independent undertakings.	Construction of the Terminal would directly disturb or alter the Hudson River Bulkhead and remaining remnants on the WTC site. Vibrations created by project construction may adversely impact 5 historic buildings in the area of potential effect.
	Archaeological Resources	The No Action Alternative would not disturb known or suspected archaeological resources. Therefore, any potential impacts to archaeological resources would result from other independent undertakings.	Construction beneath Route 9A would have an adverse impact to the Hudson River Bulkhead, which is located beneath Route 9A. The project may also disturb as yet determined archaeological resources on the eastern portion of the WTC site; however, additional testing of these sites is recommended to determine their archaeological sensitivity.
Urban Design and Visual Resources		The temporary WTC PATH station would appear as is does today. Construction activities associated with the WTC Memorial and Redevelopment Plan would be occurring on the WTC site.	Above-grade construction of the Terminal Hall may temporarily impact streetscape features. However, the Preferred Alternative would not adversely impact visual resources and view corridors during the construction period.
Transportation	PATH	The No Action Alternative would not result in adverse impacts to PATH operations during construction. However, activities associated with other projects on the WTC site may result in off-peak and weekend service disruptions.	Construction of the Preferred Alternative would be staged to fully maintain peak period PATH service. Off-peak service disruption may be necessary for certain construction activities and in order to move equipment around the site.
	Vehicular Traffic and Parking	Because the project itself would not generate construction period vehicles, there would be no associated traffic impacts during the construction period.	Project-generated, construction period vehicle trips would result in an adverse impact at the intersection of Route 9A and Liberty Street during the PM peak hour.
	Transit	The construction of other projects (i.e. Fulton Street Transit Center, South Ferry Terminal, Route 9A, and World Trade Center Memorial and Redevelopment Plan) may result in temporary disruptions to subway and bus services during off-peak periods. However, the No Action Alternative, itself, would not adversely impact transit service during the construction period.	Construction of the Preferred Alternative would not impact access to other modes of transit in the vicinity of the WTC site. Where underpinning of MTA/NYCT's 1/9 and R/W subway lines would be required, construction would be limited to off-peak hours and would be coordinated with MTA/NYCT to minimize any potential service disruptions.
	Pedestrians	The construction of other projects (i.e. Fulton Street Transit Center, South Ferry Terminal, Route 9A, and World Trade Center Memorial and Redevelopment Plan) may result in temporary disruptions to on-street, pedestrian circulation in the vicinity of the WTC site. However, the No Action Alternative, itself, would not have adverse impacts to pedestrians during the construction period.	Pedestrian circulation in the vicinity of the project site would not change substantially as compared to the No Action Alternative since most diversions would be required for construction of other independent undertakings. The current access to the temporary WTC PATH station would be maintained until replaced by new access/egress points constructed as part of the Preferred Alternative. Sidewalks along Route 9A may be closed temporarily during construction; however, north-south pedestrian access would be maintained along the Route 9A alignment.
Air Quality		Under the No Action Alternative, emissions in the area would be highly influenced by the construction activity for the WTC Memorial and Redevelopment Plan, Route 9A Project, Fulton Street Transit Center, and other public and private development projects.	The Preferred Alternative's construction would result in increased emissions of carbon monoxide (CO), particulate matter ($PM_{2.5}$, PM_{10}), and nitrogen dioxide (NO_2) at receptor sites in close proximity to the construction zone. However, the increases in CO, PM_{10}, and NO_2 would not exceed National Ambient Air Quality Standards and, therefore, would not result in adverse impacts. However, the maximum increase in 24-hour $PM_{2.5}$ concentrations of 47.8 $\mu g/m^2$ would be substantial. These increased emissions would generally be highest in the vicinity of the Route 9A connection, but at distances in excess of a few hundred feet from the construction zone increases in project-generated emissions would not be substantial.
Noise and Vibration		Under the No Action Alternative, noise levels in the area would be highly influenced by the construction activity for the WTC Memorial and Redevelopment Plan, Route 9A Project, Fulton Street Transit Center, and other public and private development projects.	Construction noise levels would exceed FTA's recommended 8-hour threshold for residential uses at the Hilton Millennium Hotel and 114 Liberty Street and would exceed FTA's 8-hour and 30-day commercial land use thresholds at the World Financial Center. Vibrations created by project construction may adversely impact 5 historic buildings within 90 feet of the construction zone. Farther than approximately one to two blocks from the construction zone, noise and vibration increases from the Preferred Alternative's construction are not expected to be substantial.
Infrastructure and Energy		Under the No Action Alternative, any potential impacts to infrastructure or energy during the construction period would be attributed to other independent actions.	Energy needed to construct the Preferred Alternative would be supplied by the City's power grid or on-site generators. However, this energy demand is not anticipated to adversely impact the supply of utilities to Lower Manhattan. The Terminal's construction has the potential for conflicts with existing utility lines along Church Street. Where utility lines would interfere with permanent elements of the Terminal, they would be permanently relocated. Where construction activities have a high potential to disrupt utility lines, shoring or temporary relocation may be undertaken.
Contaminated Materials		Under the No Action Alternative, any potential impacts from contaminated materials during the construction period would be attributed to other independent actions.	The Terminal's platform, mezzanine, and portions of its concourse would be within the portion of the WTC site that was fully cleared of contaminants as part of the post-September 11, 2001 recovery efforts. Although some soils remain near PATH's tunnel projections, the top 18 inches were previously removed and replaced with clean fill. Portions of the WTC site east of the 1 and 9 line have the potential for residual contamination since debris and structures remain in this area. Excavation and tunneling activities beneath Route 9A has the potential to encounter fill materials with elevated levels of polycyclic aromatic hydrocarbons (PAHs) and metals, which is typical of fill soils in New York City. During the Preferred Alternative's construction, PANYNJ and LMDC would repair damaged portions of the WTC basement wall, which would essentially eliminate the invasion of overburden ground water through the wall into the WTC site.
Natural and Water Resources		Under the No Action Alternative, any potential impacts to natural resources and water quality during the construction period would be attributed to other independent actions.	The Terminal's construction is not expected to result in adverse impacts to terrestrial or aquatic species. Furthermore, floodplain control and stormwater management techniques that would be implemented as part of the project would avert any adverse impacts to water quality during construction.

Table S-4
Probable Impacts of the Project Alternatives—Design Year

Resource Area		No Action Alternative	Preferred Alternative
Land Use, Neighborhood Character, and Public Policy		The existing temporary WTC PATH station was constructed for use on an interim basis and would not support long-term development of the WTC site or Lower Manhattan, as a whole. The absence of a Permanent WTC PATH Terminal may reduce the desirability and marketability of those independent developments that are planned throughout the study area, including those at the WTC site itself. Existing Lower Manhattan businesses may relocate to other areas of Manhattan or leave New York City altogether. As a result, the revitalization of Lower Manhattan may not be as robust as would otherwise be expected and any benefits to neighborhood character would not be realized.	The Permanent WTC PATH Terminal is part of a major public policy initiative by federal, state, and city agencies to restore the Project Site as a functioning use and to reestablish a focal point of civic space and amenities for Lower Manhattan. PATH commuters would benefit area businesses, particularly restaurants and shops, well beyond the Project Site, improving neighborhood character. The Terminal is consistent with efforts to enhance Lower Manhattan to retain existing uses and to attract new businesses in the long term. Thus, this alternative would have beneficial effects on surrounding areas, and no adverse impacts to land use, neighborhood character, or public policy would result from this alternative.
Socioeconomic Conditions		The absence of a Permanent Terminal and possible disruption of or limitations to temporary WTC PATH service may reduce the desirability and marketability of Lower Manhattan and could lead existing Lower Manhattan businesses to relocate. Access between New Jersey and Lower Manhattan could be achieved by other modes, but these options are more time consuming, less convenient, and sometimes more expensive than direct PATH service. Thus, the No Action Alternative may have adverse effects on residents and employees and could have a lasting negative effect on its economic vitality.	The Preferred Alternative would not include residential or office uses nor would this alternative have adverse direct or indirect effects to residents or businesses. While PATH ridership would increase over time, this change would have positive impacts to businesses within the vicinity of the WTC site. It is expected that any effects of the Terminal would be a positive and that there would be no adverse impacts to social or economic conditions.
Cultural Resources	Historic Resources	Since the No Action Alternative would not directly result in changes to the WTC site or adjacent properties, any contextual impacts to historic resources would be the result of other independent actions.	The area of potential effect is composed of historic structures near more modern structures, such that many older buildings are immediately adjacent to contemporary glass and metal structures. Thus, the modern design of the terminal, including its ventilation structures and World Financial Center entrance, is not expected to result in adverse contextual effects to historic resources within the area of potential effect. FTA and PANYNJ have executed a Memorandum of Agreement (MOA) pursuant to Section 106 of the National Historic Preservation Act. Per the stipulations of the MOA, the Terminal would incorporate architectural treatments and other measures to minimize and/or mitigate the Project's long-term use of remaining remnants and structures on the WTC site.
	Archaeological Resources	Since the No Action Alternative would not have resulted in construction in areas with known or potential archaeological sensitivity, there would be no adverse impacts to archaeological resources.	Adverse effects to the Hudson River Bulkhead beneath Route 9A and potential adverse effects to potentially sensitive areas on the WTC site would be resolved during the construction period in consultation with SHPO. Thus, this alternative would not have adverse impacts to archaeological resources during the operation of the Permanent WTC PATH Terminal.
Urban Design and Visual Resources		It is assumed that infrastructure associated with the temporary WTC PATH station would be retained on the WTC site although certain alterations may be required to maintain PATH service to the extent possible. It is not expected that the No Action Alternative would have adverse effects to visual resources.	The Terminal's modern design would complement the structures planned for the WTC site. The terminal would likely become an important visual resource for Lower Manhattan, and would create a grand point of entry for the new transportation center. Similarly, the above-ground entrance to the Terminal from the World Financial Center would not have adverse impacts on the urban design or visual resources since it would be a modern design that complements the Winter Garden. The vent structures in the median of Route 9A would not block views or view corridors. They would be clad in reflective material that would blend them with their surroundings and would be in keeping with modern buildings in the immediate area. Thus, the vent structures would not have an adverse impact on view corridors or visual resources.
Transportation	PATH	Passenger volumes would surpass the safe and efficient design capacity of the temporary WTC PATH station before 2025. To continue service, PANYNJ would implement restrictive measures to ensure safety and reliable PATH operations, such as restricted peak hour access, reduced WTC train service, or, in the worst case, full closure. These measures would fail to serve passenger demand and would have operational repercussions throughout the PATH system. Absent WTC service, some passengers would divert to PATH's Christopher Street or 9th Street stations. The estimated addition of 2,300 AM peak hour passengers at each of these stations by 2025 would adversely impact their safe and efficient operation.	The Permanent WTC PATH terminal would provide added passenger capacity that would be required given the redevelopment of the WTC site. The Permanent WTC PATH Terminal would accommodate elements that the temporary WTC PATH station could not, including pedestrian linkages to surrounding buildings, all area NYCT subways lines, and more convenient access to trans-Hudson ferries. Multiple entrances and exits would reduce walking times to access and egress the new terminal, which would lead to shorter walking distances and commute times for many users. Thus, any potential impacts of the Permanent WTC PATH Terminal to its users and to PATH operations would be beneficial.
	Vehicular Traffic and Parking	The No Action Alternative may preclude PATH service to Lower Manhattan, resulting in upwards of 1,200 peak hour vehicle trips by 2025. These additional vehicle trips would result in possible adverse impacts at key locations, such as the Holland Tunnel and Route 9A. Furthermore, increased travel delays would be expected at key Lower Manhattan locations.	The Permanent WTC PATH Terminal would reduce traffic demand as compared to the No Action Alternative. Thus, the Preferred Alternative is not anticipated to result in adverse impacts to traffic operations.
	Transit	The No Action Alternative may preclude or impede PATH service to Lower Manhattan, resulting in the diversion of up to 158,000 daily trips to other modes of transit by the 2025 design year. These diverted PATH riders would increase congestion and hinder operations for these other transit modes. Added capacity could be provided on ferry and bus routes, but these additional boats and vehicles may result in additional adverse environmental impacts. New Jersey Transit commuter trains and PATH's uptown lines would experience extreme overcrowding and may not be able to provide for adequate capacity to meet ridership demand. Thus, the No Action Alternative would have long-term adverse impacts to transit service.	The Permanent WTC PATH Terminal would provide greater passenger capacity than the temporary WTC PATH station, which would serve to alleviate crowding on complementary transit services such as trans-Hudson ferry and bus service and downtown-bound subway service from Penn Station-New York. The Permanent Terminal would provide enhanced pedestrian connections between trans-Hudson ferries, NYCT subways, and PATH, which would improve transit access to, from, and within Lower Manhattan. Thus, the impacts of this alternative are expected to be beneficial.
	Pedestrians	Under the No Action Alternative, PATH customers may be diverted to other modes, which would change patterns of on-street circulation within the vicinity of the WTC site. Furthermore, absent the sub grade transit and building connections that are proposed as part of the Terminal, substantial volumes of commuters, office workers, and others would be diverted to street level, resulting in congestion on sidewalks and at street corners and crosswalks leading to and from the WTC site. It is anticipated that the No Action Alternative would result in pedestrian levels of service that would be worse than those in the area prior to September 11, 2001.	At the intersection of Church and Liberty Streets, the Preferred Alternative would add approximately 4,490 and 2,010 new pedestrian trips in the AM and PM peak hours, respectively. These trips would be added to a pre-September 11, 2001 baseline of 8,420 and 7,050 trips in the AM and PM peak hours, respectively, and would represent more than a 50 percent increase in volumes. This increase in trips would result in level of service (LOS) F conditions for the north and west crosswalks, which may cause pedestrians to spill into the opposing traffic travel lanes during the pedestrian signal. The loss in area per person would range from 1 to 10 SFP in the crosswalks, and from 1.3 to 12.4 in the northwest corner reservoir. The northwest corner reservoir LOS F in the AM peak hour would congest pedestrian flows when pedestrians are queued to cross away from the WTC/PATH site in the west and north crosswalks, and block pedestrians crossing inbound from the northeast and southwest corners of the intersection. Pedestrians normally crossing at Church and Liberty Street may divert to the Cortlandt or Cedar Street intersections, or illegally cross Church Street between Liberty and Cortlandt Streets. Pedestrians circulating through the northwest corner reservoir during surge conditions require more physical space than could be afforded in that area, which could force pedestrians to wait on the street in Liberty or Church Street vehicular travel lanes.

Table S-4 (Continued)
Probable Impacts of the Project Alternatives—Design Year

Resource Area	No Action Alternative	Preferred Alternative
Air Quality	Air quality in Lower Manhattan would improve upon the completion of construction of the Lower Manhattan recovery efforts. However, absent a Permanent PATH Terminal, there would be an increase in air pollutant emissions from the diversion of PATH customers to vehicular modes. By 2025, upwards of 15.7 tons of VOCs, 18.0 tons of NOx, 1.5 tons of PM10, and 236.0 tons of CO would be emitted by motor vehicles destined from New Jersey to Lower Manhattan if a Permanent WTC PATH Terminal were not built and temporary service was suspended..	The Preferred Alternative would reduce motor vehicle emissions as compared to the No Action Alternative. Therefore, the Preferred Alternative would have the beneficial impacts on air quality in the New York Metropolitan Area.
Noise and Vibration	In the design year, under the No Action Alternative, noise levels in the study area would be slightly higher than with the other Project Alternatives, due to the increase in vehicular traffic (autos and buses) expected to result from a reduction in, or the elimination of, PATH service. However, this expected increase in vehicular traffic would not likely increase noise levels substantially above current conditions.	The Preferred Alternative would not result in any operational transit noise or vibration impacts for uses that currently exist on the project site. However, this alternative would exceed the FTA criteria for ground-borne noise, for the most sensitive uses defined by FTA—concert halls, TV studios, recording studios, auditoriums and theaters. These uses were conservatively used to assess potential impacts at the WTC Memorial site. However, the WTC Memorial and the Preferred Alternative are being planned and designed cooperatively to ensure that transit noise from PATH operations would not adversely impact the WTC Memorial
Infrastructure and Energy	Because the No Action Alternative may generate new vehicle trips to Lower Manhattan, there would be additional fuel consumption and energy use.	Although the Preferred Alternative would be larger than the PATH facility that existed prior to September 11, 2001, advances in building materials and systems as well as the implementation of sustainable design measures are expected to result in energy demand that would be similar to or lesser than the pre-September 11, 2001 levels of consumption.
Contaminated Materials	It is unlikely that further development efforts in surrounding areas including the WTC site would cause any contaminated materials issues at the Project Site. Any soil contamination remaining on the WTC site would have been addressed independent of this alternative. Thus, the No Action Alternative would not have adverse impacts from the generation of or exposure to contaminated materials	Any contaminated materials encountered during construction would be removed from the WTC site. PATH uses limited quantities of hazardous materials and petroleum products, but such materials would not be stored on the WTC site. PANYNJ has established standard operating procedures, which include protocols for a hazardous material or petroleum spill. Thus, this alternative would not result in adverse impacts from the exposure to or generation of contaminated materials.
Natural and Water Resources	Any adverse impacts to natural and water resources under the No Action Alternative would result from the construction or operation of independent projects on or near the WTC site. The No Action Alternative itself would not result in adverse impacts to natural and water resources.	The use of glass as the primary material for the street-level terminal has the potential to result in day-time bird strikes. However, other above-grade elements of the Terminal are not expected to result in adverse impacts to terrestrial species. Stormwater generated on-site would be pretreated and would be discharged to the City's combined sewer system. Although elements of the Terminal would be located within the floodplain, its design and operation would incorporate floodplain control devices and would comply with a New York State Department of Environmental Conservation approved State Pollution Discharge Elimination Permit. The river water cooling system includes two existing intakes located on the eastern shore of the Hudson River near the World Financial Center. The New York State Department of Environmental Conservation is currently reviewing PANYNJ's application to renew their State Pollutant Discharge Elimination System (SPDES) permit for the river water cooling system. As part of this application, PANYNJ has prepared a Best Technologies Available (BTA) study that specifies measures to protect fish eggs and larve from entrainment and entrapment associated with the systems intake grates as follows: using 3 gallons per minute (gpm)/ton chillers; variable speed pumps; and modifying the intake structure with 2 millimeter (mm) wedgewire screens to reduce the approach velocity to 0.5 feet per second (fps) with a corresponding river water flow of 120,000 gallons per minute (gpm). While some level of impact to aquatic organisms due to entrainment of fish eggs (and much smaller numbers of larvae) is unavoidable utilizing the selected design, overall aquatic impacts are materially reduced from pre-September 11, 2001 conditions. The proposed system would eliminate the potential for impingement and would reduce entrainment of yolk-sac and post-yolk sac ichthyoplankton from pre-September 11, 2001 levels by an estimated 93 percent and 97 percent, respectively. In fact, virtually all (approximately 98 percent) of the entrained organisms are eggs, which are subject to high rates of natural mortality and fecundity. By excluding life stages of entrainable organisms with higher natural survival rates, the selected design minimizes the adverse environmental impact of the cooling water intake structures. The river water cooling system would be closed-circuit such that water extracted from the Hudson River would not be mixed with potable water or stormwater as it travels through the system. Therefore, the system would not alter the composition of Hudson River water. The BTA study specifies that the maximum designed change in temperature (ΔT) of the proposed river water cooling system is 10°F. Therefore, cooling water flow discharges would not result in temperatures in excess of the 90°F criterion, since the maximum ambient surface water temperature is 80°F, which is consistent with regulations set forth in 6 NYCRR Part 704. Therefore, the cooling water discharges would have no potential impacts to water temperature and water quality within the Hudson River.
Coastal Zone Management	Because the No Action Alternative would be inconsistent with long range development plans for Lower Manhattan and because it would not improve access between the WTC site and the waterfront, it would not fully support the policies of New York City's Local Waterfront Revitalization Program.	The Preferred Alternative would comply with a New York State Department of Environmental Conservation approved State Pollution Discharge Elimination Permit as well as agreements with the State Historic Preservation Officer to minimize or avert adverse impacts to water quality; cultural resources; and visual resources within the coastal zone. Therefore, this alternative would be consistent with the policies set forth in the New York City Local Waterfront Revitalization Program.

Table S-5
Environmental Performance Commitments

Commitment	Implementation Plan
Access and Circulation	
Establish a project-specific pedestrian and vehicular maintenance and protection plan.	PANYNJ will develop a Maintenance and Protection of Traffic Plan (MPT) as part of their contract documents for the Preferred Alternative. A Construction Traffic Management Plan (TMP) will also be developed for the Lower Manhattan Recovery Projects to address these issues in a broader sense. The TMP will be coordinated by PANYNJ, LMDC, MTA, NYSDOT, NYCDOT, the Lower Manhattan Construction Command Center, and others, as appropriate, based on updated construction scheduling and staging as the designs of individual projects are advanced.
Promote public awareness through mechanisms such as: a) signage; b) telephone hotline; and c) website updates.	The TMP will have a public outreach component to communicate traffic information, lane closures, access changes, and travel advisories for the duration of project construction.
Ensure sufficient alternate street, building, and station access during construction period.	For the Preferred Alternative, the MPT Plan included in the contract documents will be used to implement this EPC. The TMP will address the access issues for the Lower Manhattan Recovery Projects by coordinating the individual MPTs required and times for specific land uses and infrastructure (i.e. bus stops, transit stations, etc.).
Regular communication with New York City Department of Transportation and participation in its construction efforts.	PANYNJ will consult with NYCDOT to develop the MPT Plan for the Preferred Alternative. NYCDOT will be active in the development, update, and implementation of the TMP for the Lower Manhattan Recovery Projects.
Air Quality	
Use ultra low sulfur diesel fuel in non–road construction equipment with engine horsepower (HP) rating of 60 HP and above.	PANYNJ has developed specifications for non–road vehicles. The Authority would collect monthly samples of the ULSD fuel to verify compliance.
Where practicable, use diesel engine retrofit technology in non–road equipment to further reduce emissions. Such technology may include Diesel Oxidation Catalyst / Diesel Particulate Filters, engine upgrades, engine replacements, or combinations of these strategies.	In its contract documents, PANYNJ will require the use of DPFs or other measures with equivalent PM removal efficiency for all non-road diesel engines of 50 horsepower or greater wherever the implementation of such a device is technically feasible. In cases where such technology is not available, the use of DOCs will be required. (In the DEIS, the EPCs previously mandated controls only for engines of 60 horsepower or greater, and did not specify DPFs.) In cases where neither technology can be used effectively and the operation cannot be performed by another engine or other means, the use of diesel engines greater than 50 horsepower would be allowed without tailpipe reduction measures. In such cases, the constructor would submit a request for an exception for review and approval by PANYNJ prior to implementation.
Limit unnecessary idling times on diesel powered engines to 3 minutes	As part of the contract specifications, the contractor would provide a Diesel Emission Mitigation (DEM) Plan for review and prior approval by the Resident Engineer (RE). The DEM Plan shall address the control of emissions from all engines and vehicles including those that are not equipped with emission control devices.
Locate diesel powered exhausts away from fresh air intakes.	As part of the DEM, the contractor, as determined by the RE will be required to ensure diesel powered engines vehicles are located away from fresh air intakes.
Control dust related to construction site through a Soil Erosion Sediment Control Plan that includes, among other things: a) spraying of a suppressing agent on dust pile (non–hazardous, biodegradable); b) containment of fugitive dust; c) adjustment for meteorological conditions as appropriate.	PANYNJ has developed specifications for dust suspension, materials handing, and wheel washing. The specifications require the contractor to submit a Dust Control Plan which would be implemented 24 hours per day 7 days per week.
Noise and Vibration	
Where practicable, schedule individual project construction activities to avoid or minimize adverse impacts.	In accordance with Governor Pataki's November 22, 2004 Executive Order, PANYNJ will coordinate the scheduling and staging of construction activities through the Lower Manhattan Construction Command Center. The Command Center will review PANYNJ's plans in conjunction with other planned activities and will recommend schedule adjustments, as appropriate.
Coordinate construction activities with projects under construction in adjacent and nearby locations to avoid or minimize impacts.	Through the ongoing coordination efforts of the LMCCG and the Command Center, adverse noise and vibration effects on sensitive receptors will be minimized through scheduling and routing of deliveries, as well as coordination of street closures and placement of truck/equipment staging areas.
Consider condition of surrounding buildings, structures, infrastructures, and utilities where appropriate.	In accordance with the Project's executed Memorandum of Agreement, PANYNJ will perform pre-construction building conditions surveys of the potentially affected historic buildings within 90 feet of the Preferred Alternative's construction zone. These efforts would be coordinated with the other appropriate Lower Manhattan project sponsors for sites that may be affected by cumulative vibration.
Prepare contingency measures in the event established limits are exceeded.	The Permanent WTC PATH Terminal construction contractor will procure the services of a qualified acoustical firm (INCE certified or licensed Professional Engineer) to assist in the implementation of a Noise Control and Abatement Plan, which will include on-site noise monitoring during construction, and implementation of mitigation measures to ensure compliance with applicable noise exposure thresholds. Vibration monitoring specifications, and corrective actions in the event threshold levels are exceeded, will be included in the Construction Protection Plan pursuant to the Stipulations of the Project's executed MOA.
Cultural and Historic Resources	
Establish coordination among projects to avoid or minimize interruption in access to cultural and historic sites.	Access to cultural sites within the APE for the Preferred Alternative will be maintained, to the maximum extent feasible given public safety considerations, as part of the Preferred Alternative's Maintenance and Protection of Traffic (MPT) Plan. The TMP for all of the Lower Manhattan Recovery Projects will also coordinate access to cultural sites.
Initiate public information and involvement outreach with sensitivity to local cultural resources.	PANYNJ has coordinated with the Section 106 consulting parties to develop and execute a Memorandum of Agreement pursuant to Section 106 of the National Historic Preservation Act. The executed Memorandum of Agreement includes stipulations for ongoing coordination and consultation as the Preferred Alternative's design and construction moves forward. Materials pertaining to the Project's effects on cultural resources will made available on the project's website in accordance with the stipulations of the executed Memorandum of Agreement.
Identify public information outlets that will receive and provide current information about access during construction.	This EPC will be implemented through the Lower Manhattan Construction Command Center pursuant to Governor Pataki's Executive Order.
Consult with SHPO and LPC regarding potentially impacted, culturally significant sites. Monitor noise and vibration during construction at such sites as appropriate.	PANYNJ has and will continue to coordinate with the ACHP, SHPO, LPC, and the Section 106 consulting parties pursuant to the stipulations of the executed Memorandum of Agreement. As specified in the executed Memorandum of Agreement, PANYNJ will consult with SHPO and LPC to develop construction protection plans to monitor fragile buildings within the Preferred Alternative's APE and to stipulate measures to avert impacts to these structures. As described in the executed Memorandum of Agreement, PANYNJ will coordinate its CPPs with LMDC, MTA/NYCT, and/or NYSDOT, as appropriate, for those structures that may be cumulatively affected by construction vibrations.
Economic Conditions	
Coordinate with LMDC, Downtown Alliance or other entities to minimize residential and retail impacts as required through: a) relocation assistance, as applicable, to persons to businesses physically displaced by the project; and b) focus on essential business and amenities to remain in Lower Manhattan.	This would be implemented as part of the project's MPT Plan and the coordinated TMP. All businesses in the affected area would be mapped, in conjunction with the MPT and construction staging plans, to determine conflicts on business access. The MPT and TMP would then identify solutions to these conflicts.
Add appropriate signage for affected businesses and amenities.	This would be implemented as part of the project's MPT Plan.

Table S-6
Mitigation Measures—Construction Period

Resource Area	Mitigation Measures
Cultural Resources	The Project's executed Memorandum of Agreement (MOA) under Section 106 of the National Historic Preservation Act stipulates measures to avoid, minimize, or mitigate the Preferred Alternative's adverse impacts during and after construction. This section presents the stipulations pertinent to the construction period for effects to the WTC site, the Hudson River Bulkhead, and potential archaeology on the eastern portion of the WTC site. Measures to avoid or mitigate potential construction vibration impacts are described below under "Noise and Vibration," the measures to mitigate long-term impacts are described in Table S-7. HISTORIC RESOURCES WTC Site Documentation: PANYNJ will document the WTC site and its historic features to Level II standards of the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) prior to the removal or alteration of any historic features from the WTC site in connection with the undertaking of the Permanent WTC PATH Terminal. This documentation will consist of large-format, black-and-white photography of the site and its historic features as they currently exist; large-format photographic reproduction of selected existing drawings of current conditions and of pre-September 11, 2001 conditions; and a written history and description of the site and its historic features using information previously generated for the Coordinated DOE for the WTC site as well as the Permanent WTC PATH Terminal's DEIS and FEIS. PANYNJ will coordinate the photographic effort with the photographic efforts related to LMDC's fulfillment of Stipulation 1 as set forth in the April 22, 2004 Programmatic Agreement among the ACHP, LMDC, and SHPO for the WTC Memorial and Redevelopment Plan. PANYNJ will consult with SHPO and HABS/HAER to determine whether particular features warrant measured drawings, and any such drawings will be prepared by an individual with demonstrated experience in the preparation of measured drawings to HABS/HAER standards. The completed documentation will be submitted to SHPO and HABS/HAER for consideration. The large-format photographs prepared to HABS/HAER standards will consist of the views itemized in Exhibit H, "Schedule of Photographs" of the Project's MOA (see Appendix B). Tower Perimeter Column Bases: Up to 4 column bases in the North Tower could be temporarily removed by work to install other Project structures and infrastructure. Of the 4 column bases that could be affected by the Project foundation, those column bases that remain in situ undisturbed or are temporarily removed and returned to their original locations will be accessible following the completion of these foundations. Removing column bases, on either a temporary or permanent basis, will be considered only after practical engineering design options pursuant to Stipulations I., 2a and 2b, to preserve column bases in place have been exhausted. Column bases that are removed will be returned to their original locations if practical engineering design permits. Permanent removal of column bases will only take place as a last resort, and these column bases will be removed and stored in accordance with the stipulations of the MOA. The temporary PATH track (in addition to the existing 5 tracks) and associated ballast that will be installed on a temporary basis during construction of the Project tracks and platforms will be removed upon completion of the permanent tracks and platforms to re-expose the North and South Tower perimeter column remnants and portions of the North and South Tower footprints that may be covered by the temporary track and ballast. The construction fill currently on the footprints has been temporarily removed for the purposes of documentation of the footprints pursuant to Stipulation I.A. of the MOA, and will be replaced with clean rounded gravel as required after the documentation in order to protect the footprints and column remnants from ongoing construction. Further treatments may be specified in the Project's Resource Protection Plan. Steel Beams in Cross Form: PANYNJ will relocate the steel column and crossbeam mounted on a concrete pedestal and currently situated within the WTC site near Church Street in accordance with Stipulation VI of the MOA. The object will remain in the custody and control of PANYNJ pending final disposition of these artifacts in accordance with the rights of the respective owners. Resource Protection Plan for the WTC Site: PANYNJ, in consultation with SHPO and in coordination with LMDC and MTA/NYCT, as appropriate, shall develop a WTC Resource Protection Plan for the Permanent WTC PATH Terminal. The plan will be prepared to protect elements of the WTC site that are to remain in situ from inadvertent damage during the Terminal's construction. It will detail the Project's construction procedures and other construction plans for the site. It will provide for an inspection and reporting of the existing condition of elements, establish protection procedures, establish a monitoring program, and establish methods and materials to be used for any repairs. A historic architect, who meets the Secretary of the Interior's professional qualifications standards (48 FR 44716) in historic preservation, will be part of the design/construction team and will have the opportunity to review design drawing and specifications prior to construction. The plan will empower the Project's historic architect in consultation with the Chief Engineer of PANYNJ to issue "stop work" orders to prevent any unanticipated damage to historic properties. Recommencement of work will only be permitted once the Chief Engineer of PANYNJ and the historic architect are assured that appropriate modifications have been made to construction techniques to assure that no further damage will occur. PANYNJ will furnish copies of the Plan to SHPO, ACHP, and the Section 106 consulting parties for review and comment prior to its implementation. ARCHAEOLOGICAL RESOURCES In consultation with SHPO and NYSDOT, PANYNJ will develop and implement a plan to locate and identify intact portions of the Hudson River Bulkhead that will be affected by construction of the Permanent WTC PATH Terminal's east-west pedestrian connection. In the event that the intact portions of the Hudson River Bulkhead are identified, PANYNJ will, in consultation with the SHPO and NYSDOT, prepare an Archaeological Resource Treatment Plan for those portions of the Hudson River Bulkhead to be affected by the Project. The Archaeological Resource Treatment Plan will be submitted to SHPO and Section 106 consulting parties for their review and comment prior to implementation Prior to any Project-related subsurface disturbance at any of the locations that have been determined to be sensitive for historic archaeological resources, PANYNJ will, in consultation with the SHPO, and LMDC as appropriate, locate, identify, and evaluate the National Register eligibility of any archaeological resources at these locations in accordance with 36 CFR 800.4. In the event that FTA, in consultation with SHPO, determines that National Register-eligible archaeological resources will be adversely affected by construction of the Preferred Alternative, PANYNJ would, in consultation with FTA, SHPO, and LMDC as appropriate, and the Section 106 consulting parties, develop and implement an Archaeological Resource Treatment Plan for the Project. The Archaeological Resource Treatment Plan and documentation will adhere to the standards established by the Secretary of the Interior's Standards and Guidelines for Archaeology (48 FR 44716),including the standards therein for professional qualifications The plan will be submitted to SHPO and Section 106 consulting parties for their review and comment prior to implementation.
Vehicular Traffic and Parking	Project-generated vehicle trips will result in one construction period impact during the PM peak hour at the intersection of Route 9A and Liberty Street. A modest transfer of 5 seconds of green signal time from the Liberty Street approach to Route 9A will mitigate this adverse impact. NYSDOT has committed to prepare a construction-period traffic circulation plan. PANYNJ will incorporate this mitigation into the Preferred Alternative's Maintenance and Protection of Traffic (MPT) Plan and will coordinate this project-specific mitigation with NYSDOT as part of the Transportation Management Plan for the Lower Manhattan Recovery Projects.

Table S-6 (Continued)
Mitigation Measures—Construction Period

Resource Area	Mitigation Measures
Air Quality	In addition to measures identified in the original EPCs, PANYNJ would implement the following mitigation to further reduce project-generated emissions during the construction period. • Ultra Low Sulfur Diesel Fuel (ULSD): As described in the EPCs, PANYNJ would require that contractors use ULSD for all non-road vehicles that operate with diesel engines. • Electrification: PANYNJ or its contractor would develop a plan, in consultation with Con Ed, as appropriate, to disperse grid power throughout the contraction zone for the Preferred Alternative. In its contract documents, PANYNJ would require all contractors and subcontractors to use electrically powered equipment for air compressors, pumps, mixing, desanding and grout plants, welding machines, and any other diesel powered equipment that can be replaced with an electrically powered version. However, this does not apply to the east-west pedestrian concourse beneath Route 9A if the concourse is built by NYSDOT, since NYSDOT has not yet finalized what level of electrification would be possible for its projects. Given current conditions, it is expected that at lest 50 percent of the air compressors, pumps, mixing, desanding and grout plants, welding machines, and other diesel powered equipment that can be replaced with an electrically powered version would operate on electric power sources. • Advanced Reduction Technologies: In its contract documents, PANYNJ would require the use of Diesel Particle Filters (DPFs) or other measures with equivalent PM removal efficiency for all nonroad diesel engines of 50 horsepower or greater wherever the implementation of such a device is feasible. However, there may be cases where DPFs would not be feasible for safety considerations, mechanical reasons, or where the technology would not function properly. In such cases, the constructor would submit a request for an exception for review and approval by PANYNJ prior to implementation, and in these cases, DOCs may be used. Only in cases where, for technical reasons, neither DPFs or DOCs can be used effectively, and where the operation cannot be performed by another engine or other means, would the use of diesel engines greater than 50 horsepower be allowed without tailpipe reduction measures, subject to the above described approval process. • Newer Engines: In its contract documents, PANYNJ would require the use of post-1995 fuel injection engines, which meet the Tier II engine emissions standards, as defined in Title 40, Part 89.112. Exceptions will be made only for specific engines that are not yet commercially available as Tier II, and where the task cannot be reasonably accomplished using alternative engines or means which do comply with these demands. In such cases, the contractor would submit a request for an exception for review and approval by PANYNJ prior to implementation. • Diesel Emission Mitigation (DEM) Plan: PANYNJ would require contractors to prepare a DEM Plan that shall address the control of emissions from all engines and vehicles including those that are not equipped with emission control devices. As described in the EPCs, the DEM Plan would limit idling times on diesel powered engines to 3 minutes and would require that contractors locate diesel powered engines away from fresh air intakes. • Dust Control Plan: As described in the EPCs, PANYNJ would require contractors to submit a Dust Control Plan. Among other things, the plan would contain protocols and procedures for the spraying of dust piles, containment of fugitive dust, and appropriate adjustment measures to accommodate changes in meteorological conditions. • Verification: The effectiveness of measures to reduce construction period emissions depends on compliance. To that end, verification procedures would be implemented through construction specifications and contract documents. PANYNJ would verify mitigation and would identify opportunities to expand its implementation as part of its ongoing oversight and auditing of the Project's construction. Furthermore, verification procedures would be implemented in accordance with decisions of the Lower Manhattan Construction Command Center, including procedures for reporting updates to the public. • Other Emissions Reduction Technologies: PANYNJ is and will continue to investigate additional means (e.g., fuel emulsions) to reduce NOx (NO and NO2) emissions, but it is not yet known whether these measures would reduce the effectiveness of the above described mitigation. Therefore, specific means to further reduce NOx have not been identified in the mitigation plan for the Preferred Alternative at this time. If this investigation results in additional means to reduce NOx without jeopardizing the PM reduction measures and if other constraints such as technological availability are resolved, then PANYNJ would implement these additional mitigation techniques, as appropriate.
Noise and Vibration	NOISE PANYNJ will require contracts to use specific equipment during phases of construction to reduce noise levels below the FTA impact criteria. During the permanent track, platform, and mezzanine construction contractors will be required to use Impact wrenches with noise emission level of 82 dBA at 50 ft and mufflers on pavement breakers. During the construction of the east-west concourse, contractors will be required to place air operated grout drills inside acoustical enclosure. VIBRATION PANYNJ, in consultation with SHPO and Section 106 consulting parties, and in coordination with LMDC, NYSDOT, and MTA/NYCT, where appropriate, shall develop a Construction Protection Plan (CPP) for the Preferred Alternative. The CPP will set forth measures for the protection and avoidance of structural and architectural damage to the 5 historic properties within 90 feet of the construction zone. The CPP will be based on requirements in the "New York City Department of Buildings Technical Policy and Procedure Notice (PPN) #10/88" regarding procedures for the avoidance of damage to historic structures resulting from adjacent construction. The PPN defines adjacent historic structures as being contiguous or within a lateral disturbance of 90 feet from a lot under development or alteration. The CPP will describe in detail the construction procedures of the Preferred Alternative, as well as the construction procedures associated with other projects under construction in the vicinity of each of these historic properties. It will also provide for the inspecting and reporting of existing conditions at these properties, establish protection procedures, establish a monitoring program to measure vertical and lateral movement and vibration, establish and monitor construction methods to limit vibration; and establish methods and materials to be used for any repairs. The plan shall also specify the implementation of special vibration protection measures to protect these historic properties from increased vibration levels associated with construction activities. The CPP will provide for a historical architect meeting the Secretary of Interior's Standards to supervise implementation of the CPP. The CPP will empower the historical architect, in consultation with the Chief Engineer of PANYNJ to issue "stop work" orders to prevent any damage to historic properties, and any recommencement of work shall only be permitted at such time that the Chief Engineer and historical architect have assurance that the appropriate modifications have been made to the construction technique to assure that no damage will occur to historic properties.
Contaminated Materials	PANYNJ will require contractors to prepare a Health and Safety Plan (HASP) as part of contract documents and will be in conformance with the above described goals/objectives and will include elements outlined in the following framework: • Identification of potential contaminants and, as necessary, development of a soil or ground water sampling plan to determine contaminant concentrations in environmental media; • Identification of thresholds or action levels for contaminants and development of procedures for modification or cessation of work activities based on field screening result; • Worker health and safety training including the identification of a project health and safety officer who will be responsible for overall oversight and will maintain all appropriate documentation of safe working conditions and permits/approvals for the management of construction related wastes and residuals; • Development and implementation of field screening for contaminant detection and worker health and safety; • Identification of PPE to be used (worn) during specified phases of construction; • •Development and implementation of a Soil Management Plan identifying the methods to be used in handling, staging, disposal, transportation, and decontamination of equipment and personnel in accordance with local, state, and federal regulations; • Development and implementation of a Ground Water Management Plan to address dewatering actions from ground water infiltration and overland stormwater and the methods to be used in handling, staging, disposal, transportation, and decontamination of equipment and personnel in accordance with local, state, and federal regulations; • Development and implementation of a Dust Management Plan to address dust generated through excavation or general construction activities; • Development and implementation of management plans to address PCBs and asbestos; and, • Identification of proposed licensed waste haulers and disposal/recycling facilities, for the transportation and disposal/recycling of waste materials generated from the project. The project specific HASP will be in accordance with all applicable local, state, and federal regulations and will document that safe conditions relative to onsite workers and the public are maintained throughout the project.

Table S-7
Mitigation Measures—Design Year

Resource Area	Mitigation Measures
Cultural Resources	As noted in Table S-6, the Project's executed MOA includes stipulations to avoid, minimize, or mitigate the Project's long-term use of the National Register-eligible WTC site. As such, the Terminal will incorporate certain design elements to preserve or acknowledge remaining remnants and structures as follows. Tower Perimeter Column Bases: Up to a total of 5 column bases in the North Tower and up to a total of 3 column bases in the South Tower may be temporarily or permanently removed to construct PATH Platform D. Where Platform D will intersect the northeast corner of the North Tower footprint, the platform will be clear of vertical obstructions and architectural treatments will be used to symbolically represent the location of the footprint. A minimum of 5 to a maximum of 7 column bases of the east column line of the North Tower will be visible from Platform D. The viewing area will consist of a glass wall tilted inward from the platform combined with a mirrored wall to the west to provide a view of the column bases from this area of the platform. Appropriate signage, graphics, and lighting will complete the viewing area. The locations of column remnants of the South Tower that may be removed or permanently obscured by PATH platforms B, C, and D will be symbolically represented on these platforms through architectural treatments that define and differentiate the portions of the infrastructure that are within the Tower footprint areas. These treatments may include color differentiation, texture differentiation, symbolic representation of Tower perimeter column remnants, and/or an emblematic marker designating the location of the historic resource. East-West Slurry Wall: The design for the Preferred Alternative will provide visibility from within the Terminal to a portion of the east or west slurry wall if the following criteria are met: the condition of the slurry wall evokes the image now understood to represent the historic nature of the wall (e.g. tiebacks are part of the area to be exposed, tiebacks project beyond the re-stabilized slurry wall); the exposure provided will enable a view of the slurry wall that is clear, recognizable, and respectful of the slurry wall; and the exposure will not pose a safety hazard to the public from exposed finishes of the wall or its components. The design for the east-west pedestrian concourse shall include a location from which the members of the public may view a plaque and photograph of the west slurry wall. Passageway to the NYCT Subway Station (E Train): The new pedestrian connection between the Permanent WTC PATH Terminal and the MTA/NYCT WTC E Subway Station will incorporate the existing E subway entrance, in its current location, in a manner that retains existing materials and features of this entrance, including, but not limited to, the handrails, the travertine flooring, the steps and doors separating the E train from the pedestrian connection, and overhead signage, to the extent possible and in accordance with current building codes and Americans with Disabilities Act requirements. The design will include, at a minimum, a plaque identifying the historic features of the E subway entrance.
Pedestrians	At the intersection of Liberty and Church Streets, LOS F conditions will result on the northwest corner reservoir, and in the north and west crosswalks in the AM peak hour. More aggressive mitigation will be required at this location, consisting of widening crosswalks by 11 feet and sidewalks by six feet. PANYNJ will coordinate these improvements along with other crosswalk widenings in the vicinity of the WTC site with LMDC and the New York City Department of Transportation.
Noise and Vibration	PANYNJ will incorporate acoustical and vibration treatments as part of the Terminal to reduce sound levels and prevent reverberation with the WTC Memorial. Examples of acoustical treatments include absorptive acoustical panels and enclosures, acoustical louvers, dampers, silencers, absorptive duct linings and plenums, and mufflers. Examples of vibration reduction treatments being considered for the PATH tracks include use of resilient fasteners, ballast mats, resiliently supported ties, and floating slabs.
Natural and Water Resources	TERRESTRIAL RESOURCES The preliminary design of the terminal building poses some concern for fatal strikes by migratory birds both during the day and at night. Measures that have the potential to reduce daytime bird strikes include: • Place attractants (such as feeders or vegetation) either within 1 foot of the glass surface so that birds that have been attracted to them do not build up enough momentum to sustain serious injury if they hit the glass upon departure, or more than 33 feet from the glass surface; • Transform glass into a recognizable obstacle by uniformly covering glass surfaces with a decorative grid with 2- to 4-inch intervals; • Angle windows such that the panes reflect the ground instead of surrounding vegetation and sky; • Minimize use of reflective glass; and • Minimize the illumination of interiors behind clear glass and the visibility of indoor plants from outside (Klem 1990b, Klem 1991 in Ogden 1996). Measures that have the potential to decrease bird strikes of nocturnal migrants include: • Minimize amount of light emanating upward during the migratory season; and • Minimize exterior floodlighting during the migratory season. Measures to reduce potential impacts to birds from striking the surface of the street-level terminal, such as those presented above, and to minimize the potential for birds to enter the building through an opening in the top of the structure, will be explored during final design. PANYNJ will explore all feasible, cost effective, and practical measures for reducing bird strikes that are in keeping with the Terminal's design concept. FLOODPLAINS Existing and rehabilitated flood protection measures will be implemented as part of the Preferred Alternative. As such, flood control will meet or exceed pre-September 11, 2001 conditions. Stormwater discharges will be managed with an approved Stormwater Pollution Prevention Plans (SWPPPs) and established regulatory programs to minimize potential impacts to floodplains, groundwater, water quality, and aquatic resources.

Substantial impairment occurs only when the protected activities, features, or attributes of the resource are substantially diminished.

For the Permanent WTC PATH Terminal, a Section 4(f) evaluation has been prepared for the following reasons:

- The Permanent WTC PATH Terminal would be constructed within the boundaries of the approximately 16-acre WTC site (National Register-eligible) and would have an effect on this historic resource;
- The project would an adverse effect on the Hudson River Bulkhead (State and National Register-eligible);
- The project may require alteration or removal of potential archaeological resources within the eastern portion of the WTC site; and
- The project's construction may result in vibration impacts to known historic buildings within 90 feet of the project's construction zone. These resources are as follows: Barclay-Vesey Building, Former East River Savings Bank; St. Paul's Chapel and Graveyard; Beard Building; and 114-118 Liberty Street.

Both of the Project Alternatives—No Action and the Preferred Alternatives—was evaluated for their potential use with respect to Section 4(f) rules and regulations, and it was determined that each would have adverse effects to one or more of the Section 4(f) resources identified above. Alternatives were explored to determine if the Project's goals and objectives could be met without the use of the Section 4(f) resources. Two alternatives, No PATH Service to Lower Manhattan and Relocate PATH Projections could avoid one or more of the Section 4(f) resources. Although the Draft Section 4(f) statement concluded that these alternatives were feasible, they were not prudent. The U.S. Department of the Interior concurred with this finding in a letter dated July 30, 2004.

Since it has been determined that no prudent and feasible alternative would avoid the use of all of the Section 4(f) resources, PANYNJ and FTA implemented measures to minimize harm through the medium of the project's MOA pursuant to Section 106 of the National Historic Preservation Act. As described above, the MOA stipulates measures to avoid, minimize, and mitigate the Project's effects to the WTC site and the Hudson River Bulkhead.

F. CUMULATIVE EFFECTS

Generally, the long-term cumulative effects of projects currently planned for Lower Manhattan are beneficial while some of the short-term effects are adverse. Because the Lower Manhattan Recovery Projects are either improvements to existing infrastructure or replacements of facilities destroyed on September 11, 2001, they have been planned with the specific purpose of economic recovery coupled with improvements to the environment of Lower Manhattan. This is particularly true with respect to transportation, since all five of the federal Lower Manhattan Recovery Projects include elements that would improve access to, from, and within Lower Manhattan as compared to pre-September 11, 2001 conditions. However, to attain these goals, the area would experience an intense level of construction over the next several years. Therefore, this cumulative analysis gives a greater focus to minimizing and mitigating of the potential adverse effects during construction of these projects.

As described above in "Approach to Cumulative Effects," construction schedules for the World Trade Center Memorial and Redevelopment Plan, Route 9A Project, and Permanent WTC PATH Terminal have been delayed such that there would be less overlap of the peak construction activities for the five Lower Manhattan Recovery Projects. The effects of the construction schedule changes was studied, and it was determined that the impacts would not change substantially as compared to the analysis presented in the DEIS. Furthermore, the mitigation measures that are proposed would continue to be sufficient.

CONSTRUCTION PERIOD

ACCESS AND CIRCULATION

Vehicular Traffic

The *WTC Memorial and Redevelopment Plan FGEIS* contains a comprehensive examination of expected traffic conditions in the peak construction year for Lower Manhattan Recovery Projects. The analysis of cumulative traffic effects considered a total of 24 intersections. Overall, future conditions with the construction activities for the Lower Manhattan Recovery Projects would result in adverse traffic impacts at 6 intersections as follows:

- Route 9A and Vesey Street (AM peak hour)
- Church Street and Chambers Street (AM and PM peak hours)
- Church Street and Barclay Street (AM peak hour)
- Church Street and Cortlandt Street (midday peak hour)
- Broadway and Canal Street (PM peak hour)
- Broadway and Worth Street (AM, midday, and PM peak hours)

The mitigation of cumulative traffic effects of the various Lower Manhattan construction activities would also be a coordinated effort under the auspices of NYSDOT and NYCDOT, since both agencies have jurisdiction over the affected roadways. As described in the Route 9A Project SDEIS, NYSDOT would prepare a Maintenance and Protection of Traffic (MPT) Plan on behalf of the Lower Manhattan project sponsors through the either the Command Center or the Lower Manhattan Construction Coordination Group, as appropriate. The MPT Plan would include input from PANYNJ, MTA/NYCT, LMDC, and NYCDOT and would specify measures to stage construction areas (e.g., lane and sidewalk closures) while ensuring the proper circulation of traffic through Lower Manhattan (e.g., traffic diversions, parking restrictions, signal timing adjustments).

Pedestrians

Generally, crosswalks in the vicinity of the WTC site would operate at level of service D (LOS) or better during the critical construction year, and there would be no change in LOS as compared to baseline conditions. However, there would be deterioration to LOS E conditions at the intersections of Church Street and Dey Street and at Church Street and Cortlandt Street in the AM and PM peak hours. As describe above, a MPT Plan will be prepared for the Lower Manhattan Recovery Projects. This plan will include measures to ensure that safe and efficient pedestrian access and circulation is maintained throughout the construction period. Such measures may include signal timing adjustments; protected pedestrian walkways, and crossing guards. It is anticipated that the MPT Plan would be administered by the Command Center in coordination with NYSDOT, NYCDOT, PANYNJ, LMDC, and MTA/NYCT.

AIR QUALITY

The analysis of the potential cumulative impact of activities related to the construction of the Permanent WTC PATH Terminal and the other Lower Manhattan Recovery Projects on air quality consider both stationary (e.g., on-site equipment) and mobile (e.g., trucks) sources. Since almost all stationary construction equipment and trucks use diesel engines, the main pollutants of concern for local analysis are particulate matter, and nitrogen dioxide, emitted both as engine exhaust and fugitive dust, and analyzed as $PM_{2.5}$ and PM_{10}, and NO_2. An analysis of the effects of truck traffic on carbon monoxide (CO) concentrations was also conducted.

The cumulative air quality assessment was modified since publication of the DEIS to reflect changes in the project commitments for the WTC Memorial and Redevelopment Plan as well as to describe both alternatives for the Route 9A Project. LMDC incorporated additional mitigation measures (e.g., electrification and diesel particle filters) in their ROD for the WTC Memorial and Redevelopment Plan. These measures were included in this cumulative effects analysis. Furthermore, analysis was prepared for both the at-grade and short bypass alternatives for Route 9A since construction methods for both Route 9A and PATH's east-west concourse would vary.

All diesel construction engines, excluding on-road trucks, would use ultra-low sulfur diesel (ULSD) fuel. Furthermore, per the guidance of the original EPCs, engines larger than 60 horsepower (HP) would include emissions reduction measures to reduce emissions of PM and volatile organic compounds (VOCs). For the purpose of the base case analysis (i.e. without additional mitigation beyond the original EPCs), it was assumed that PM emissions from all such engines would be reduced by 40 percent—the reduction achieved by using diesel oxidation catalysts (DOC).

Maximum predicted CO concentrations in the critical analysis year were predicted at two intersections along Route 9A. These locations are of concern because of the high level of traffic currently using the roadway and the potential for construction vehicles to adversely affect traffic flow and thereby increase CO emissions at critical intersections. The analysis includes all construction vehicles from the five major Lower Manhattan Recovery Projects, which totals approximately 2,000 per day. Approximately, a third of the construction vehicles would use Route 9A to access the WTC, PATH, and Route 9A construction work areas. Maximum predicted 8-hour average CO concentrations would increase by 0.6 parts per million (ppm) over the condition without any activity from the five major projects. With that increase, total CO concentrations would still be well below the National Ambient Air Quality Standards (NAAQS).

Under the Route 9A at-grade alternative, the maximum increase in PM_{10} concentrations would be 117.9 $\mu g/m^3$ on a 24-hour basis and 4.0 $\mu g/m^3$ on an annual basis in close proximity to the site. These potential maximums would occur at the temporary bikeway along Route 9A or at the intersection of Vesey and Route 9A. The incremental increase in the 24-hour PM_{10} concentrations would exceed the NAAQS; however, with the enhanced mitigation measures described below this exceedance would not occur. Increases in PM_{10} at other locations would be significantly lower, with a maximum increase at residential locations of 26.5 $\mu g/m^3$ and 2.5 $\mu g/m^3$ on a 24-hour and annual basis, respectively.

Under the Route 9A at-grade alternative, the predicted increase in maximum $PM_{2.5}$ concentrations in the immediate vicinity of the sites would be a maximum of 82.5 $\mu g/m^3$ and 2.4 $\mu g/m^3$ on a local 24-hour average and annual average basis, respectively. The annual average increase in neighborhood scale $PM_{2.5}$ concentrations would be 0.42 $\mu g/m^3$. The maximum predicted increase in $PM_{2.5}$ concentrations would exceed the interim guidance threshold values

established by the New York State Department of Environmental Conservation. Concentrations decrease rapidly with distance from the construction sites and exceedances would not be expected at approximately 1,300 feet from the sources. However, exceedances could occur at residential receptors in closer proximity if enhanced mitigation measures were not implemented. With mitigation, increases in $PM_{2.5}$ would be reduced by approximately 66 percent, and the potential exceedance of the interim guidance thresholds would be limited to a small area adjacent to Route 9A.

The NO_2 concentrations were predicted to increase substantially under the Route 9A at-grade scenario with a maximum increment of 21.5 $\mu g/m^3$ in the immediate vicinity of the site, with the total concentration, including background levels, potentially reaching 93.5 $\mu g/m^3$. Although exceedances of the NO_2 standard are not predicted, the U.S. Environmental Protection Agency expressed concern about NO_2 as it is a precursor to ozone. The mitigation proposed to reduce particulate matter (e.g. electrification) would also reduce NO_2 emissions.

Under the Route 9A short-bypass alternative the maximum 24-hour increase in PM_{10} concentrations of 86.5 $\mu g/m^3$ an annual increase of in PM_{10} 17.1 $\mu g/m^3$, and the annual 24.3 $\mu g/m^3$ increase in NO_2 would not exceed the NAAQS. However, the maximum annual increase in $PM_{2.5}$ of 2.4 $\mu g/m^3$ and maximum 24-hour increase of 68.4 $\mu g/m^3$ would exceed the interim guidance threshold values. Similar to the at-grade alternative for Route 9A, concentrations under the short bypass scenario decrease substantially with distance from the construction sites; however, without additional mitigation there would continue would be an exceedance of the $PM_{2.5}$ interim guidance thresholds at residential receptors.

Since publication of the DEIS, the Lower Manhattan project sponsors have committed to additional mitigation that was not originally contemplated with the EPCs. The following describes these commitments.

- Electrification: Certain construction engines that operate in a fixed or temporarily fixed position, such as welding machines and compressors, could potentially be connected to the City's power grid if available by Con Edison at the start of construction. The electrification of this equipment would eliminate the on–site diesel exhaust from these sources. However, in some cases, electrification may not prove effective due to the need for mobility, and some local power generation may be needed where connection points are not available. MTA/NYCT and PANYNJ would require all contractors and subcontractors to use electric power for all diesel powered equipment that can be replaced with an electrically powered version unless access to grid power is not available. However, this does not apply to PATH's pedestrian concourse beneath Route 9A if it is constructed by NYSDOT since NYSDOT has not finalized what level of electrification is possible for its project.

- Diesel Particle Filters (DPFs): Technologies are available that can achieve greater reductions in particulate matter emissions as compared to DOCs. DPFs, for example, can reduce particulate matter emission by at least 85 percent and as high as 98 percent. However, DPFs are not effective for every type of engine operation, and there may be technical difficulties in applying DPFs to some engines. The Lower Manhattan project sponsors would require the use of DPFs or other measures with equivalent PM removal efficiency for all nonroad diesel engines of 50 horsepower or greater wherever the implementation of such a device is commercially available. At this time, it is assumed that DPFs can be used on 75 percent of nonroad diesel engines and that the remaining 25 percent could employ DOCs.

- Newer Engines: The use of new construction engines would ensure that older, higher polluting engines are not operating on–site and would make the operation of added control technologies easier and more efficient. The Lower Manhattan project sponsors would require the use of post-1995 fuel injection engines, which meet the Tier II engine emissions standards, as defined in Title 40, Part 89.112. Exceptions will be made only for specific engines that are not yet available as Tier II, where the task cannot be reasonably accomplished using alternative engines or means to comply with these demands. However, given current technology, it is assumed that all engines would be Tier II compliant.
- The Lower Manhattan project sponsors are investigating the use of other methods to reduce NO_2 emissions. However, given the current uncertainty, additional NO_2 reduction techniques were not assumed as part of the cumulative mitigation analysis.

With these enhanced mitigation measures, the potential exceedance of the PM_{10} 24–hour, NAAQS would be eliminated. Furthermore, the cumulative $PM_{2.5}$ increment would be reduced by approximately 66 percent and the potential for exceedance of 24-hour, interim guidance thresholds for $PM_{2.5}$ would be reduced to a single location, the temporary Route 9A bikeway. As described above, the NO_2 NAAQS would not be exceeded during construction. However, the proposed electrification of motors would significantly reduce NO_2 emissions, and levels of NO_2 would be further reduced if NYSDOT commits to some level of electrification for the Route 9A Project.

NOISE AND VIBRATION

The analysis of cumulative construction noise considered twelve receptor sites in Lower Manhattan. Without mitigation, the predicted cumulative levels would exceed the recommended 8-hour L_{eq} and 30-day L_{dn}/L_{eq} thresholds at the Hilton Millennium Hotel, the World Financial Center, and 114 Liberty Street, and 4 Albany Street. Cumulative levels would also exceed the recommended 8-hour L_{eq} threshold at St. Peter's Church. The Preferred Alternative, itself, would result in significant adverse noise impacts at the Hilton Millennium Hotel, the World Financial Center, and 114 Liberty Street, but these project-generated impacts would be mitigated as identified above (see Table S-5). Although the Preferred Alternative would not contribute substantially to the cumulative noise levels at 4 Albany Street and St. Peter's Church, PANYNJ, in coordination with the other Lower Manhattan project sponsors, is investigating additional measures to reduce construction period noise as described below.

PANYNJ and the other major Lower Manhattan Recovery Projects are developing construction noise mitigation measures, examples of which are provided below. Implementation of these mitigation measures is expected to minimize or eliminate construction-related individual and cumulative noise impacts. The sponsors are coordinating their efforts through the Lower Manhattan Construction Coordination Group.

- The use of acoustic barriers and walled enclosures around certain construction activities. For example, noise tents/enclosures could be used around workers using jackhammers. A temporary noise barrier of 20 feet in height could be installed along the fence line/property line of the construction zone to reduce the noise levels. In addition, temporary barriers (e.g., wood panels on top of Jersey barriers) could also be positioned adjacent to and moved along slurry walls and other construction operations, etc.;
- The placement of construction equipment in shielded locations, such as below grade in the Project Site;

- The installation of silencers on jackhammers, air compressors, generators, light plants, and cranes to reduce noise levels at specific locations (i.e., adjacent to existing residential);
- The use of electrically operated equipment, rather than combustion equipment;
- The use of soil beds, timber planking and/or exterior rubber lining on truck body and aluminum carrying case to reduce rock impact noise during truck load/unloading operations;
- The use of drive-through street-level truck enclosures for truck loading and unloading;
- The use of sheds/enclosures at concrete pump sites during concrete truck unloading; and
- The placement of most loading/unloading inside the bathtub and away from areas at street level.
- The designation of central areas within projects for noisy activities, such as cutting steel or wood or use of noisy equipment such as impact wrenches. Use of pre-cut, pre-fabricated, or modular construction materials that minimize need for on-site fabrication or cutting methods.

Programmatic measures to control construction noise levels would be undertaken throughout the construction period. These programmatic measures would be administered through either the Command Center and/or the Lower Manhattan Construction Coordination Group and may include:

- Enforcement of designated truck routes during construction;
- Adherence to construction equipment noise performance standards specified by EPA and possible development of additional standards by the LMCCG;
- Noise monitoring before construction begins, to establish baseline noise levels, and ongoing monitoring during the various construction phases; and
- Evaluation of the noise reduction potential, and cost effectiveness, of alternative construction methods and/or changes to the sequencing of construction activities.

Cumulative construction of the Lower Manhattan Recovery Projects would result in varying degrees of vibration, depending on the stage of construction, the equipment and construction methods employed, and the distance from the construction to buildings and vibration sensitive structures. Construction equipment such as pile drivers can produce levels that exceed the 0.12 and 0.20 inches per second vibration damage threshold criterion for fragile buildings at distances of 50 feet. At distances closer to the construction zone (20 feet or less), additional equipment such as clam shovel drop, caisson drilling, and large bulldozers can produce levels exceeding the vibration threshold criterion for fragile and some extremely fragile buildings. Predicted vibration levels would be 0.23 or greater at the historic/fragile buildings within 50 feet from the construction area, during activities such as pile driving. The structures most prone to potential cumulative vibration impacts are located along Fulton and Dey Streets between Church Street and Broadway, on Liberty Street west of Church Street, and on West Street near Vesey Street.

As described in the executed MOA for the Permanent WTC PATH Terminal, PANYNJ, in consultation with the State Historic Preservation Officer (SHPO) and in coordination with other Lower Manhattan project sponsors, as appropriate, would develop a Construction Protection Plan (CPP) based on the requirements laid out in the "New York City Department of Buildings Technical Policy and Procedure Notice #10/88." The CPP would avoid or minimize vibration for historic resources within 90 feet of the Terminal's construction zone.

CULTURAL AND HISTORIC RESOURCES

The Permanent WTC PATH Terminal's Area of Potential Effect (APE) contains 21 resources that are listed or are eligible for listing on the National and New York State Registers of Historic Places and/or as a New York City Landmark. The assessments of potential impacts identified 9 sites within the APE that may be impacted by the Permanent WTC PATH Terminal's construction. Because construction of the South Ferry Terminal would occur outside the APE for the Permanent WTC PATH Terminal, there is no potential for cumulative construction-period impacts from the combination of these projects. However, construction of the WTC Memorial and Redevelopment Plan, Fulton Street Transit Center, and the Route 9A Project would have cumulative construction-period effects to seven resources within the APE that may also be impacted by the Permanent WTC PATH Terminal as follows:

- Hudson River Bulkhead, Battery to 59th Street;
- Barclay-Vesey Building, 140 West Street;
- St. Paul's Chapel and Graveyard;
- Former East River Savings Bank Building, 26 Corlandt Street;
- 114-118 Liberty Street;
- Beard Building, 125 Cedar Street; and
- The WTC site.

The cumulative construction of the Permanent WTC PATH Terminal, Fulton Street Transit Center, Route 9A Project, and World Trade Center Memorial and Redevelopment Plan may generate ground-borne vibration impacts at the Barclay-Vesey Building, St. Paul's Chapel and Graveyard, Former East River Savings Bank Building, 114-118 Liberty Street, and the Beard Building. Per the stipulations of the executed MOA for the Permanent WTC PATH Terminal, these potential impacts would be resolved through a coordinated CPP, which would establish the sensitivity of fragile structures and provide stipulations to protect them during construction of the Lower Manhattan Recovery Projects. As per the guidance of the EPCs, PANYNJ would coordinate with the SHPO, the New York City Landmarks Preservation Commission, the appropriate Lower Manhattan Project Sponsors, and Section 106 consulting parties to develop and implement these plans.

The Hudson River Bulkhead may be cumulatively affected by the construction of PATH's east-west concourse and Route 9A. As described in the executed MOA for the Permanent WTC PATH Terminal, PANYNJ would develop and implement a plan to locate and identify intact portions that would be affected by the concourse's construction. This plan would be developed in consultation with SHPO and in coordination with NYSDOT. In the event that intact portions of the Bulkhead are identified within the vicinity of the east-west pedestrian concourse, PANYNJ, in consultation with SHPO and in coordination with NYSDOT, would prepare an Archaeological Resource Treatment Plan for these portions of the Bulkhead.

The executed MOA also provides for stipulations to address potential cumulative effects from construction on the WTC site. As described in the MOA, PANYNJ would request that all agencies constructing projects within the WTC site submit preliminary and pre-final documents to PANYNJ. PANYNJ and its designated historic preservation consultant would consult with SHPO and the Lower Manhattan Emergency Preservation Fund to asses whether there would be potential for a cumulative adverse effect from the Permanent WTC PATH Terminal and other WTC site projects based on the preliminary and pre-final plans. If SHPO and PANYNJ, agree that planned or completed activities would result in cumulative adverse effects on the WC site,

then PANYNJ would consider measures with respect to the Permanent WTC PATH Terminal to mitigate or minimize these effects, including technical or financial measures for the protection, stabilization, or repair of resources and/or modifications to the Preferred Alternative's design. PANYNJ would make its documentation of potential cumulative effects and accompanying mitigation plans available for review by the National Park Service, the Advisory Council on Historic Preservation, the Lower Manhattan project sponsors, and the Section 106 consulting parties. PANYNJ's plans to minimize or mitigate adverse cumulative effects would also consider the stipulations within the Programmatic Agreements for the World Trade Center Memorial and Redevelopment Plan, the Route 9A Project, and the Fulton Street Transit Center.

ECONOMIC CONDITIONS

The Lower Manhattan Recovery Projects would create thousands of construction jobs. Not only would these projects spur employment in Lower Manhattan, but they would provide jobs for the region, as a whole. These projects would also directly enhance the local economy with the expenditure of dollars for labor and materials, the generation of tax revenues, and induced benefits to local businesses in the vicinity of construction sites.

Construction activities in general have the potential to disrupt business and retail operations as a result of restricted access for pedestrians (customers) and vehicles (deliveries). The Permanent WTC PATH Terminal is unlikely to directly restrict business access for extended periods of time during construction since most activities would be contained within the WTC site. However, some access restrictions may occur on streets surrounding the WTC site with construction of the PATH's Route 9A connection as well as periods of construction for the WTC Memorial and Redevelopment Plan.

The Fulton Street Transit Center would include cut-and-cover construction with potential restrictions to access on Dey Street, Church Street, and Fulton Streets. However, a detailed staging plan is being prepared to ensure that street and sidewalk traffic can be maintained in these areas, to the extent possible.

As currently planned, NYSDOT would maintain four lanes of traffic through their construction zone during most periods of the day. In addition, NYSDOT has completed a pedestrian bridge across Route 9A at Vesey Street that connects to an at-grade, protected pedestrian walkway along Vesey Street. Together these temporary measures would maintain access between Church Street and Battery Park City for businesses, workers, commuters, and residents.

The sponsors of the Lower Manhattan Recovery Projects are working with NYSDOT and NYCDOT to develop a Construction Management Plan (CMP) for Lower Manhattan that would coordinate the MPT plans of the individual projects. The CMP would ensure access is maintained through the area as individual projects proceed into their construction phases. This coordinated plan would help to minimize the potential adverse economic effects to businesses during the construction period.

The sponsors of the Lower Manhattan Recovery Projects would also provide for temporary signage to direct vehicles and pedestrians to businesses within the construction zone. These efforts would be coordinated between the sponsors and with the effected businesses to ensure that the maximum visibility for these businesses would be achieved.

DESIGN YEAR EFFECTS

NO ACTION ALTERNATIVE

The No Action Alternative could generate up to 1,200 new vehicle trips into Manhattan in the AM peak hour by 2025. These new vehicle trips would congest area roadways and would limit access to businesses for customers and deliveries. The No Action Alternative would also increase on-street pedestrian congestion since it would not provide for sub-grade concourses through the WTC site. Thus, there would be significant crowding of crosswalks and sidewalks on and near the WTC site, resulting in reduced traffic flow. Furthermore, the larger volume of pedestrians that would cross Route 9A would limit the future roadway's ability to process vehicular traffic and may necessitate the construction of a pedestrian bridge.

Because the No Action Alternative would increase vehicular traffic in Lower Manhattan, it would increase emissions and noise levels. The cumulative effect of a No Action Alternative for the Permanent WTC PATH Terminal may degrade air quality and noise levels as compared to pre-September 11, 2001 conditions. Over the long-term, increased traffic congestion, reduced air quality, and higher noise levels would degrade the quality of life for Lower Manhattan's residents and workers.

Increased congestion associated with the No Action Alternative would limit access to, from, and within Lower Manhattan. This would degrade the ability of visitors to access the areas many cultural sites and would reduce the capabilities of local businesses to process customers and deliveries. Because the No Action Alternative may limit or fully disrupt direct transit service between Lower Manhattan and New Jersey, it may force residents, commuters, and visitors to use more costly or more time consuming modes of travel. By reducing access to and from Lower Manhattan, the No Action Alternative has the potential to stagnate the overall recovery of Lower Manhattan, including the full redevelopment of the WTC site.

PREFERRED ALTERNATIVE

The Preferred Alternative has been planned and designed in cooperation with the Lower Manhattan Recovery Projects in its vicinity including the Fulton Street Transit Center, Route 9A Project, and the WTC Memorial and Redevelopment Plan. In the long-term, these projects would collectively provide for the integration of land use and transportation in the vicinity of the WTC site and would be an enhancement over pre-September 11, 2001 conditions.

The Preferred Alternative would form a critical sub-grade pedestrian link between Battery Park City and Church Street via the WTC site. The proposed connection between the Permanent WTC PATH Terminal and Fulton Street Transit Center's Dey Street Underpass would provide all-weather access between Tran-Hudson Ferries and the World Financial Center and the majority of the subway lines that serve Lower Manhattan. Furthermore, the Route 9A connection would reduce at-grade pedestrian trips during peak commuter periods. As a result, traffic circulation would be improved in the vicinity of the WTC site, which has resultant economic, traffic, air quality, and noise benefits.

The collection of transit services that would be offered by a Permanent WTC PATH Terminal in concert with a new trans-Hudson ferry terminal; a Fulton Street Transit Center; and other potential transportation projects, such as JFK airport access, would strengthen Lower Manhattan's role as a regional transit hub. As such, the area would attract scores of daily commuters and visitors who would frequent local retail establishments such as shops and restaurants. Further-

more, the integration of numerous transit services with the ability to serve residents throughout the region would increase the attractiveness of Lower Manhattan as a center of commerce.

G. PUBLIC PARTICIPATION AND AGENCY INVOLVEMENT

PUBLIC AND AGENCY INVOLVEMENT ACTIVITIES TO DATE

A comprehensive public involvement program was implemented for this project. The public involvement effort was designed to help provide complete information, to be early, timely in public notice, to be broad in public outreach, and to be responsive. The process requires extensive and intensive outreach to private citizens, local businesses and associations, development authorities, elected officials, affected government agencies and others in New Jersey and New York.

A project mailing list was developed for the distribution of outreach materials related to the environmental review process for the Permanent WTC PATH Terminal. The list currently contains approximately 500 addressees representing elected officials; federal, state, and local agencies; Technical Advisory Committee (TAC) members; Section 106 consulting parties; community and interest groups; local property owners and managers; and any members of the public who have requested mailings, including those who attended the public scoping meetings and the public hearings on the DEIS. Public outreach materials have been and will continue to be distributed throughout the environmental review process for this EIS. These activities and mailers include: flyers; mobile public information centers; newsletters; and postings to the project's website.

In addition, FTA and PANYNJ have organized formal and informal public meetings to inform elected officials, public agencies, community and interest groups, local stakeholders, and the general public of the progress of this environmental review process. These forums include:

- Federal Inter-Agency Review Team Meetings;
- Technical Advisory Committee Meetings;
- Section 106 Consulting Party Meetings;
- Congressional Briefings;
- Stakeholder Briefings;
- Community Board Briefings;
- Presentations to Community, Advisory, and Technical Interest Groups;
- Public Scoping Meetings; and
- DEIS Public Hearings.

As described previously, the Permanent WTC PATH Terminal is part of the larger, ongoing redevelopment effort in Lower Manhattan. Thus, the planning and construction of a project alternative for a Permanent WTC PATH Terminal must be coordinated with other current planning efforts in Lower Manhattan. To that end, FTA and PANYNJ have been active participants in a number of forums working with the other federal, state, and local agencies and groups having a role or interest in the overall redevelopment efforts. These forums have included:

- Coordinated Section 106 Consulting Party meetings for the WTC site;
- Federal Inter-Agency Review Team;
- Lower Manhattan Construction Coordination Group; and
- The Technical Advisory Committee to the Permanent WTC PATH Terminal.

Agency coordination efforts will continue throughout the further planning, design, and construction of the Permanent WTC PATH Terminal. As the Lower Manhattan Recovery Projects move from their early planning phases to design and construction, coordination efforts will focus both independently and through the Lower Manhattan Construction Command Center on the implementation of the EPCs, construction logistics, contract specifications, and ongoing public outreach. The goal of these efforts is to achieve the greatest long-term benefits for Lower Manhattan and the region as a whole while minimizing the short-term, adverse construction period impacts.

FTA AND PANYNJ CONTACTS

If you would like to request further information regarding this document, please visit the project's website at www.panynj.gov/pathrestoration, or you may contact one of the following:

Mr. Bernard Cohen, Director
Lower Manhattan Recovery Office
Federal Transit Administration
One Bowling Green, Room 436
New York, NY 10004
212-668-1770
www.fta.dot.gov

Mr. Anthony Cracchiolo, Director
Priority Capital Programs
The Port Authority of New York and New Jersey
115 Broadway, 10th Floor
New York, NY 10006
212-435-5599
www.panynj.gov/pathrestoration

*

Chapter 1: Purpose and Need

A. INTRODUCTION

Trans-Hudson transit service between New Jersey and New York has long been an integral part of the Lower Manhattan transportation system. Prior to the terrorist attacks of September 11, 2001, the World Trade Center's (WTC) Port Authority Trans-Hudson (PATH) Terminal served some 67,000 daily boardings and was the gateway to Lower Manhattan for most commuters from west of the Hudson River. However, the attacks resulted in extensive damage to the PATH system including the destruction of its WTC Terminal. As a result, the system lost a substantial portion of its capacity to serve commuters throughout the New York and New Jersey region and mass transit access to Lower Manhattan was severely hindered.

Since September 11, 2001, those commuting between Lower Manhattan and communities west of the Hudson River have resorted to often less convenient, more time-consuming, and more expensive modes of travel. Although a temporary PATH station has been constructed on the WTC site, it will not support the future development planned for the area nor does it meet the long-term needs of commuters.

A Downtown Transportation Hub, herein referred to as the Permanent WTC PATH Terminal, is proposed to be a full service, regional transportation facility that would be integrated with the existing and future transportation infrastructure on and near the WTC site, future WTC site development, and the surrounding area. This Project is needed to reestablish and enhance transportation facilities that existed at the WTC complex before September 11, 2001 and to ensure the long-term accessibility and economic vitality of Lower Manhattan.

The U.S. Congress has committed $21 billion to New York City since September 11, 2001 to support a variety of programs including clean up and recovery efforts, economic aid to residents and businesses, survivorship benefits, human services and crisis counseling, health programs, and infrastructure (Public Laws 107-38, 107-117, and 107-206). This federal relief package contains four elements: FEMA assistance, Community Development Block Grants, Liberty Zone Economic Stimulus Package, and appropriations to specific agencies to fund programs for Lower Manhattan. The $4.55-billion transportation recovery effort, which includes funds for this Project, is being administered through FEMA and the FTA. Although the grant package would be jointly funded, FTA is serving as the lead agency as agreed to in a Memorandum of Understanding (August, 2002) and subsequent correspondence between the agencies (November 18, 2002).

This chapter provides background information on the PATH system, its WTC Terminal, and Lower Manhattan in general; characterizes PATH's ridership; defines the need for this Project; and outlines the goals and objectives that it would achieve.

B. HISTORICAL OVERVIEW

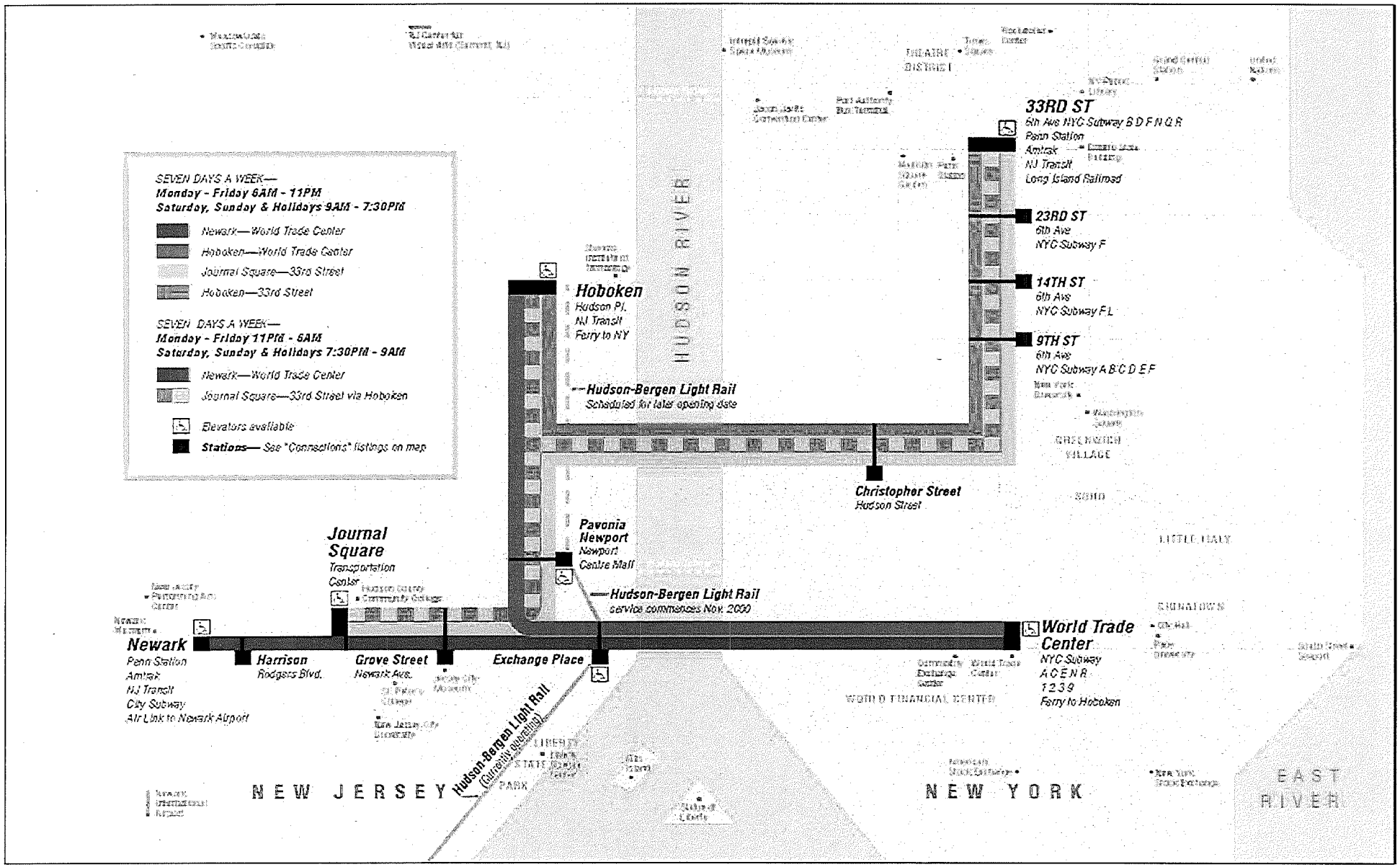
THE PATH SYSTEM

PATH is an electrified heavy-rail transit system with a total of 13 stations (see Figure 1-1 and Table 1-1). It is a fully owned subsidiary corporation of PANYNJ, which acquired the system as the Hudson & Manhattan (H&M) Railroad in 1962. PATH is recognized by the federal oversight agencies as a commuter rail system. Therefore, it operates according to policies and procedures set forth by the USDOT Federal Railroad Administration (FRA).

Table 1-1
PATH Stations and Connecting Transit Services

Station	Location	Connecting Service
9th Street	Sixth Ave. at 9th St., New York, NY	NYCT Subway, NYCT bus service
14th Street	Sixth Ave. at 14th St., New York, NY	NYCT Subway, NYCT bus service
23rd Street	Sixth Ave. at 23rd St., New York, NY	NYCT Subway, NYCT bus service
33rd Street	Sixth Ave. between 30th and 33rd Streets, New York, NY	Amtrak, NJ Transit and LIRR commuter rail, NYCT Subway; NYCT, and private bus service
Christopher Street	Christopher St. between Greenwich and Hudson Streets, New York, NY	NYCT Subway, NYCT bus service
Exchange Place	Montgomery St. at Hudson River, Jersey City, NJ	Hudson-Bergen Light Rail, NY Waterway ferry, NJ Transit, and local bus service
Grove Street	Newark Ave. between Grove St. and Luis Munez Marin Blvd., Jersey City, NJ	Coach, NJ Transit, and local bus service
Harrison	Frank E. Rodgers Blvd. between Somerset and Cape May Streets, Harrison, NJ	NJ Transit bus service
Hoboken	Hudson Place at River Street, Hoboken, NJ	NJ Transit and Metro-North commuter rail, Hudson-Bergen Light Rail, NY Waterway ferry, NJ Transit, and local bus service
Journal Square	Kennedy Blvd. between Pavonia and Sip Avenues, Jersey City, NJ	A&C, Bergen Avenue, Central Avenue, Community Lines Hudson, County Executive Express, Carefree, Red & Tan, Lafayette-Greenville, NJ Transit, and local bus service
Newark	1 Penn Plaza West, Newark, NJ	Amtrak and NJ Transit commuter rail, Newark City Subway, Greyhound, NJ Transit, and private bus service
Pavonia/Newport	Washington Blvd. at Pavonia Ave., Jersey City, NJ	Hudson-Bergen Light Rail, NY Waterway ferry, NJ Transit, and local bus service
World Trade Center	Fulton St. at Church St. New York, NY	NYCT Subway, NY Waterway and Water Taxi ferries, NYCT, and private bus service

Note: Information for the World Trade Center station reflects temporary PATH service.
Source: www.panynj.gov/path; www.mta.info.



PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 1-1
PATH System

PATH has four routes: Newark-WTC, Hoboken-WTC, Journal Square-33rd Street, and Hoboken-33rd Street. Trains operate 24 hours a day, seven days a week, although routes are modified somewhat during late night and weekend hours.

PATH directly serves communities in Jersey City, Newark, Hoboken, and Manhattan but also provides connections for other west-of-Hudson residents. At Newark-Pennsylvania Station, PATH customers can access Amtrak, New Jersey Transit's (NJ Transit) Northeast Corridor, Raritan Valley, and North Jersey Coast commuter rail lines; the Newark City Subway; and bus and rail service to Newark Liberty International Airport. In Hoboken, PATH connects with Metro-North Railroad's Port Jervis line; NJ Transit Boonton, Morris & Essex, Main/Bergen County, Pascack Valley, and North Jersey Coast commuter rail lines; numerous NJ Transit bus routes; ferry service; and the Hudson-Bergen Light Rail. In New York, PATH stations are located in close proximity to New York City Transit (NYCT) subway stations serving a total of 20 subway lines. There are also connections to NYCT and privately operated bus routes, ferries, and commuter rail service.

HISTORY OF PATH SERVICE TO LOWER MANHATTAN

THE HUDSON & MANHATTAN TERMINAL

The Hudson & Manhattan (H&M) Railroad began operation of the Hudson Tubes to Lower Manhattan in 1909. The Hudson Tubes provided transit service between Hudson and Essex Counties in New Jersey and the Hudson Terminal in Lower Manhattan. The Hudson Tubes served both as a commuter service and as a connection to Manhattan for short- and long-distance rail customers arriving at Newark Pennsylvania Station, Hoboken Terminal, and Exchange Place.

The Hudson Terminal was located between Greenwich, Cortlandt, Church, and Fulton Streets parallel to the two subway lines. Above street level, the H&M constructed what was then the world's largest office building, consisting of two towers. Beneath the towers was the station itself, which occupied two city blocks. The station contained three levels: a pedestrian concourse with stores, restaurants, and services; a train level with five tracks; and a powerhouse level. The H&M Terminal formed a loop with the tunnels to and from New Jersey. Eastbound trains would enter the station from the south river tunnel and exit westbound through the north river tunnel.

When the H&M Railroad began to experience major financial difficulties, the States of New York and New Jersey looked to PANYNJ to assume control of the system. In 1962, the States enacted legislation authorizing PANYNJ to undertake a port development project consisting of 1) a World Trade Center; 2) the Hudson Tubes; and 3) certain extensions of the Hudson Tubes. PANYNJ was authorized to cooperate with other government agencies in the rehabilitation and redevelopment of the WTC, its environs, and the Hudson Tubes, for the purpose of renewal and improvement of these areas as part of the port development project.

The legislation of 1962 mandated that PANYNJ acquire, rehabilitate, and operate the rail transit property associated with the H&M Railroad and the Hudson Tubes, either directly or through a wholly owned subsidiary corporation. Accordingly, PANYNJ established the Port Authority Trans-Hudson (PATH) Corporation, which acquired, by condemnation, the railroad, its equipment, and its assets, including the Hudson Terminal building.

As mandated by the legislation of 1962, PANYNJ planned and constructed a WTC on an approximately 16-acre site that included the area bounded by Church Street, Liberty Street,

Route 9A, and Vesey Street, with an extension to the north to include the block that would become 7 World Trade Center (7 WTC). In connection with the construction of the WTC, PANYNJ razed the Hudson Terminal and replaced it with a new facility, which was located beneath the office towers of the WTC.

THE WTC PATH TERMINAL

The WTC PATH Terminal opened in 1971. It was constructed west of the original H&M Terminal in the portion of the WTC site referred to as the "bathtub" and was located beneath the office and retail space. The Terminal was fully compliant with the Americans with Disabilities Act (ADA; 24 USC §§12101 et seq.; 49 CFR Parts 27, 30, and 38), and it was the first station in the world to be fully climate controlled.

The platform level contained three 10-car platforms and five tracks. The orientation of the platforms and the track configuration was similar to the H&M Terminal such that trains entered the station from New Jersey via the south Hudson River tunnel (Tunnel F) and exited to New Jersey via the north tunnel (Tunnel E). Thus, the platform level formed the loop in the PATH system allowing trains to enter and leave Manhattan without changing the location of the train's engineer or conductor. As a result, trains could have a relatively short dwell time at the Terminal.

A mezzanine was located above the platforms, housing vertical circulation between the platforms and levels above, fare equipment, and accessory retail and food stalls. The principal access between the mezzanine and the WTC retail concourse was a bank of escalators that traveled upward under NYCT's 1 and 9 line. The escalators terminated in a portion of the retail concourse known as PATH Square.

As shown in Figure 1-2, PATH Square was located in the northeast portion of the WTC retail concourse. The retail concourse provided for all-weather connections between PATH, the office buildings on the WTC site, the World Financial Center, NYCT subways, and street level. From PATH Square, passengers could access three NYCT subway stations with connections to five NYCT subway routes (1, 9, E, N, and R) via the corridors of the WTC retail concourse. (The World Trade Center Station provided direct access to the E route, but connected with the Chambers Street Station on the A and C routes and the Park Place Station on the 2 and 3 routes.) The retail concourse had street-level access from Church, Vesey, Route 9A, and Liberty Streets. A second-level pedestrian bridge over Route 9A provided a connection between the retail concourse via 1 WTC and the World Financial Center.

On September 11, 2001, the WTC PATH Terminal and a seven-car PATH train were destroyed. Subsequently, Tunnels E and F under the Hudson River were flooded, and PATH's Exchange Place Station in Jersey City, New Jersey, was damaged and rendered inoperable because the track configuration would not allow trains to turn around before entering the Hudson River tunnels. As a result, the PATH system lost a substantial portion of its capacity to serve commuters throughout the New York and New Jersey region, and mass transit access to Lower Manhattan was severely hindered.

CURRENT PATH SERVICE TO LOWER MANHATTAN

Rescue and recovery operations began in and around the WTC site immediately following September 11, 2001. Work on the WTC site continued 24 hours a day, seven days a week, for approximately nine months. During this period, the New York City Department of Design and

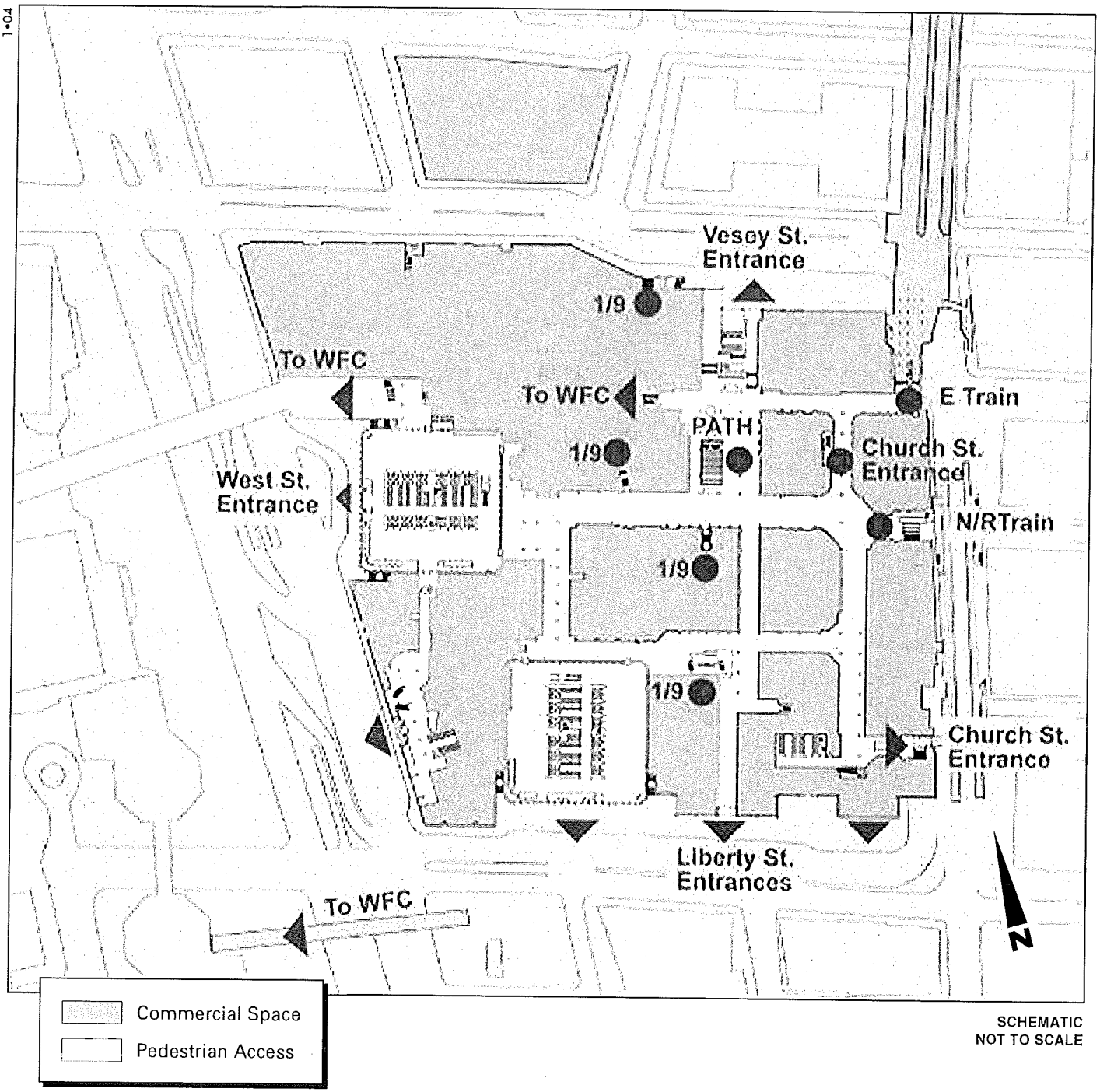


Figure 1-2

Pre-September 11, 2001
WTC PATH Terminal

Construction (NYCDDC) controlled the WTC site and was responsible for material removal, including contracting with private entities to provide such services in coordination with various federal and state entities. Control of the portion of the site that contained 7 WTC was returned to PANYNJ on May 7, 2002. The balance of the site was returned on June 30, 2002.

In February 2002, PANYNJ commenced work on the expansion of PATH's Exchange Place Station as well as repairs to the tunnels under the Hudson River. This work included electrical and signal replacements for components destroyed by water damage and excavation for new track crossovers and other improvements required to bring the station back in service. The Exchange Place Station was reopened to passengers on June 29, 2003.

PANYNJ began construction on a temporary WTC PATH station in July 2002, which was opened on November 23, 2003. The temporary station is located in the WTC "bathtub." It has five tracks and three eight-car platforms and provides street-level access through a single entry/exit at the intersection of Fulton and Church Streets. There are also direct connections to stations on NYCT's E, R, and W routes. (In February 2004, NYCT implemented long-term service adjustments that route N trains over the Manhattan Bridge and W trains over the local line to Whitehall Street. Thus, N trains no longer serve the Cortlandt Street Station.)

PATH RIDERSHIP

PRE-SEPTEMBER 11, 2001 REGIONAL TRAVEL TO MANHATTAN

The New York Metropolitan Transportation Council (NYMTC) periodically collects data to characterize daily trips to and from Manhattan's Central Business District (CBD). Referred to as hub bound counts, these data reflect regional travel to areas of Manhattan south of 60th Street. NYMTC classifies the data by cordon, which is the point where a person enters the Manhattan CBD. Five cordons have been defined: 60th Street, Brooklyn, Queens, New Jersey, and other (Roosevelt Island Tram and Staten Island Ferry).

The hub bound data reflects all trips into and out of the CBD, including work trips, non-work trips, and commercial vehicle trips. The New Jersey cordon includes all vehicular and transit trips into Manhattan for the modes and crossings south of 60th Street, including the Lincoln and Holland Tunnels, NJ Transit and Amtrak tunnels, PATH tunnels, and ferries. However, those entering the CBD via the George Washington Bridge are counted as part of the 60th Street cordon.

In the year 2000, the New Jersey cordon accounted for 14 percent of the approximately 3.9 million daily trips into the Manhattan CBD (see Table 1-2). During the AM peak period (7AM to 10AM), some 17 percent of trips crossed the New Jersey cordon, and in the AM peak hour, nearly 1 in 5 entered via the New Jersey cordon.

As shown in Table 1-3, transit riders comprised the majority of trips into Manhattan via the New Jersey cordon. The combined ridership of PATH, NJ Transit and Amtrak rail, commuter buses, and private ferries represented 62 percent of the total daily trips. The transit share was even higher at 75 percent and 81 percent during the AM peak period and AM peak hour, respectively.

PATH riders represented 30 percent of the total AM peak hour trips, 26 percent of the total AM peak period trips, and 23 percent of the total daily trips into Manhattan from the New Jersey cordon. As shown in Table 1-4, between 60 and 70 percent of these PATH trips used the downtown lines between Exchange Place and the WTC.

Table 1-2
2000 Weekday Hub Bound Trips by Sector

Sector	Peak Hour (8AM – 9AM)		Peak Period (7AM – 10AM)		24 Hour	
	Number	Percent	Number	Percent	Number	Percent
60th Street	155,130	25%	380,142	25%	1,482,768	38%
Brooklyn	199,938	32%	486,783	32%	1,044,744	27%
Queens	151,516	24%	376,383	25%	795,838	20%
New Jersey	111,955	18%	255,486	17%	536,952	14%
Other	1,992	1%	8,844	1%	31,687	1%
Total	620,531	100%	1,508,065	100%	3,891,989	100%

Note: Other includes the Staten Island Ferry and the Roosevelt Island Tram.
Sources: New York Metropolitan Transportation Council, *2000 Hub Bound Travel Report, Transportation to the Manhattan Central Business District* (May 2003).

Table 1-3
2000 Weekday Hub Bound Trips by Mode of Travel for the New Jersey Sector

Mode	Peak Hour (8AM – 9AM)		Peak Period (7AM – 10AM)		24 Hour	
	Number	Percent	Number	Percent	Number	Percent
Auto, Taxi, Van, and Truck	21,361	19%	63,546	25%	202,169	38%
NJTransit / Amtrak	18,224	16%	35,518	14%	62,098	11%
Commuter Bus	33,747	30%	78,350	31%	134,377	25%
Private Ferry	5,216	5%	11,029	4%	15,924	3%
PATH	33,407	30%	67,043	26%	122,384	23%
Total	111,955	100%	255,486	100%	536,952	100%

Sources: New York Metropolitan Transportation Council, *2000 Hub Bound Travel Report, Transportation to the Manhattan Central Business District* (May 2003).

Table 1-4
2000 Weekday Hub Bound Trips by PATH

Mode	Peak Hour (8AM – 9AM)		Peak Period (7AM – 10AM)		24 Hour	
	Number	Percent	Number	Percent	Number	Percent
Uptown Tubes	11,094	33%	20,219	30%	47,986	39%
Downtown Tubes	22,313	67%	46,824	70%	74,398	61%
Total	33,407	100%	67,043	100%	122,384	100%

Sources: New York Metropolitan Transportation Council, *2000 Hub Bound Travel Report, Transportation to the Manhattan Central Business District* (May 2003).

PRE-SEPTEMBER 11, 2001 PATH RIDERSHIP

Prior to September 11, 2001, the PATH system had approximately 257,000 boardings on an average weekday (see Figure 1-3). The WTC was the busiest of the 13 PATH stations with approximately 67,000 average weekday boardings. The WTC Terminal supported an average weekday two-way patronage of approximately 140,000 riders.

Volumes at the WTC Terminal were heaviest during the AM and PM peak hours. During these periods, the principal direction of travel was inbound to Manhattan in the AM and outbound to New Jersey in the PM; however, approximately 15 percent of riders commuted in the reverse direction. In the morning peak (8AM to 9AM), a total of approximately 26,000 riders used the station with 22,000 alighting and 4,000 boarding. In the evening peak (5PM to 6PM), the terminal accommodated 20,000 riders with 16,000 boardings and 4,000 alightings.

Table 1-5 shows the origins and destinations of PATH riders within Lower Manhattan during the AM and PM peak hours based on surveys conducted by PANYNJ in 1996. For those commuting to Lower Manhattan from New Jersey in the AM peak hour, the majority (61 percent) were destined to off-site buildings; 24 percent remained on the WTC site; and the remaining 15 percent connected to NYCT subways. For those leaving Lower Manhattan via PATH in the AM peak hour, some 65 percent accessed the system from NYCT subways; 3 percent from the WTC site itself; and another 32 percent from off-site buildings. Similar origins and destinations were observed for the PM peak hour.

Table 1-5
Pre-September 11, 2001 Origins and Destinations of Riders at the WTC PATH Terminal

Origin/Destination	Commuters to Lower Manhattan		Commuters from Lower Manhattan	
	AM Peak (Exit PATH)	PM Peak (Enter PATH)	AM Peak (Enter PATH)	PM Peak (Exit PATH)
NYCT Subways	15%	19%	65%	65%
WTC Site	24%	25%	3%	4%
Off-Site	61%	56%	32%	31%

Sources: Port Authority of New York and New Jersey

Table 1-6 shows the origins/destinations for those traveling between the WTC PATH Terminal and off-site developments. For those commuting to Lower Manhattan from New Jersey in the AM peak hour, the primary off-site destination was southeast from the WTC site toward the Financial District, representing about 40 percent of the total off-site trips. Trips to the north (Tribeca), northeast (Civic Center), and west (World Financial Center and Battery Park City) were fairly evenly distributed, each representing about 16 to 20 percent of the total off-site trips.

In the PM peak hour, there was a lower percentage of trips entering PATH from off-site; however, the distribution of these trips was similar to the AM peak hour.

Table 1-6
Pre-September 11, 2001 Off-Site Origins and Destinations of Riders at the WTC PATH Terminal

To/From	Commuters to Lower Manhattan		Commuters from Lower Manhattan	
	AM Peak (Exit PATH)	PM Peak (Enter PATH)	AM Peak (Enter PATH)	PM Peak (Exit PATH)
West (World Financial Center and Battery Park City)	20%	17%	5%	6%
North (Tribeca)	16%	21%	19%	28%
Northeast (Civic Center)	16%	22%	62%	53%
Southeast (Financial District)	40%	32%	13%	13%
South: Greenwich South	8%	6%	1%	1%
Sources: Port Authority of New York and New Jersey				

For those commuting from Lower Manhattan to New Jersey during the AM peak hour, the majority (62 percent of the total off-site trips) entered PATH from the northeast. Another 19 percent entered from the north (Tribeca); 13 percent from the southeast (Financial District); 5 percent from the west (World Financial Center and Battery Park City); and 1 percent from the south. A similar pattern of off-site trips was observed during the PM peak hour.

Approximately 5,900 and 5,700 commuters transferred between PATH and NYCT's subways during the AM and PM peak hours, respectively. The transfer to/from NYCT's WTC Station (E) was the most heavily used, representing approximately 55 percent of the transfer volume. One-third of the transfers were between PATH and NYCT's N and R trains, and the remaining 12 percent transferred to or from NYCT's 1 and 9 trains.

THE WTC CONCOURSE

The WTC retail concourse was an important, all-weather link to destinations within and around Lower Manhattan. Although PATH riders comprised the largest portion of pedestrians using the concourse during peak hours, thousands of other commuters traversed the facility en route to or from work. In both the AM and PM peak hours, some 19,000 non-PATH commuters entered or exited the concourse transferring between NYCT subways, buildings on the WTC site, and off-site developments.

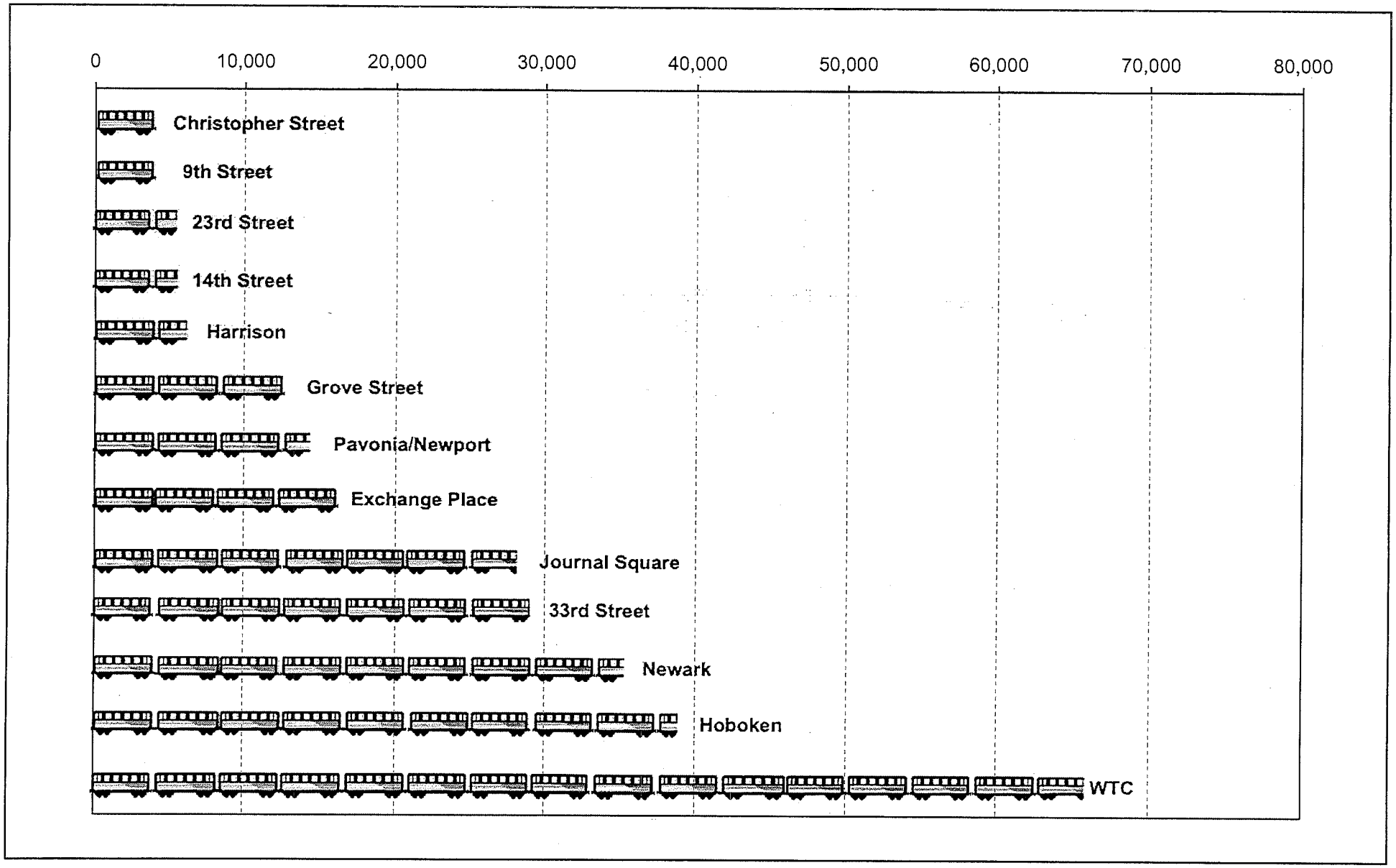
CURRENT PLANNING CONTEXT

LOWER MANHATTAN RECOVERY PROJECTS

Since September 11, 2001, several projects have been planned to redevelop and revitalize Lower Manhattan. Replacement and enhancement of transportation facilities, office, retail and hotel spaces, museum and cultural facilities, and open space are essential to the economic success of Lower Manhattan. Presently, four environmental reviews are being or have been prepared under NEPA independent of this Project, as described below.

World Trade Center Memorial and Redevelopment Plan

New York Governor George Pataki and New York City's then-Mayor Rudolph Giuliani formed the Lower Manhattan Development Corporation (LMDC) in November 2001, as a subsidiary of



PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 1-3
Pre-September 11, 2001 Daily Boardings

the New York State Urban Development Corporation (UDC) which does business as the Empire State Development Corporation (ESDC), a political subdivision and public benefit corporation of the State of New York. LMDC will oversee the revitalization and rebuilding of Lower Manhattan, defined as the areas south of Houston Street.

LMDC is undertaking, in cooperation with the United States Department of Housing and Urban Development (HUD) and PANYNJ, a World Trade Center Memorial and Redevelopment Plan. The plan includes the construction of a WTC Memorial and memorial-related improvements, as well as commercial, retail, and hotel space; museum and cultural facilities; open space; new street configurations; and infrastructure improvements at the WTC site and adjacent parcels.

The World Trade Center Memorial and Redevelopment Plan is independent of this Project and is undergoing a separate environmental review. LMDC is conducting a coordinated environmental review of their proposed action, pursuant to federal statute, as the recipient of HUD Community Development Block Grant program funds (42 USC 5304(g)), and as lead agency under NEPA and the New York State Environmental Quality Review Act (SEQRA) and its implementing regulations (6 NYCRR Part 617). LMDC published a Generic Environmental Impact Statement for this project and a Record of Decision was issued in June 2004. Consult the project's website (www.renewnyc.com) for current information about the WTC Memorial and Redevelopment Plan.

Fulton Street Transit Center

The Fulton Street Transit Center is a project being proposed by the Metropolitan Transportation Authority (MTA). The Fulton Street Transit Center (FSTC) will rehabilitate, reconfigure, and enhance the multilevel complex of subway stations serving nine different lines in the area of Fulton Street and Broadway. The project will improve platforms, mezzanines, and connecting corridors, and will provide a new central concourse with an above-grade presence. The facility has a proposed Dey Street concourse to NYCT's Cortlandt Street Station (R and W) and the Permanent WTC PATH Terminal. The FSTC is projected for completion in 2008.

The FSTC project is independent of this Project and is undergoing a separate environmental review by the FTA and MTA. A Draft Environmental Impact Statement for the FSTC was published in May 2004 and a Final Environmental Impact Statement was published in October 2004. FTA issued a Record of Decision on the project in November 2004. Consult the project's website (www.mta.info) for current information about the FSTC project.

Route 9A Project

The New York State Department of Transportation (NYSDOT) is currently considering the reconstruction of Route 9A south of Chambers Street with either at-grade improvements or a below-grade bypass for vehicular through traffic. The reconstruction of Route 9A is independent of this Project and is undergoing a separate environmental review by the USDOT, Federal Highway Administration (FHWA), and NYSDOT. A Draft Supplemental Environmental Impact Statement was published in May 2004 and a Final Environmental Impact Statement will be published in spring or summer of 2005. Consult the project's website (www.route9A.com) for current information about the Route 9A Project.

South Ferry Terminal

MTA, in cooperation with FTA, proposes to reconstruct the South Ferry Terminal on the 1 and 9 line. Presently, South Ferry is a loop station with a single platform that can only accommodate

five-car trains. MTA proposes to replace the loop station with a stub-end terminal having two tracks and one platform able to accommodate 10-car trains. This project would increase both the capacity of the South Ferry Terminal and the 1 and 9 line during peak periods. This project is independent of the Permanent WTC PATH Terminal and is undergoing a separate environmental review by the FTA and MTA. A Environmental Assessment was published in May 2004, and a Finding of No Significant Impact was issued in August 2004. Consult the project's website (www.mta.info) for current information about the South Ferry Terminal.

OTHER DOWNTOWN PROJECTS

Before September 11, 2001, several projects were planned downtown that are still under study. These include commercial and residential buildings at Battery Park City and within the Washington Street Urban Renewal Area as well as offices, open space, cultural institutions, and modest commercial development throughout Lower Manhattan.

Federal, state, and local initiatives have been implemented to encourage private development in Lower Manhattan. The Liberty Bonds program provides federal funds for commercial and residential development in Lower Manhattan, which has resulted in the conversion or construction of several new apartment and condominium buildings. LMDC is overseeing Governor Pataki's short-term capital projects, which include temporary pedestrian connections across Route 9A, streetscape improvements, security improvements at the New York Stock Exchange, the reopening of Millennium High School, and public open space and art.

C. PROBLEM DEFINITION

ECONOMIC RECOVERY

Transportation links have long been critical to the commercial development of Lower Manhattan. In its early days, Lower Manhattan was the center of the region's sea commerce with its numerous riverfront ports. As its economy shifted to office-sectors, Lower Manhattan depended on modes of transportation that would deliver workers to and from the area. Formerly the Hudson Tubes and now PATH, the transit link between New Jersey and New York was and is integral to the movement of employees to and from their Lower Manhattan offices. More recently, employment centers have emerged in Jersey City and Newark. These businesses depend on PATH to deliver workers from New York City and other points east of the Hudson River. Furthermore, several major businesses have located facilities in both Lower Manhattan and Jersey City to allow for office expansion while maintaining a close connection between company functions on both sides of the River.

A successful economic redevelopment of Lower Manhattan requires the replacement and enhancement of transportation facilities that were lost or damaged on September 11, 2001. As described above, current plans, which are independent of this Project, call for the rehabilitation of vehicular and transit facilities throughout Lower Manhattan. Although these projects would improve access to and from the area for those commuting to and from New Jersey, none offers the direct and high-capacity linkage that can be served by PATH and the Permanent WTC PATH Terminal.

In a survey of 25 executives of major employers located in Lower Manhattan, a Permanent WTC PATH Terminal was identified as "extremely" important to the future economic health of Lower Manhattan (Alliance for Downtown New York, Inc., April 2003). As described below, 15

percent of Lower Manhattan's workforce lived in New Jersey prior to September 11, 2001 and the WTC PATH Terminal was the busiest of downtown's transit stations. It is expected that as the WTC and other sites are developed with future commercial workers, a similar pool of new employees would be drawn from New Jersey. Thus, a restored and enhanced WTC PATH facility would be needed to accommodate newly generated demand for employees and their commute to and from Lower Manhattan offices. If such a facility were not provided, the full potential of Lower Manhattan's revitalization may never be realized.

RIDERSHIP GROWTH

Lower Manhattan is a vital component of the New York economy. It is second only to Midtown Manhattan in terms of gross floor area of office space, and it is a growing residential neighborhood and retail destination.

Prior to September 11, 2001, businesses in the area south of Canal Street employed more than 388,000 workers. Based on 1990 reverse journey-to-work data prepared by the U.S. Bureau of the Census, approximately 15 percent of Lower Manhattan's workforce commuted from west of the Hudson River and, as with the majority of workers in Lower Manhattan, transit was their predominant mode of travel.

The terrorist attacks resulted in the loss of 12 million square feet of office space and 500,000 square feet of retail space south of Canal Street. This physical loss of space coupled with a general economic downturn resulted in a reduction of 80,000 jobs in Lower Manhattan. As described above, LMDC and PANYNJ are planning for the redevelopment of the WTC site, meaning that most of the office space damaged or destroyed on September 11, 2001 will be replaced by 2015. In addition, a memorial, cultural facilities, and retail space will be constructed on the WTC site that will attract visitors in addition to the anticipated return of office workers.

Prior to September 11, 2001, proposals had been made for the continued development of vacant or underutilized sites in Lower Manhattan with various office, retail, and residential projects. These projects combined with the anticipated return of workers to the area would increase the future demand for transportation infrastructure.

It is estimated that PATH's daily ridership at the WTC would be 175,000 by 2025, which would exceed the capacity of the temporary station. Therefore, without this project, the PATH system cannot adequately support the planned redevelopment of the WTC and the overall revitalization of Lower Manhattan.

COMMUTING TO LOWER MANHATTAN WITHOUT PATH

As described above, the WTC PATH Terminal was the gateway to Lower Manhattan for some 67,000 daily commuters. It was among the most heavily used transit facilities in the area, and it offered critical connections to destinations within downtown as well as NYCT subway service for access to other parts of New York City.

Immediately following September 11, 2001, commuters formerly using PATH's WTC lines were forced to seek other routes or modes of travel to reach destinations in Lower Manhattan. As a result, there were substantial ridership increases on Trans-Hudson ferries, uptown PATH lines, and NJ Transit commuter rail. Although these modes enable commuters to reach Lower Manhattan, they do not have the capacity or the flexibility to serve as a long-term alternative to a Permanent WTC PATH Terminal.

TRANS-HUDSON FERRIES

Following the terrorist attacks, demand for ferry service between New Jersey and Lower Manhattan increased by more than 100 percent. Ferry operators rushed to respond by implementing increased peak hour service and new routes. Although ferries served as an important interim mode of travel for Lower Manhattan's commuters, they would not serve long-term travel needs between New Jersey and Lower Manhattan:

- Ferries have a much lower capacity than heavy-rail. Thus, numerous additional boats and services would be required to accommodate the anticipated future transit demand to and from Lower Manhattan.
- Ferries to Lower Manhattan must dock along the Hudson or East Rivers. While the location of ferry terminals may be convenient for those who work along Water Street and at the World Financial Center, others must walk much farther to reach interior destinations than was required with PATH service. Furthermore, most ferry passengers must transfer to one or more additional modes within New Jersey during their commute. Additional transfers and longer walks within Lower Manhattan increase the overall commute time and, thereby, decrease the attractiveness of this mode of travel.
- Ferry service is limited during inclement weather. During heavy rain storms or when the waters of the Hudson are icy, the ability to maintain ferry service is constrained.

UPTOWN PATH LINES

Following the destruction of the WTC PATH Terminal on September 11, 2001, many commuters diverted to PATH's Midtown routes. Once in Manhattan, these passengers would connect to NYCT subways to reach destinations in Lower Manhattan. As a result, ridership at PATH's Christopher and 9th Street Stations doubled during peak periods.

Both the Christopher and 9th Street Stations have a limited capacity. Platforms are narrow, there is only one point of access/egress, and fare zones are too small to serve large numbers of commuters. To immediately address these problems, PANYNJ had to limit station access during certain hours. Although upgrades are planned for these stations (see Chapter 8, Section A, "PATH"), they will not have adequate capacity to support general PATH system growth if a Permanent WTC PATH Terminal is not constructed.

NEW JERSEY TRANSIT COMMUTER RAIL

Following the terrorist attacks, ridership on NJ Transit commuter rail increased by approximately 30 percent, requiring additional trains on its routes serving New York's Pennsylvania Station. Although this additional capacity could accommodate the demand generated by the absence of PATH service to Lower Manhattan, it precluded certain service enhancements planned for this system.

For example, NJ Transit recently completed construction of the Secaucus Transfer, which provides a link between the Northeast Corridor line serving Pennsylvania Station, and the Main and Bergen County lines that serve Hoboken. Prior to its opening, passengers on several NJ Transit commuter rail lines would travel to Hoboken and then connect to PATH trains or ferries to access Midtown Manhattan. With the Secaucus Transfer, these passengers can now connect to Penn Station-bound commuter trains, resulting in a shorter commute time. Although the project was completed in summer of 2003, its full opening was delayed until temporary PATH service

was restored. NJ Transit could not support the increased ridership associated both with diverted PATH passengers and the Secaucus Transfer. If PATH service is not permanently restored to Lower Manhattan, it is expected that capacity constraints would exist on NJ Transit, thereby reducing the utility of the Secaucus Transfer and potentially limiting options for future system improvements.

Furthermore, NJ Transit and Amtrak share the rail lines that traverse the Hudson River between New Jersey and Lower Manhattan. Although a second Hudson River Tunnel is currently being studied, the interim expansion of the NJ Transit system is limited by the capacity of the single rail tunnel. Thus, if permanent PATH service is not restored to Lower Manhattan, there may not be additional capacity to support passengers that would be diverted to commuter rail.

LIMITATIONS OF TEMPORARY PATH SERVICE

To expedite the restoration of PATH service to Lower Manhattan, PANYNJ designed and built, on a fast-track basis, a temporary station. The temporary station was a commitment to restore the facilities damaged by the terrorist attacks and it was determined to be a catalyst to restore and redevelop Lower Manhattan by providing commuter service from west of the Hudson River. To ensure the speedy restoration of PATH service, the temporary station was constructed in essentially the same location as the pre-September 11, 2001 Terminal. This allowed PANYNJ to reuse certain infrastructure elements including the 1 and 9 underpass, portions of the retail concourse, and the NYCT subway station connections that remained on the WTC site. Furthermore, design documents could be advanced more quickly since track and platform configurations and other station elements could be constructed based on pre-September 11, 2001 plans. However, to achieve this commitment within two years after the attacks, PANYNJ compromised certain elements of the pre-September 11, 2001 Terminal with regard to operational capacity, service amenities, and pedestrian connections.

Because PANYNJ could use as-built plans from the pre-September 11, 2001 Terminal to design and construct the temporary station, extensive survey work was not needed. Designers could lock in the station and track configuration both horizontally and vertically. As such, steel detailing could be expedited and steel sizing accelerated. Since it was intended as a temporary station, platforms were designed to be removed and not integral to the platform walls; interior drainage was less than desired since only the outer bay of the station has interior drains; and, roof insulation was minimal since it was an outdoor facility.

The temporary station has 8-car platforms as compared to the 10-car platforms that were part of the pre-September 11, 2001 Terminal, resulting in 20 percent less operational capacity. Prior to September 11, 2001, PANYNJ was studying the extension of stations along its Newark-WTC route to provide for 10-car train service. These improvements were in response to ridership levels that were reaching maximum capacity on this route during peak periods.

Some of the infrastructure elements within the station have a limited service life. The vertical elements, while ADA-compliant, do not provide a sufficient level of service to accommodate future demand. Escalators from the platform to the mezzanine level and from mezzanine level to the NYCT 1 and 9 subway line underpass were not provided. The station's design does not allow for new construction above, as planned for the WTC redevelopment, nor can it easily support connections to future buildings on the WTC site or other off-site destinations.

To expedite service restoration, the temporary station's tracks and platforms are located outdoors in the WTC "bathtub." Weather protection is provided, but the station is not fully enclosed and

is not climate-controlled. Local radiant heating is provided in waiting areas, but many portions of the station complex are not heated during winter months or cooled during summer months. As noted previously, the pre-September 11, 2001 Terminal was fully climate-controlled.

The temporary station includes security and fire protection equipment, but advanced passenger amenities are not provided. The station is ADA-compliant, but its configuration requires four separate elevator rides to reach street level. Emergency exits are provided, but they lead passengers either to Church Street or to the WTC bathtub area with access to the street via the temporary access ramp and a temporary stairway to West Street.

Because construction of the WTC site is ongoing, pedestrian access to the temporary station is limited as compared to the pre-September 11, 2001 Terminal. All patrons enter and exit at street level near the intersection of Church and Fulton Streets at the eastern boundary of the WTC site. Thus, patrons traveling to the World Financial Center must double-back along Vesey or Liberty Street. The temporary station has connections to NYCT's E, R, and W lines, but access to 1 and 9 trains is not available because NYCT has not yet reopened its Cortlandt Street Station. As such, two fewer subways are served compared to pre-September 11, 2001 conditions.

D. GOALS AND OBJECTIVES

The Permanent WTC PATH Terminal would be a full-service, regional transportation hub that would be coordinated with existing and future transportation infrastructure, WTC site development, and the surrounding area. The Project is needed to reestablish and enhance transportation facilities and infrastructure that existed at the WTC complex prior to September 11, 2001 and to ensure the long-term accessibility and economic vitality of Lower Manhattan.

EFFECTIVELY RESTORE LONG-TERM PATH SERVICE BETWEEN NEW JERSEY AND LOWER MANHATTAN

The Project should provide for a facility that maintains a direct transit connection between New Jersey and Lower Manhattan. It should serve as a long-term, high-capacity facility with enhanced amenities as compared to the pre-September 11, 2001 WTC PATH Terminal. To successfully address this goal, the Project must meet the following objectives:

- Accommodate pre-September 11, 2001 PATH ridership;
- Provide for additional capacity at the Terminal to support ridership growth;
- Provide for modern station design with ADA-accessibility, climate control, and station security; and
- Minimize disruption to temporary PATH service during construction.

ESTABLISH AN INTERMODAL TRANSPORTATION FACILITY IN LOWER MANHATTAN

The Project should enhance transportation connections to, from, and within Lower Manhattan as compared to pre-September 11, 2001 conditions. The opportunity to rebuild a PATH facility should take advantage of connections to existing and future transit infrastructure and should allow for improved at-grade and below-grade pedestrian connections as compared to the pre-September 11, 2001 and temporary PATH facilities. To successfully address this goal, the Project must meet the following objectives:

- Improve street-level visibility and access;
- Provide for adequate and state-of-the-art pedestrian circulation within the facility; and
- Provide for connections to NYCT subways and other major origination and destination points.

PLAN AND CONSTRUCT A TERMINAL THAT WOULD SUPPORT THE REDEVELOPMENT OF LOWER MANHATTAN

The Project should support the physical and economic recovery of Lower Manhattan, including proposals for the reconstruction or rehabilitation of other transportation infrastructure, redevelopment of the WTC site, and construction and occupation of other off-site projects, all of which are undergoing separate environmental reviews, as detailed above. To successfully address this goal, the Project must meet the following objectives:

- Construct a facility that is coordinated with the master plan for the WTC site;
- Provide for future connections to WTC buildings and functions, including the proposed memorial;
- Coordinate PATH facilities with other sub-grade uses at the WTC site; and
- Plan and coordinate PATH elements with proposals for the reconstruction of Route 9A, the Fulton Street Transit Center, and other off-site development.

MINIMIZE ADVERSE IMPACTS TO THE ENVIRONMENT

The construction and operation of the Project should not, to the extent possible, adversely effect the local and regional environment in the short-term or long-term. The desired alternative would not only minimize adverse effects but would also provide for the greatest positive benefits to both the build and natural environment. To successfully address this goal, the Project must meet the following objectives:

- Reuse existing infrastructure to the extent possible;
- Provide for efficient and environmentally friendly construction techniques;
- Minimize disruption to PATH and NYCT subway service during construction; and
- Provide for "green" and sustainable design. ✷

A. INTRODUCTION

As described in Chapter 1, "Purpose and Need," the Permanent World Trade Center (WTC) PATH Terminal is one of four projects proposed for funding under the $4.55-billion Lower Manhattan Transportation Recovery Effort. The federal government is also proposing to fund the Fulton Street Transit Center (FSTC), South Ferry Terminal, and Route 9A Project in addition to the Permanent WTC PATH Terminal. These other transportation projects are being sponsored and evaluated independent of the Permanent WTC PATH Terminal. The federal government, through the U.S. Department of Housing and Urban Development (HUD), is also proposing to fund the Lower Manhattan Development Corporation's (LMDC) WTC Memorial and Redevelopment Plan. Although the WTC Memorial and Redevelopment Plan and the Permanent WTC PATH Terminal would both occupy spaces on the WTC site, these projects are considered independent actions under the National Environmental Policy Act (NEPA) process and are therefore being evaluated and assessed in separate Environmental Impact Statements (EISs).

Project Alternatives for a Permanent World Trade Center (WTC) PATH Terminal were identified as part of early planning studies conducted by the Port Authority of New York and New Jersey (PANYNJ) following the terrorist attacks of September 11, 2001, and throughout this environmental review process. This chapter describes the process for developing Project Alternatives, including a discussion of the overall alternatives development process, a description of the Preferred Alternative, and a review of alternatives considered and eliminated from further study.

Three Project Alternatives were advanced through the alternatives development process for detailed study in the Draft EIS (DEIS), as follows:

- No Action Alternative
- Terminal without Liberty Plaza Connection Alternative
- Terminal with Liberty Plaza Connection Alternative

Since publication of the DEIS, PANYNJ and FTA have selected the Terminal without a Liberty Plaza Connection as the Preferred Alternative for a Permanent WTC PATH Terminal. This alternative was selected after careful consideration of the public comments received during the public review process for the DEIS. Not only would the Preferred Alternative meet the goals and objectives of the project, but it would also provide for substantial improvements over the pre-September 11, 2001 WTC PATH Terminal and the temporary WTC PATH station.

As described in the DEIS, the design of the Permanent WTC PATH Terminal is being closely coordinated with the other Lower Manhattan recovery efforts described above. To anticipate potential modifications to this Project that may be necessary to coordinate with these independent actions, the DEIS identified design options for components of the Terminal. Specifically, the DEIS described options for the coordination of the Terminal's construction with other uses on the WTC site, the location of ventilation structures, the cooling system to be

employed, and the pedestrian connection across Route 9A. Since publication of the DEIS, PANYNJ has advanced the Terminal's design and has determined that these design options are no longer needed. As such, this Final EIS (FEIS) identifies the options selected as part of the Preferred Alternative and describes the options eliminated from further consideration.

This chapter in conjunction with Chapter 3, "Construction Methods and Materials," also describes the framework for the assessments of environmental effects presented in the technical chapters that follow. This discussion includes the development of baseline conditions for analysis, assumptions applied in the analysis of the No Action and Preferred Alternatives, and the approach to studying cumulative effects. This framework also presents the Environmental Performance Commitments (EPCs) and environmentally friendly "green" measures that would be incorporated into the design and construction of the Preferred Alternative to avoid or minimize potential adverse impacts to the environment.

B. ALTERNATIVES DEVELOPMENT PROCESS

LOCATIONS FEASIBILITY ANALYSIS

While restoring temporary PATH service to Lower Manhattan as described in Chapter 1, "Purpose and Need," PANYNJ began planning for a permanent facility, including tracks, platforms, mezzanines, pedestrian concourses, and a terminal building on or near the WTC site. Not only did PANYNJ intend to restore the capacity and connectivity that existed within the pre-September 11, 2001 WTC PATH Terminal but also wished to enhance pedestrian connections through the site and adjacent properties and to create a world-class transportation hub for Lower Manhattan. To that end, PANYNJ conducted a detailed analysis of alternatives for transit service between New Jersey and Lower Manhattan. The process that was undertaken is described below.

LOCATIONS FEASIBILITY ANALYSIS FRAMEWORK

Planning Constraints

The PATH system operated between New Jersey and Lower Manhattan for almost 100 years prior to the September 11, 2001 terrorist attacks. Thus, a substantial infrastructure had been built to support this high-capacity, heavy-rail service. Although the attacks and their resultant damage severely hindered operations, PATH was able to maintain service at all but two of its stations (Exchange Place and WTC). Furthermore, PATH's Hudson River tunnels between Exchange Place and Lower Manhattan were damaged by flooding but were determined to be structurally sound. New York City Transit's (NYCT) 1 and 9 line, which traverses the WTC site, was also damaged but was reconstructed on an expedited schedule to restore service within one year of the attacks. In planning for long-term transit service between New Jersey and Lower Manhattan, PANYNJ made an early decision not to preclude operations on portions of the PATH and NYCT systems that remained intact. To that end, PANYNJ's planning was constrained by four important considerations as described in Table 2-1.

Given these constraints, the only reasonable alternatives would be alternate locations for a Lower Manhattan PATH terminal.

Table 2-1
Locations Feasibility Planning Constraints

Planning Constraint	Description
Re-use Hudson River tunnels	Construction of new Hudson River tunnels would be time-consuming and expensive and may have potential adverse effects on the environment. New tunnels would also require right-of-way that may be outside current PANYNJ jurisdiction. Thus, it was determined that future Trans-Hudson service should use the existing tunnels between Exchange Place and the WTC site.
Maintain a heavy-rail system	Use of the Hudson River tunnels limits the type of service that can be provided because PATH's infrastructure, fleet, and support systems would not be easily adapted to other types of service. The introduction of alternative modes would severely disrupt the remainder of the PATH system.
Connect to existing tunnel projections	Use of the Hudson River tunnels requires connections to the PATH projections at the WTC site, which constrains the alignment within Lower Manhattan. New links to these projections must comply with PATH's systemwide grade and curvature specifications.
Maintain NYCT's 1 and 9 train alignment	Any PATH infrastructure that penetrates through NYCT's 1 and 9 line must be below the subway tracks. Such plans would need to consider the height, depth, and width of these protrusions and their potential effects on subway service.

Planning Guidelines

In planning for a permanent terminal, PANYNJ not only desired to restore the facility that existed before September 11, 2001 but also strived to improve and enhance service to Lower Manhattan. Chapter 1, "Purpose and Need", outlined the goals and objectives for the Project. In order to fully assess location options for a Terminal, these goals and objectives were refined into more specific planning guidelines so as to weigh various benefits and potential shortfalls of the locations being considered. These planning guidelines are described in Table 2-2.

Location Options

Given the planning constraints described above, PANYNJ identified four sites of an appropriate size and configuration for a permanent PATH terminal. These locations are shown in Figure 2-1 and are described below.

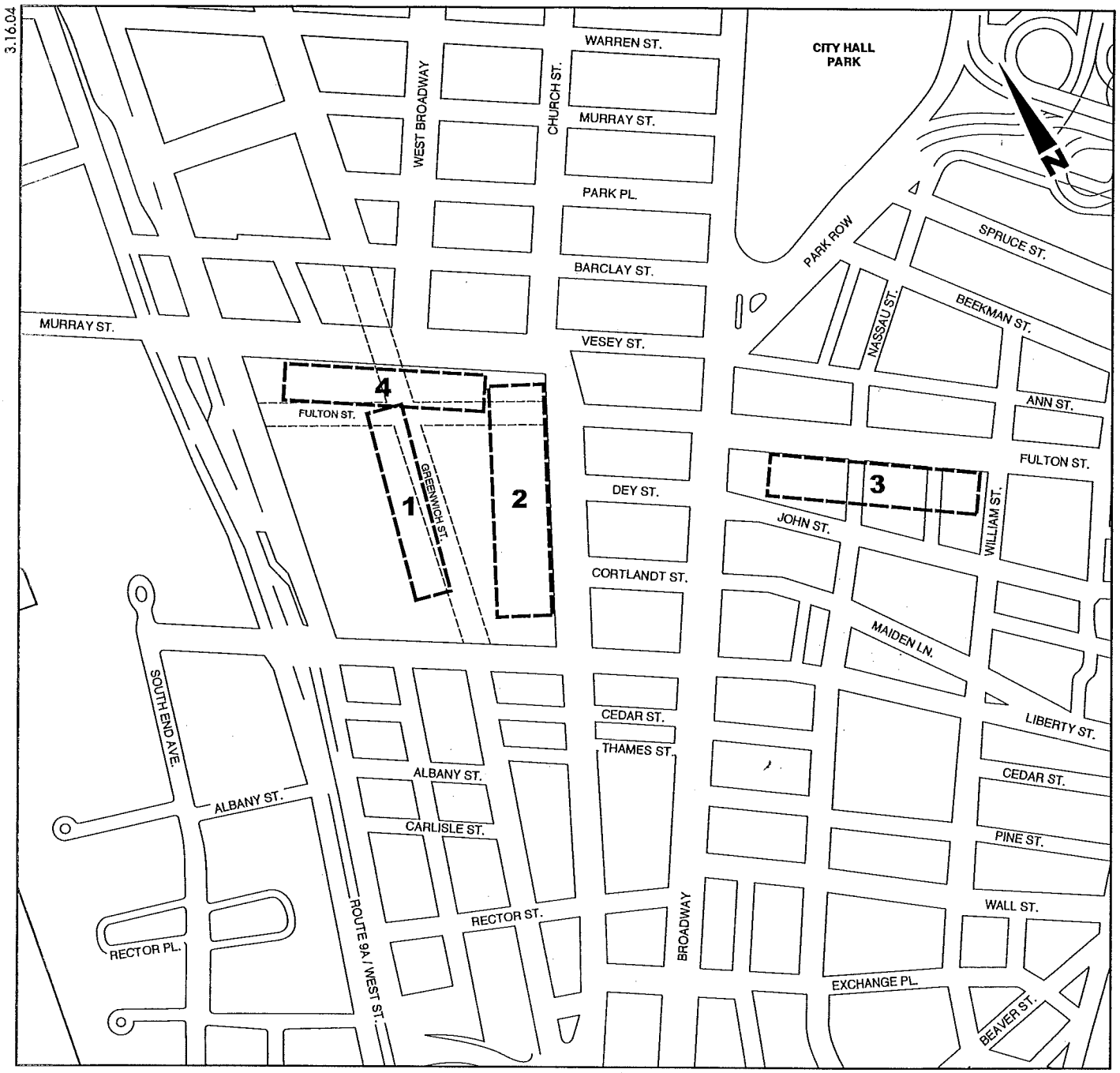
- Location 1, WTC "Bathtub": The WTC "Bathtub" option would restore service in the location of the pre-September 11, 2001 WTC Terminal by building the tracks, platforms, and mezzanines in the same location as the temporary PATH station. The platform level would have a north-south configuration with a loop track arrangement. There would be five tracks and three 10-car platforms. A terminal building would be constructed at street level, directly above the platforms and mezzanine, with access from Greenwich Street, and pedestrian concourses would allow for all-weather access to the World Financial Center, future buildings on the WTC site, NYCT's Fulton Street Transit Center, and NYCT's WTC and Cortlandt Street subway stations.

  Location 2, Church Street: The Church Street option would be a new facility in the approximate location of the original Hudson and Manhattan (H&M) Terminal, along the west side of Church Street between approximately Fulton and Cortland Streets. It would be a loop station and would have a north-south orientation on the eastern portion of the WTC site between Church and Greenwich Streets. The proposed plan would be for five tracks and five 10-car platforms. Four of the five platforms would accommodate separate boarding and alighting operations. A terminal building would be constructed above the platforms and mezzanine and would have street-level access from Church Street. This location would also provide for pedestrian concourses with all-weather access to the World Financial Center, future buildings on the WTC site, NYCT's Fulton Street Transit Center, and NYCT's WTC and Cortlandt Street subway stations.

Table 2-2
Locations Feasibility Planning Guidelines

Planning Objective	Description
Create a world-class, transportation facility in Lower Manhattan	The new PATH facility should be integrated with existing and proposed transportation infrastructure and other uses but should also have a significant presence in Lower Manhattan. A desirable location would allow for integration of sub-grade pedestrian connections with other facilities and for an above-grade terminal building that enhances the overall experience of PATH customers.
Support the redevelopment of Lower Manhattan	The permanent terminal should support the redevelopment of Lower Manhattan and its economic recovery. Although PATH is critical to Lower Manhattan's transportation infrastructure, a permanent terminal should not preclude other development on or off the WTC site. A desirable location would allow for the restoration and enhancement of PATH service but would not hinder other redevelopment efforts. The objective is to maximize space on the WTC site for redevelopment.
Provide for improved pedestrian connections	The permanent terminal should provide pedestrian connections to the facilities previously served by PATH, including NYCT's WTC (E) and Cortlandt Street (1 and 9; R and W) subway stations, Battery Park City, World Financial Center, and future buildings on the WTC site. The terminal should also connect to NYCT"s Fulton Street Transit Center (2, 3, 4, 5, A, C, J, M, and Z subway lines) and provide for concourses to serve other destinations based on pedestrian demand in Lower Manhattan.
Minimize impacts to temporary PATH service during construction	To avoid the commutation problems that existed immediately following September 11, 2001, PANYNJ desires not to disrupt weekday, peak-period service at the temporary WTC PATH station during construction of a permanent terminal.
Minimize impacts to the local environment during and after construction	The blocks immediately adjacent to the WTC site contain some of the area's largest office buildings as well as historic structures, which would be sensitive to disruption, displacement, underpinning, or other construction activities associated with a permanent terminal. Thus, any option that would directly displace businesses would not be desired.
Enhance pre-September 11, 2001 PATH operations	The permanent terminal should maintain the maximum operation of the pre-September 11, 2001 Terminal of 30 trains per hour. The terminal should also reduce the cross-flow conflicts that existed previously. Although 5 platforms and 5 tracks would virtually eliminate cross-flow, it was determined that 4 platforms would greatly improve conditions as compared to pre-September 11, 2001.
Support 10-car PATH trains	PANYNJ plans to widen platforms on PATH's Newark-WTC route to support 10-car trains. Thus, a future terminal should not preclude this long-term operating plan.
Provide for advanced security	To prevent future incidents at the WTC site, including the PATH terminal, PANYNJ, LMDC, Metropolitan Transportation Authority (MTA), and New York State Department of Transportation (NYSDOT) would provide for integrated, enhanced, and state-of-the-art security measures within the design of the individual projects. As such, the physical design of a permanent terminal and the WTC site must provide for adequate facilities to support security measures such as surveillance, structural hardening, and truck checkpoints for the protection of Lower Manhattan.
Re-use existing PATH right-of-ways	A location outside the WTC site would require property acquisition and potential demolition of existing structures, which may increase the cost of the project, increase the duration of construction, and may have potential adverse impacts on the local environment. PANYNJ would be less inclined to pursue a location needing additional right-of-way.
Minimize construction cost and duration	While working to pursue the other planning goals, PANYNJ would desire a location that provides the greatest benefits at a reasonable cost and within a reasonable construction timeframe.

- Location 3, Broadway-Nassau: The Broadway-Nassau option would be a new facility located east of the WTC site under Dey Street and beneath NYCT's Fulton Street Transit Center. It would be a stub-end station, meaning that conductors and engineers would need to change positions within the train to continue service in the reverse direction. The station would have five tracks and five 10-car platforms. It would be integrated with the Fulton Street Transit Center and would have street-level access from Broadway, Fulton Street, and John Street. Convenient, below-grade access to NYCT's 2, 3, 4, 5, A, C, J, M, and Z trains



PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 2-1
Alternative Locations

would be provided. Connections to NYCT's R and W trains would be via a newly constructed concourse under Dey Street. There may also be all-weather connections to the World Financial Center or the future buildings on the WTC site.

- Location 4, Vesey Street: The Vesey Street option would be located in the WTC "Bathtub" along Vesey Street. It would have an east-west orientation and would form a loop with the Hudson River tunnels. It would have five tracks and five 10-car platforms. A terminal building would be constructed immediately above the platforms and mezzanines at street level with pedestrian access from Vesey and Fulton Streets. Pedestrian concourses would allow for all-weather access to the World Financial Center, future buildings on the WTC site, and NYCT's 1, 2, 3, 9, A, C, E, R and W subway lines with a possible connection to the Fulton Street Transit Center.

LOCATIONS EVALUATION

Fatal Flaws Analysis

Before advancing any design options, PANYNJ conducted an initial screening of the four sites to determine if any were seriously flawed. It was determined that any location, which 1) would not provide for adequate PATH operations, 2) would fully disrupt temporary PATH service, or 3) require major property acquisition and/or demolition of active buildings, would not be consistent with the overall goals and objectives for the Project identified in Chapter 1, "Purpose and Need". Using the planning guidelines described above, PANYNJ established that two locations would not satisfy the current and future needs of PATH customers as described below.

- Location 1, WTC "Bathtub": Location 1 would allow for a maximum operating capacity of 30 trains per hour. It would require some disruption to temporary PATH operations when portions of the station are upgraded during construction. However, careful staging would maintain service during peak periods. Since the terminal would be located on the WTC site, property acquisition and demolition of buildings would not be required. Furthermore, potential business disruption would be minimal since most construction activities would occur off-street. Thus, Location 1 was carried forward for further study.

- Location 2, Church Street, would allow for a maximum operating capacity of 30 trains per hour. It would require minor disruption to temporary PATH operations when its tracks are connected to the Hudson River tunnels, but service could be maintained during peak periods. Since the terminal would be located on the WTC site, property acquisition and demolition of active buildings would not be required. Furthermore, potential business disruption would be minimal since most construction activities would occur off-street. Thus, Location 2 was carried forward for further study.

- Location 3, Broadway-Nassau, would allow for a maximum operating capacity of 20 trains per hour, which is below the goal of 30 trains per hour. It would require full closure of the temporary PATH station for several months during construction as the tracks leading to the terminal would cross those of the temporary station such that the temporary tracks would need to be removed. The terminal's construction would require the acquisition of property and certain buildings would need to be demolished. Furthermore, above- and below-ground construction activities would likely require street closures. This could result in direct displacement of businesses in the vicinity of the proposed terminal. Because Location 3 failed to meet the operational requirements of PATH, it was considered fatally flawed.

- Location 4, Vesey Street, would have a maximum operating capacity of 30 trains per hour. However, it would require full closure of the temporary PATH station during construction because the tracks and platforms of the terminal would require the removal of infrastructure from the temporary station. Since the terminal would be located on the WTC site, property acquisition and demolition of buildings would not be required, and potential business disruption would be minimal. Because Location 4 would preclude temporary PATH service during construction, it was considered fatally flawed.

Detailed Screening Analysis

PANYNJ conducted further analysis for Location 1 (WTC "Bathtub") and Location 2 (Church Street) to evaluate their consistency with the long-range planning guidelines described above. Since these locations were similar in terms of many general goals, the detailed screening focused on specific differences in terms of their construction, long-term operations, and compatibility with redevelopment efforts for the WTC site.

Construction

PANYNJ prepared cost estimates and construction schedules for the development of a permanent terminal at Locations 1 and 2 based on preliminary engineering. This analysis showed that the Church Street option would cost 20 to 25 percent more and would require 7 to 10 percent more time to construct than the WTC "Bathtub" option.

The differences in construction cost and duration were mainly attributed to the site preparation and structural underpinning required for the Church Street option. Because the WTC "Bathtub" option is located in the area of the site that was fully cleared during recovery efforts, little site preparation would be necessary. The Church Street option is located on a portion of the site that retains five sub-grade levels (two basement levels of the former WTC complex and the three levels of the old H&M Terminal). These structures would need to be demolished and debris removed. Furthermore, a new slurry wall would need to be constructed east of the NYCT 1 and 9 subway line to excavate new PATH right-of-way between Church, Greenwich, Vesey, and Liberty Streets. Thus, front-end construction activities for the Church Street option would be longer and more costly than for the WTC "Bathtub" location.

The WTC "Bathtub" location would be constructed within and above the temporary station, requiring a complex staging plan to maintain PATH service. Thus, certain activities that could normally be implemented in a single phase would be spread over multiple stages of construction. Because the majority of the Church Street option would not directly affect temporary PATH operations, a less complicated construction phasing plan could be implemented, resulting in a more efficient construction process than with the WTC "Bathtub" option.

The Church Street option requires new track and tunnels beneath the 1 and 9 line; therefore, extensive underpinning of NYCT's infrastructure would be necessary. These activities would add to the project cost, require extensive staging and coordination to minimize disruption to subway service, and prolong the construction schedule. The WTC "Bathtub" option would require underpinning of NYCT's 1 and 9 subway line for platform and concourse construction, but such activities would be far less intensive than with the Church Street option.

Operations

Both locations would provide for improved operations as compared to the pre-September 11, 2001 Terminal. However, each would offer certain operating advantages.

The Church Street option would have two additional platforms as compared to the WTC "Bathtub" location, which would facilitate dedicated loading and unloading activities during peak periods and an extremely efficient platform circulation. The three-platform configuration of the WTC "Bathtub" location could not support dedicated loading and unloading. Although the Church Street location would have superior circulation as compared to the WTC "Bathtub" option, the maximum throughput of both stations would be 30 trains per hour.

The configuration of the WTC "Bathtub" location allows for better vertical circulation than the Church Street option. Because vertical elements could be arranged to allow for a diagonal ascension to street level, the WTC "Bathtub" location would facilitate passenger movements from platform level to concourse/street level in the desired direction of travel. Since space for the Church Street option is more constrained, vertical elements would be stacked and arranged in a scissor-style such that some passengers would double-back within the station complex to maneuver between platform and concourse/street level. Thus, the vertical circulation of the WTC "Bathtub" option would be more efficient than the Church Street location.

Each location offers relative proximity to certain destinations in Lower Manhattan. The Church Street option would be approximately 300 feet east of the WTC "Bathtub" location; thus, it would be one block closer to the Financial District, the Civic Center, the Fulton Street Transit Center, and NYCT's Cortlandt Street (R and W) and WTC (E) subway stations. The WTC "Bathtub" location would be closer to Battery Park City and the World Financial Center. Each location, therefore, offers advantages for certain riders.

Compatibility with WTC Redevelopment Efforts

The Church Street or WTC "Bathtub" PATH terminal would be one component of the redevelopment on the WTC site. Any future terminal must not preclude redevelopment efforts, and the most desirable location would allow planners to achieve the maximum programming of other uses. Furthermore, the terminal must allow for the enhanced security measures that would need to be incorporated into the site's design so as to not limit the ability of site developers to provide for enhancements as compared to pre-September 11, 2001 conditions.

Because infrastructure is required throughout the site to support all of the redevelopment components, it was determined that the first four levels of the WTC from the bathtub floor would be dedicated to transportation, utilities, internal circulation elements, and building support. These levels would also contain the tracks, platforms, and mezzanines for PATH. Areas above the fourth level would follow a master plan for the site with programmed spaces for a memorial, cultural facilities, open space, and commercial uses.

All infrastructure associated with the WTC "Bathtub" option would be on the western portion of the site, freeing the eastern portion of PATH elements. This would allow maximum flexibility for commercial development and the incorporation of mechanical, security, and building servicing infrastructure required for such development. Furthermore, secured loading and servicing as well as large retail spaces could be made available in the below-grade spaces on the eastern portion of the WTC site. With the ability to provide multi-level retail spaces on the eastern portion of the site, major anchor tenants could be sought such as "big-box" retailers or department stores, which would restore and enhance the overall retail composition of Lower Manhattan. Because much of the rest of Lower Manhattan is fully developed, it would be difficult to provide adequate spaces for such retailers off-site. The above-grade portions of the WTC "Bathtub" option would be within the area of a proposed memorial, including its headhouse.

The Church Street option would have PATH elements throughout the WTC site. While the western portion would only contain the tracks and ancillary facilities, the platforms, mezzanines, concourses, and terminal building would be located wholly within the eastern portion. Given the "scissor-style" configuration of a Church Street terminal, safe passenger egress would require that the level of the terminal's tracks and platforms be higher than for the WTC "Bathtub" location. These below-grade spaces dedicated to PATH either would preclude or would require that retail, security and other support services are located elsewhere. Thus, loading areas and parking facilities would be located above grade or eliminated. If above-grade loading areas were needed, it is likely that they would be accessed from Greenwich Street because New York City guidelines typically disallow such activities from wide avenues such as Church Street. These trucking activities would not be sensitive to the memorial zone, which would be located opposite Greenwich Street. Furthermore, since above-grade loading would likely require that individual areas be provided in each of the offices towers, ground-level space would be lost and centralized security could not be provided. Based on preliminary programming for the WTC site, it is estimated that a total of approximately 15 to 25 percent of the potential on-site retail spaces would be lost under the Church Street location as compared to the WTC "Bathtub" option.

Construction of commercial towers above a PATH terminal at the Church Street location would require advanced engineering and a longer schedule to complete. Certain structural elements within the PATH terminal would be required to support a commercial overbuild, which would reduce the flexibility of the station's design and the flexibility of the above-grade development. Furthermore, other site uses within the eastern portion of the site could not be constructed until PATH elements are completed; thus, the Church Street location may result in an extended timeframe for the overall redevelopment of the WTC site.

Analysis Results

Table 2-3 compares the results of the detailed screening analysis. Location 1 was determined to be more desirable in terms of construction because it would be less expensive with slightly shorter duration. Although intensive coordination would be needed to maintain temporary PATH service, the WTC "Bathtub" location would allow for simultaneous construction of other projects on the WTC site. Thus, the schedule for the overall site redevelopment may be reduced.

The Church Street option would allow for superior platform circulation as compared to the WTC "Bathtub" option; however, vertical circulation would be more difficult. Both locations would have all-weather connections to NYCT subways, but the Church Street option would be closer to most of the existing stations. It would also be one block closer to developments within the Civic Center and the Financial District. However, the WTC "Bathtub" location would have better proximity to the World Financial Center and Battery Park City.

Generally, the WTC "Bathtub" option would be more compatible with proposed uses on the WTC site. Certain above-grade portions would need to be integrated with the future memorial. However, this location would allow for the maximum development potential of other uses, which would enhance the economic recovery of Lower Manhattan. The Church Street option would not require above-grade structures within the area of the memorial, but it would hinder sub-grade and above-grade commercial development on other portions of the site. Furthermore, the Church Street option would have contextual impacts to the memorial since building servicing, such as truck loading and security would likely be at street level, and it is probable that spaces beneath the memorial would be needed to support other buildings on the site.

Table 2-3
Locations Feasibility Detailed Screening Analysis Results

Criteria	Location 1 WTC "Bathtub"	Location 2 Church Street
Construction		
Cost	30% to 35% less expensive	30% to 35% more expensive
Duration	7% to 10% shorter	7% to 10% longer
Constructability	Requires complex staging plan to avoid disruption to temporary PATH service	Requires extensive site preparation and underpinning of NYCT infrastructure
Operations		
Tracks	5	5
Platforms	3	5
Platform Cross-flow	Cross-flow conflicts on all platforms	Cross-flow conflicts on 1 platform
Vertical Circulation	Easily navigable	More complex with double-back movements to reach street level
Proximity to Civic Center	One block farther	One block closer
Proximity to Financial District	One block farther	One block closer
Proximity to World Financial Center and Battery Park City	One block closer	One block farther
Proximity to NYCT Cortlandt Street Station (1 and 9)	No difference	No difference
Proximity to NYCT Cortlandt Street Station (R and W)	One block farther	One block closer
Proximity to NYCT World Trade Center Station (E)	One block farther	One block closer
Proximity to Fulton Street Transit Center (2, 3, 4, 5, A, C, J, M, and Z)	One block farther	One block closer
Proximity to World Financial Center Ferry Terminal	One block closer	One block farther
Compatibility with WTC Redevelopment		
Compatibility with Memorial	Certain above-grade elements would be within the memorial zone; these facilities could be integrated into the memorial's design	Contextual effect if building servicing is moved to street level. Certain site elements may be located beneath the memorial.
Compatibility with Other Site Development	Allows for more flexibility in above-grade development and approximately 15% to 25% more on-site retail.	Requires spaces that could be programmed for commercial uses and reduces the flexibility of site planning and construction. Could result in a 15% to 25% reduction in retail space.
Compatibility with site infrastructure and security	Allows for sub-grade security checkpoints, building servicing, and goods delivery.	Requires at-grade building servicing and goods delivery; may preclude centralized security checkpoint.

The "Hybrid" Option

PANYNJ reviewed the results of the detailed screening analysis to determine locations for the permanent terminal to be evaluated further. Because PANYNJ recognized certain benefits of both options, a plan that would accommodate the advantages of both locations was developed. As the conceptual planning of the WTC site was advanced, it was determined that spaces between Greenwich and Church Streets could be made available for a PATH terminal, but there would not be sufficient below-grade space to accommodate new tracks and platforms along Church Street. Thus, PANYNJ proceeded with a plan that would maintain the tracks and platforms within the WTC "Bathtub" but would locate the major pedestrian connections and terminal building in the vicinity of Church Street. Table 2-4 compares the evaluation of this "hybrid" option to the WTC "Bathtub" and Church Street locations.

Table 2-4

Comparison of the WTC "Bathtub", Church Street, and "Hybrid" Locations

Criteria	Location 1 WTC "Bathtub"	Location 2 Church Street	"Hybrid" Location
Construction			
Cost	Lowest Cost	Medium Cost	Highest Cost
Duration	Shortest Duration	Longest Duration	Medium Duration
Constructability	Requires complex staging plan to avoid disruption to temporary PATH service	Requires extensive site preparation and underpinning of NYCT infrastructure	Requires site preparation on eastern portion and extensive coordination with temporary PATH
Operations			
Tracks	5	5	5
Platforms	3	5	4
Platform Loading and Unloading	Cross-flow conflicts could not be eliminated	Cross-flow conflicts could be eliminated on 4 of 5 platforms	Cross-flow conflicts could be eliminated on 1 of 4 platforms
Vertical Circulation	Easily navigable	More complex with some double-back movements to reach street level	Allows for improved vertical circulation over Location 2
Proximity to Civic Center	One block farther	One block closer	Same as Location 2
Proximity to Financial District	One block farther	One block closer	Same as Location 2
Proximity to World Financial Center and Battery Park City	One block closer	One block farther	Same as Location 1
Proximity to NYCT Cortlandt Street Station (1 and 9)	No difference	No difference	No difference
Proximity to NYCT Cortlandt Street Station (R and W)	One block farther	One block closer	Same as Location 2
Proximity to NYCT World Trade Center Station (E)	One block farther	One block closer	Same as Location 2
Proximity to Fulton Street Transit Center	One block farther	One block closer	Same as Location 2
Proximity to World Financial Center Ferry Terminal	One block closer	One block farther	Same as Location 1
Compatibility with WTC Redevelopment			
Compatibility with Memorial	Certain above-grade elements would be within the memorial zone; these facilities could be integrated into the memorial's design	Contextual effect if building servicing is moved to street level. Certain site elements may have to be located on the western portion of the site beneath the memorial	Limited effect but would have more below-grade infrastructure in WTC "Bathtub" than would Location 2
Compatibility with Other Site Development	Allows for more commercial development with greater flexibility	Requires spaces that could be programmed for commercial uses and reduces the flexibility of site security and planning	Allows use of below-grade levels for commercial uses, building servicing, and security but terminal building would occupy above-grade space

The "hybrid" option would be more costly and more difficult to construct than either the WTC "Bathtub" or the Church Street options. Because the construction of PATH elements would require site excavation on some of the eastern portion of the WTC site, the "hybrid" location would carry some of the construction costs that would be required for the Church Street location. However, construction of the PATH elements in both the eastern and western portions of the WTC site could be undertaken simultaneously; thus, the "hybrid" option would have shorter construction duration than the Church Street. Although the "hybrid" option does not have advantages over the WTC "Bathtub" or Church

Street locations in terms of construction, the long-term benefits were determined to outweigh these short-term construction issues.

The "hybrid" option would have the same number of tracks but one additional platform as compared to the WTC "Bathtub" location and therefore would be an improvement over PATH's pre-September 11, 2001 operations. Upon review and refinement with PATH's operations staff, it was determined that a four-platform configuration would be acceptable to accommodate long-term ridership demand. The "hybrid" option would be oriented similar to the pre-September 11, 2001 WTC PATH Terminal such that patrons would enter the station at platform level west of Greenwich Street but would travel eastward toward Church Street as they ascend through the complex. However, an additional egress in the westward direction would be provided to allow better connections to Battery Park City and the World Financial Center. Thus, in terms of its pedestrian connections, the "hybrid" location would combine the advantages of both the Church Street and the WTC "Bathtub" options.

The "hybrid" option gives greater flexibility for WTC site redevelopment than does the Church Street location but allows for the memorial zone to be freed of most, if not all, above-grade PATH structures. Above-grade and below-grade elements of the PATH terminal could be fully integrated with commercial development to provide benefits to both uses. Truck loading and unloading could be accommodated below grade; thereby reducing the adverse street-level effects of the Church Street location. Furthermore, a terminal building could be located on Church Street to provide greater visibility for PATH. The hall would be oriented to accommodate the predominant pedestrian movements to and from PATH.

Since the "hybrid" option combined many of the advantages of both the Church Street and the WTC "Bathtub" locations, it was determined to be favorable for further study. This option was advanced into preliminary design and is evaluated as the "Preferred Alternative" in this FEIS, as described below.

ALTERNATIVES FOR FURTHER STUDY

NO ACTION ALTERNATIVE

Under the No Action Alternative, a Permanent WTC PATH Terminal would not be constructed, and the temporary station would remain in service to the extent possible. However, as described in Chapter 1, "Purpose and Need," the temporary station was constructed with the principal goal of restoring PATH service to Lower Manhattan as quickly as possible following the terrorist attacks of September 11, 2001. As such, certain components of the station may require replacement or upgrade to extend its service life beyond the anticipated 2009 opening year of a Permanent WTC PATH Terminal.

Under the No Action Alternative, PANYNJ would retain temporary PATH service between New Jersey and Lower Manhattan until either 1) elements of the WTC Memorial and Redevelopment Plan would preclude operations, 2) the station would not safely accommodate passenger demand, or 3) the major elements of the station would exceed their useful service life.

As described in Chapter 5, "Socioeconomic Conditions," the residential and employee population of Lower Manhattan will increase as the redevelopment of the WTC site and other projects are completed. These populations will generate new demand for PATH service as compared to today. As ridership nears the temporary station's design capacity, PANYNJ would need to implement operational adjustments to safely accommodate passengers. Two options

would be considered to extend temporary PATH service beyond its design capacity—reduced service and restricted access.

Reduced train service would result in fewer trains entering and leaving the station during the AM and PM commuter periods. As a result, there would be longer headways between trains, which allow the platforms to be cleared of passengers before the next train arrives. Reduced operations also help the throughput of vertical elements, such as escalators and stairways, by decreasing congestion. As will be described in Chapter 8, Section A, "PATH," reduced operations may result in the diversion of PATH customers to other modes of travel to and from Lower Manhattan.

Restricted access would result in the suspension of entering PATH customers at the temporary WTC station during the AM peak period. A similar operating plan was enacted at PATH's Christopher Street Station in the months following September 11, 2001. Restricted access would prohibit customers wishing to travel from Lower Manhattan to New Jersey in the morning peak period from using the system. Thus, these riders would need to seek alternative modes of travel to reach their destinations. It should be noted that a similar operation could be implemented, albeit in the reverse direction, during the PM peak period.

Restricted access eliminates cross-flow traffic within the station complex and results in more efficient platform operations. Furthermore, vertical elements can operate with a single flow of traffic in a uniform direction. This increases the throughput of these elements and allows for the processing of a larger number of passengers.

Although PANYNJ could implement measures to extend the design capacity of the temporary station, it is anticipated that vital systems within the station would exceed their service life over the next 20 years. Therefore, without a major infusion of capital, it would be necessary to cease operations at the temporary WTC PATH station sometime between 2009 and 2025.

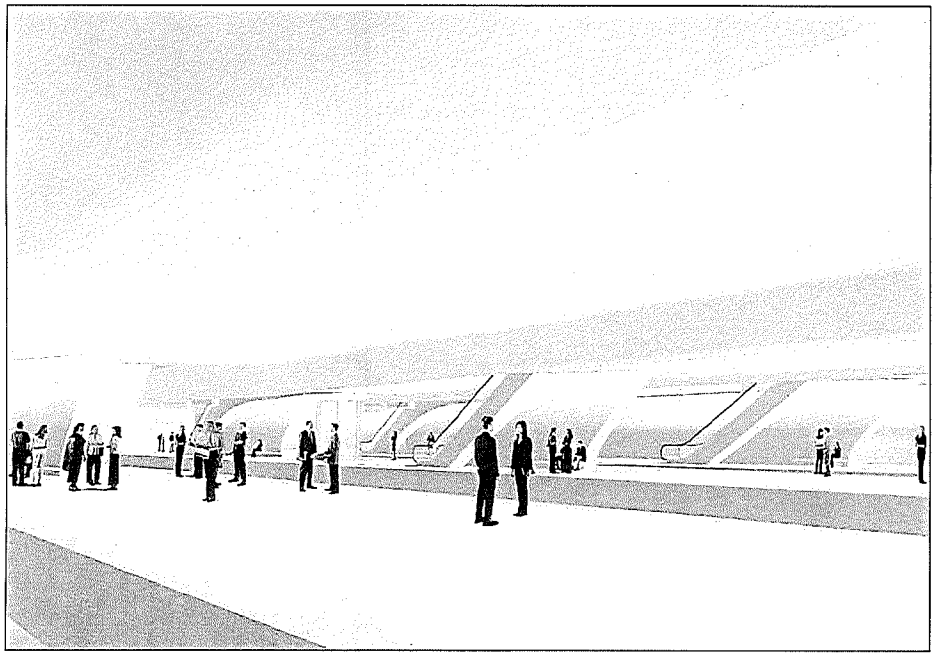
PREFERRED ALTERNATIVE

The Preferred Alternative would result in a new Permanent PATH Terminal on the WTC site. As described above, this alternative was developed through an evaluation of the benefits and constraints of two Terminal locations (WTC "Bathtub" and Church Street) on the WTC site, which was previously described as the "hybrid" location. This alternative combines an above-grade terminal building and sub-level pedestrian concourses on the eastern portion of the site with additional pedestrian concourses, tracks, platforms, and a mezzanine on the western portion of the site. Under this alternative, the Permanent WTC PATH Terminal would have four levels—platform, mezzanine, concourse, and a street-level terminal building.

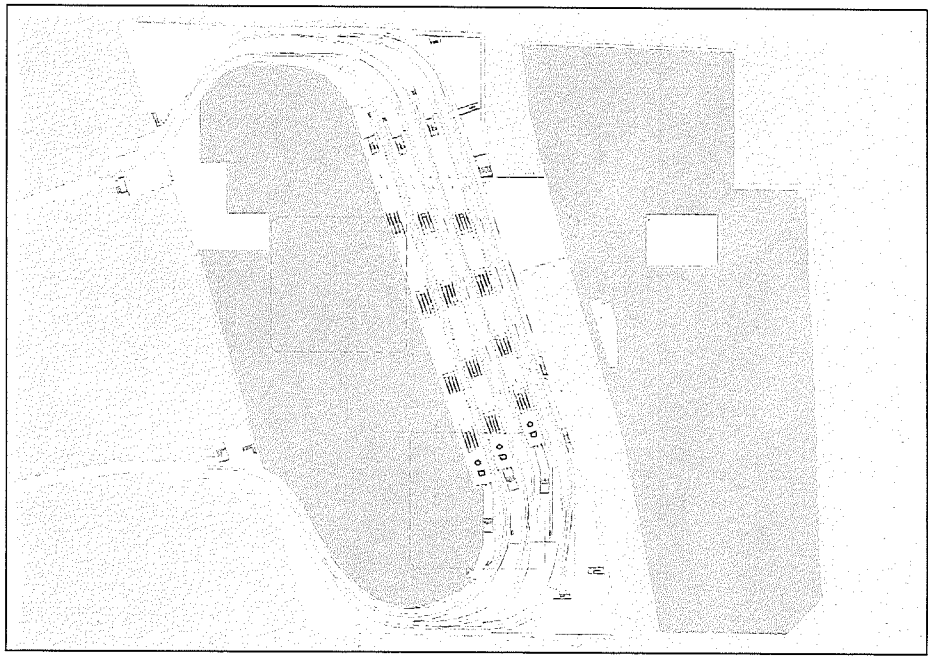
Proposed Design

Figure 2-2 shows the platform level, which would be located immediately west of NYCT's 1 and 9 train line and atop the concrete slab at the base of the WTC "Bathtub." The platforms and tracks would have a north-south orientation to complete a loop with the Hudson River tunnels. Trains would enter the station from the south Hudson River tunnel (Tunnel F) and would exit via the north tunnel (Tunnel E). With this configuration, PATH trains would enter and leave Manhattan without changing the location of the train's engineer or conductor. Thus, trains could have a short dwell time at the Terminal.

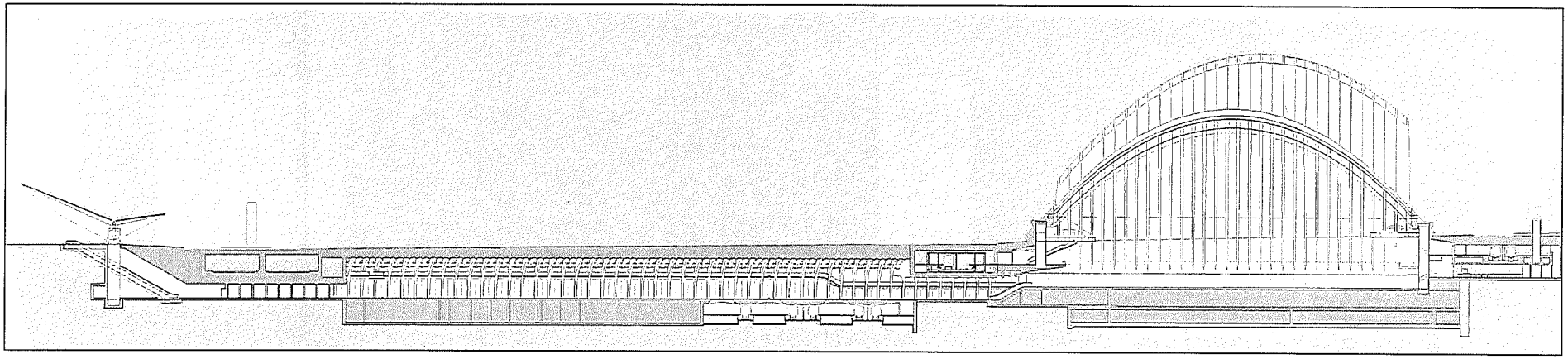
2.24.05



Rendering



Plan



Elevation

PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 2-2
Platform Level

The Preferred Alternative would have four platforms (Platforms A through D) and 5 tracks (Tracks 1 through 5). The four platforms would be long enough to accommodate 10-car trains in accordance with PATH's long-range goal to increase the operational capacity of its system.

Platform A would effectively be a lengthening and rehabilitation of the temporary WTC PATH station platform that is adjacent to the east slurry wall. It is constrained to its east by the slurry wall and to its west by Track 1. Due to the narrowness of Platform A, it would not provide sufficient capacity to board and alight trains during peak hours. However, it is being retained as part of the Preferred Alternative to serve five functions: 1) as a failure management egress platform; 2) for access to trains stored on Track 1 during overnight hours; 3) as a service platform; 4) for use to alight trains that would end revenue service at the WTC Terminal; and 5) for staging the movement of trains to Harrison and Journal Square for inspection and repair.

Platform B would effectively be a rehabilitation of the temporary WTC PATH Station platform. It is constrained to the east by Track 2 and to the west by Track 3. It would serve Hoboken-WTC trains on Tracks 2 and 3. Platforms C and D would serve Newark-WTC trains on Tracks 4 and 5. Platform C would effectively be a rehabilitation of the temporary WTC PATH Station platform. It is constrained to the east by Track 4 and to the west by Track 5. PATH would allow both boarding and alighting to Track 4 from Platform C and dedicated boarding to Track 5. Alighting from Track 5 would be to Platform D.

Platform A would range in width from 13 to 23 feet. Platform B would be 30 feet wide, Platform C would be 31 feet, and Platform D would be 30 feet. As described in Chapter 6, "Cultural Resources" the PATH platforms would have architectural treatments to identify the areas at which they overlap with the footprint of the former South Tower. Furthermore, Platform D would contain a glass viewing area atop the portion of the former North Tower that it would cover.

Each of the four platforms would have multiple vertical circulation elements to move passengers between the platform and mezzanine levels. As planned, all platforms would contain elevators in accordance with the Americans with Disabilities Act. Platforms would also contain a combination of stairways and escalators.

The number and location of stairways and escalators is still being planned for Platform A. Platforms B and C would have a total of ten stairways and escalators and Platform D would have a total of 12. Certain structural elements that support the levels above would touch down within Platforms B and C. As planned, these elements would intersect the center of the platform between two stairways, two escalators, or a combination of stairways and escalators. Because these structural elements would not intersect Platform D, two additional stairways and/or escalators would be constructed.

As shown in Figure 2-3, the mezzanine level would have a north-south orientation and would be located directly above the platform level. This level would house fare equipment, vertical circulation to the platforms and concourse level, and up to approximately 5,000 square feet of retail services, such as newsstands and food stalls. The mezzanine level would have two entrances/exits to the above concourse level. An east entrance/exit would direct passengers beneath NYCT's 1 and 9 line to the eastern portion of the WTC site. A west entrance/exit would direct passengers beneath Route 9A toward Battery Park City and the World Financial Center.

Figures 2-4a and 2-4b show the concourse, which consists of a main level and a balcony. The concourse's main level would connect to the mezzanine's east and west entrances/exits via escalators and elevators and would provide connections to offices and retail on the WTC site and

FSTC's Dey Street Underpass, and a corridor beneath Route 9A would allow for access to the World Financial Center. The concourse's balcony level would provide connections to NYCT's Cortlandt Street (1 and 9), Cortlandt Street (R and W), and WTC (E) subway stations.

Figure 2-5 shows the terminal building, which would be constructed on the eastern portion of the WTC site along Church Street near its intersections with Dey and Fulton Streets. It would provide access from Church Street and proposed elements of the WTC Memorial and Redevelopment Plan, including Greenwich Street and a public plaza. The building would also provide for natural light to the concourse level.

Ancillary Facilities

The Terminal would include ancillary facilities and systems, such as mechanical rooms, ventilation, communications, emergency egress, and security. Some of the major elements of this ancillary work are described in the next few paragraphs.

Prior to September 11, 2001, PATH had two ventilation structures within the median of Route 9A. These vent structures were used for both smoke evacuation and piston relief. Piston relief is necessary because when trains operate within a fully enclosed structure, they create air pressure as they move. The structures within the Route 9A median vented this air, thereby reducing the pressure it would otherwise create with the PATH tunnels and Terminal. These vent structures also contained evacuation stairs for emergency egress. The vents were 12 feet tall and were located immediately above the PATH tunnels.

As part of their program to enhance security within and around the WTC site, PANYNJ plans to reconstruct the ventilation structures to be 40 feet tall. Ideally, the future vents would serve the combined purpose of piston relief, smoke evacuation, and emergency egress, as they did prior to September 11, 2001. PANYNJ would construct a north ventilation structure within the Route 9A median above PATH's Tunnel E. The south ventilation structure would also be located within the median of Route 9A above Tunnel F.

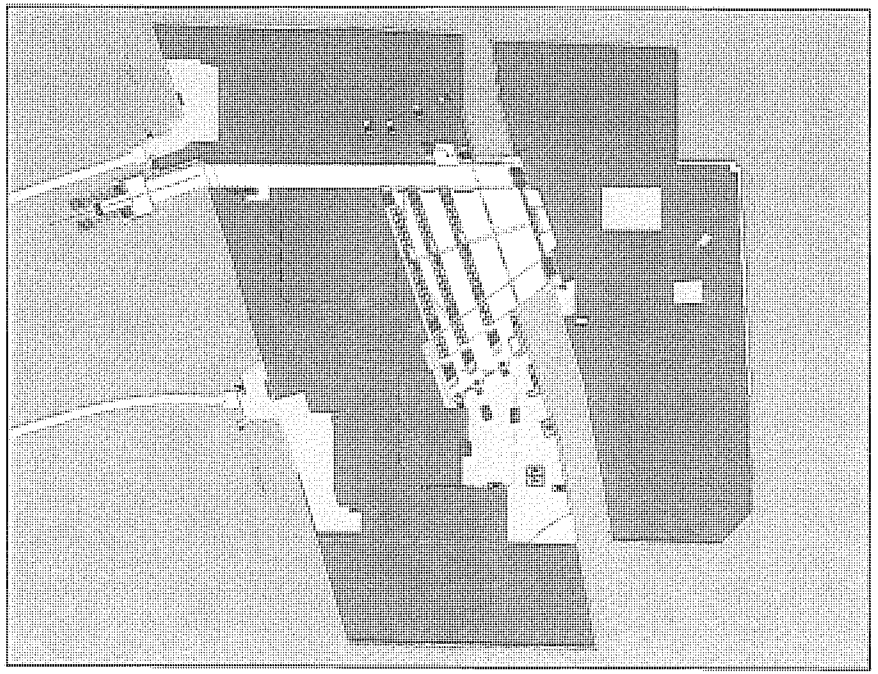
NYSDOT is currently evaluating its plans for the reconstruction of Route 9A. Although PANYNJ prefers to locate the PATH vents in the future Route 9A median, it may be necessary to seek other locations (i.e., within the future Memorial Center) if NYSDOT cannot accommodate the vents as port of the ultimate design of the roadway. This FEIS identifies the Route 9A median as the Preferred Alternative for the ventilation structures. If the future plans for the Route 9A Project mandate an alternative location for the vents, FTA and PANYNJ would assess the alternative location through the appropriate NEPA process.

In addition to the emergency egress that would be provided via the vent structures, PANYNJ would construct emergency egress from the Terminal's track/platform and mezzanine levels. Egress stairways would be located near the north and south ends of the Terminal and would provide emergency access to Greenwich Street. The Permanent WTC PATH Terminal would share its emergency egress with the emergency egress for other facilities on the WTC site. PANYNJ plans to collocate one of these stairways within the proposed Performing Arts Center on the site's northwest quadrant and the other on the southwest quadrant within a museum or building that would be part of the WTC Memorial.

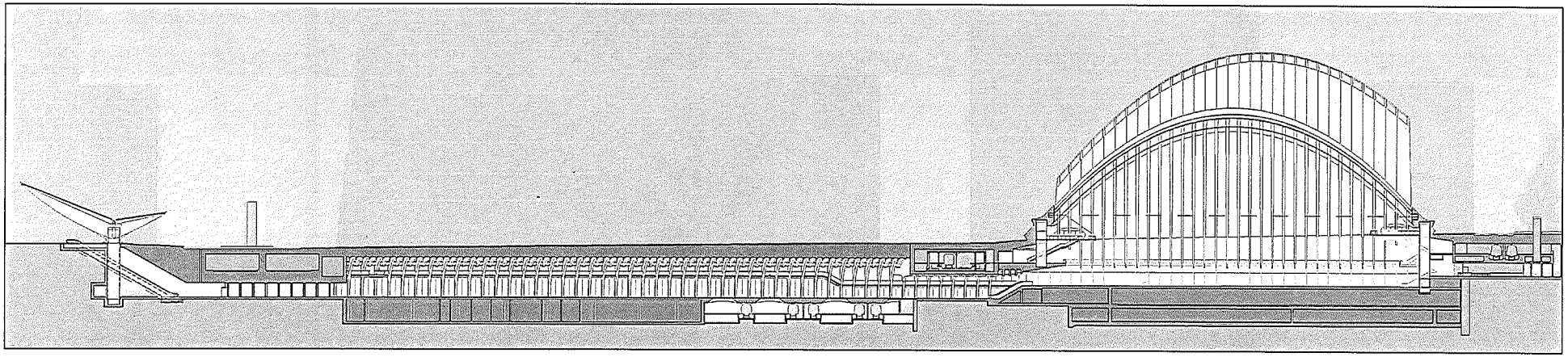
PANYNJ would reinforce the roof of the Terminal's east-west pedestrian concourse. The roof of the Terminal's east-west concourse would also serve as the road bed for the future extension of Fulton Street between Route 9A and Greenwich Street. The reinforced roof would consist of hardened, reinforced concrete to enhance the security of the east-west concourse below. The

3.18.05

Rendering



Plan

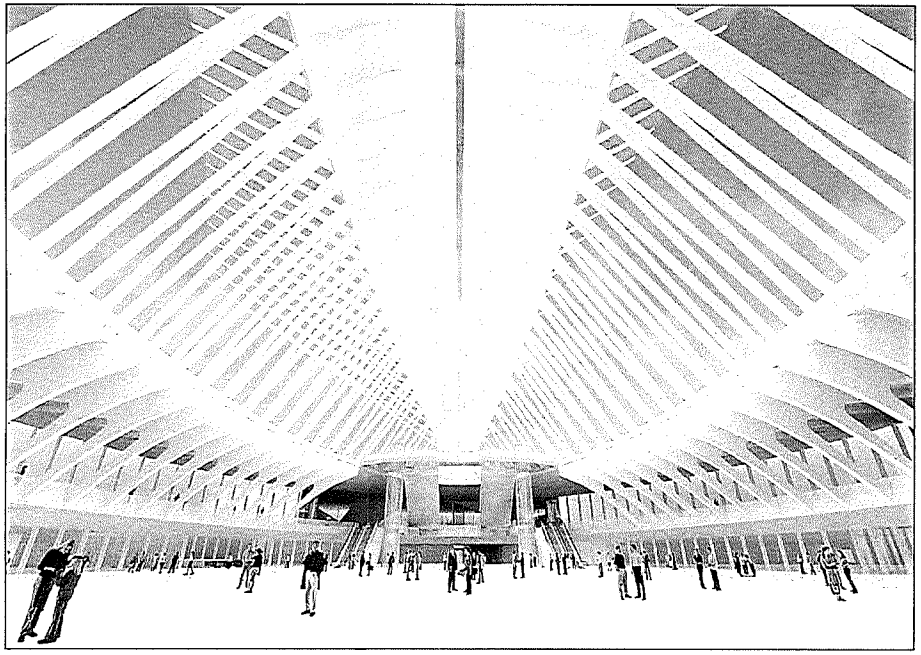


Elevation

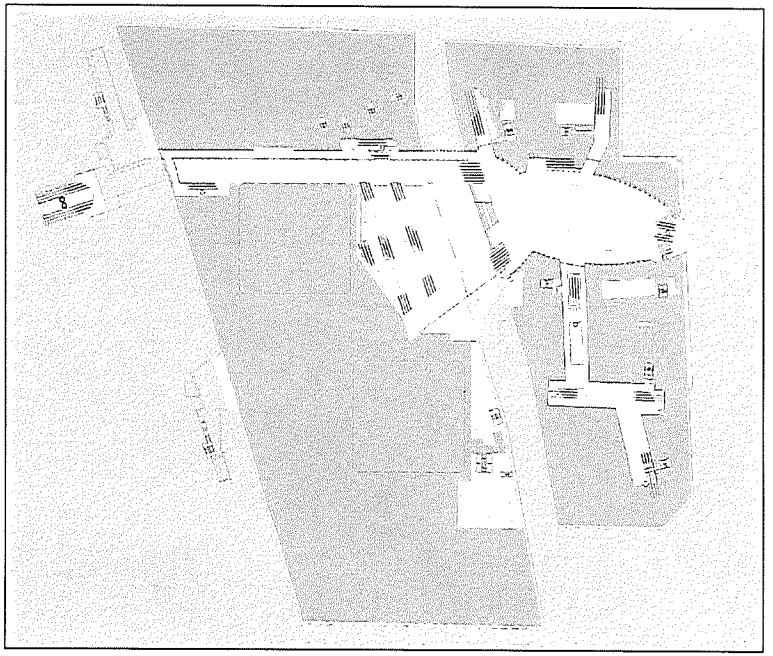
PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 2-3
Mezzanine Level

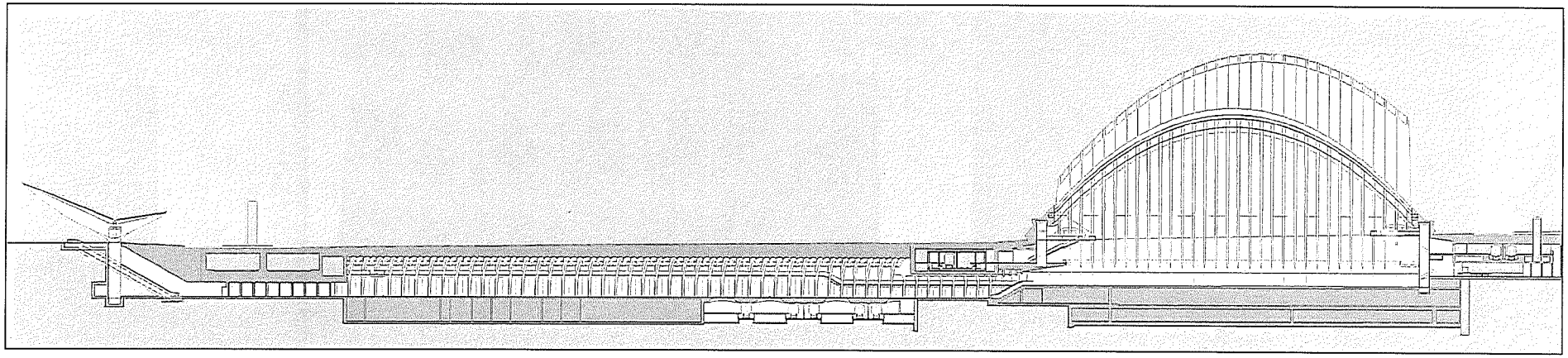
2.24.05



Rendering



Plan



Elevation

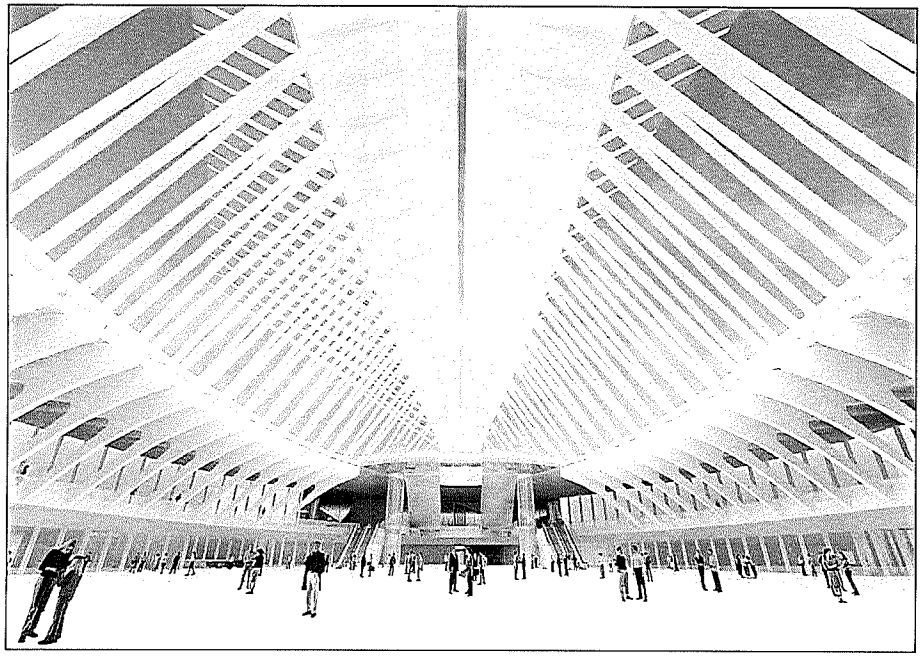
☐ Permanent WTC Path Terminal

▨ Portions of the WTC site to be constructed by others

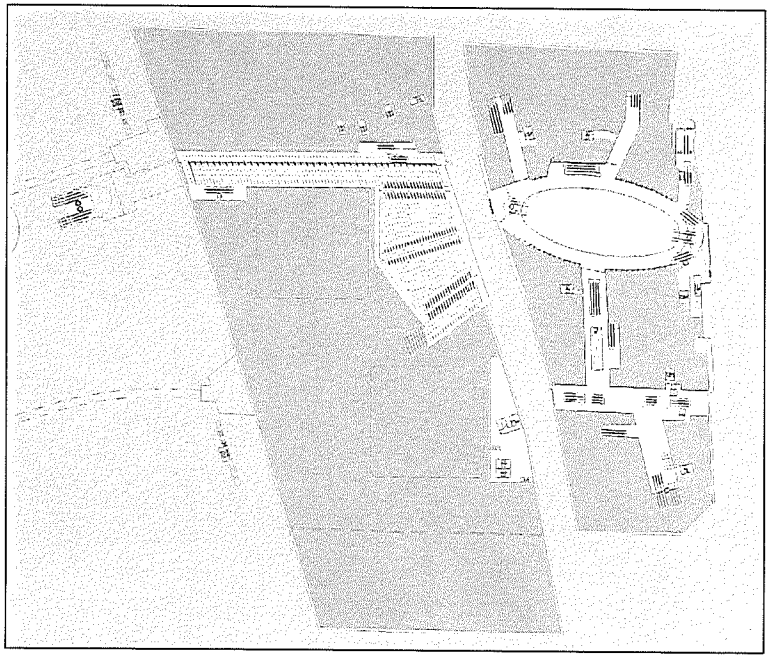
PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 2-4a
Concourse Level (Main)

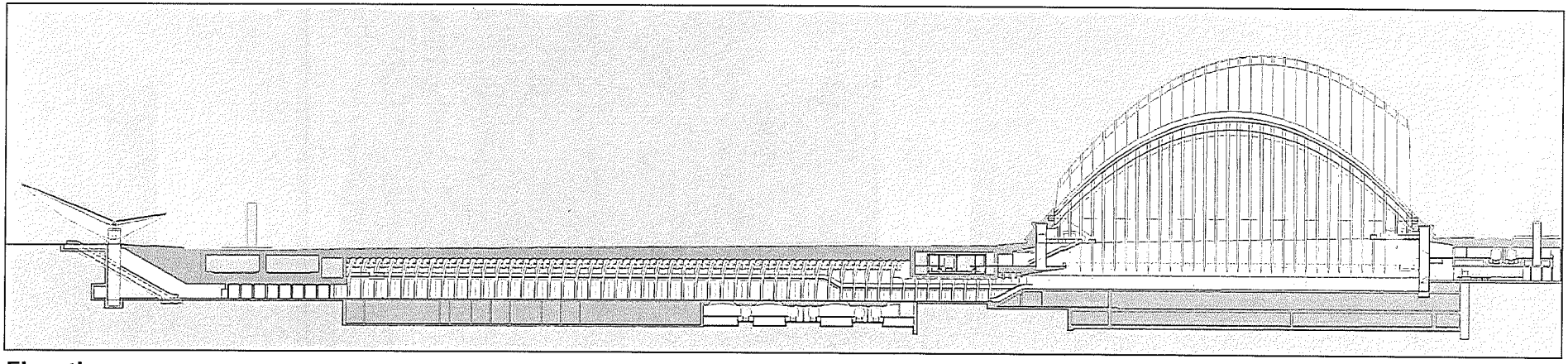
2.24.05



Rendering



Plan

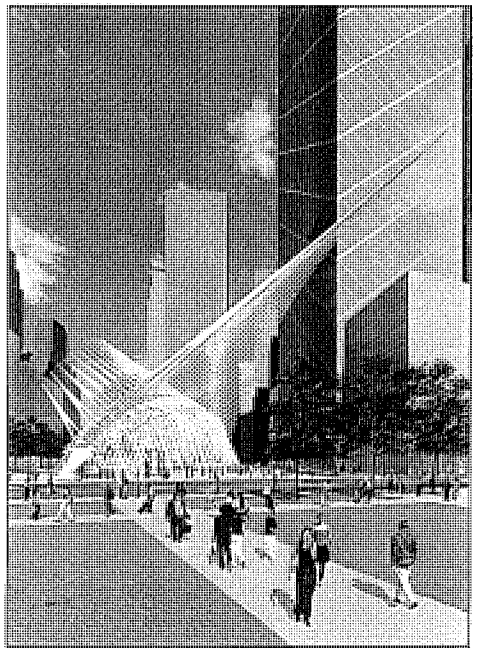


Elevation

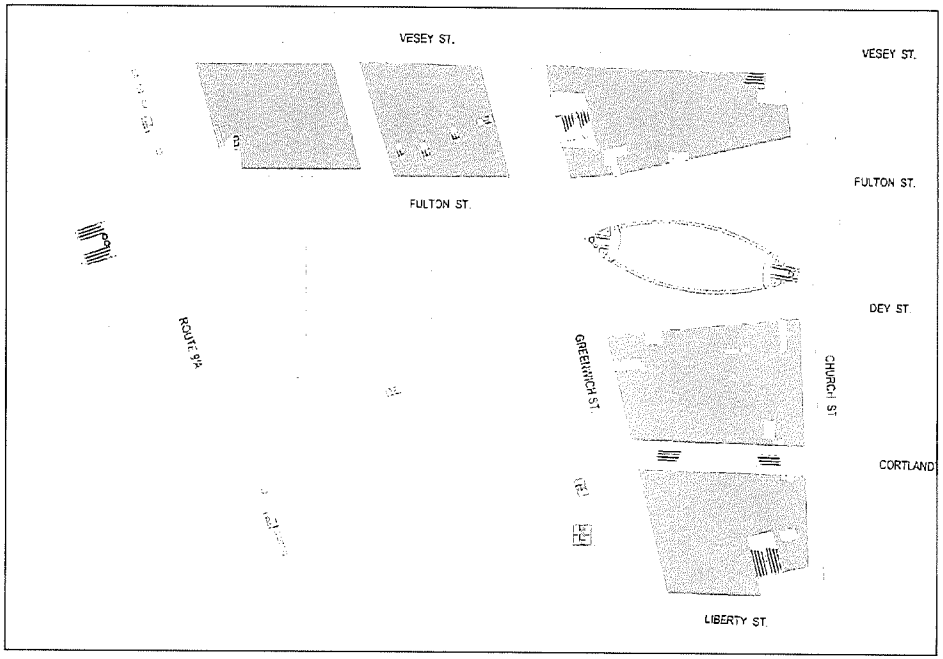
PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 2-4b
Concourse Level (Balcony)

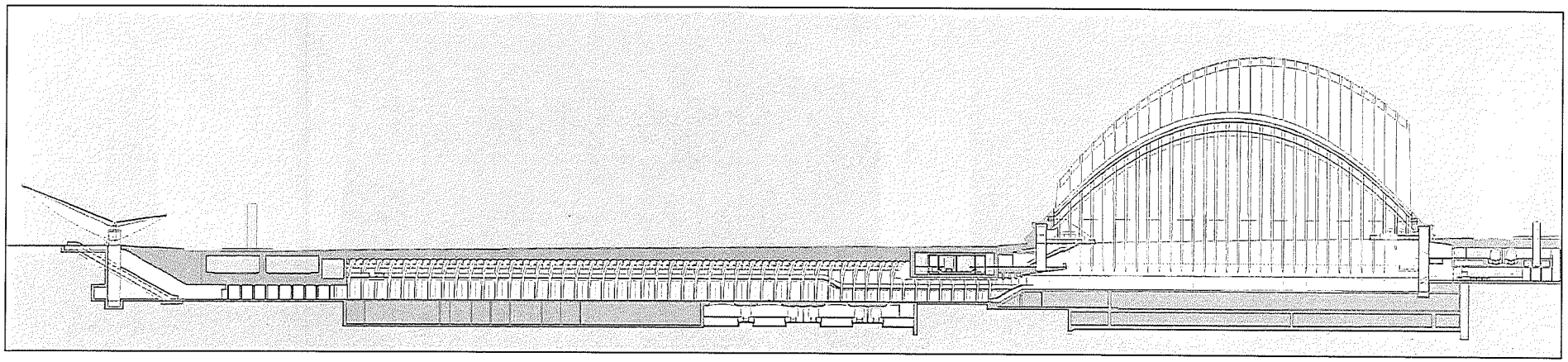
3.17.05



Rendering



Plan



Elevation

PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 2-5
Street Level

actual paving, landscaping, and opening of Fulton Street would be undertaken as part of the WTC Memorial and Redevelopment Plan.

The Preferred Alternative includes funds for the reinforcement of the basement walls, which form the "bathtub" within the WTC site. This work is necessary to ensure the structural integrity of the walls and to support future redevelopment of the WTC site, including the Permanent WTC PATH Terminal. As part of the Permanent WTC PATH Terminal's construction, PANYNJ could reinforce the entire west bathtub wall except for portions that would remain visible as part of the WTC Memorial. PANYNJ would also reinforce portions of the east bathtub wall abutting NYCT's 1 and 9 line that were not previously reinforced. If other development on the WTC site does not move forward according to current schedules or plans, it may also be necessary to reinforce portions of the north bathtub wall east of Freedom Tower and portions of the south bathtub wall above the existing PATH substation. It is currently estimated that approximately 30 percent of the required slurry wall repairs would be undertaken as part of the Preferred Alternative.

Construction of the Terminal may also require the demolition and excavation of remaining structures within the eastern portion of the WTC site between NYCT's 1 and 9 line and Church Street, which includes all portions of the former H&M Terminal. This work would also support the future development of the site by others.

The DEIS noted that the removal of portions of the northwest remnant sub-grade structures on the WTC site may be undertaken as part of the Terminal's construction. However, subsequent to the publication of the DEIS, the removal of the northwest remnant sub-grade structures have been undertaken as an independent action pursuant to the stipulations of the Programmatic Agreement prepared for the WTC Memorial and Redevelopment Plan.

Sustainable Design Elements

The Terminal would incorporate the sustainable/"green" design guidelines being developed by the agencies participating in the Lower Manhattan recovery projects. As described below, these measures would include the use of natural lighting, construction materials specifications, energy-efficient design, and renewable energy sources for heating and cooling.

One of the major sustainable/"green" design guidelines developed for the Permanent WTC PATH Terminal is the ability to use a river water system for cooling the Terminal's heating, ventilation, and air conditioning (HVAC) system. River water cooling was also at the WTC site prior to September 11, 2001. The river water cooling system circulates water from the Hudson River through a central refrigeration plant. The river water would withdraw heat from the HVAC system and then would be returned to the River.

The reuse of the existing Hudson River water intakes and outfalls is an economical and energy-efficient method to provide cooling for the components of the Permanent WTC PATH Terminal. The intakes, pumps, outfalls, and associated pipelines that existed prior to September 11, 2001, remain largely intact. Furthermore, since river water, on average, provides lower supply temperature than other alternatives, greater energy efficiency during the heat transfer process would be achieved. Finally, river water cooling reduces the Terminal's demand on the city's infrastructure.

The river water cooling system is being reestablished as part of the overall redevelopment of the WTC site. However, it may not be fully operational before components of the Permanent WTC

PATH Terminal are opened. Therefore, PANYNJ would employ open air-cooling of the Terminal's HVAC systems in the interim.

PANYNJ has filed an application with the New York State Department of Environmental Conservation to renew the State Pollution Discharge Elimination System (SPDES) permit for the WTC's river water cooling system. This application is being reviewed under an independent action. In the event that the permit's renewal is substantially delayed, PANYNJ would maintain the Terminal's temporary cooling system.

Project Cost

The Preferred Alternative for a Permanent WTC PATH Terminal would cost $2.138 billion, which is $186 million more than identified in the DEIS. Since publication of the DEIS, PANYNJ has advanced the design of the Preferred Alternative and has determined that certain components would be more costly than originally estimated. As a result, the Preferred Alternative would have a higher cost than the "Terminal with Liberty Plaza Connection Alternative" presented in the DEIS.

A total of $1.75 billion would be funded by the FTA through the Lower Manhattan Transportation Recovery Effort (see Chapter 1, "Purpose and Need"). The remaining $388 million would be funded by PANYNJ through their capital improvements budget. Table 2-5 shows a breakdown of the project cost by its various components.

Table 2-5
Project Cost

Project Component	Cost (in millions)
PATH Station Elements	$807
East-West Concourse	$208
North-South Concourse	$318
Terminal Hall and Plaza	$805
Total	$2,138

Note: "Other Project Elements" includes costs for security systems and infrastructure; construction staging for temporary PATH service; utility relocation; and other miscellaneous project costs.

Construction of the Terminal is estimated to begin in 2005. Components of the station, including platforms, mezzanine, and certain pedestrian connections, would be completed by the end of 2009. The remaining portions would be completed in 2010.

ALTERNATIVES CONSIDERED AND ELIMINATED

PATH-6 TRAIN CONNECTION

During the scoping process, public interest groups and local elected officials suggested an alternative that would connect the PATH system with NYCT's 6 subway line. Their proposal would extend the PATH tracks through the WTC site to a new station beneath Fulton Street between Greenwich Street and Broadway. Beyond Broadway, a new track would be constructed beneath Park Place to merge with the 6 line, which currently terminates at NYCT's Brooklyn Bridge-City Hall Station.

PANYNJ considered their proposal, including subsequent iterations, and determined that a number of critical construction and operational issues would need to be resolved to make this

alternative feasible. These considerations would likely delay the completion of this Project and may also result in substantial alterations to existing and planned transportation infrastructure.

The general engineering feasibility of this alternative was considered, referring to the NYCT's *MW-1 Track Standards and Reference Manual* (2002). The criteria considered from this manual included a 3 percent maximum grade, minimum 530-foot long stations on a tangent alignment, and the use of spiral transition curves. In order to achieve clearance of existing subway infrastructure in Lower Manhattan, the 3 percent grade would be exceeded within certain portions of the alignment. Furthermore, to achieve a 530-foot station beneath Fulton Street, certain structures may need to be demolished or underpinned. Finally, the alignment of the connection between PATH and NYCT's 6 line may preclude both a temporary and permanent PATH facility on the WTC site. To align tracks between the Hudson River tunnel portals and the proposed Fulton Street station, a complicated curving scheme would be needed, which would forgo NYCT's requirement for spiral transition curves.

The construction of a new station and tracks beneath Fulton Street would require underpinning of existing NYCT subway infrastructure beneath the streets of Lower Manhattan as well as buildings in the vicinity of Fulton Street, Park Row, and Broadway. Underpinning of NYCT's 1 and 9, N and W, A and C, 2 and 3, and 4 and 5 lines would be required. In addition, structural support for station platforms under Greenwich Street, Church Street, Fulton Street, Nassau Street, and Broadway may also be required.

The connection between PATH and NYCT's 6 train would require the reconfiguration of the 4 and 5 line between the Fulton Street and Brooklyn Bridge-City Hall Stations. The proposal would likely require the reconstruction of the Brooklyn Bridge-City Hall Station to allow for increased passenger loads and operational changes on the 6 line. Construction may also require full disruption of 4, 5, and 6 train service to and from Lower Manhattan for an extended period.

NYCT operates the 6 train through a loop formed by an unused station immediately south of the Brooklyn Bridge-City Hall Station. Similar to the arrangement proposed for the Permanent WTC PATH Terminal, this loop operation allows the 6 train to reverse direction without repositioning the train's engineer or conductor. Thus, trains enter and leave their terminal at the Brooklyn Bridge-City Hall Station with relatively short dwell times, which increases the throughput and capacity of the 6 line. The unused station, which provides for this loop arrangement, was part of the original 1904 subway system. Because of its historical and architectural significance, this station is designated a New York City landmark and is considered eligible for listing on the State and National Registers. In order to connect PATH and the 6 line, this station would have to be physically altered, which may adversely affect its historic integrity.

The train cars that operate on PATH and NYCT's 6 line are similar but are not fully compatible. NYCT recently completed procurement of a new fleet of cars for the 6 train. PATH would need to upgrade to these same cars to fully integrate the systems.

NYCT operates 10-car trains on the 6 line, and PATH plans to implement 10-car service on its Newark-WTC line. However, an upgrade to 10-car operations on the Hoboken-WTC line is not planned at this time. Thus, the integration of PATH and NYCT's Lexington Avenue Local line may preclude direct service between Hoboken and Lower Manhattan.

The 6 line operates under the oversight of the Federal Transit Administration (FTA), and must comply with FTA specifications for station and train operations. As described in Chapter 1, "Purpose and Need," PATH operates under the oversight of the Federal Railroad

Administration. In order to integrate these systems, PANYNJ and NYCT would need to consolidate their operating plans under a single federal oversight agency.

Given the above-described constraints of integrating the PATH and NYCT 6 line, this alternative was not considered to be reasonable and was not carried forward for further consideration.

TERMINAL WITH LIBERTY PLAZA CONNECTION ALTERNATIVE

The DEIS considered a Terminal with a Liberty Plaza Connection Alternative. Generally, the Terminal with a Liberty Plaza Connection Alternative would result in the same facility as described above for the Preferred Alternative. However, it would include an additional pedestrian connection under Church Street between the WTC site and Liberty Plaza Park. As such, the lower concourse corridor shown in Figure 2-4a would be extended beyond the WTC site to serve the subgrade tunnel beneath Church Street. Patrons would ascend to street level within the western portion of Liberty Plaza. This alternative would not have altered the design of the platform, mezzanine, and terminal levels, including the connections to subways, buildings on the WTC site, and the FSTC.

The Liberty Plaza connection was estimated to cost $81 million. Thus the total project cost for this alternative would be approximately $81 million more than the estimate presented for the Preferred Alternative.

The analysis presented in the DEIS showed that the Terminal with a Liberty Plaza Connection Alternative would have more intense and/or a greater number of adverse impacts than the Preferred Alternative during construction. As compared to the Preferred Alternative, the Terminal with a Liberty Plaza Connection would result in vibration impacts on a greater number of historic structures, would result in temporary lane closures and pedestrian diversions on Church Street, and would have increased emissions and noise levels. In the long term, the Terminal with a Liberty Plaza Connection would divert pedestrians from street-level to a sub-grade concourse, which could detract from local businesses, and it would reduce the availability of open space within Liberty Plaza Park.

During the public review process for the DEIS, public officials and concerned citizens stated that the Liberty Plaza Connection would adversely impact community character. A public goal for the rebuilding of Lower Manhattan has been to revive its retail and to ensure its longevity as a 24-hour community. Citizens and agency officials believed that the diversion of pedestrians from street-level to the underpass would detract from this goal. Upon further consideration, PANYNJ decided to eliminate the Liberty Plaza Connection as part of the Preferred Alternative.

DESIGN OPTIONS CONSIDERED AND ELIMINATED

The DEIS presented options for the design of certain components of the Permanent WTC PATH Terminal. As planning has advanced, certain components of the project have been finalized such that design options could be dropped from further consideration. The following describes the options previously presented and the outcome of the design process that has occurred since publication of the DEIS.

STAND-ALONE TERMINAL

The construction of the Preferred Alternative would be closely coordinated with the construction of elements of the WTC Memorial and Redevelopment Plan. However, a Stand-Alone Terminal

option was developed to determine the design and cost implications absent elements of the WTC Memorial and Redevelopment Plan. The assumption was that the Permanent WTC PATH Terminal would be constructed without the adjacent commercial and retail facilities on the eastern portion of the WTC site. The only elements of the WTC Memorial and Redevelopment Plan that would advance simultaneously would be the Memorial substructure and Freedom Tower on the western portion of the WTC site. This assumption resulted in three major adjustments to the Preferred Alternative as described below.

- The interface walls with the retail would be replaced with blast resistant glass above street level. Below street level, stand alone walls would be constructed and would be comparable to the walls of an integrated Terminal.
- The terminal building and pedestrian concourses east of the 1 and 9 line would be supported on anchor slab and piles rather than on the foundations of the future WTC office towers.
- Construction and operational costs for mechanicals, electrical systems, and plumbing would be higher with a stand-alone Terminal since these functions could be integrated with the retail and commercial uses of the WTC Memorial and Redevelopment Plan if constructed simultaneously.

It would be feasible to construct a stand-alone Terminal, and its cost would be approximately 5 to 10 percent greater than a facility that is coordinated with other construction on the WTC site. However, the ability to develop retail and commercial facilities subsequent to the Terminal would be much more difficult with potentially large increases in the time and cost required over the coordinated approach.

A Record of Decision was issued for the *WTC Memorial and Redevelopment Plan, Generic Environmental Impact Statement*, in May 2004 and LMDC has been developing plans for the Memorial and uses on the eastern portion of the WTC site. PANYNJ has been working closely with LMDC to coordinate the subgrade infrastructure to ensure that the construction of the Preferred Alternative would not preclude future uses on the WTC site. As such, the Permanent WTC PATH Terminal would be coordinated with elements of the WTC Memorial and Redevelopment Plan. However, given that WTC site development plans may be delayed or may change over time, PANYNJ may advance certain components of the Terminal as integrated and others as stand-alone. The FEIS generally considers the benefits and impacts of an integrated Terminal; however, where Permanent WTC PATH Terminal elements may be stand-alone to advance its design and construction, the potential environmental effects are noted.

ROUTE 9A PEDESTRIAN BRIDGE

NYSDOT is currently undertaking an environmental review for the reconstruction of Route 9A from Barclay to Albany Streets. At present, NYSDOT is considering three alternatives for the roadway: No Action, At-grade, and Short Bypass. Under the No Action Alternative, NYSDOT would rehabilitate the existing "interim" roadway, which was reconstructed following September 11, 2001 to upgrade its pavement and landscaping. The At-grade Alternative would restore the roadway to its eight-lane, pre-September 11, 2001 condition with modifications to accommodate future uses on the WTC site. The third, "Short Bypass," alternative would reroute approximately 75 percent of vehicular traffic through a four-lane, sub-grade bypass. A four-lane, at-grade boulevard would also be constructed to accommodate local traffic and to improve the pedestrian links between the WTC site, the World Financial Center, and Battery Park City.

The design of the Permanent WTC PATH Terminal's connection to the World Financial Center must be coordinated with the outcome of the Route 9A Project. As will be described in Chapter 11, "Infrastructure and Energy," numerous utility lines, including a 66-inch water line, a 78-inch sewer main, a 48-inch water main, and an 84-duct telephone utility, lie beneath the roadbed of Route 9A. If a short bypass is constructed, NYSDOT would relocate these utilities to facilitate their proposed traffic tunnel. This utility relocation would also allow for construction of PATH's sub-grade concourse. In the event that the No Action or At-grade Alternative for the Route 9A Project is selected, NYSDOT may not undertake this utility relocation.

As described in the DEIS, PANYNJ considered a pedestrian bridge over Route 9A as an alternative to the subgrade concourse in the event that utility relocation would not be undertaken by NYSDOT. However, since publication of the DEIS, PANYNJ has determined that the subgrade concourse could be constructed at a lower elevation, which would avoid these utility lines regardless of the selected alternative for the Route 9A Project. As such, the Route 9A pedestrian bridge has been eliminated from further consideration as part of this FEIS.

SOUTH VENTILATION STRUCTURE

The DEIS identified two options for the location of the Terminal's south ventilation structure—Route 9A median and Deutsche Bank.

Under the Route 9A option, the south ventilation structure would be identical to the north ventilation structure described above, but it would be located atop PATH's Tunnel F. Like the north structure, it would serve for piston relief, smoke evacuation, and emergency egress. However, the New York State Department of Transportation raised concerns regarding the location of this building given their planned reconstruction of Route 9A, As such, PANYNJ considered a second option to locate the vent outside the Route 9A right-of-way within the former site of Deutsche Bank.

Under the Deutsche Bank option, PANYNJ would construct the ventilation system within the new office tower planned for the former location of Deutsche Bank. The vent would be at a minimum height of 40-feet above ground and would likely be constructed within a mechanical level of the future building. Because of the proposed building's distance from the PATH tunnels, a vent structure at this location would not be collocated with emergency egress. Therefore, PANYNJ would need to provide for an emergency stairway with access from the planned plaza adjacent to the office tower or within the north or south sidewalk along Liberty Street. As such, this option would result in additional PATH structures and may increase the overall project cost.

Subsequent to the publication of the DEIS, PANYNJ has selected the Route 9A option for the south vent as the Preferred Alternative and will coordinate its design with the selected alternative for the Route 9A Project.

C. ANALYSIS FRAMEWORK

ASSESSMENT OF PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

BASELINE CONDITIONS

The terrorist attacks of September 11, 2001 have resulted in unique conditions under which to evaluate the potential environmental effects of planned projects as prescribed by NEPA. In a typical setting, an EIS considers the effects of a new or expanded project in comparison to a

future condition absent the proposal. The Permanent WTC PATH Terminal, however, would essentially be a replacement of a facility that existed prior to the attacks.

As described in Chapter 5, "Socioeconomic Conditions," the terrorist attacks resulted in the loss of more than 12 million square feet of office space and the relocation of some 80,000 jobs to other parts of the metropolitan area. As a result, today's demand for certain infrastructure and services in Lower Manhattan is much reduced from pre-September 11, 2001 levels. However, other sensitive uses may be more vulnerable to adverse environmental affects following the terrorist attacks than would have been the case prior to September 11, 2001. To fully investigate the potential for future impacts, the technical analyses that follow consider two baseline conditions to formulate future scenarios for the Project Alternatives.

Pre-September 11, 2001 Baseline

The pre-September 11, 2001 baseline condition reflects the built environment in Lower Manhattan prior to the terrorist attacks. The pre-September 11, 2001 baseline is used for the evaluation of potential future long-term environmental impacts and for the preparation of appropriate mitigation measures.

Because the terrorist attacks resulted in drastic differences in the physical and social characteristics of Lower Manhattan, the current environment in Lower Manhattan does not reflect the level of activity that existed prior to September 11, 2001. The planned redevelopment of Lower Manhattan would result in the replacement of much of the real estate and infrastructure that was lost, resulting in increased trips to the area. However, it is anticipated that the environment in the vicinity of the Permanent WTC PATH Terminal could continue to support the level of activity that existed before September 11, 2001. Therefore, the quantified analysis of future impacts and mitigation is based on a theoretical comparison that assumes the terrorist attacks had not occurred, in order to evaluate the future condition when Lower Manhattan has truly recovered and continues to grow.

The pre-September 11, 2001 baseline condition precludes the federally sponsored redevelopment and recovery projects in Lower Manhattan since it is assumed that the terrorist attacks had not occurred. Therefore, the future conditions developed based on the pre-September 11, 2001 baseline does not include the following projects:

- WTC Memorial and Redevelopment Plan;
- Route 9A;
- Fulton Street Transit Center; and
- South Ferry Terminal.

However, other real estate development is assumed to have been constructed whether or not the terrorist attacks had occurred. These projects, therefore, are accounted for in the future conditions based on the pre-September 11, 2001 baseline.

Post-September 11, 2001 Baseline

The post-September 11, 2001 baseline condition reflects the current environment in Lower Manhattan. This scenario considers the loss of the WTC and transportation infrastructure as well as changes in employment and land use resulting from the terrorist attacks.

Because the revitalization of Lower Manhattan would take more than a decade to complete, the post-September 11, 2001 baseline condition is used to project future conditions in the interim (construction period and opening year) analysis years presented in this EIS. It also considers the

numerous projects planned for the redevelopment of Lower Manhattan, including the $4.55 billion transportation recovery projects. In addition to its use in projecting construction and design year conditions, this scenario is applied to the design year conditions without PATH service under the No Action Alternative, since the other recovery efforts would be pursued independently.

ANALYSIS YEARS

To assess the potential impacts of the Project Alternatives, this EIS considers three analysis years—construction period, opening year, and design year. The basic framework for these analysis years is described below.

Construction Period

PANYNJ estimates that construction of the Permanent WTC PATH Terminal would begin in summer 2005, concurrent with other sub-grade work for the redevelopment of the WTC site. The platform and mezzanine levels and portions of the pedestrian connections could be completed in 2006, while remaining portions of the complex would be done in phases between 2007 and 2009. The EIS considers the potential environmental effects throughout the 2005 to 2009 construction period. However, to estimate peak construction period conditions, a critical analysis year of 2006 has been selected. Chapter 3, "Construction Method and Materials," presents the methodology for selecting this critical analysis year.

Opening Year

Construction activity at other sites in Lower Manhattan would continue after the Permanent WTC PATH Terminal is fully operational in early 2009. Due to concerns about cumulative effects and potential changes in pedestrian travel associated with the Project Alternatives, an analysis of the 2009 opening-year conditions is included.

Design Year

Typically, the analysis of impacts associated with a transit facility also anticipates future conditions approximately 20 years hence, also known as the design year. The design year varies from the initial year of operation because it anticipates future development that might increase transit demand and behavioral changes that may result in varied patterns of travel. For consistency with analyses being conducted for other downtown transportation projects and regional forecasts prepared by the New York Metropolitan Transportation Council (NYMTC), this EIS considers a 2025 design year for the Permanent WTC PATH Terminal.

THE FUTURE COMMON TO ALL ALTERNATIVES

A "Future Common to All Alternatives" has been developed for each of the analysis years described above. The Future Common to All Alternatives projects conditions in these various analysis years independent of the Permanent WTC PATH Terminal and provides a base to analyze, assess, and mitigate potential adverse impacts of the No Action, and Preferred Alternatives. The Future Common to All Alternatives considers planned or proposed initiatives that will have direct or substantial indirect effects on development patterns and transportation access to, from, and within Lower Manhattan. The Future Common to All Alternatives also considers known changes in local, state, and federal regulations that may affect this Project's potential to generate impacts as compared to today.

PROJECT ALTERNATIVES

No Action Alternative

As described above, the No Action Alternative would require that PANYNJ continue the use of the temporary WTC PATH station beyond 2009, but because of certain limitations, it is anticipated that the PATH operations between New Jersey and Lower Manhattan would need to be suspended at some point before 2025. To assess the potential impacts of this alternative, this EIS considers that the temporary station would continue operations in 2009 (opening year) but that there would be no PATH service to Lower Manhattan in 2025 (design year).

Preferred Alternative

A detailed analysis of the potential impacts of the Preferred Alternative is presented in all of the technical chapters of this EIS.

ASSESSMENT OF CUMULATIVE EFFECTS

The Preferred Alternative for the WTC PATH Terminal would be part of the larger redevelopment of Lower Manhattan that includes transportation and development projects being sponsored by both public and private groups. Although funded and planned separately, these projects would have a cumulative effect on the character and quality of Lower Manhattan and the region as a whole both during and after construction. Recognizing the potential impacts of such large-scale development in a relatively small geographic area, the FTA developed a framework for the analysis of cumulative effects for their Lower Manhattan recovery projects being reviewed under NEPA.

This framework ensures that findings presented within the individual environmental documents for the federally sponsored projects in Lower Manhattan are based on a consistent baseline condition and analysis approach. Therefore, the analysis of both the potential impacts attributed directly to the Permanent WTC PATH Terminal and those that may result cumulatively are based on guidance developed by the FTA and the sponsors of the Lower Manhattan Recovery Projects. The following describes the framework that was developed and its application to the evaluation of the Permanent WTC PATH Terminal.

FEDERAL GUIDANCE

A Memorandum of Understanding (MOU) was prepared jointly by the Federal Emergency Management Agency, the FTA, the Federal Highway Administration, HUD, the New York State Urban Development Corporation (Empire State Development Corporation) and its subsidiary LMDC, the U.S. Coast Guard, EPA, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service in August 2002. This MOU formalized the commitment among the listed Federal agencies to coordinate and accelerate the review of projects under NEPA. The MOU applied to projects developed and/or funded as a result of the September 11, 2001 terrorist attacks. The MOU specified the role of the participating government entities and defined procedures and commitments to ensure a comprehensive yet expeditious environmental review process under NEPA.

To further the federal coordination established by the MOU, the FTA Lower Manhattan Recovery Office published its *Approach to Cumulative Effects Analysis for the Lower Manhattan Recovery Effort* in July 2003. This document provides guidance for the sponsoring agencies being funded from the $4.55-billion Lower Manhattan Transportation Recovery Projects. The principal features of the coordinated analysis are:

- Promoting efficient project delivery and environmental stewardship,
- Advancing each project independently, but in a coordinated manner, and
- Focusing attention on critical environmental factors.

The approach promotes environmental stewardship through the proactive evaluation of environmental factors and includes measures to streamline the review and project delivery. The coordinated approach will ensure consistency between projects through a consistent set of analysis assumptions and methodologies for all of the transportation recovery projects. As a project advances through the NEPA process, its analysis and any identified impacts will be incorporated into the documentation of later projects to ensure a consistent, up-to-date, and comprehensive evaluation of potential cumulative effects.

To expedite the environmental review process, the study of cumulative effects will focus on subject areas that are prone to potential adverse effects. The federal partners and local project sponsors have coordinated to identify five key areas with the highest potential for adverse cumulative effects: access and circulation, air quality, noise and vibration, cultural and historic resources, and economic factors. The local project sponsors coordinated with the FTA and EPA to develop consistent methodologies, assumptions, data sources, and impact criteria for the evaluation of impacts under each of the five cumulative effects subject areas.

The temporary waiver of most transportation air quality conformity requirements provided by Public Law 107-230 allows for these projects to proceed without a full conformity determination. To meet obligations set forth with the conformity waiver, the framework recognizes the need and value of interagency consultation and is consistent with the enhanced interagency consultation procedures set forth during the transportation conformity waiver period.

ENVIRONMENTAL ANALYSIS FRAMEWORK

In response to the federal guidance provided by the FTA, the governmental entities involved with the recovery efforts in Lower Manhattan have developed an environmental analysis framework (see Appendix I). This framework was prepared by LMDC, MTA, NYSDOT, and PANYNJ, in cooperation with the FTA and interested Federal agencies. The framework was used by LMDC, MTA, NYSDOT, and PANYNJ for the preparation of environmental documentation for each of their recovery projects. Local Project Sponsors will be introduced to this framework, as appropriate, when additional federally sponsored recovery projects are identified and prioritized.

The framework considers the regulations set forth by the Council on Environmental Quality (CEQ) and accounts for the guidance of the State Environmental Quality Review Act (SEQRA) regulations, the *New York City Environmental Quality Review (CEQR) Technical Manual*, industry best practices, and public input.

The framework consists of the following components:

- Green Design, Green Construction, and Sustainable Design Principles;
- Construction Environmental Protection Plan;
- Public Involvement and Governmental Entities Coordination Plan; and
- Baseline Assessment of Resources and Coordinated Cumulative Effects Analysis Approach

Green Design, Green Construction, and Sustainability Principles

The Project Sponsors for the Lower Manhattan Recovery Projects have developed a common set of Environmental Performance Commitments (EPCs) that they will each undertake such as design

elements, construction techniques, and operating procedures that will lower the potential for adverse environmental impacts.

Unlike a typical NEPA process, which responds to potential impacts with appropriate mitigation, the EPCs provide specific measures for the avoidance and reduction of potential impacts in advance of the environmental review process (see Appendix I). These EPCs incorporate design features and construction practices to preserve the capacity of the local environment and successfully allow for the development of all of the Lower Manhattan recovery projects. Table 2-6 shows the EPCs that were formalized by LMDC, MTA, NYSDOT, and PANYNJ in September 2003.

Each project sponsor would implement the EPCs through specific actions identified in its public involvement and governmental entities coordination plan, construction environmental protection plan, design documents, and contracts.

The EPCs established a general guidance for developing green design and sustainability principals to reduce the demand for and use of resources during construction and once projects would be operational. Subsequently, PANYNJ has outlined preliminary sustainable design guidelines for the Preferred Alternative, which will continue to be formalized as the Project's design advances.

Principals and actions were organized into six component areas: urban considerations, site, water, energy, materials, and indoor environment. These guidelines are consistent with criteria contained in the NYCT Environmental Guidelines, the U.S. Green Building Council, Leadership in Energy Efficiency (LEED) Guidelines 2.1, and requirements of New York State (NYS) Executive Order 111, "Green And Clean State Buildings And Vehicles," which direct State agencies to be more energy-efficient and environmentally aware, and the NYS Green Building Tax Credit (Chapter 63 of the NYS Laws of 2000), which promotes environmentally sound building practices through a package of tax incentives.

Urban Considerations

For urban considerations, the design guidelines support development in existing urban areas, the development of public transportation by linking inter-modal systems, promote regional mass transit, increase bicycle access, facilitate pedestrian pathways, and improve neighborhood air quality by reducing back-up of traffic into neighborhood streets. To implement these guidelines, PANYNJ would support the existing infrastructure by exceeding a minimum development density, integrate the use of public transportation by providing access to NYCT subway and buses, and provide the services and support to facilitate pedestrian movements.

Site

PANYNJ would integrate water, material, and energy resources to optimize the utilization of all resources on site. The project would implement a storm water management plan to collect storm water from site surfaces and implement a filtration structure in conjunction with the Water Management Plan. Pollution prevention would also be in place to control site erosion. PANYNJ would integrate existing slurry walls, bathtub excavation, elements of the temporary PATH station, and utilities for re-use in the new site development. PANYNJ would also study opportunities for "waste to reuse" for food, paper, metal, and construction waste. To reduce the effect of the urban heat islands phenomena, PANYNJ would provide green infrastructure, along with albedo surfaces to mitigate thermal loading of site surfaces and building roofs. Light pollution would be minimized by reducing sky glow, glare, and light trespass.

Table 2-6
Environmental Performance Commitments

Technical Area	Proposed Commitments
Air Quality	Use ultra low sulfur diesel fuel in off-road construction equipment with engine horsepower (HP) rating of 60 HP and above.
	Where practicable, use diesel engine retrofit technology in off-road equipment to further reduce emissions. Such technology may include Diesel Oxidation Catalyst or Diesel Particulate Filters, engine upgrades, engine replacements, or combinations of these strategies.
	Limit unnecessary idling times on diesel powered engines to 3 minutes
	Locate diesel powered exhausts away from fresh air intakes.
	Control dust related to construction site through a Soil Erosion Sediment Control Plan that includes, among other things: a) Spraying of a suppressing agent on dust pile (non-hazardous, biodegradable); b) Containment of fugitive dust; c) Adjustment for meteorological conditions as appropriate.
Noise and Vibration	Where practicable, schedule individual project construction activities to avoid or minimize adverse impacts.
	Coordinate construction activities with projects under construction in adjacent and nearby locations to avoid or minimize impacts.
	Consider condition of surrounding buildings, structures, infrastructures, and utilities where appropriate.
	Prepare contingency measures in the event established limits are exceeded.
Cultural and Historic Resources	Establish coordination among projects to avoid or minimize interruption in access to cultural and historic sites.
	Initiate public information and involvement outreach with sensitivity to local cultural resources.
	Identify public information outlets that will receive and provide current information about access during construction.
	Consult with the New York State Office of Parks, Recreation, and Historic Preservation and the New York City Landmarks Preservation Commission regarding potentially impacted, culturally significant sites. Monitor noise and vibration during construction at such sites, as appropriate.
Access and Circulation	Establish a project-specific pedestrian and vehicular maintenance and protection plan.
	Promote public awareness through mechanisms such as: a) signage; b) telephone hotline; and c) Web site updates.
	Ensure sufficient alternate street, building, and station access during construction period.
	Regular communication with New York City Department of Transportation and participation in its coordinated construction efforts.
Economic Effects	Coordinate with LMDC, Downtown Alliance or other entities to minimize residential and retail impacts as required through: a) relocation assistance, as applicable, to persons to businesses physically displaced by the project; and b) focus on essential business and amenities to remain in Lower Manhattan.
	Add appropriate signage for affected businesses and amenities.
Design for the Environment	Energy Efficiency/Renewable Energy
	Enhanced Indoor Environmental Quality
	Conserving Material and Resources
	Environmentally-friendly Operations & Maintenance
	Water Conservation and Site Management
	Waste Management and Recycling (including during construction)

Water

PANYNJ would incorporate sustainable water principals by providing on-site collection of storm water and treatment of waste water. Where practicable, the project would use reclaimed water for toilet flushing, cooling tower makeup, and landscape irrigation. PANYNJ's measures to improve water use to reduce the burden on municipal water supply include efficient water fixtures, automatic controls, and waterless urinals.

Energy

Energy conservation is another component to sustainable development that PANYNJ would implement. Optimizing of energy use would consist of premium efficiency motors, superior insulations, and sensors on light fixtures. Another "green" principal PANYNJ would incorporate is to utilize site-generated and/or purchased renewable energy for a portion of total energy use. PANYNJ would reduce emission of ozone-depleting chemicals by specifying that building systems have zero levels of chlorofluorocarbon refrigerants and use only insulation materials that do not contain chlorine-based gases. PANYNJ would also institute an independent authority to execute a commissioning plan, which would comprise design phase reviews, contractor submittal reviews, functional testing, training, operations and maintenance reviews.

Materials

A key component to sustainable development is material management in construction. The "green" design principals for material management include a comprehensive materials management plan, construction waste management, material reuse, recycled content of the material, proximity of manufactured material to project site, wood certification, and agricultural materials. PANYNJ would develop a comprehensive materials management plan to optimize the use of materials and to reduce waste generation to landfill. This plan would reduce the travel distance for building products and systems. PANYNJ would coordinate with other uses on the site to maximize recycling and to provide a centralized recycling facility.

Indoor Environment

Indoor environmental quality would be enhanced with the following sustainability principals: indoor air quality performances and monitoring, daylight and outdoor views, reduction of contaminants from materials, chemicals and particulates, acoustics, and thermal comfort. PANYNJ would implement an Indoor Air Quality Management Plan that includes architectural and HVAC design strategies to establish high indoor air quality and provide a plan for a permanent monitoring system with centralized controls to supply feedback on ventilation performance and the resultant concentrations of carbon monoxide, carbon dioxide, and volatile organic compounds (VOCs) in accordance with the NYS Executive Order 111, Article 19.638.7(d)(1). PANYNJ would also implement a Materials Management Plan to minimize use of materials with high levels of VOCs and other toxic characteristics. PANYNJ would implement a facility for system default to 100 percent outside air, where practicable, and in balance with energy conservation. PANYNJ would incorporate natural lighting into the terminal building and concourses to reduce demand for artificial illumination. An ambient lighting system would be coordinated with day lighting strategy for flexible illumination.

PANYNJ would provide a plan to reduce potential noise and vibration from mechanical equipment in conformance with the recommendations of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers Applications Chapter 46 Design Guidelines. PANYNJ would provide a plan to manage air flow, moisture, and thermal energy and use an integrated system to monitor and control air temperature in each zone.

Construction Environmental Protection Plan

As the design and environmental review of the Permanent WTC PATH Terminal is advanced, the PANYNJ will provide a detailed outline of the EPCs and any other procedures to be implemented to protect sensitive resources that may be affected by the project's construction. This plan will describe how the initial condition of the resources will be assessed, how the

construction work will be implemented to avoid or minimize impacts, and how the project will be monitored during construction. The plan will use the best available information from the ongoing construction coordination process for projects in Lower Manhattan and a shared projects inventory being developed by LMDC. The plan will also provide for an effective means of disseminating current information to the public and other developers.

Public Involvement and Governmental Entities Coordination Plan

As per the framework, PANYNJ will maintain on going communication with the community at-large (including environmental groups, interested governmental entities, and the general public) and they will be involved as the Project is advanced through the design and construction process.

PANYNJ has developed a public involvement plan that has and will continue to guide the outreach for the Permanent WTC PATH Terminal EIS (see Chapter 18, "Agency Coordination, Process, and Public Participation"). A key goal of this plan is to communicate potential impacts during construction and to coordinate with other projects in the vicinity to avoid, or at least minimize, adverse effects on the environment. As the process continues, this plan will be updated to identify a protocol for 1) addressing comments received during the construction phase; 2) communicating appropriate current information to the public, including implementation schedules; and 3) means and measures of on-going coordination with other projects. The process will build on an existing construction coordination protocol among parties already involved in rebuilding Lower Manhattan.

Baseline Assessment and Coordinated Cumulative Effects Analysis Approach

The framework establishes the components of the baseline assessment and coordinated cumulative effects analysis to be used for the Federal Transportation Recovery Projects. These parameters have been applied not only to the study of cumulative effects but also to the analysis of potential impacts resulting directly from the construction and operation of the Permanent WTC PATH Terminal. The guidelines specifically addressed in the framework are as follows:

- Each Project Sponsor will address cumulative effects, as applicable, as part of its independent project-specific environmental review process.
- The baseline to be used for the No Build comparison required under NEPA will be pre-September 11, 2001 conditions.
- The baseline used for assessment of construction-related impacts for each project will be adjusted, where appropriate, to reflect anticipated conditions at the time of construction.
- Project Sponsors will share appropriate information, databases, and documentation of the baseline and forecasted conditions.
- Each Project Sponsor will apply a consistent approach for the evaluation of cumulative effects focused on the five following resources: Air Quality (including the Enhanced Procedures during the Transportation Conformity Waiver Period); Pedestrian and Vehicular Access and Circulation; Historic and Cultural Resources; Noise and Vibration; and Business/Economic Interests
- The geographic area for analysis will be the area of Lower Manhattan south of Canal Street but, where appropriate, the geographic area may be adjusted for specific resources.

- Each Project Sponsor will adhere, at a minimum, to the set of common EPCs to lower the potential for adverse environmental impacts, thereby lessening the potential for each project to contribute to overall adverse cumulative effects.
- As each project matures through the NEPA process, the findings of the project will be incorporated into the cumulative effects analysis for the projects that follow it. As such, the project on which findings have been issued will constitute an existing condition for the cumulative effects analysis of the next project.

The "Methodology" sections of Chapters 4 through 14 of this FEIS detail the specific data sources, study areas, and criteria applied to the assessment of potential impacts associated with the Preferred Alternative. The approach to the evaluation of cumulative effects is further described in Chapter 15, "Cumulative Effects."

Since publication of the DEIS, PANYNJ has coordinated with NYSDOT and MTA to refine the EPCs and other mitigation commitments identified in the environmental documents for the Lower Manhattan Recovery Projects. As such, PANYNJ and MTA have agreed to additional measures to minimize or mitigate air quality emissions, noise, and vibration during the construction of their projects. These measures are described in more detail in Chapter 9, "Air Quality" and Chapter 10, "Noise and Vibration."

Furthermore, on November 22, 2004, New York State Governor George E. Pataki signed an Executive Order creating the Lower Manhattan Construction Command Center (see Appendix I). The Command Center will administer the construction of project's within Lower Manhattan that either 1) have a construction value of more than $25 million; 2) require governmental actions or permits or; 3) require work within a City or State street or highway.

The Command Center will coordinate community information, construction logistics, utility coordination, environmental compliance and safety, and diversity and equal opportunities in employment. The Command Center will be managed by an Executive Director to be appointed by the Governor and the Mayor of the City of New York. The Mayor will also appoint a Director of City Operations to act as a liaison between the Command Center and City officials. An Executive Committee, to be chaired by the Executive Director, will be appointed to facilitate communications between the Command Center, the Lower Manhattan Project Sponsors, and other key city and state departments and agencies. Chapter 3, "Construction Methods and Materials" provides a more detailed description of the roles and functions of the Lower Manhattan Construction Command Center.

As described in Chapter 18, "Process, Agency Coordination, and Public Participation," the Lower Manhattan Construction Command Center is only one of the several forums in which PANYNJ will coordinate with other agencies and the general public as the planning and construction of the Permanent WTC PATH Terminal moves forward. As the owners of the WTC site, PANYNJ will maintain close contact with LMDC, MTA, and NYSDOT as their efforts move forward. In addition, PANYNJ will continue to coordinate with the project's Section 106 consulting parties on issues relating to archaeological and historic resources, and they will continue their outreach with project stakeholders and community groups to report on the project's progress. ✳

Chapter 3: Construction Materials and Methods

A. INTRODUCTION

This chapter describes the activities required for construction of the Preferred Alternative for a Permanent World Trade Center (WTC) PATH Terminal. The potential environmental impacts that may result from construction and any required mitigation measures are detailed in Chapters 4 through 14 of this Environmental Impact Statement (EIS).

The purpose of this chapter is to develop a framework for the analysis of potential impacts from the construction of the Preferred Alternative. At this time, design of the project is still ongoing, and will continue to evolve. Similarly, planning for construction of the project will also evolve. Therefore, while the actual construction process may differ somewhat from the scenario discussed below, the analysis methods have been conservatively developed to maximize the potential for construction-related impacts. Specifically, it has been assumed for concurrent construction activities that the peaks will overlap and cumulatively affect air quality, noise, and traffic conditions to a higher degree than what is likely to occur. Therefore, any measures required to mitigate these impacts would then be sufficient for any number of possible future construction scenarios.

B. NO ACTION ALTERNATIVE

Under the No Action Alternative, it is assumed that construction activities associated with the WTC Memorial and Redevelopment Plan, the Fulton Street Transit Center, South Ferry Terminal, the Route 9A Project, and certain private developments would occur on or near the WTC site as described in Chapter 15, "Cumulative Effects." As such, certain modifications may be required to maintain temporary WTC PATH service and to ensure the safety of PATH riders as construction occurs around and above the station complex. Furthermore, it is assumed that specific plans to maintain and protect temporary PATH service and any required modifications to the station in support of other area developments would be undertaken by the respective project sponsors.

As described in Chapter 2, "Project Alternatives", minor construction may be required within and adjacent to the temporary station to extend its service life through the opening year, but such activities would be similar to station maintenance that occurs on a regular basis throughout the PATH system. Generally, the effects of this maintenance are anticipated to be far less than those with the construction of a Permanent WTC PATH Terminal since the activities described below for the Preferred Alternative would be far more intense.

C. PREFERRED ALTERNATIVE

The DEIS presented a construction schedule and phasing plan developed in October 2003. This plan was prepared as part of the coordinated efforts for the cumulative effects analysis

framework for the Lower Manhattan recovery projects. The phasing plan presented in the DEIS consisted of 6 Elements as follows:

- Element 1: Permanent Tracks, Platform Conversion, Mezzanine, and Concourse Construction;
- Element 2: Tunnels under 1 and 9 Line;
- Element 3: Route 9A Connection;
- Element 4: Liberty Plaza Connection;
- Element 5: Excavation/Deconstruction of the temporary PATH station; and
- Element 6: PATH Terminal Building.

As noted in Chapter 2, "Project Alternatives," the Liberty Plaza Connection is not being proposed as part of the Preferred Alternative. Therefore, Element 4 of the phasing plan described in the DEIS has been eliminated in this FEIS. Furthermore, since publication of the DEIS, project engineering and design have progressed allowing for a more refined assessment of the construction schedule and phasing. The analysis in the DEIS assumed construction would begin in the first quarter of 2005, but it is now anticipated to start in the third quarter of 2005. Furthermore, the DEIS analysis of construction impacts assumed a more fast-tracked approach with the majority of construction activities occurring in 2006. Based on current engineering data, design considerations, and coordination issues with other separate undertakings on the WTC site, the construction activities would be more evenly distributed through 2006, 2007, and 2008. Since the analysis in the DEIS was based on a higher level of activity than is currently proposed, the corresponding construction-related impacts are higher than what is now expected. Assumptions in the DEIS regarding construction scheduling and phasing have not been revised for the FEIS, as they represent the maximum predicted noise levels and pollutant concentrations that could possibly occur under the most aggressive construction schedule. Mitigation measures developed with respect to these maximum predicted levels would be even more effective under a less aggressive construction schedule.

This section presents the construction schedule and phasing for the Preferred Alternative as currently proposed. Section D, "Construction Analysis Framework" describes the construction scenario that was originally developed for the DEIS and is used in this FEIS to assess potential impacts and to recommend mitigation.

SCHEDULE

Construction of the Preferred Alternative is comprised of five major elements, within which there are stages to be performed concurrently or sequentially. As shown in Figure 3-1, these five construction elements would occur from approximately July 2005 through early 2010. However, the major components of the Terminal are expected to be operational in 2009.

During all elements of the project, construction workers and supervisors would arrive on site either in personal vehicles or via mass transit. A limited amount of parking would be available on-site and would primarily be used by supervisors arriving in light trucks. Other workers arriving by private vehicle would park off-site. Heavy and light trucks would be present during demolition and construction stages throughout all elements; however, the number and type of trucks would vary between elements.

Generally, the hours of construction would be Monday through Saturday from 7 AM to 6 PM in one 10-hour shift. A 10-hour work shift was assumed not only for the construction of the Preferred Alternative but was also assumed for analyses prepared for the World Trade Center

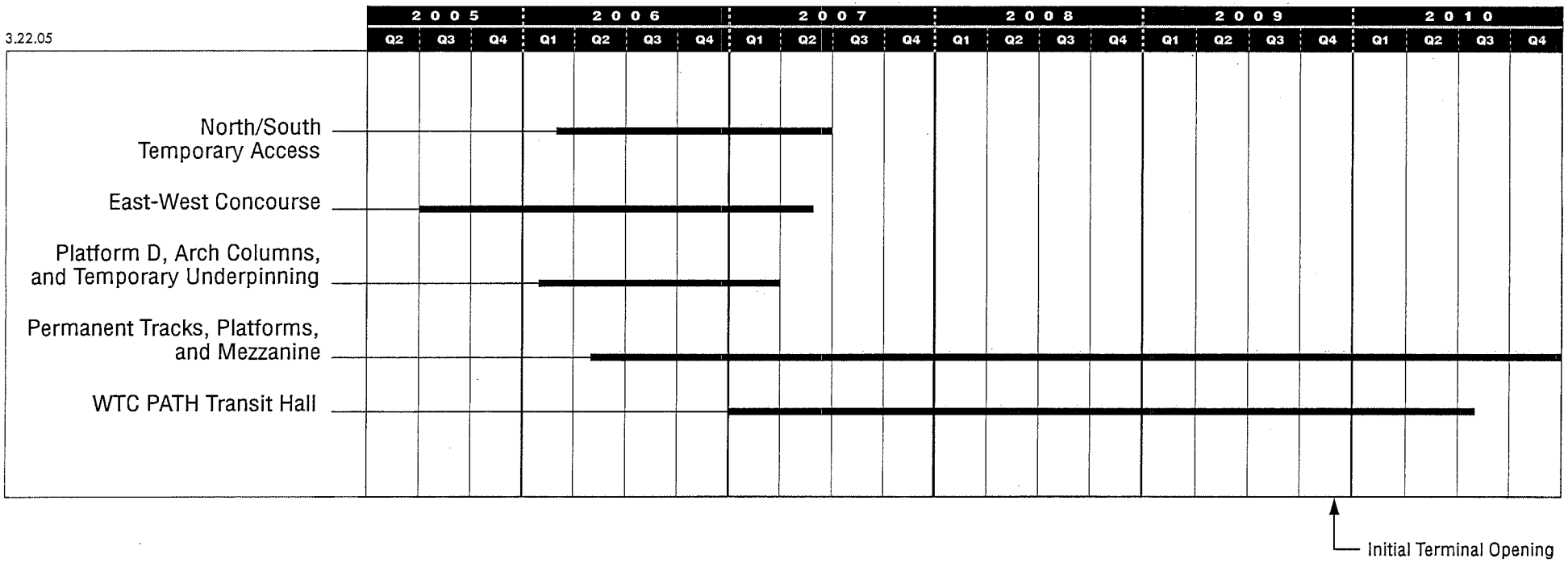


Figure 3-1
Construction Schedule

Memorial and Redevelopment Plan. The proposed hours of construction are consistent with New York City construction guidelines.

In some cases, it may be necessary to conduct construction activities at night, particularly when temporary lane closures would be needed or to coordinate and stage activities for the daytime shift. These nighttime activities would be limited throughout the construction period and would have fewer staff than the daytime shift. These nighttime activities would be required to meet the New York City Noise Control Code (NYC Administrative Code Title 24 §201 et seq.), which does not allow for activities that would exceed specific noise criteria.

CONSTRUCTION ELEMENTS

For descriptive purposes, the construction process for the Preferred Alternative is divided into five elements. Prior to or during construction of the Preferred Alternative, the bathtub walls surrounding the western portion of the WTC site will require permanent reinforcement and stabilization to protect the Preferred Alternative from extensive infiltration of water from the Hudson River and potential flooding. All or part of this bathtub reinforcement and stabilization work may be done as part of the Permanent WTC PATH Terminal project. Following is a brief description of each of these project components.

NORTH/SOUTH TEMPORARY ACCESS

Beginning in late 2005, PANYNJ would construct temporary access to the temporary WTC PATH station. As currently planned, the temporary access would be located on Vesey or Liberty Street or both and would allow for the continued use of the temporary station as construction of the Permanent Terminal proceeds. The temporary access would be maintained until the Terminal Hall and other permanent street-level entrances can be provided. The duration for the construction of this element is 15 months.

EAST-WEST CONCOURSE

During this phase, PANYNJ would construct the east-west pedestrian connection through the WTC site. This phase also includes the construction of the east-west connection beneath Route 9A and of the headhouse adjacent to the World Financial Center. The portion of the connection beneath Route 9A may be constructed by NYSDOT using cut-and-cover methods or by PANYNJ with mining. If NYSDOT pursues a short-bypass alternative for the Route 9A Project, then they would construct the east-west concourse in tandem with their construction of the roadway tunnels. If NYSDOT pursues an at-grade alternative for Route 9A, then the east-west concourse would be constructed at nearly the same elevation by PANYNJ; however, the tunnel would be mined with spoils removed from within the WTC site or from a shaft near the World Financial Center that would eventually provide the vertical connection between the concourse and the street-level headhouse. The full duration for the east-west concourse construction is 36 months.

The hardening of the roof of the east-west concourse, which would eventually become the road bed of Fulton Street between Route 9A and Greenwich Street would occur during this element. The hardening of roof would involve the laying and reinforcement of high density concrete. Upon completion, the hardened road bed would serve as staging for the construction of Freedom Tower, which is being undertaken independent of the Preferred Alternative for the Permanent WTC PATH Terminal. The road bed would be prepared for street traffic as part of a separate undertaking.

PLATFORM D, ARCH COLUMNS, AND TEMPORARY UNDERPINNING

This element of construction involves the preparation work needed to maintain PATH operations as components of the Permanent Terminal are construction. It includes the laying of a temporary Track 6 and the permanent Platform D within the WTC "bathtub." The temporary track is needed to allow for continuous PATH operations as other tracks are reconfigured for use in the Permanent Terminal. Platform D provides access to trains using Track 6 and is, therefore, the first permanent platform to be constructed. Track 6 would be removed once PATH service can be fully restored on Tracks 1 through 5. During this phase of construction, the column supports for the Terminal's arches would be placed. Also, temporary underpinning of the 1 and 9 Line would be undertaken to support the later widening of the passageway between the mezzanine level and the concourse level. The total duration of this element is 20 months.

PERMANENT PLATFORMS, TRACKS, AND MEZZANINE

This component of construction includes the major structural and finishing work for the platform and mezzanine levels of the Permanent Terminal. It includes placement of the structural arches, mezzanine construction, the underpinning of the 1 and 9 Line and construction of the passageway between the mezzanine and concourse levels, the lengthening and upgrade of Platforms A, B, and C, the completion of Platform D, and the construction of PATH's ventilation structures in the median of Route 9A. The total duration for this phase of construction is 45 months.

Grouting beneath the existing NYCT 1 and 9 subway tunnel would be performed from within this tunnel to protect the existing subway tunnel from the subsequent excavation work. Grouting is used in soft soil to stabilize surrounding soils as a tunnel is excavated. In this case, a machine would be used to stabilize the surrounding soils by injecting cement or a similar material to form a hard tunnel shell. It would involve the use of compressed air operated drill rigs and grout pumps.

Excavation and tunneling beneath the subway would occur from the west bathtub and proceed east. Tunneling would be accomplished via conventional mining techniques (e.g., shield with hand or mechanical excavation) and would require removal of existing piling supporting the subway tunnel and replacement with new piles/foundations. Spoils would be removed via the existing ramp to Liberty Street or by lifting to the surface with a crane and skip box.

Demolition of temporary and construction of the permanent tracks, platforms, and mezzanine would occur alternating between northern and southern portions of track, platform, and mezzanines. To maintain train service and passenger safety and access, only one half (either the northern or southern half) of the platform would be demolished and converted, then the second half would follow. This stage of activity would continue until all tracks and platforms are converted. All work would occur within the west bathtub of the WTC site with access from the existing ramp from Liberty Street. No street closings are anticipated for this work to take place.

Two ventilation structures with emergency egress would be constructed as part of the Preferred Alternative. The north ventilation structure would be below and within the median of Route 9A near the projection of PATH Tunnel E. Similarly, the south ventilation structure would be within Route 9A above Tunnel F. This construction would also involve the installation of fans. Estimated duration for construction of the ventilation shafts is approximately 6 months. The vent structure construction would be undertaken in coordination with NYSDOT.

WTC PATH TRANSIT HALL

This element consists of construction of the PATH terminal building, which includes the construction of all sub-grade and above-grade levels, the north-south pedestrian concourse, and the Terminal's mechanical and support systems. A preliminary estimate for the duration for the construction of the building area is 42 months, from late 2006 through early 2010. Lane closings on Church Street may be required for materials delivery and for the erection of pre-fabricated trusses and for the structural steel framing.

MATERIALS DELIVERY AND SPOILS REMOVAL

The vehicles, primarily trucks, needed to deliver materials for construction activities and remove demolition debris would be required to adhere to established site ingress and egress truck routes. For access to the site, trucks arriving and departing would use Route 9A, Broadway, Liberty Street, Church Street, and Barclay Street (see Figure 3-2).

The staging of materials would generally occur within the WTC site or along Vesey and Liberty Streets, which would remain closed to vehicle access during the construction period. At limited times during the Project's construction, it may be necessary to stage materials on Church Street, which would require temporary lane closures. PANYNJ and its contractors would coordinate such activities with the New York City Department of Transportation.

Excavation and demolition of existing site infrastructure and remaining soil would result in the removal of spoils throughout the construction period. As described in Chapter 12, "Contaminated Materials," these spoils would be removed from the site by licensed handlers and would be tested prior to disposal in accordance with U.S. Environmental Protection Agency, New York State Department of Environmental Conservation, and New York City Department of Environmental Protections guidelines and policies. Spoils would be deposited in a licensed facility.

ENVIRONMENTAL PERFORMANCE COMMITMENTS

As discussed in Chapter 2, "Project Alternatives," PANYNJ has committed to a series of common Environmental Performance Commitments (EPCs) as part of the Environmental Analysis Framework for Federal Transportation Recovery Projects in Lower Manhattan. Actual requirements and specifications implementing the commitments will be set forth in PANYNJ's design and contract document.

As described in the DEIS, the project sponsors developed a framework for construction coordination, which included several working groups to address issues that have been identified in the individual environmental documents for the Lower Manhattan recovery projects and to implement the EPCs. The sponsors established a Schedule Working Group, a Logistics Working Group, a Traffic Working Group, and a Standards Working Group. Through this coordinated approach to the construction of individual projects, the project sponsors strove to meet or exceed the EPCs and to investigate and remediate issues and concerns that could arise during the construction process.

Since the publication of the DEIS, Governor Pataki established, by way of an Executive Order, the Lower Manhattan Construction Command Center (see Appendix I). This entity will coordinate the construction of the Lower Manhattan Recovery Projects but will also coordinate any other construction projects in Lower Manhattan with a value in excess of $25 million through 2010. The Command Center will have an Executive Committee consisting of representatives from the various project sponsors and other key state and local agencies. The

Command Center and its Executive Committee will be managed by an Executive Director, who was appointed in February 2005.

As stated in the Executive Order, the functions of the Command Center will be:

- "Coordinating the work of the participants in the rebuilding process and ensuring that the construction in Lower Manhattan proceeds as scheduled by mediating conflicts in schedules and street and site access between construction projects, agencies, and the Lower Manhattan Community;"
- "Coordinating protocols, contract requirements and activities outside of individual project limits through planning on a daily basis throughout construction for government agencies, developers, construction managers, general contractors, and contractors;"
- "Coordinating construction projects to minimize inconvenience for residents, workers, pedestrians, vehicles, and commuters;"
- "Ensuring that the Lower Manhattan area remains neat, clean and orderly throughout construction;"
- "Communicating with residents, businesses, and the general public through a communications director working with each agency's communications and public outreach personnel; providing a central focus on issues critical to the local community and the construction industry, by coordinating initiatives, public outreach, and information;" and
- "Utilizing technology to facilitate coordination of projects."

Although the Command Center and the Lower Manhattan Project Sponsors may further refine the EPCs as construction moves forward, PANYNJ has already committed to specific measures to mitigate potential impacts resulting from the project's construction. As noted in Chapter 2, "Project Alternatives," the EPCs address five categories as follows:

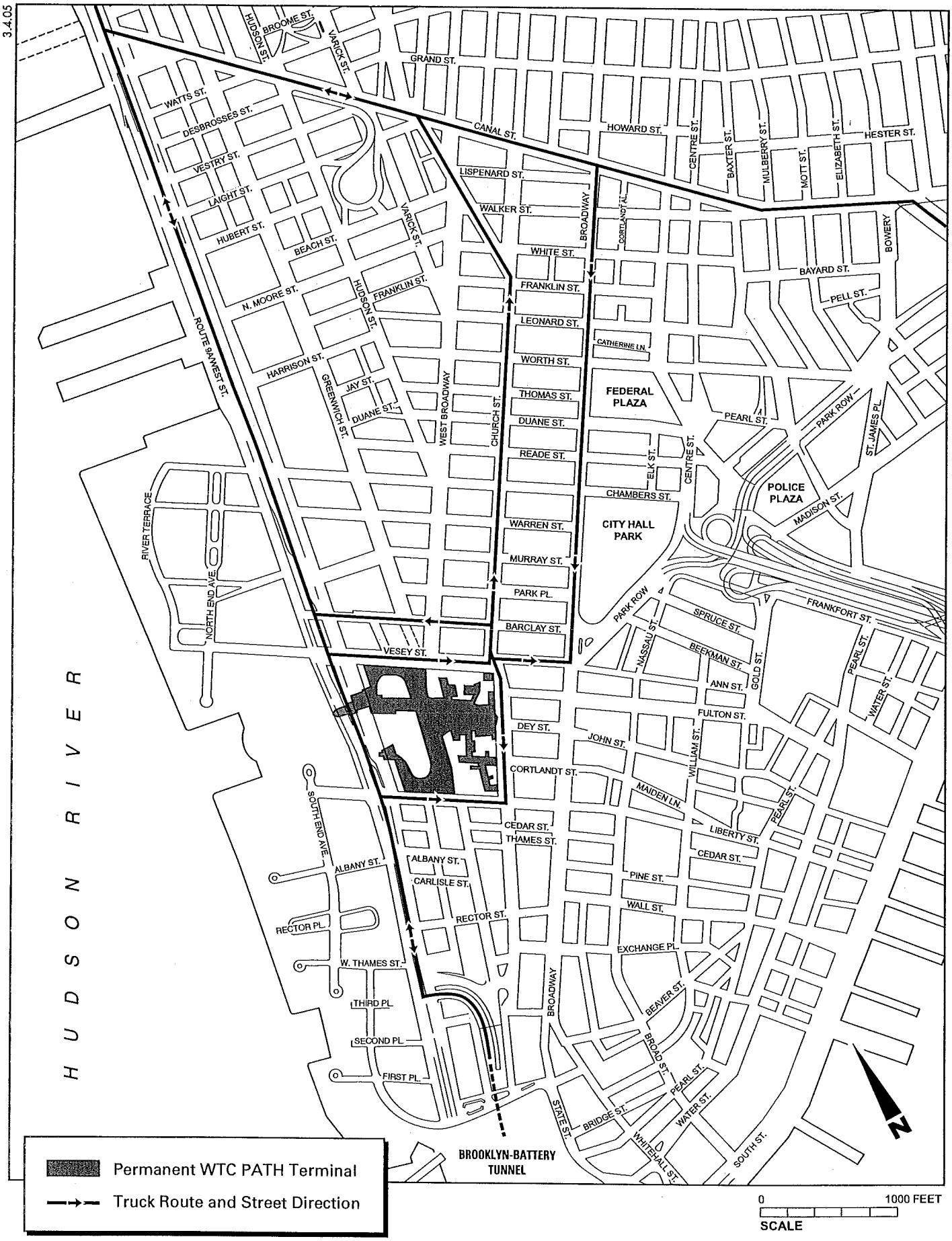
- Economic Conditions;
- Cultural Resources;
- Access and Circulation;
- Air Quality; and
- Noise and Vibration.

Chapter 5, "Socioeconomic Conditions," Chapter 6, "Cultural Resources," Chapter 8, Section B, "Vehicular Traffic and Parking," Chapter 9, "Air Quality," and Chapter 10, "Noise and Vibration," describe these commitments, plans for their implementation, and their anticipated benefits to local conditions during the construction period.

PANYNJ will also ensure that its EPCs are met independent of the Lower Manhattan Construction Command Center. Coordination and circulation plans will accompany the Project's design documents, and the project's contract documents and construction specifications will include the EPC requirements for contractors and specific measures to monitor these commitments as construction moves forward.

D. CONSTRUCTION ANALYSIS FRAMEWORK

As described above, the DEIS presented a construction analysis framework developed through a coordinated effort with the sponsors of the Lower Manhattan recovery projects in October 2003.



PERMANENT WTC PATH TERMINAL
Draft Environmental Impact Statement

Figure 3-2
Truck Routes

This framework considered the peak period of activity (2006) when four elements of the Terminal would be in simultaneous construction. The Liberty Plaza Connection was one of the four elements assessed for the peak construction year in the DEIS. Since the Preferred Alternative does not include the Liberty Plaza Connection, this element is dropped from the construction analysis framework for this FEIS. Furthermore, although the current phasing and schedule of the Preferred Alternative varies somewhat, the analysis framework presented in the DEIS reflects a more aggressive schedule and is considered a reasonable yet conservative framework to evaluate potential impacts and mitigation.

The assessment of potential impacts due to project construction requires the development of a framework that reasonably simulates, both temporally and spatially, those activities that may adversely affect the adjacent environment. To develop this framework, a critical analysis year is first selected. For construction projects that extend over multiple years, a critical year is identified to isolate the greatest potential for adverse effects. In the case of the Preferred Alternative, the peak period of construction activity would occur in 2006. Generally, the assessment of impacts in the critical or peak construction year results in an analysis and mitigation that would also alleviate adverse effects in other years of the construction period since activities on and near the Preferred Alternative would be less intense than in the critical analysis year. For each stage of construction, a peak condition is developed that replicates the daily activities that may be encountered for each stage. These activities include the type and location of construction occurring, a roster of construction equipment on site, the hours of operation for each equipment type, and a quantification of the numbers of trucks providing material or demolition transport. It is also necessary to develop estimates of construction worker vehicle trips even though these are not expected to occur in the peak analysis hours but may be substantial over a 24-hour period. Once these activities are detailed over the individual construction stages, an analysis scenario can be developed that is used as input to the traffic, air quality, and noise impact assessments.

CRITICAL ANALYSIS YEAR (2006)

For the Preferred Alternative, 2006 has been selected as the critical analysis year. During most of that year major work on three elements (Elements 1 through 3) would be occurring simultaneously. While work on Element 5 would be beginning at the end of 2006, construction activities on Elements 1 and 2 would be nearly complete. Therefore, the peak activities associated with Element 5 would not overlap with those of the first three elements. A detailed description of the work for Elements 1 through 3 follows.

Some construction activities may occur sequentially and some may occur simultaneously to increase efficiency and progress. The movement of heavy and light trucks would be a daily recurring activity throughout the duration of each stage of each element (i.e.., trucks to and from the site). On the other hand, some construction activities specific to each element (i.e., spoils removal, concrete pouring, and underpinning) would occur in stages and would not overlap, as it may be necessary to complete one activity before proceeding to the next. Additionally, one process or section of an element (e.g., reinforced steel installation) may be finishing while another is beginning in another area of the same work zone (e.g., pouring concrete). The analysis takes this into consideration by developing a reasonable number of concurrent activities for the impact assessment.

The average daily truck traffic numbers represent each vehicle counted once. It is assumed that the vehicles (i.e., numbers shown) would make one trip in and one trip out of the site (i.e.,

round-trip). Truck trips have been assumed to be evenly distributed throughout the day because the major truck generators, like demolition and concrete pouring, would require staging throughout the day at a more or less even pace as work proceeds.

As stated above, the work week would be six days, and a work day would be one 10-hour shift between the hours of 7 AM and 6 PM. However, the construction equipment is assumed to be operating a maximum of nine hours per day. Additionally, the total number of employees arriving at the site includes those arriving in personal vehicles as well as employees traveling via mass transit to the site. Although some activity may occur outside the assumed 10-hour shift during certain times of the construction period, these activities would employ far fewer workers and implements of equipment than the daytime shift. Thus, the daytime, 10-hour shift is considered a conservative scenario for the evaluation of potential construction-period impacts.

It is assumed that each material delivery truck (e.g., concrete, steel) would idle for approximately one-half hour per day (i.e., 5 percent of the 10-hour day).

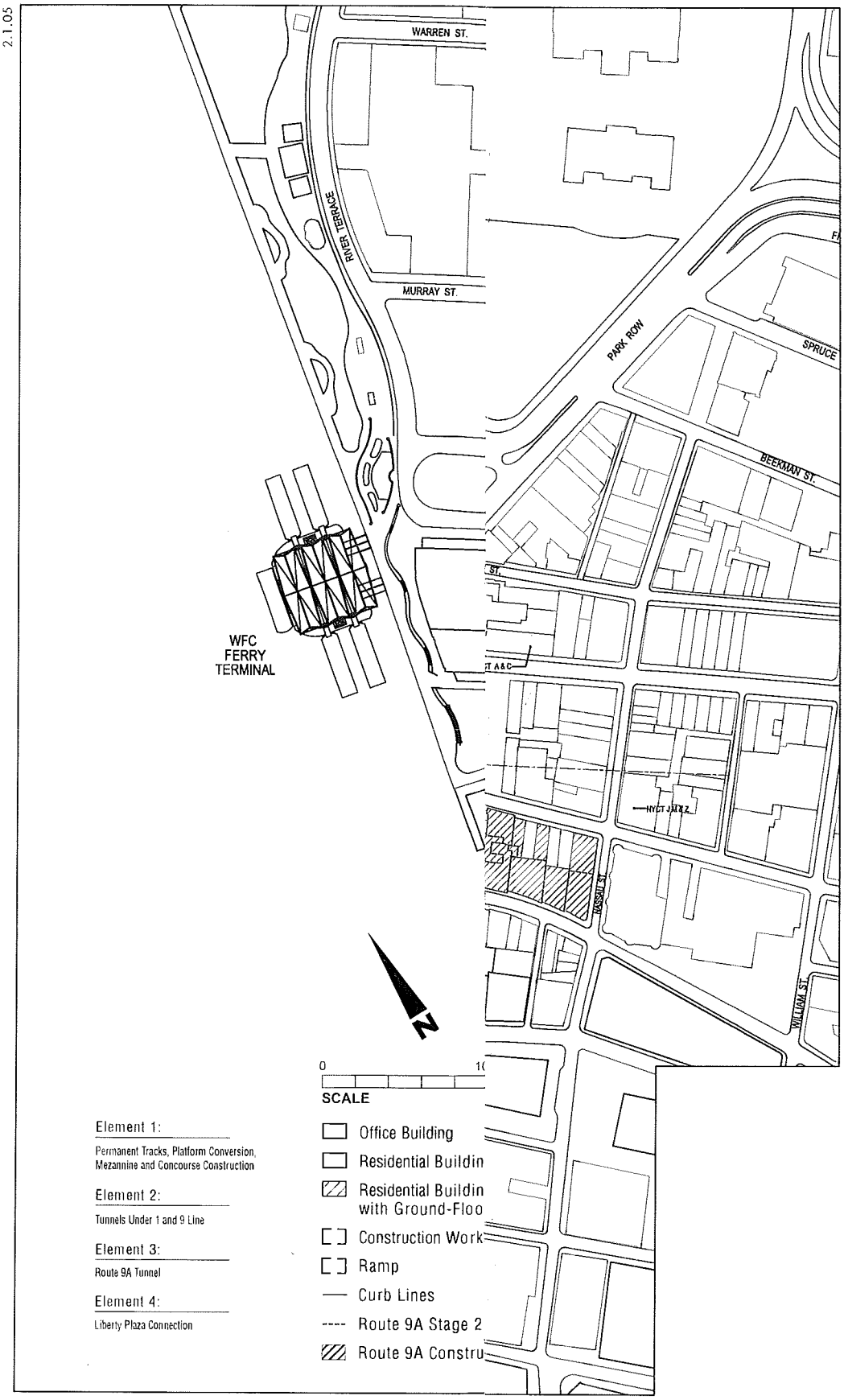
DESCRIPTION OF CONSTRUCTION ELEMENTS

The following section describes in greater detail the construction activities in Elements 1 through 3. Figure 3-3 shows the areas in which the elements would take place and generally where the construction equipment would operate on site.

Element 1 – Permanent Tracks, Platform Conversion, Mezzanine and Concourse Construction

Element 1 would take place in the central portion of the site (see Figure 3-3). This element consists of constructing a temporary track to add to the existing five tracks, then demolishing temporary platforms and mezzanines and installing structural steel and reinforcing steel/concrete for new platforms and mezzanines. Demolition activities would take place for one-half month (i.e., 10 days) to prepare half a platform section for construction. The construction of the new platforms/mezzanines would involve the installation of reinforcing steel, concrete, and structural steel. The time required to complete one-half of a platform would be approximately three months. While each activity (e.g., placement of reinforcing steel) may only take a total of 30 working days, it may be spread out over the entire three-month cycle. Including demolition, the entire stage would last approximately 3.5 months. There would be two periods, each 3.5 months in duration, per stage and three stages for a total of six periods and 21 months.

While the exact pattern of construction is not known at this time, it has been assumed for the environmental analysis that all construction activities could be occurring simultaneously. Table 3-1 presents the number of trucks for each stage of this element. The table shows both the number of daily trucks required for an activity and the assumed number for the environmental impact assessment (i.e., the peak trips). As shown, it has been conservatively assumed that both demolition and construction are occurring on the same day. Only the trucks related to mobilization are not included in the peak trips, since it is not possible for mobilization to occur concurrently with the other activities. The maximum number of concurrent daily truck trips during demolition in Element 1 is estimated at 16 trips while construction would require an estimated 71 trucks. As shown in the table, the majority of the heavy-duty trucks coming to the site are related to the demolition and concrete pouring. Since demolition activities only occur for 10 days over the 3.5-month cycle, a total of 87 trucks (light- and heavy-duty) could only be reached on a small number of days, if at all.



PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 3-3
Elements 1-3

2.1.05

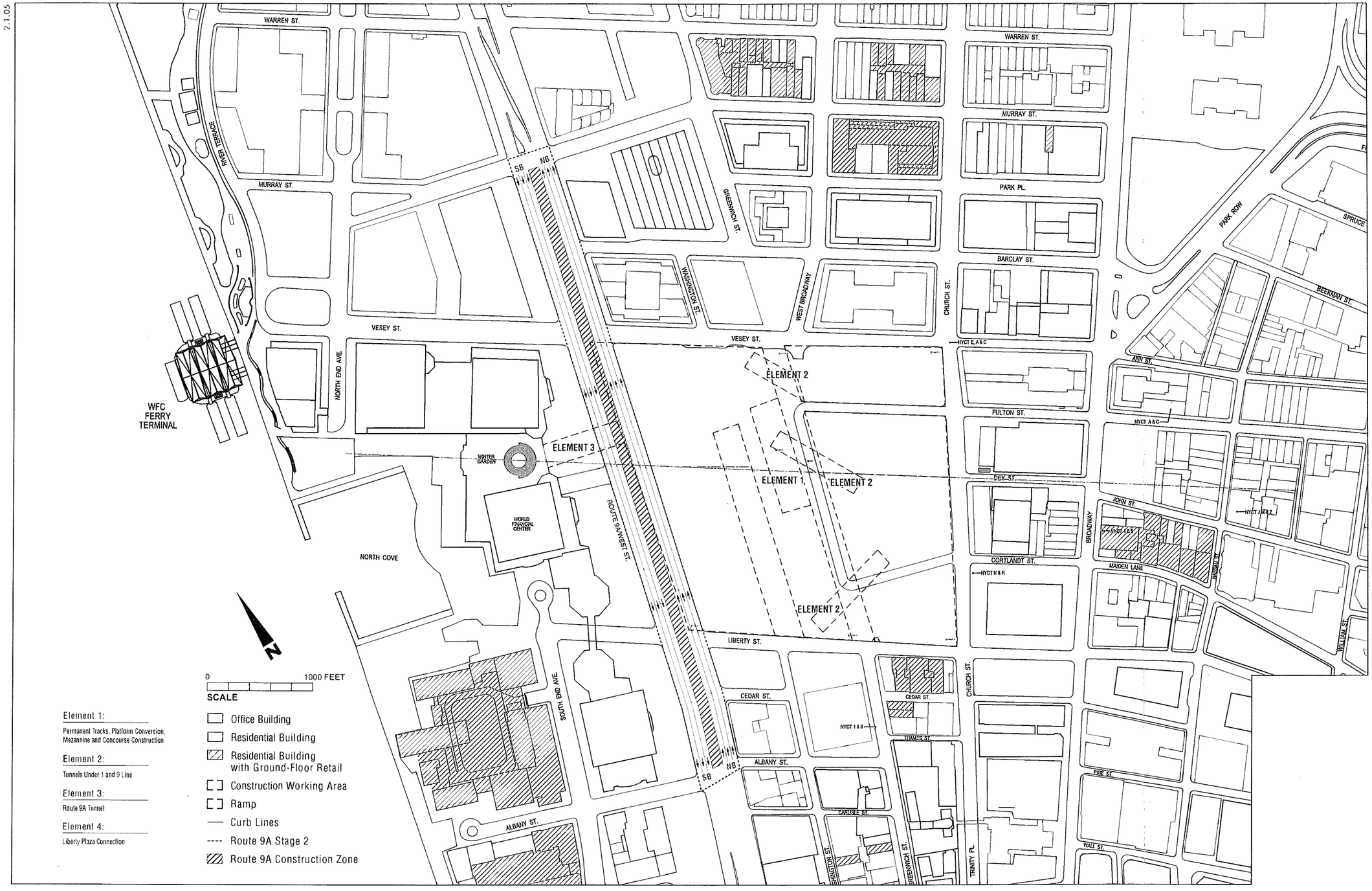


Figure 3-3
Elements 1-3

Table 3-1
Element 1 – Summary of Off-Site Construction Activity

Activity	Peak Daily Trucks	Average Daily Trucks
Demolition		
Debris Removal*	5/day	3/day
Service Trucks	3/day	2/day
Light Trucks	8/day	6/day
Construction		
Concrete*	50/day	2/day
Reinforcing Steel*	1/day	1/day
Structural Steel*	4/day	1/day
Service Trucks	3/day	2/day
Light Trucks	13/day	11/day
Total	87/day	28/day

Note:
* Heavy trucks would be used for these activities.

The equipment usage for the demolition and construction activities has also been conservatively estimated. Table 3-2 presents a roster of equipment that would be used for the demolition and construction activities. These tables also show the number and types of equipment in use for peak days and the number of days in a year that each piece would be operating. It is important to distinguish between the peak days and the annual usage since some air pollutants, notably particulates and nitrogen dioxide, have an average annual standard that will be assessed in the impact analysis. The peak days will be used for the short-term (i.e., 8- and 24-hour averages) air quality and noise assessments, while the annual numbers will be used for the long-term standards (30-day and annual average). The maximum number of days that a piece of equipment would be used in a year is 288, which represents a six-day work week. A 48-week work year has been assumed to account for holidays and inclement weather conditions.

All of the equipment needed for the demolition, placement of reinforcing steel, pouring of concrete and erection of structural steel is included in these tables. As shown, a wide range of equipment would be employed for the various construction elements. Some equipment types (e.g., crane) are used in most activities while others are specific to an individual activity (e.g., concrete pump).

Element 2 – Tunnels under 1 and 9 Line

Element 2 consists of tunneling and underpinning of the 1 and 9 subway line at three locations, each labeled in Figure 3-3. Activities in this element include underpinning of the subway tunnel (six months), excavation and removal of spoil material (six months), and placement of steel and concrete within the excavated tunnel (eight months). The total duration of this element is 20 months. Underpinning would occur slightly ahead of excavation and spoil removal followed by the placement of concrete and steel to complete the activity. Since all three types of work occurring in this element could be performed in multiple locations, and given that this work could be performed together, all three activities could occur simultaneously during a typical work day.

Table 3-2
Element 1 – Summary of On-Site Construction Activity

Equipment	Quantity
Air Compressor for Impact Wrenches	2
Air Compressor for Pavement Breakers	1
Concrete Pump	1
Crawler Crane	1
Hi-Lift (forklift)	2
Hydraulic All-terrain Crane	1
Hydraulic Excavator with Hoe Ram	1
Hydraulic Excavator with Thumb	1
Impact Wrenches	20
Pavement Breakers	4
Welding Machines	2
Workers in Private Vehicles during Demolition	6/day
Workers in Private Vehicles during Construction	11/day

Table 3-3 presents the number of trucks needed for each stage of Element 2. The maximum number of peak daily truck trips during construction is estimated at 16.

Table 3-3
Element 2 – Summary of Off-Site Construction Activity

Activity	Peak Daily Trucks	Average Daily Trucks
Spoil Removal*	6/day	2/day
Underpinning*	1/day	1/day
Concrete/Steel*	2/day	1/day
Service Trucks*	2/day	1/day
Light Trucks	5/day	3/day
Total	16/day	8/day

Note:
* Heavy trucks would be used for these activities.

As previously discussed, the grouting operations for the underpinning would occur from within the subway tunnel. This activity would occur during late-night or weekend periods to minimize the effects to subway operations. The grouting is used to control the flow of soil and/or groundwater during the subsequent excavation stages. Concurrent with grouting, the internal framing for the subway structure would be reconstructed and socketed into bedrock with caissons. Temporary sheet piling would also be installed before excavation begins.

The staging for the tunneling work and placement of the concrete/steel structural elements would occur in the west bathtub. Tunneling would proceed east in a step-wise fashion. After grouting, underpinning and dewatering are completed for a section, the tunneling would proceed and material would be excavated and removed. As the tunneling progresses, the structural elements (i.e., concrete and steel) would be installed in the previously excavated tunnel space. Once the tunneling is complete, finishes would be installed.

Table 3-4 shows the types and quantity of equipment that would be used for this element.

Table 3-4
Element 2 – Summary of
On-Site Construction Activity

Equipment	Quantity
Air Operated Grout Drills	2
Concrete Pump	3
Crawler Crane	1
Hi-Lift (forklift)	2
Backhoe or Boom Cutter for Tunneling	2
Welding Machines	1
Workers in Personal Vehicles	6/day

Element 3 – Route 9A Connection

Element 3 would take place in the northwestern portion of the site (see Figure 3-3). This element consists of tunneling under Route 9A for the pedestrian concourse under this roadway. Under the short-bypass alternative for Route 9A, excavation would employ cut and cover construction methods beneath the existing roadway.

As described previously, the methods employed to construct the Route 9A connection depend upon the alternative selected for the Route 9A Project. Under the short-bypass alternative, NYSDOT would construct PATH's connection on behalf of PANYNJ. NYSDOT would use cut-and-cover methods and would incorporate the excavation of PATH's connection with their construction efforts for the roadway tunnels. If the at-grade alternative is selected for Route 9A, then PANYNJ would construct the concourse beneath Route 9A by mining.

The cut-and-cover method of construction would result in the maximum predicted impacts on traffic circulation and noise as compared to mining; thus, these chapters consider the cut-and-cover method for the evaluation of impacts. The potential impacts on air quality vary depending upon the construction method; therefore, the analysis presented in Chapter 9, "Air Quality," considers both methods of construction.

Furthermore, the short-bypass alternative for the Route 9A Project requires relocation of utilities in the vicinity of the roadway; however, these utilities would not be relocated if the at-grade alternative is pursued. Although utility relocation is not required in the proposed location of PATH's Route 9A connection, it is described below as part of the coordinated cut-and-cover method.

It is anticipated that the structure would be completed in two halves. If the Route 9A short bypass is selected as the alternative in this location, the cut-and-cover excavation would be integrated for the two projects. Basically, the ceiling of the concourse would become the floor of the short bypass.

Due to the amount of existing deep utilities, piles, timber cribbing and other obstructions in the eastern portion of the planned concourse area, a slurry wall would be used to create the temporary excavation. For the remaining portions of the concourse the excavations would be created with interlocking piles that can be grouted to form a watertight seal.

The construction of the concourse under Route 9A would be staged to minimize the disruption to the World Financial Center and the existing roadway. Shallow utilities would be temporarily

relocated and/or protected in-place until construction is complete in that area. Once the utilities have been relocated, the excavation work would begin. As the work progresses, the walls of the excavation (i.e., either slurry or interlocking piles) would be laterally supported by internal bracing. The concourse would be constructed as a separate box within the temporary excavation. Each portion of the concourse would have to be bulk-headed until the next portion is constructed and the two can be connected. Once completed, the excavation would be backfilled and work on the other half (e.g., eastern or western depending upon sequencing) of the roadway could begin.

Table 3-5 presents the number of trucks for each stage of Element 3. As shown, the peak daily trucks would be 15 since it is assumed that all operations could occur simultaneously. Table 3-6 summarizes the types and quantities of equipment that would be used during this phase of construction.

Table 3-5
Element 3 – Summary of Off-Site Construction Activity

Activity	Peak Daily Trucks	Average Daily Trucks
Spoil Removal*	5/day	2/day
Underpinning*	1/day	1/day
Concrete/Steel*	2/day	1/day
Service Trucks*	2/day	1/day
Light Trucks	5/day	4/day
Total	15/day	9/day

Note:
* Heavy trucks would be used for these activities.

Over the 15-month duration for this element, each activity (underpinning, excavating and placement of concrete/steel) would occur for approximately one-third of the time. Therefore, while the assumptions for the peak day include all equipment operating simultaneously, the annual usage reflects that equipment such as the welding machines or concrete pump would be in use for only one-third of the year.

Table 3-6
Element 3 – Summary of On-Site Construction Activity

Equipment	Quantity
Air Operated Grout Drills	3
Concrete Pump	1
Crawler Crane	1
Hi-Lift (forklift)	2
Pavement Breakers	1
Backhoe	1
Welding Machines	2
Workers in Private Vehicles	6/day

Summary

A summary of the peak trucking activity (i.e., total number of light and heavy trucks that would be on site during construction) in Elements 1 through 3 is presented in Table 3-7. As discussed above, since activities in all elements could potentially overlap, it is conservatively assumed that a total of 118 trucks could arrive on site per day during project construction. Since each truck would travel both to and from the project site, this would represent 236 daily truck trips.

Table 3-7
Summary of Total Peak Daily Trucks (Elements 1 through 3)

Table 3-5	Light Trucks (Per Day)	Heavy Trucks (Per Day)	Total Trucks (Per Day)
Element 1	21	66	87
Element 2	5	11	16
Element 3	5	10	15
Total for All Elements	31	87	118

Of these 118 trucks, 87 would be heavy-duty trucks while 31 would consist of light-duty or subcontractor pick-up trucks. In addition to the delivery and service vehicles generated by the Preferred Alternative's construction, it is estimated that a small number of construction workers would arrive at and depart the area by car. The subsequent traffic, air quality and noise assessment reflect the different characteristics of each of these vehicles. ✱

Chapter 4: Land Use, Neighborhood Character, and Public Policy

A. INTRODUCTION

This chapter examines the effects of the Preferred Alternative within the context of existing and future land use and development trends, neighborhood character, and public policy. The analysis assesses the Preferred Alternative's ability to support the economic recovery of Lower Manhattan as the third largest central business district in the United States. This chapter describes the anticipated changes in land use, neighborhood character, and public policy that are independent of the Preferred Alternative in each of the analysis years and assesses its potential impacts.

B. METHODOLOGY

Three analysis years—2006 (construction year and critical analysis year), 2009 (opening year), and 2025 (design year)—are considered. While the analysis is primarily based upon conditions that exist today at the Project Site and in the surrounding study area (defined below), a discussion of the environment prior to the events of September 11, 2001 is included in this chapter to provide an overall context for the analysis which follows. Anticipated changes in land use, neighborhood character, and public policy that are expected to occur independently of the Preferred Alternative by each analysis year are identified, and its potential impacts to land use, neighborhood character, and public policy are assessed.

Projections of potential future baseline conditions were developed based on the New York Metropolitan Transportation Council's regional modeling for its Regional Transportation Plan. However, these projects were adjusted to local levels based on current knowledge of existing and proposed Lower Manhattan land use. As described in Chapter 2, "Project Alternatives" and Chapter 15, "Cumulative Effects," PANYNJ has coordinated with the other sponsors of the Lower Manhattan Recovery Efforts (Lower Manhattan Development Corporation, Metropolitan Transportation Authority, and New York State Department of Transportation) to develop a consistent approach to the evaluation of potential environmental effects for their respective projects. The methodology for this land use and neighborhood character analysis follows this guidance, and the development of baseline and future conditions has been closely coordinated between the project sponsors.

STUDY AREA AND SUBAREAS

The Preferred Alternative would be constructed almost entirely within the bounds of the approximately 16-acre WTC site, bounded by Vesey Street to the north, Church Street to the east, Liberty Street to the south, and Route 9A to the west (see Figure 4-1). Street level access points and below-grade connections would extend farther, from the World Financial Center (WFC) on the west side of Route 9A in Battery Park City (BPC) to Liberty Park Plaza located east of Church Street between Liberty and Cedar Streets. These areas are referred to collectively as the Project Site.

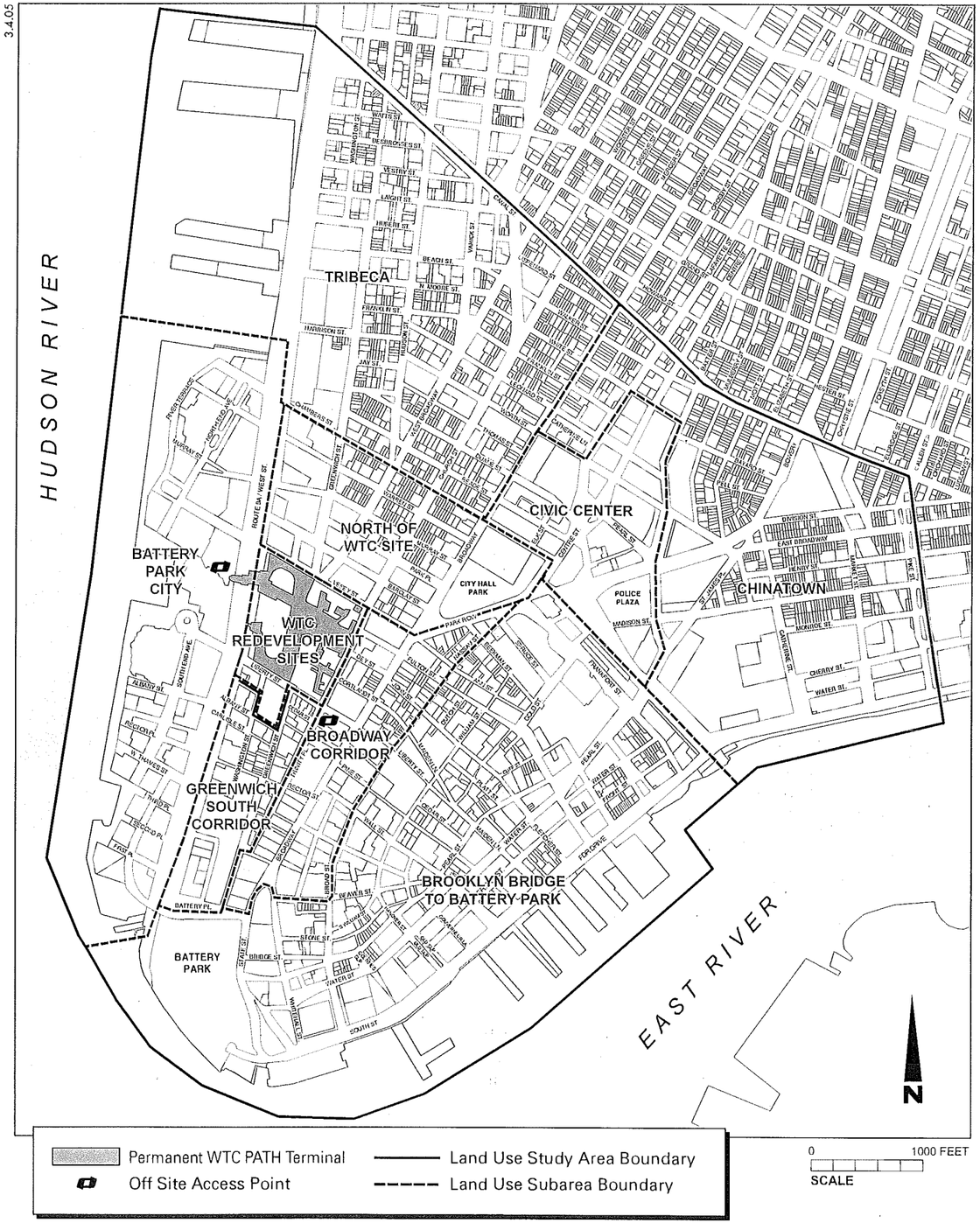
For the purposes of assessing existing and future land use, public policy, and neighborhood character, the land use study area surrounding the Project Site has been divided into nine subareas established based on geographic boundaries as well as commonly accepted neighborhood boundaries.

While the Project Site, as defined below, is largely contained within the boundaries of the former WTC site, the areas to be used specifically to construct the Preferred Alternative are analyzed separately from the rest of the developments expected to occur at the WTC Redevelopment Sites, as defined below. The Project Site and the five subareas immediately surrounding the Project Site represent the primary catchment area for PATH riders and the areas where impacts from the Preferred Alternative are most likely to occur. They are also the areas that experienced the greatest impacts from September 11, 2001 and its aftermath. The remaining four subareas are located further away from the Project Site and therefore are less likely to be affected by the Preferred Alternative. However, these areas capture almost all additional PATH riders who travel to Lower Manhattan, and are included to be consistent with the study areas established for other major projects in the area, including the Lower Manhattan Development Corporation's (LMDC) WTC Memorial and Redevelopment Plan.

To assess potential off-site impacts, a Lower Manhattan study area was defined which includes all uses south of Canal Street. For discussion purposes, this study area is divided into nine subareas as shown in Figure 4-1 and described below.

- *WTC Redevelopment Sites:* (1) the WTC site, bounded by Vesey, Church, and Liberty Streets, and Route 9A; and (2) the two city blocks south of the WTC site, one bounded by Liberty, Greenwich, Albany, and Washington Streets, and the other bounded by Liberty, Washington, and Cedar Streets and Route 9A, plus portions of Liberty and Washington Streets.
- *North of WTC site*, bounded by Chambers Street to the north, Vesey Street to the south, Route 9A to the west, and the eastern boundary of City Hall Park to the east.
- *Broadway Corridor*, extending from Vesey Street and Pace Plaza in the north to Beaver Street between Trinity Place/Church Street and Nassau/Broad Streets in the south.
- *Greenwich South Corridor*, bounded generally by Liberty Street to the north, Trinity Place to the east, Battery Place to the south, and Route 9A to the west.
- *Battery Park City*, encompassing the area between Route 9A and the Hudson River, from approximately Chambers Street to Battery Place.
- *Tribeca*, bounded by Chambers Street to the north, Broadway to the east, Canal Street to the south, and the Hudson River to the west.
- *Chinatown below Canal Street*, bounded by Canal Street to the north, Pike Street and the East River to the east, the Brooklyn Bridge to the south, and Pearl Street to the west, in addition to the blocks between Broadway and Pearl Street from Canal Street in the north to Worth Street/Clavin Place in the south.
- *Civic Center*, bounded by Pearl Street to the east, the Brooklyn Bridge to the south, and Broadway to the west, and extending north to Worth Street/Clavin Place between Lafayette and Pearl Streets.

3.4.05



PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 4-1
Land Use Study Area

- *Brooklyn Bridge to Battery Park*, bounded by the bridge to the north, Centre/Nassau/Broad Streets to the west, the East River to the east, and south of Beaver Street/Battery Place in the southwest corner.

C. DESCRIPTION OF THE AFFECTED ENVIRONMENT

PRE-SEPTEMBER 11, 2001 BASELINE CONDITIONS

Prior to the September 11, 2001 attacks on the WTC, the Project Site was occupied by the WTC PATH Terminal located in the WTC complex. As the Preferred Alternative would effectively result in the Terminal's replacement, an understanding of the conditions that existed on the Project Site and in the surrounding area when the original Terminal was active will help to provide the context for the analysis which follows. Those land uses, public policies, and neighborhood characteristics that existed prior to September 11, 2001 are discussed in this section.

LAND USE AND NEIGHBORHOOD CHARACTER

Project Site

Before September 11, 2001, the Project Site was occupied by the WTC PATH Terminal, which included a track and platform level, an associated mezzanine/fare-zone level, and sub-grade pedestrian connections to adjacent streets, New York City Transit (NYCT) subways, and WTC site developments. The terminal was the busiest of the 13 PATH stations with approximately 67,000 average weekday boardings. Access to the mezzanine and platforms was located on the eastern portion of the Project Site within the WTC Concourse. The track and platform and mezzanine levels were located on the western half of the site, below the WTC Towers 1 and 2. The tracks connected to the Hudson Tubes beneath Route 9A and extended west under the Hudson River to New Jersey. Below ground, remnants of the former Hudson & Manhattan (H&M) Terminal existed in an altered state and were used for parking, truck access, and storage for the other facilities on the WTC site.

The WTC Concourse that housed the WTC PATH Terminal also contained retail stores and a transportation hub providing pedestrian connections to seven subway lines operated by the Metropolitan Transportation Authority (MTA) as well as the PATH trains. Although not particularly successful initially and deserted on weekends for years, the shopping area had been improved and by 2001 had become an extremely lucrative retail hub. Austin J. Tobin Plaza (Tobin Plaza) and the additional outdoor public areas along the east side of Church Street housed the popular Greenmarket and several outdoor cafes, and served as a regular performance venue for free concerts.

Liberty Plaza contained benches, planters, and lighting, providing respite for area workers and visitors. The WFC was connected to the Project Site and the WTC complex by a pedestrian bridge over Route 9A.

Study Area

The project study area was generally characterized by a mixed land use pattern which prevails today. Dominated by the scale of the WTC buildings and their populations, there was a strong and growing residential community in Tribeca and the Financial District, and a number of

institutional uses in addition to offices. The blocks immediately surrounding the Project Site were extremely active and a vital part of the dense commercial core of Lower Manhattan.

WTC Redevelopment Sites. Prior to September 11, 2001, the WTC site contained over 10 million square feet (msf) of office space in five buildings, approximately 500,000 square feet of retail space, a 22-story hotel, and a public plaza. The site was best known for the Twin Towers: One and Two WTC, two 110-story buildings that rose over 1,350 feet. Each tower contained more than 4.1 msf of rentable Class A office space. Between the Towers at the southwest corner of the WTC site was Three WTC, a 22-story Marriott Hotel with 820 rooms and meeting spaces. Along the north and west edges of the WTC site were two nine-story buildings (Four and Five WTC) and the eight-story U.S. Custom House (Six WTC).

The five office buildings and the hotel surrounded Tobin Plaza where concerts and other public events were held. Along Church Street was more plaza area expanded by the southbound lanes of the street that were closed to traffic and improved with benches and planters with trees.

The Twin Towers dominated the Project Site and the surrounding blocks. Area streets and sidewalks bustled with traffic and with pedestrians going to work, shop, sightsee, and travel to other areas. Approximately 48,000 workers were employed at the WTC Redevelopment Sites with 34,000 employees in the Twin Towers alone (see Chapter 5, "Socioeconomic Conditions"). Over 200,000 workers and commuters poured through the WTC each weekday and into the evening hours.

Although weekends were less active, the Twin Towers and retail stores attracted a steady flow of tourists and shoppers. Tourists from around the world came to see and photograph the Twin Towers, to visit the observation deck, and to dine at Windows on the World. Although it was a busy nexus of transportation, which included the WTC PATH Terminal, and an important destination itself, the WTC superblock blocked view corridors and was often a barrier for residents, workers, and visitors of the three distinct neighborhoods surrounding it—Tribeca to the north, BPC to the west, and the Financial District to the east and south.

To the south, the building at 130 Liberty Street was a fully occupied office tower with ground-floor retail. It had a plaza with a fountain in the summer that was replaced by shrubs in the winter. Above this was an additional plaza level originally intended to connect to the plaza level at the WTC. To its west, the block at the corner of Liberty Street and Route 9A was an active parking lot and the site of the St. Nicholas Greek Orthodox Church.

North of WTC site. The area north of the WTC site contained a variety of land uses, including office, residential, institutional, light industrial/utilities, and open space, as well as vacant land. It was a transition zone between the mainly commercial office buildings to the south and the more residential and institutional development in Tribeca to the north. Prior to September 11, 2001, Vesey Street carried substantial vehicular and pedestrian traffic volumes. With the approximately two million-square-foot 7 WTC, the Federal Office Building/U.S. Post Office (90 Church Street), and the Barclay-Vesey Building (Verizon Building), used for housing telephone equipment and offices, lining the north side of Vesey Street between Route 9A and Church Street, these blocks were a vital part of the dense commercial core of Lower Manhattan. A number of additional office buildings, many with ground floor retail uses, were located along Park Place and Murray Street to the north and between Church Street and Broadway to the east.

The renovation of the Borough of Manhattan Community College's (BMCC) Fiterman Hall, located immediately north of Seven World Trade Center (7 WTC), was near completion and actively used.[1] Other institutional uses included P.S. 234 and St. John's University School of Risk Management, Insurance and Actuarial Science, both between Greenwich Street and Route 9A. Located among these educational institutions were two large, vacant parcels known as Site 5B and Site 5C under the Washington Street Urban Renewal Area (WSURA) Plan (see "Pre-September 11, 2001 Baseline Conditions—Public Policy").

The blocks east of Greenwich Street and north of Murray Street had a greater mix of uses more typical of the Tribeca community. They were characterized by smaller commercial and residential buildings with a variety of ground-floor retail uses, including banks, restaurants, dry cleaners, and convenience-goods stores. The retail uses were more heavily concentrated along the north-south streets and Chambers Street, with smaller businesses along the east-west streets. Residential uses were concentrated on Greenwich Street between Murray and Chambers Street, on Murray Street east from Greenwich Street, and on Park Place from West Broadway to the east. In the easternmost portion of the subarea was City Hall Park and City Hall which housed the Mayor's offices and chambers of the New York City Council.

Broadway Corridor. Several buildings with a range of uses were located directly across Church Street from the Project Site. A church (St. Paul's Chapel), a hotel (the Millennium Hotel), a department store (Century 21), and a massive office building (1 Liberty Plaza) covering almost its entire block lined Church Street from Vesey to Liberty Streets. Across Liberty Street to the south was Liberty Park Plaza, part of the Project Site.

Office and other commercial uses generally dominated the Broadway Corridor before September 11, 2001. It was part of the historic financial district, the traditional home of financial institutions and corporate headquarters and the smaller businesses and industries which serve them. Class A and B office buildings lined Broadway as well as Church Street/Trinity Place and Nassau/Broad Streets. Such notable buildings as 140 Broadway, the Bank of New York Building, and the New York Stock Exchange were located here. Residential buildings with retail use at street level were concentrated in the northern portion of the corridor east of Broadway. Heavy vehicular and pedestrian traffic, especially along Church Street and Broadway, were typical throughout the weekday and into the evening hours.

Greenwich South Corridor. The area south of the WTC site contained a mix of land uses on blocks of varying sizes, including residential, office, educational, and public parking as well as the entrance and exit ramps for the Brooklyn Battery Tunnel. The area was densely developed with buildings generally occupying their entire lots and public plazas non-existent.

The New York City Fire Department (FDNY) firehouse for Ladder Company 10 and Engine Company 10 stood at the corner of Liberty and Greenwich Streets. To its east were residential uses in converted commercial buildings with active ground-floor retail uses, and a fast-food restaurant building. West of Greenwich Street, the 39-story office tower at 130 Liberty Street dominated the block. A public parking lot and St. Nicholas Greek Orthodox Church occupied the block to the west along Route 9A. Farther south, the buildings at 90 West Street and 130 Cedar Street were used as commercial office space. The building at 19 West Street was occupied by the Downtown Athletic Club, a private health club with hotel rooms and the home of the Heisman Trophy.

[1] BMCC's main campus is located four blocks to the north along Route 9A in the Tribeca subarea.

A number of commercial buildings both large and small south of Cedar Street between Route 9A and Greenwich Street had been or were in the process of being converted to residential use, following an ongoing trend in Lower Manhattan that began in the 1990s. Office uses were also located throughout the corridor with several buildings between Washington Street and Trinity Place, including the American Stock Exchange, the Trinity Building, and 40 Rector Street. Other commercial uses included restaurants, informal eating establishments, clothing stores, and small-scale retail businesses concentrated along Greenwich and Washington Streets, with limited retail along Route 9A.

Institutional uses included two schools and a religious organization. The High School for Leadership and Public Service and the High School of Economics and Finance were both on Trinity Place near Thames Street. Occupying the historic Downtown Community House on Washington Street north of Rector Street was the True Buddha Diamond Temple of New York. The corridor also contained several public parking structures, including the massive Battery Garage. Extending from Route 9A to Greenwich Street near the Brooklyn Battery Tunnel ramps, the garage could accommodate more than 2,000 vehicles.

Battery Park City. BPC, one of New York City's newest neighborhoods, is a "city within the city" that was still being completed before September 11, 2001. Built in part on landfill from the large volume of soil excavated for the WTC complex, BPC is a mixed-use community with a commercial center, two residential neighborhoods, schools, cultural facilities, hotels, and neighborhood amenities such as dry cleaners, grocery stores, shopping opportunities, movie theatres, and restaurants, as well as the most extensive open space network in Lower Manhattan.

BPC was generally divided into three sections: the North neighborhood (north of Vesey Street), the World Financial Center (WFC), and the South neighborhood (south of Liberty/Albany Streets). All three sections were bound together by a common scale and style and by the extensive waterfront parks and public esplanade, which began at Battery Park in the south and extended along the Hudson River to just north of Chambers Street at the north end. BPC was physically divided from the WTC site and the other subareas by Route 9A. This eight-lane divided highway served as a major thoroughfare along Manhattan's west side and provided access to the Brooklyn-Battery Tunnel. The highway also contained a separate Class I bikeway and walkway, part of the Hudson River Park, for bicycles, pedestrians, and recreational users.

Buildings in the North neighborhood were generally newer and taller, with several vacant parcels between Vesey and Warren Streets. The residential buildings at 20 and 22 River Terrace were under construction. Street-level activity was light in this area. However, the presence of Stuyvesant High School and P.S./I.S. 89 increased the level of activity during daytime hours.

The WFC consisted of four large office towers with retail shops and restaurants, and the Winter Garden, a large, glass-enclosed public atrium. These buildings were strategically positioned to tie into the WTC complex which stood directly across Route 9A. Two pedestrian bridges connected the WFC with the WTC complex to the east.

The South neighborhood contained mostly low- and mid-rise residential buildings in addition to cultural and hotel uses. With the exception of two large vacant parcels along Route 9A, the South neighborhood was fully developed. The Ritz-Carlton Hotel was approaching its scheduled opening, and construction of the Jewish Museum Expansion was underway.

Tribeca. Residential and commercial uses dominated the Tribeca neighborhood, with institutional, industrial, and open space uses also present throughout the subarea. Late 19th and early 20th century corniced loft buildings were interspersed with new mid-rise apartment

buildings with terraces and bay windows that seek to evoke the style of the older buildings. High-rise buildings were primarily located along the wider north-south streets with smaller buildings occupying the midblocks. Many of the smaller commercial buildings were converted to residential use with loft-style apartments and a variety of ground-floor retail uses. These included basic neighborhood amenities, such as banks, dry cleaners, and convenience goods stores, as well as large concentrations of art galleries, boutique shops, bars, and restaurants.

Notable institutional uses included the main campus of BMCC (also home to the Tribeca Performing Arts Center), New York Law School, and the Tribeca Film Center. Office buildings were concentrated along Broadway and Worth Street, with a large office complex situated on the block bound by Route 9A and North Moore, Hubert, and Greenwich Streets. Some of the industrial uses that characterized the neighborhood before the residential conversions began were still present in the northwestern portion of the study area, mainly in the area bounded by West, Greenwich, Laight, and Canal Streets. Open spaces included Washington Market Park at Chambers and Greenwich Streets, a 1.65-acre public landscaped park with active recreation areas for children. The Hudson River Park included a permanent bicycle and pedestrian greenway running up the west side of Manhattan, with interim uses on the piers and waterfront offering volleyball, minigolf, basketball courts, batting cages, concessions, a boathouse, and fishing and passive use areas.

The subarea had a slightly irregular street pattern, with heavy north-south traffic, particularly along Route 9A and all around St. John's Rotary which provided access to the Holland Tunnel. With such a diversity of uses, pedestrian activity was steady during the day and evening throughout much of the subarea.

Chinatown below Canal Street. The Chinatown below Canal Street subarea included mainly commercial and residential uses in small, older buildings, and large residential towers. High concentrations of commercial and mixed-use buildings existed throughout the subarea, concentrated along Canal Street, between Broadway and Pearl Street, and along the north-south streets throughout the subarea. Restaurants, fresh food markets, tea and rice shops, and garment factories are the main businesses in Chinatown, and the area's distinct character and mix of businesses made it a popular tourist destination. The largest Asian community in North America could be found among the narrow streets of Chinatown, a neighborhood which extends north of Canal Street beyond the study area.

The eastern and southern sections of the subarea included large-scale residential developments, such as Chatham Towers, the Governor Alfred E. Smith Houses along the East River, Knickerbocker Village, and Confucius Plaza, a large, middle-income residential building at the Bowery and Division Street.

Additional uses in the subarea included institutional, transportation, office, and open space. Three elementary schools and numerous religious institutions were scattered throughout the area. Cultural institutions included the Museum for Chinese in the Americas at Mulberry and Bayard Streets, and the Eldridge Street Project between Canal and Division Streets, which undertook a massive restoration of the Eldridge Street Synagogue, a National Historic and New York City Landmark. Columbus Park between Baxter and Mulberry Streets and a number of ballfields near the Manhattan Bridge at the East River were all well-utilized open spaces.

Civic Center. The Civic Center subarea was characterized by a high concentration of government and government-related uses, including several courthouses, city and state government office buildings, and the New York Police Department headquarters as well as their

office uses. Several small parks were located near the courthouses as well as a small portion of the African burial ground, located along Duane Street east of Broadway. The historic courthouse buildings lined Center Street, the area's main thoroughfare, which passed through Foley Square. The ramps to the Brooklyn Bridge created a physical and visual barrier to the neighborhoods to the south.

Brooklyn Bridge to Battery Park. This subarea comprises the eastern section of the Financial District and was largely commercial, with pockets of residential, institutional, entertainment, and open space uses. The area between Wall, Pearl, and Whitehall Streets is where New York City began and where Lower Manhattan's reputation as a major international economic hub was born. Huge skyscrapers housing financial service institutions, law firms, and insurance companies tower over narrow, winding streets in the Wall Street area. Large commercial buildings dating from the early 1930s include 70 Pine Street, 40 Wall Street, and 20 Exchange Place. More modern office buildings include One Chase Manhattan Plaza, 55 Water Street, One New York Plaza, and Financial Square.

The area's historic significance combined with a large presence of cultural institutions, including Federal Hall, the South Street Seaport Museum, and Castle Clinton National Monument, which provided ferry connections to the Statue of Liberty and Ellis Island Immigration Museum, made this area a major tourist destination. A greater mix of uses was present in the northern portion of the subarea, including several residential buildings and institutional uses. The largest residential use in the area was Southbridge Towers, located on the superblock bounded by Gold, Fulton, and Water Streets, and the Brooklyn Bridge. The area surrounding these towers contained small concentrations of residential buildings, most with ground-floor commercial uses. Major institutional uses included Pace University and NYU Downtown Hospital, located just south of the Brooklyn Bridge.

The South Street Seaport was a dominant use along the East River waterfront, attracting large numbers of visitors to shop, restaurants, boat rides, and boardwalk entertainment. At the southern tip of Manhattan, the Whitehall Ferry Terminal provided access to the Staten Island Ferry. Adjacent to it and encompassing 23 acres along the waterfront was Battery Park. The park contained expansive lawns and landscaping, a waterfront promenade, playgrounds, several monuments and memorials, and cultural programs.

The eastern edge of the study area included Franklin D. Roosevelt Drive (FDR Drive) and Water Street, two roadways that carried heavy volumes of local and through traffic. Streets were crowded during the workday with large numbers of office workers, as well as tourists and a growing number of residents. The area was substantially less active during evening hours and on weekends.

PUBLIC POLICY

Since office vacancy rates began to increase in Lower Manhattan in the early part of the 1990s, public policy has been used to influence land use and has begun to bring about the transformation of the Financial District into a more diverse, 24-hour community. Policy initiatives were developed beginning in 1995 to offer economic and financial incentives intended to increase office occupancy as well as promote reinvestment and adaptive reuse of the more obsolete buildings in Lower Manhattan. The policies were designed to lower the area's commercial vacancy rates, convert targeted commercial office buildings into residential space, help build a 24-hour, mixed-use neighborhood, invest in and upgrade Class B office space, and attract new retailers to the area.

Many of the public policies in effect today to support Lower Manhattan as a vibrant, attractive residential community as well as a center of business and tourism were in place prior to September 11, 2001. The only policy in effect prior to September 11, 2001, that is not in effect today is the Washington Street Urban Renewal Area (WSURA). Each of these policies is described below. Those policies specifically created in response to the terrorist attacks are discussed in the following section (see "Changes in the Affected Environment Since September 11, 2001—Public Policy").

Zoning

While zoning regulations do not apply to a large portion of the Project Site itself, they are applicable to the land use study area generally. Therefore, a brief discussion of zoning is included to further establish the context of the Preferred Alternative.

The Project Site is located in an area zoned C6-4 and C5-3 and falls within the boundary of the Special Lower Manhattan District (see Figure 4-2 and Table 4-1). The surrounding area located in Liberty Park Plaza is zoned C5-5, a high-density restricted central commercial district intended for retail and large offices, as well as high-density residential and community facilities. The open plaza was constructed as part of the development of 1 Liberty Plaza, a large office building to the immediate north. The surrounding area located at the WFC is zoned under the Special BPC District, described below.

The entire approximately 16-acre WTC site is owned by PANYNJ. The 1962 legislation authorizing the development of the WTC provides that so long as the WTC is owned by PANYNJ, no agency, commission, or municipality shall have jurisdiction over the WTC. The New York City Zoning Resolution, Building Code, and Fire Code do not therefore apply to the WTC site, including the Project Site. However, it is PANYNJ policy to voluntarily conform to the maximum extent practicable to local building and fire codes. This policy is evidenced by the various Memoranda of Understanding (MOUs) that PANYNJ has entered into with the City's Department of Buildings and Fire Department. These MOUs establish the policy of PANYNJ to ensure that its facilities meet code requirements to the maximum extent practicable and, where appropriate, exceed them.

Table 4-2 summarizes the existing zoning districts located throughout the larger study area. The North of WTC Site, Broadway Corridor, and Greenwich South Corridor subareas are largely zoned for medium- and high-density commercial office development. The Project Site is surrounded by General Central Commercial (C6) districts to the north and south, as well as Restricted Central Commercial (C5) districts to the north and east. The C6 districts are zoned for a wide range of retail, office, amusement, service, custom manufacturing, and related uses normally found in the central business district. These districts typically contain corporate headquarters, large hotels, entertainment facilities, and some residential development, with ground-floor retail uses in some buildings. The C5 districts, found in the Broadway Corridor and portions of the Greenwich South Corridor and North of WTC site subareas, are designed to provide for office buildings and a great variety of retail stores.

Table 4-1
Study Area Zoning

Zoning District	Permitted Uses/Bulk
Commercial Districts	
C2-8	Low-density neighborhood shopping/services. High-density residential and community facility use.
C4-6	Medium-density general commercial (such as department stores and theaters). High-density residential and community facility.
C5-3, C5-5	High-density restricted central commercial district intended for retail and large offices. High-density residential, community facility.
C6-1, C6-2, C6-3	Medium-density general central commercial outside CBD. Low- to medium-density residential and community facility.
C6-1G	Medium-density general central commercial district. Allow residential conversion of non-residential floor area only by special permit.
C6-2A, C6-3A	Contextual* medium-density general central commercial district outside CBD. Low- to medium-density residential and community facility.
C6-4, C6-9	High-density general central commercial intended for CBD, allowing medium- to high-bulk offices. High-density residential, community facility.
C6-4A	Contextual high-density general central commercial intended for CBD, allowing medium- to high-bulk offices. High-density residential, community facility.
C8-4	General service district intended to provide for necessary service establishments often involving objectionable influences (noise from operations or truck traffic). Incompatible with residential and retail uses.
Residential Districts	
R7-2	Medium-density residential, community facility.
R8	General residence district. High-density residential, community facility.
Manufacturing Districts	
M1-4	Low-density light industrial uses (high performance) and certain community facilities.
M1-5, M1-6	Medium-density light industrial uses (high performance) and certain community facilities (for loft areas).
M2-3	Low-density general industrial uses (medium performance), most commercial uses.
Special Purpose Districts	
LM	Special Lower Manhattan District
TMU	Special Tribeca Mixed-Use District
BPC	Special Battery Park City District
TA	Special Transit Land Use District

Note: * Contextual districts mandate street wall heights, lot coverage and density requirements, which produce lower, bulkier buildings that maintain the scale and street space of the existing neighborhoods.
Source: Zoning Resolution of the City of New York.

Table 4-2
Zoning Districts by Subarea

Subarea	Zoning Districts
WTC Redevelopment Sites (Adjacent Sites only)	C6-9, Special Lower Manhattan District, Special BPC District
North of WTC site	C5-3, C6-2A, C6-3, C6-3A, C6-4, Special Tribeca Mixed-Use District, Special Lower Manhattan District
Broadway Corridor	C5-3, C5-5, Special Lower Manhattan District
Greenwich South Corridor	C5-5, C6-9, Special Lower Manhattan District
Battery Park City	Special BPC District
Tribeca	C6-2A, C6-3A, C6-4, C6-4A, M1-5, M1-6, M2-3, Special Tribeca Mixed-Use District
Chinatown below Canal Street	C2-8, C6-1, C6-1G, C6-4, C6-4A, C8-4, R7-2, M1-4, M1-5, M1-6, Special Transit Land Use District
Civic Center	C6-1, C6-4
Brooklyn Bridge to Battery Park	C2-8, C4-6, C5-3, C5-5, C6-9, R8, M1-4, Special Lower Manhattan District

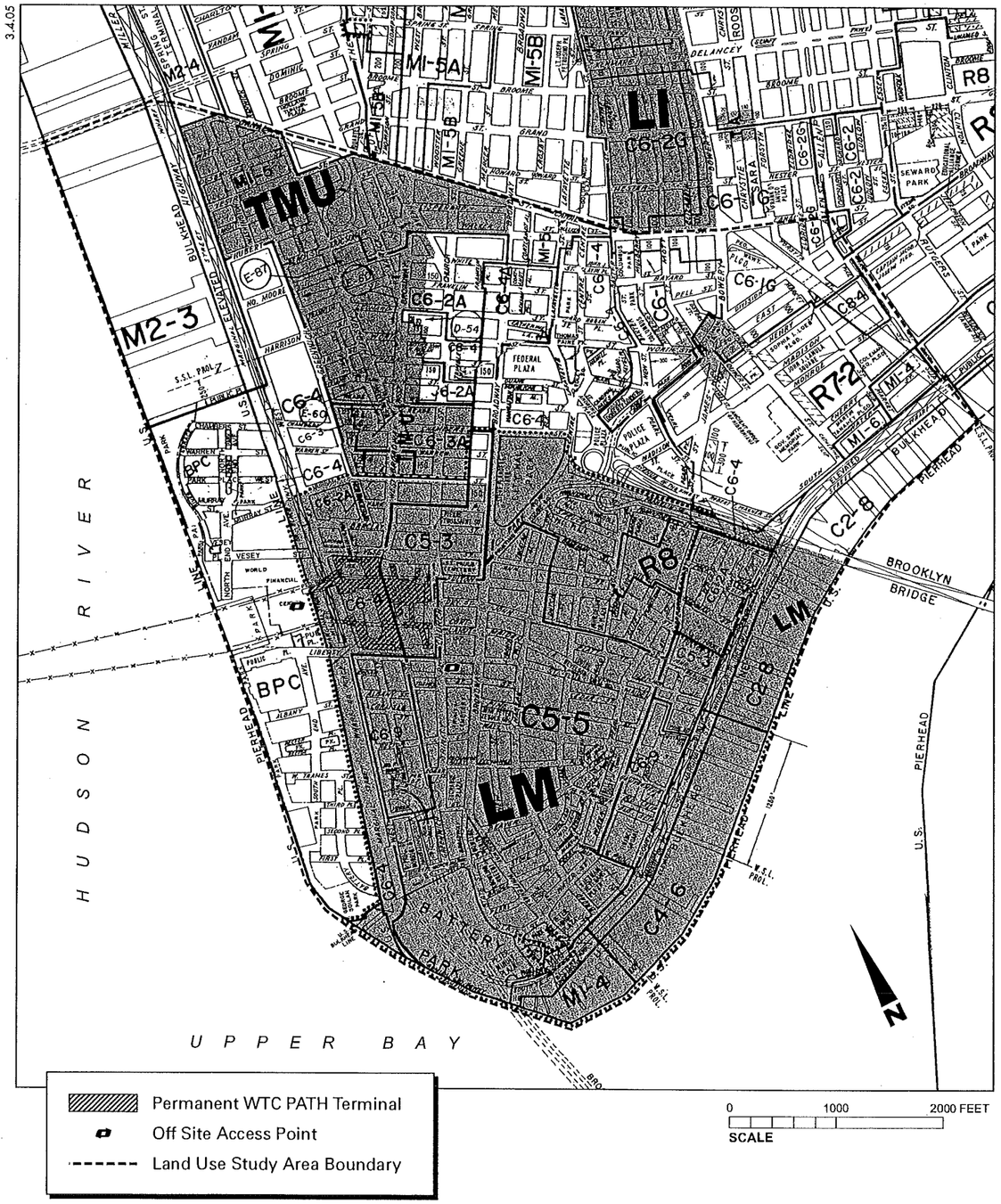


Figure 4-2
Zoning Map

Tribeca is primarily zoned with medium-density commercial districts (C6), with manufacturing districts (M1 and M2) mapped in the north and west sections of the subarea near Canal Street and along the Hudson River waterfront. The Chinatown below Canal Street subarea contains commercial (C6 and C8), manufacturing (M1), and residential (R7) zoning districts. The C6-4 zoning district encompasses nearly the entire Civic Center subarea allowing for medium- to high-bulk office buildings. The Brooklyn Bridge to Battery Park subarea is primarily zoned with medium- and high-density commercial districts (C5 and C6), with low- to medium-density districts (C2-8 and C4-6) mapped along the East River waterfront. In addition, the R8 residential district is mapped specifically for the Southbridge Towers residential development just south of the Brooklyn Bridge. With the exception of the manufacturing districts along the waterfront, zoning districts throughout the study area permit residential uses.

In addition to the underlying zoning, three special districts cover portions of the study area: the Special Lower Manhattan District, the Special BPC District, and the Special Tribeca Mixed-Use District.

Special Lower Manhattan (LM) District. The Project Site and a large portion of the surrounding study area lie within the Special LM District. Established in 1998, it covers the country's third-largest central business district including all of Lower Manhattan generally south of Murray Street and the Brooklyn Bridge. It was created to simplify and consolidate the overlapping complex regulations previously governing Lower Manhattan, to allow the area to grow while reinforcing its historic character and built fabric, and to facilitate the change to a mixed-use community. The zoning change relaxed strict use controls that had inhibited the retail, entertainment, and service establishments generally needed to support a 24-hour community. New height and setback controls also allow considerable design flexibility and, at the same time, are intended to encourage new development that would be consistent with the historic character of Lower Manhattan.

Special Battery Park City District. That portion of the Project Site located at the WFC and BPC as a whole are governed by the Special BPC District. The Special BPC District was established by the city and the BPCA in 1973 to guide development in accordance with the BPC Master Plan. Elements of the Master Plan include a central office complex flanked by residential neighborhoods to the north and south, and a continuous, publicly accessible esplanade along the Hudson River waterfront. The district contains special design controls with respect to floor area ratio (FAR), required building walls, and permissible building height.

Zoning text modifications for the special district occurred in 1981, 1987, and 2001. The BPC District is divided into three subdivisions: Zone A, Zone B, and Zone C. Zone A provides for residential development with ancillary retail and service uses and hotels. Zone B, which encompasses the WFC and the New York Mercantile Exchange Building, provides for commercial and mixed-use development with ancillary retail and service uses. Zone C provides for commercial and mixed-use development, parking, and ancillary retail and service uses.

Special Tribeca Mixed-Use (TMU) District. The Special TMU District covers the area from Greenwich Street to the west of West Broadway and from north of Harrison Street to Murray Street, and includes portions of the Tribeca and North of WTC site subareas. It is intended to retain stable industries within the Tribeca neighborhood that provide jobs and adequate wages and to encourage stability and growth by permitting controlled residential uses and light manufacturing to coexist. In addition, the district aims to facilitate the change to a mixed-use community and permit the area to grow while protecting its historic character.

World Trade Center Act of 1962

In 1962, the States of New York and New Jersey enacted legislation which authorized PANYNJ to undertake a port development project consisting of 1) the WTC, 2) the Hudson Tubes, and 3) certain extensions of the Hudson Tubes. PANYNJ was authorized to cooperate with other government agencies in the rehabilitation and redevelopment of the WTC and Hudson Tubes for the purpose of renewal and improvement of these areas as part of the port development project. The legislation provided for PANYNJ to acquire, rehabilitate, and operate the rail transit property associated with the Hudson Tubes either directly or through a wholly owned subsidiary corporation. Accordingly, PANYNJ established the Port Authority Trans-Hudson (PATH) Corporation, which acquired, by condemnation, the railroad and equipment owned by the H&M Railroad Company, including the Hudson Terminal Building in Lower Manhattan.

Lower Manhattan Economic Revitalization Plan

The Lower Manhattan Economic Revitalization Plan was the center of public policy initiatives that generated new economic activity in Lower Manhattan. This plan was enacted into law in 1995 and has been extended until June 30, 2007. The plan includes benefits for both commercial tenants and residential conversions, as well as other cost-savings programs. Commercial tenant benefits include a five-year real estate tax abatement and a commercial rent tax special reduction. Both programs are applicable for pre-1975 commercial buildings with leases executed prior to March 31, 2001. The program benefits are required to pass through to commercial tenants. A residential conversion program is also available for a 100 percent exemption of the increased assessed value due to residential conversion for 8 years (9 years for landmarked buildings) and phased in at 20 percent every year for 4 years thereafter, for a total of 12 years. In addition to tax incentive benefits, the plan includes a 12-year energy program consisting of a reduction of electricity costs. The plan attracted traditional Lower Manhattan commercial tenants and multi-media, entertainment, and technology entrepreneurs, creating a new Information Technology District in the area.

The Alliance for Downtown New York

The Alliance for Downtown New York (Downtown Alliance), the city's largest Business Improvement District (BID), was established in 1995. Generally, a BID delivers supplemental services such as sanitation and maintenance, public safety and visitor services, marketing and promotional programs, capital improvements and beautification in a designated area. BIDs are funded by a special assessment paid by property owners within the district. The Downtown Alliance's mission is to transform Downtown into a 24-hour neighborhood and to create a safe, clean, live-work, wired community for the 21st century. The BID covers the area from City Hall to the Battery and from the East River to Route 9A, and includes approximately 100 msf of office space and over 100 city blocks.

Battery Park City Authority

The BPCA is a public benefit corporation created in 1968 by Governor Nelson Rockefeller and the New York State Legislature to develop and operate the 92-acre landfill at the southwestern tip of Manhattan known as BPC. Parcels of land are leased to private developers who build in accordance with BPCA guidelines, as described above (see "Special BPC District").

Hudson River Park Trust

In 1998, the Hudson River Park Act created the Hudson River Park Trust (HRPT) and established the boundaries for the Hudson River Park. HRPT is a public benefit corporation under the jurisdiction of both the City and the State that is responsible for developing and operating the Hudson River Park, which extends from Battery Park to West 59th Street, where it connects with Riverside Park. The 5-mile, 550-acre park, much of which is in construction, will be built in six segments. When complete, Hudson River Park will consist of 13 park piers, a continuous waterfront esplanade, active and passive recreation space, boating, and three commercial development nodes.

The portion of the park opposite the Project Site and as far north as Chambers Street is Segment 2. Segment 3, located in the Tribeca subarea, runs from Chambers Street to north of Canal Street and includes Piers 25, 26, 32, and 34.

Local Waterfront Revitalization Program

The Project Site is located within the boundaries of the coastal zone. Pursuant to federal legislation, in 1999 and 2002, New York City and State, respectively, adopted policies aimed at protecting resources in the coastal zone. New York City's Waterfront Revitalization Program (WRP) contains 10 major policies, each with several objectives focused on improving public access to the waterfront; reducing damage from flooding and other water-related disasters; protecting water quality, sensitive habitats, such as wetlands, and the aquatic ecosystem; reusing abandoned waterfront structures; and promoting development with appropriate land uses. The principles of the WRP formed the basis for a NYCDCP study and the resulting adoption of new waterfront zoning. For City actions, the New York City Planning Commission (CPC) certifies whether a proposed action is in compliance with the City's WRP. The New York State Department of State (NYSDOS) or the applicable state agency has this responsibility on the state level. Chapter 14, "Coastal Zone Management," provides a detailed analysis of the compatibility of the Preferred Alternative with the 10 WRP policies.

421-g Program

The 421-g program provides a real estate tax exemption and abatement incentive for developers to convert commercial buildings, generally south of Murray and Frankfort Streets, into residential dwellings. Up to 25 percent of the converted building may contain commercial, community facility or accessory use space, with the tax exemption reduced proportionally if the total nonresidential space exceeds 12 percent of the aggregate floor area. The program generally provides for a 14-year exemption from the increase in real estate taxes resulting from the work and abatement of substantially all existing real estate taxes on the site. Since 1998, more than 50 buildings in the study area have been converted from office to residential use under the 421-g program.

Washington Street Urban Renewal Area

The city established WSURA in 1961; it expired on January 25, 2002. The WSURA Plan's stated objective was to promote diversified and economically sound development in the area from Barclay to Hubert Streets, between Greenwich Street and Route 9A. Originally, the plan called for development of commercial, light manufacturing, or warehouse uses, but after being amended nine times, the plan called for community space and residential or office development. Today, Sites 5B and 5C between Chambers, Greenwich, and Murray Streets and Route 9A are the only two WSURA sites that remain undeveloped.

CHANGES IN THE AFFECTED ENVIRONMENT SINCE SEPTEMBER 11, 2001

This section provides a detailed description of those land uses and public policies in the land use study area which have changed since September 11, 2001. These differences are largely concentrated on the Project Site, the WTC site, and the subareas immediately surrounding these sites. The land uses and public policies which characterize the Project Site and surrounding study area today form the basis for future land use projections and public policy as well as the basis for the impact analysis which follows. This section highlights those land uses which have changed as a direct result of the terrorist attacks along with any other changes which have occurred, including new construction, conversions, and vacancies, and the effect of such changes on neighborhood character and public policy. Figure 4-3 shows a land use map for the study area as it exists today.

LAND USE AND NEIGHBORHOOD CHARACTER

Loss of the WTC complex left Lower Manhattan without PATH train service to New Jersey due to the destruction of the WTC PATH Terminal and reduced the amount of commercial office space by approximately 13.3 msf, including over 10 msf on the WTC site itself. A substantial number of residents and businesses were displaced by the attacks, and the events resulted in the loss or relocation of hundreds of corporations, small businesses, and retail and office establishments. Except for the Project Site, the WTC Redevelopment Sites, and the immediately surrounding blocks, land use and neighborhood character remain much the same today as they were prior to September 11, 2001. Those buildings which were destroyed or severely damaged as a result of the attacks of September 11, 2001, and its aftermath are listed in Table 4-3. Figure 4-4 shows those parcels with changes to land use since September 11, 2001.

Table 4-3
Affected Buildings

Building/Address	Pre-September 11 Use	Current Status
WTC PATH Terminal	Transportation	Destroyed
1-6 WTC	Office-Retail-Hotel	Destroyed
WFC 1-3	Office-Retail	Repaired and Reopened
WFC Winter Garden	Public Atrium	Rebuilt and reopened
Barclay-Vesey Building (140 West Street)	Utilities-Office	Partially reopened; undergoing renovations
7 WTC	Office	Destroyed; new building under construction
Federal Office Building/U.S. Post Office (90 Church Street)	Office-Institutional	Closed for renovations
Fiterman Hall (30 West Broadway)	Educational	Closed; planned for demolition and rebuilding
Millennium Hotel	Hotel	Renovated and reopened
Century 21	Retail	Renovated and reopened
1 Liberty Plaza/Brooks Brothers	Office-Retail	Renovated and reopened
106 Liberty Street	Restaurant	Renovated and reopened
110 Liberty Street	Residential	Renovated and reoccupied
114 Liberty Street	Residential	Vacant; undergoing renovation
125 Cedar Street	Residential	Renovated and reoccupied
FDNY Liberty Street Firehouse	Institutional	Rebuilt and opened
130 Liberty Street	Office	Vacant; planned for demolition
St. Nicholas Greek Orthodox Church	Institutional	Destroyed
130 Cedar Street	Office	Vacant
90 West Street	Office	Vacant; planned for conversion to residential use

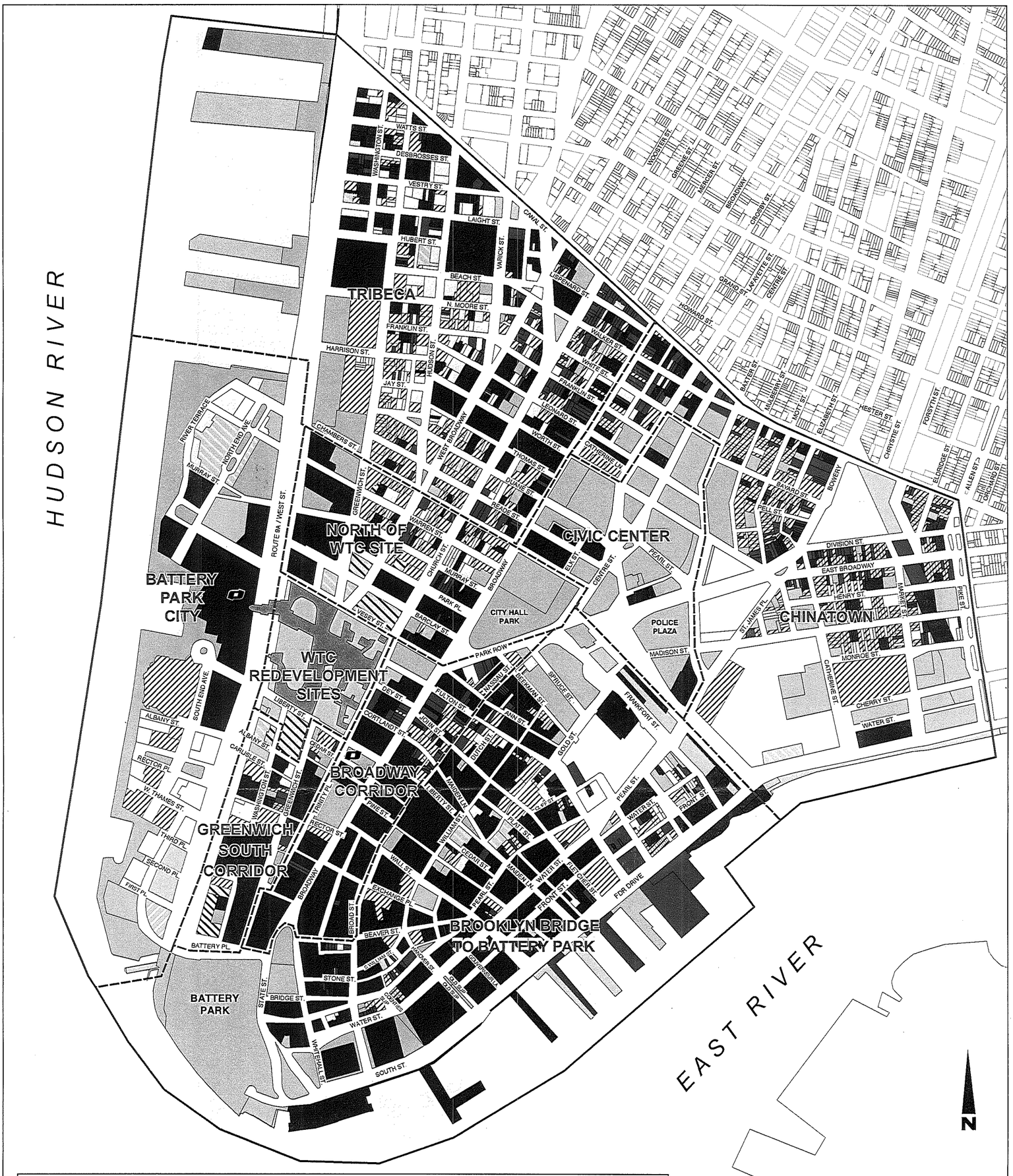


Figure 4-3
Existing Land Use (January 2004)

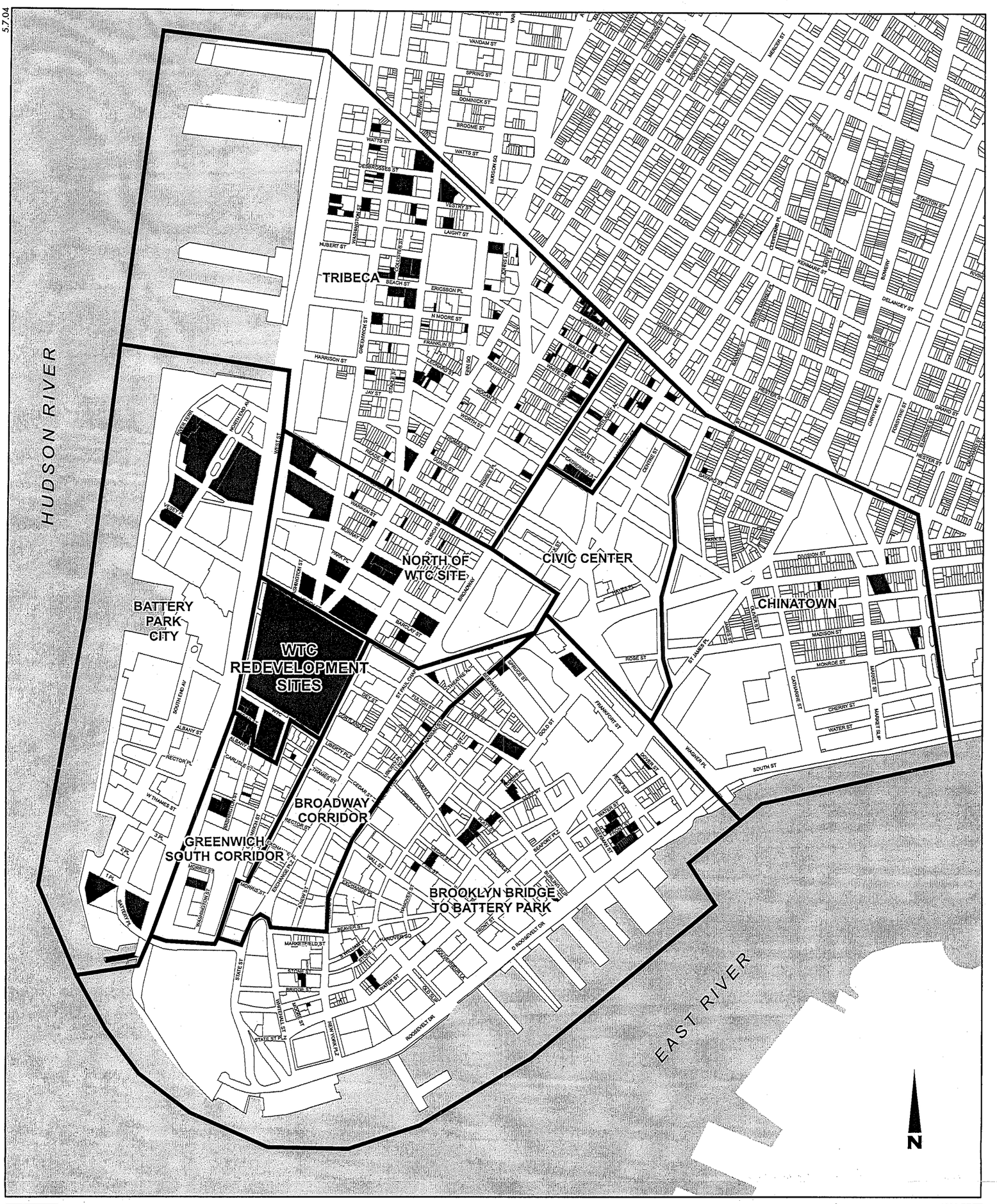


Figure 4-4

Parcels with Changes in Land Use Since September 11, 2001

In addition to the buildings damaged or destroyed as a result of the terrorist attacks, notable changes to land use in the study area since September 11, 2001 include:

- Construction of temporary WTC PATH station.
- Reconstruction of IRT No. 1/9 subway lines through the WTC site.
- Residential conversions continued throughout the study area, concentrated in the North of WTC Site, Tribeca, and Brooklyn Bridge to Battery Park subareas.
- New residential construction in the Battery Park City North neighborhood and the Brooklyn Bridge to Battery Park subarea. Construction has begun on several additional buildings.
- Completion of several cultural institutions in Battery Park City (Skyscraper Museum, Jewish Museum Expansion, and Irish Hunger Memorial), and the opening of Millennium High School at 75 Broad Street in the Brooklyn Bridge to Battery Park subarea.

Project Site

The attacks of September 11, 2001 destroyed the WTC PATH Terminal along with the Twin Towers and the rest of the WTC complex. Today, the temporary WTC PATH station, which opened in November 2003, occupies a large portion of the Project Site. The station entry plaza and canopy occupy the west side of Church Street at Fulton Street on the eastern portion of the Project Site. The rebuilt IRT No. 1/9 subway lines also cross through the eastern portion of the site. The temporary WTC PATH station's mezzanine level, station platforms, and rail tracks are located on the western portion of the site. The rest of the Project Site remains vacant or under construction, and is not accessible to the public.

Liberty Park Plaza is generally open to the public for passive recreational use after being closed for many months after September 11, 2001. The plaza is now the site of the Greenmarket that used to operate across Church Street at the WTC. The Winter Garden at the WFC was reconstructed after suffering severe damage on September 11, 2001.

Study Area

WTC Redevelopment Sites. Each of the Twin Towers was struck on September 11, 2001, by a terrorist hijacked airline jet. Within hours, the Twin Towers collapsed onto the WTC and surrounding areas, causing massive death and devastation. Today, the WTC site is vacant except for the temporary WTC PATH station, the IRT No. 1/9 subway lines crossing the site, and ongoing construction activity. Except for the temporary WTC PATH station and a newly constructed sidewalk/viewing area on the west side of Church Street at the edge of the WTC site, the site is fenced off and not accessible to the public.

The north façade of the office tower at 130 Liberty Street was severely damaged in the attacks of September 11, 2001, and its two-level plaza was completely destroyed. The building stands shrouded in protective black netting and is slated for demolition. To its west, the St. Nicholas Greek Orthodox Church was destroyed and the block on which it stood remains vacant and part of the staging area for ongoing construction activities at the WTC site.

North of WTC Site. Directly across Vesey Street from the WTC site, office buildings were damaged or destroyed on September 11, 2001. In the center, 7 WTC is being rebuilt on the block bounded by Vesey, Barclay, and Washington Streets and West Broadway. It will replace the two Consolidated Edison Company of New York, Inc. (Con Edison) electrical substations and most of the Class A office space that formerly occupied the site. The new building is being

constructed on the west end of its former footprint to preserve the Greenwich Street corridor for pedestrians and possibly vehicles.

West of the 7 WTC site, the Verizon Building's south side was damaged by the collapse of WTC Tower 1 and its east side was damaged by the subsequent collapse of 7 WTC. Portions of the Verizon Building were recently reopened as the building continues to undergo extensive repairs. To the east, although there is little or no visible damage to the exterior of the massive Federal Office Building/U.S. Post Office, it is undergoing extensive interior cleaning and reconstruction. Vesey Street remains closed between Route 9A and Church Street. A narrow pedestrian walkway runs adjacent to the Federal Office Building/U.S. Post Office (90 Church Street); west of Washington Street the walkway is actually in the bed of Vesey Street. BMCC's Fiterman Hall also sustained extensive damage due to the collapse of 7 WTC and remains closed. These blocks are less populated and therefore noticeably quieter than before September 11, 2001.

The rest of the subarea has seen a number of changes in land use. The Woolworth Building on Broadway between Barclay Street and Park Place is being converted in phases to a mixed-use building to house the New York University (NYU) School of Continuing and Professional Studies (which recently occupied several of the lower floors) and luxury condominiums. Sites 5B and 5C are now used for public and private parking uses and planned for mixed-use residential developments in the future. The area has also seen several residential conversions, the largest of which is 50 Murray Street.

Broadway Corridor. Land use and neighborhood character in the Broadway Corridor are substantially the same today as they were prior to September 11, 2001. The wrought iron fence surrounding St. Paul's grounds has been the location of many informal memorials. The buildings on Church Street immediately east of the WTC site that suffered damage on September 11, 2001, have since reopened with the same uses after undergoing repairs and renovations. Without the WTC buildings across Church Street, these large buildings are now more visible from the north, west, and south.

Although not as busy as before September 11, 2001, the area attracts large numbers of workers and visitors throughout the day and evening traveling to and from work, shopping, or viewing the WTC Site across the street. Traffic along Broadway and Church Street is lighter. More blocks are closed to traffic in the vicinity of the New York Stock Exchange, hindering traffic flow along the east-west streets. While the area is quieter, it is not so different as to indicate any substantial change in neighborhood character.

Greenwich South Corridor. A number of buildings in the Greenwich South Corridor were severely damaged or destroyed as a result of the terrorist attacks. All but one (114 Liberty Street) of the buildings along Liberty Street have been cleaned, renovated, and reoccupied. The reopening of the redesigned FDNY firehouse and the active ground floor businesses along Liberty Street facing the WTC site have brought back activity and with it some sense of normalcy to these blocks which remained inactive for many months, and in some cases years, after September 11, 2001. Immediately south of the WTC site, Liberty Street remains closed to vehicular traffic. Part of Liberty Street is closed off for WTC site reconstruction and part of it is open for pedestrian circulation and access to the Liberty Street bridge across Route 9A to BPC. 90 West Street, planned for residential conversion, is also vacant.

The former office building at 90 Washington Street was converted to residential use, having been partially financed through the Liberty Bond program (see "Changes in the Affected

Environment Since September 11, 2001—Public Policy"). The Downtown Athletic Club has closed since September 11, 2001, and the building remains vacant.

Except for the buildings identified above, land use in the remainder of the Greenwich South Corridor has generally been the same since September 11, 2001. This subarea remains less active than the other subareas surrounding the Project Site, with increased retail and building vacancies and some interior streets closed to traffic.

Battery Park City. The Winter Garden was severely damaged in the aftermath of September 11, 2001, and has since been rebuilt and opened to the public, along with the rest of the shops and offices at the WFC. In the northern part of BPC, the residential buildings at 20 and 22 River Terrace have since opened, and two more residential buildings are under construction nearby. Teardrop Park, a new open space adjacent to 22 River Terrace, is also currently under construction.

The portion of the Route 9A roadway adjacent to the WTC site suffered extensive damage on September 11, 2001, its aftermath, and during the recovery period. Today, a six-lane temporary roadway runs between Liberty and Vesey Streets. One permanent pedestrian bridge across Route 9A at Liberty Street, damaged on September 11, 2001, and two temporary pedestrian bridges at Rector and Vesey Streets help connect BPC to the rest of Lower Manhattan.

The overall neighborhood character remains the same in BPC, with a slightly more active North neighborhood due to the addition of several hundred dwelling units. The buildings of the WFC are more visible from the east but feel more isolated from the Lower Manhattan business core, having been designed to harmonize with the size and design of the Twin Towers. In addition, the ballfields along Route 9A between Warren and Murray Streets were opened for use in the summer of 2003. Teardrop Park between River Terrace and North End Avenue is under construction and expected to be complete in 2004. Across the street from the recently expanded Jewish Museum, the Skyscraper Museum recently opened its doors at the base of the Ritz-Carlton building.

Tribeca. The major change in Tribeca is the continued increase in residential conversions which have appeared throughout the subarea, particularly along Broadway, Hudson Street, and in the northwest corner of the subarea.

Chinatown below Canal Street. Other than a few residential conversions in the western portion of the study area, there is little new development in Chinatown. An increased number of commercial vacancies and dilapidated buildings can be found throughout the subarea with a decrease in street activity since September 11, 2001.

Civic Center. No changes to land use or neighborhood character have occurred in the Civic Center subarea since September 11, 2001.

Brooklyn Bridge to Battery Park. A number of residential conversions and new construction are occurring throughout the subarea. Construction of two new residential buildings is near completion at 2 Gold Street and 10 Liberty Street, both of which are funded in part through the New York Liberty Bond Program (see "Changed to the Affected Environment Since September 11, 2001—Public Policy" below).

At the southern tip of Manhattan, the Whitehall Ferry Terminal is currently undergoing renovations. The Fritz Koenig *Sphere*, a sculpture that originally stood in Tobin Plaza on the WTC site and was damaged on September 11, 2001, stands in Battery Park as an interim memorial.

PUBLIC POLICY

Since September 11, 2001, a number of public policy initiatives have been implemented to assist in the recovery efforts and continued revitalization of Lower Manhattan. These are in addition to policies that continue to be in effect since before the terrorist attacks (see "Pre-September 11, 2001 Baseline Conditions—Public Policy"). The major policies and plans addressing the Project Site and surrounding study area are discussed below.

Lower Manhattan Development Corporation

LMDC was created in November 2001 as a subsidiary of the Empire State Development Corporation (ESDC) to help plan and coordinate the rebuilding and revitalization of Lower Manhattan south of Houston Street so that it will re-emerge as a stronger and more vibrant community. LMDC is charged with assisting New York City to recover from the terrorist attacks on the Twin Towers. Through consultation with its many advisory councils representing a cross-section of affected communities and direct communication with government officials, elected representatives, community organizations, affected individuals, and members of the public, LMDC has gathered information on issues critical to the city's recovery, including transportation and infrastructure, residential and commuter concerns, economic development, education, and tourism and the arts. LMDC has also sponsored several initiatives and studies relating to short-term and long-term solutions to the challenges facing Lower Manhattan neighborhoods in the wake of September 11, 2001. Among these efforts are open space and streetscape improvements and studies of affordable housing, Chinatown traffic and transportation, the Fulton Street corridor, and Greenwich Street south of the WTC site. LMDC receives federal funding through two Community Development Block Grants totaling $2.783 billion from the U.S. Department of Housing and Urban Development (HUD).

New York City's Vision for a 21st Century Lower Manhattan

On December 12, 2002, Mayor Michael Bloomberg released a *Vision for a 21st Century Lower Manhattan* (New York City's *Vision*) with the stated purpose to connect Lower Manhattan to the world around it, build new neighborhoods, and create public places that make Lower Manhattan one of the most appealing places in the world. It was released in conjunction with LMDC's announcement of seven design proposals for the Project Site. The plan describes various recommendations to help revitalize and improve Lower Manhattan as a global center of business by creating new regional transportation links. To attract new investment in the neighborhoods south and east of the Project Site, the city calls for the creation of Fulton Market Square and Greenwich Square. Other goals include improvements to streetscapes, the expansion and creation of public plazas and parks, and the continued revitalization of the waterfront. The *Vision* aims to spark private market reactions from these public investments to increase the number of businesses and residents in Lower Manhattan.

New York Liberty Bond Program

As part of the efforts toward rebuilding and revitalizing New York City in the wake of September 11, 2001, the New York Liberty Bond Program was introduced as a cooperative program between New York Liberty Development Corporation, New York City Industrial Development Agency, New York State Housing Finance Agency, and New York City Housing Development Corporation. These agencies offer tax-exempt financing for the construction and renovation of commercial and residential properties that lie primarily within the Liberty Zone, which is the area of Manhattan south of Canal Street, East Broadway, and Grand Street. The

goal of the program is to create a seven-day-a-week, 24-hour mixed-use, diversified community in Lower Manhattan by repairing and replacing damaged and destroyed commercial space; creating additional multifamily residential and neighborhood retail development; providing modern office space for displaced and decentralized businesses; attracting new residents and employers to New York City; and encouraging environmentally responsible design and construction.

Federal Policies

In recognition of the disastrous impact of the terrorist attacks, President George W. Bush declared Lower Manhattan a national disaster area and $21 billion in aid was approved by the United States Congress for the repair, restoration, and recovery efforts. These funds were allocated to the Federal Emergency Management Agency (FEMA), the Federal Transit Administration (FTA), and HUD for specific objectives and grants to be separately administered by each of the agencies and local project sponsors under Defense Appropriations Act of 2002 (Public Law 107-117), and Supplemental Appropriations Act of 2002 for Further Recovery From and Response to Terrorist Attacks on the United States (Public Law 107-206). The U.S. Small Business Administration (SBA) offered low-interest loans to eligible individuals to repair or replace damaged property and personal belongings not covered by insurance. In addition to emergency response efforts, FEMA's Disaster Housing Program also made funds and services available to individuals whose homes were uninhabitable and also provided cash grants to those who did not qualify for the SBA loans.

D. PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

CONSTRUCTION PERIOD (2006)

FUTURE COMMON TO ALL ALTERNATIVES

Land Use and Neighborhood Character

A number of major projects will be completed during the construction period resulting in increased land use densities throughout the study area. Overall, an additional 1.7 msf of new office space, 1.8 msf of restored office space, 53,000 square feet of additional commercial space, over 700,000 square feet of institutional space, and over 5,400 new residential units are expected for completion by 2006. The major projects are discussed briefly below. A complete list of projects expected to be complete by 2006 in the study area can be found in Appendix A, Table A-1.

While these developments may result in some changes to the character of the area in the immediate vicinity of the development sites, most of the neighborhoods throughout the study area are expected to retain their most prominent characteristics, and overall neighborhood character will be minimally affected. Lower Manhattan will continue to possess a diversity of uses including commercial office, retail, residential, government, cultural, educational, and open space. Residential use will increase as a result of new construction and conversions throughout the study area. Most of the buildings damaged on September 11, 2001 will be repaired and restored to their former use, increasing activity on now underutilized blocks. All new projects are being developed within the boundaries of existing blocks and would not result in the removal of any architecturally distinguished buildings located throughout the study area.

Although additional employees are expected in the area by 2006, the worker population will be substantially less than pre-September 11 densities while the WTC Redevelopment Sites remain largely vacant. Any increase in worker and residential populations is not likely to result in

changes to the character of the neighborhoods beyond the area immediately surrounding the specific developments.

WTC Redevelopment Sites. In 2006, major construction will be in progress at the WTC site on the Memorial, related cultural uses, the retail bases of the four planned office towers, and below-grade concourse levels for retail use and pedestrian connections. The two blocks south of Liberty Street, planned for office and open space uses, will be vacant and possibly used as construction staging areas. The construction of a new St. Nicholas Church is planned and may be underway in 2006.

North of WTC Site. The Verizon Building and the Federal Office Building/U.S. Post Office directly north of the WTC site on Vesey Street will be restored, repaired, renovated, and reopened with the same land uses as existed prior to September 11, 2001. Between these buildings, the new 1.6 msf 7 WTC office tower (and two Con Edison substations) will be completed and occupied. In addition, several residential and mixed-use developments are expected to be built. The largest of these will be on the former WSURA Site 5C at the corner of Chambers Street and Route 9A. NYU's School of Continuing Education and Professional Studies will have expanded its presence at the Woolworth Building (233 Broadway), and 150 new residential units will occupy the upper floors of this landmark building.

Broadway Corridor. No development projects have been identified for completion by 2006 in the Broadway Corridor.

Greenwich South Corridor. Restoration and conversion of 90 West Street will have provided over 400 residences with street-level retail space and accessory parking.

Battery Park City. Most of the vacant parcels remaining in BPC are expected to be complete by 2006. Four primarily residential buildings will have produced almost 1,500 new dwelling units. Some of these buildings will include street-level retail or institutional space to be used by the BPC Parks Conservancy. The planned development at BPC Site 16/17, the large parcel bounded by Murray Street, North End Avenue, Vesey Place, and River Terrace, will contain over 500 housing units, a New York Public Library branch, not-for-profit space, a café, and new public open space. Redevelopment of Pier A between BPC and Battery Park for retail and tourism uses is also expected to be complete before 2006. Lastly, Route 9A south of West Thames Street will have a new esplanade and open space.

Tribeca. Consistent with existing trends, small- to medium-sized buildings throughout Tribeca are expected to continue to be converted from office or industrial to residential use and new residential buildings will be constructed by 2006. These buildings would each contain between 4 and 120 units of various sizes. An expansion is also planned for the New York Law School on Church Street between Leonard and Worth Streets.

Chinatown below Canal Street. No planned or proposed land use development projects in the Chinatown below Canal Street subarea that will be completed by 2006 have been identified.

Civic Center. No development projects have been identified for completion by 2006 in the Civic Center subarea.

Brooklyn Bridge to Battery Park. A number of developments are planned for the Brooklyn Bridge to Battery Park subarea. Several sites will be developed with mixed-use residential buildings, which will include a combination of residential and institutional, office, retail, and/or parking uses. These include the NYU Downtown Hospital parking lot on Gold and Beckman Streets, 15 William Street, also a parking lot, and 2 Gold Street. In total, over 2,700 residential

units will be added to the Brooklyn Bridge to Battery Park subarea by 2009. Millennium High School will have expanded to its full capacity at 75 Broad Street. The reconstructed Whitehall Ferry Terminal will be opened at the southern tip of Manhattan.

Public Policy

The implementation of the projects described above by the 2006 construction year would be consistent with public policies for the area. The city and state policies that support the recovery and growth of Lower Manhattan as both a thriving central business district and an evolving 24-hour community are expected to continue. An increase in residential development through conversions and new construction would be consistent with existing trends for the area. Overall, infrastructure improvements and developments providing new and expanded uses would represent a demonstration of city, state, and federal policy, along with private investment, to rebuild Lower Manhattan.

NO ACTION ALTERNATIVE

In 2006 under the No Action Alternative, the temporary WTC PATH station would continue to operate as it does today with a single entry/exit at Fulton and Church Streets and no change in land use would occur. The temporary WTC PATH station would continue to provide a direct transportation connection between Lower Manhattan and New Jersey and accommodate expected commercial and residential growth throughout the study area (see Chapter 5, "Socioeconomic Conditions"). Construction activity associated with the WTC Memorial and Redevelopment Plan will continue on the remainder of the Project Site independent of this alternative. Land use at the Project Site, including the WFC and Liberty Park Plaza surrounding areas, would not change and no changes to neighborhood character would result.

PREFERRED ALTERNATIVE

Land Use and Neighborhood Character

In 2006, portions of the Preferred Alternative would be operational, with phased completion of other station components expected between 2007 and 2009. Construction on the remainder of the Preferred Alternative would be in progress at the Project Site in conjunction with ongoing construction at the WTC site. No changes in land use would occur. Much of the temporary WTC PATH station would continue to operate as it does today in conjunction with the completed portions of the permanent facility. Throughout the construction period, pedestrian access may be hindered due to sporadic closing, rerouting or narrowing of sidewalks used to access the sole entrance/exit of the temporary WTC PATH station at Fulton and Church Streets. While these construction activities may inconvenience pedestrians, these disruptions would be temporary and no long-term effects to land use or neighborhood character would result.

The construction of the proposed project would have temporary impacts on neighborhood character in the immediate vicinity of the project site. Temporary road closures, trucking activities, noise, and changes in air quality associated with construction activities may temporarily affect the quality of life for employees, residents, and visitors in the vicinity of the Project Site resulting in an adverse impact on neighborhood character in the immediate area. However, such activities are necessary to ensure the long-term vitality of Lower Manhattan and thus are likely to lead to a long-term positive benefit on the community and overall character of the area.

Public Policy

Construction of the Preferred Alternative would be consistent with the goals of PANYNJ, LMDC, and the city's *Vision* to revitalize Lower Manhattan as a competitive, thriving business district. No adverse impacts to public policy would result from the Preferred Alternative in the construction year.

OPENING YEAR (2009)

FUTURE COMMON TO ALL ALTERNATIVES

Land Use and Neighborhood Character

Project Site/WTC Redevelopment Sites. Development through 2009 would result in enormous changes to land use and neighborhood character at the WTC site, independent of the Preferred Alternative. The WTC site will change from a largely vacant site in 2006 to a mixed-use development with a Memorial and museum and office, cultural, retail, and open space uses. To the south, Washington Street will be closed, St. Nicholas Greek Orthodox Church will be reconstructed, and an open space will be created between Route 9A and Greenwich Street. These developments will strengthen and be a key element in the revitalization of Lower Manhattan by introducing a range of active and attractive uses (see Appendix A, Table A-2).

First, the initial development will include the Memorial and the related museum (Memorial Center). The extension of two streets, Greenwich and Fulton, through the WTC site, would recreate north-south and east-west linkages for pedestrians and vehicles that have not existed since before the creation of the WTC. The proposed performing arts center, a major new use for Lower Manhattan, will also face onto this intersection in the heart of the WTC site.

Freedom Tower, at the northwest corner of the WTC site, will also be completed by 2009. At a height of 1,776 feet this structure will be the tallest on the island of Manhattan and restore an element of the skyline lost on September 11, 2001. With 2.6 msf of office space, the tower will begin to replace the Class A office space lost on the WTC site. Its restaurants and observation decks will also be replacements for September 11, 2001 losses.

Retail bases of the three other towers on the WTC site will be complete by 2009 and together with the below-grade retail will provide up to 1 msf for stores. Major portions of this retail space will be at grade and open onto and enliven the sidewalks around and inside the WTC site.

A number of new open spaces will be created totaling approximately 5.6 acres. All of the open spaces, including the Memorial, will be at grade and immediately accessible from the sidewalks. Wedge of Light Plaza and PATH Plaza will be part of the east-west circulation system along with Fulton Street. Liberty Park South will stretch from Greenwich Street to Route 9A.

The potential bus garage for tour buses coming to the Memorial will be located below grade on the WTC site or, possibly, south of Liberty Street.

The Memorial and Memorial Center, along with the observation decks of Freedom Tower and its restaurants, will become major tourist attractions and attract visitors from all over the world to Lower Manhattan. The increase in visitors will benefit area businesses, particularly restaurants and shops well beyond the vicinity of the WTC site throughout the entire land use study area (see Chapter 5, "Socioeconomic Conditions"). Together, the diverse components of the WTC Memorial and Redevelopment Plan will contribute to the creation of a more active and attractive

WTC site. The overall character of the area will be improved from an essentially blighted state into a major destination for workers, tourists, and other visitors.

North of WTC Site. In keeping with the trend of increasing residential use in Lower Manhattan, a large residential project is expected to be complete at 270 Greenwich Street, formerly known as WSURA Site 5B, adding approximately 730 new residential units and 240,000 square feet of major retail uses to the area. This will serve to better connect the blocks to the east of Greenwich Street with BPC to the west by replacing a large, empty parcel with active residential and retail uses. BMCC's Fiterman Hall will be demolished and the site redeveloped for its former educational use.

Broadway Corridor. A major transportation project and several residential developments are expected to be complete in the Broadway Corridor by the 2009 opening year. The FTA in cooperation with MTA and NYCT is planning the Fulton Street Transit Center, scheduled for completion in late 2008/early 2009. The project's goal is to improve access to and from Lower Manhattan. It will consist of the construction and operation of a rehabilitated, reconfigured, enhanced multi-level underground transit hub that will incorporate four subway stations serving 12 subway lines. It will provide underground connections to WTC site developments and the Permanent WTC PATH Terminal, if built, at Dey and Church Streets. In addition, several residential conversions will be complete along Maiden Lane, Fulton, and John Streets.

Battery Park City. Another transportation project expected for completion by 2009 is the rehabilitation of Route 9A between Chambers and West Thames Streets. This section of highway, a portion of which is adjacent to the WTC Site, will either be restored at grade or placed in a short bypass beneath a wide median with an adjacent local roadway. Residential development will also continue in the North and South neighborhoods, adding over 850 residential units to BPC. The North neighborhood developments will include a new indoor community recreation center and additional space for the BPC Parks Conservancy. In the South neighborhood, the planned mixed-use development at 1st Place between Route 9A and Battery Place, will be home to the new Women's Museum. In addition, Site 26 will be developed with a 2.3 million-square foot commercial office tower with ground-floor retail and accessory parking uses.

Tribeca. Segment 3 of the Hudson River Park, which runs from Chambers Street to Houston Street north of the study area, will be complete. Currently in design development, this segment will feature two of the park's longest piers—25 and 26 near North Moore Street in Tribeca—and an "eco-pier" at Canal Street. A number of public use facilities, including a river education center, habitat planting area, boathouse, restaurant, park concessions, playgrounds, volleyball, practice field, boat docking, minigolf, skate park, and other passive and active recreation opportunities, will be operating by 2009. Residential conversions are also expected to continue throughout the subarea.

Brooklyn Bridge to Battery Park. The expanded South Ferry Subway Terminal will be opened at the southern tip of Manhattan. The completely redesigned subway station will accommodate the full length of a typical 10-car subway train (rather than the five cars it accommodates in 2004) and provide new connections to the Staten Island Ferry and to the Whitehall Street subway station. Also planned are several large residential developments through both new construction and conversion. Almost 3000 new dwelling units will be added there by 2009.

More generally, an aggressive street reconstruction program is being undertaken in Lower Manhattan both to relocate and strengthen infrastructure lost during the events of September 11, 2001, and to repair streets damaged by recovery vehicles in the months following. By 2007, the

New York City Department of Design and Construction will have reconstructed nearly all of the city's streets south of Canal Street from river to river.

Public Policy

The implementation of the development projects described above by 2009 will be consistent with public policy in the study area. The city and state policies that support the recovery and growth of Lower Manhattan as both a central business district and an evolving 24-hour community are expected to continue. Infrastructure improvements and developments providing new commercial, residential, and open space uses are being planned by the state and city and will represent a demonstration of city, state, and federal policy to rebuild Lower Manhattan. Several of these projects are federally sponsored, including the Fulton Street Transit Center, Route 9A, South Ferry Terminal, WTC Memorial and Redevelopment Plan, and the numerous commercial and residential developments subsidized through the New York Liberty Bond Program. Together, these projects demonstrate ongoing governmental interest in actively promoting infrastructure improvements and new developments throughout Lower Manhattan.

NO ACTION ALTERNATIVE

Land Use and Neighborhood Character

Under the No Action Alternative, the temporary WTC PATH station would continue to operate on the WTC site. As described above, considerable development is expected at the WTC site and in the surrounding neighborhoods, increasing the demand for PATH service and other modes of public transportation. However, without the increased capacity of the Preferred Alternative, transit service in the area may not meet the demand from other planned land use developments throughout Lower Manhattan. Furthermore, the temporary WTC PATH station is not consistent with the current master plan for the WTC site. In the event that it would need to continue operations through the opening year, components of the WTC master plan would need to be revised to accommodate PATH operations.

Although the absence of the Preferred Alternative may not preclude those developments planned throughout the study area, it may affect the desirability and marketability of Lower Manhattan's residential, office, and retail establishments. As described in Chapter 2, "Project Alternatives," as ridership nears the temporary station's design capacity, PANYNJ would need to implement operational adjustments to safely accommodate passengers, such as reduced service and/or restricted access. PATH service is vital to the movement of employees to and from their offices throughout the study area. In addition, businesses located in Jersey City and Newark depend on PATH to deliver workers from New York City and other points east of the Hudson River. More recently, PATH service has become critical to those businesses that have located facilities in both Lower Manhattan and Jersey City to allow for office expansion while maintaining a close connection between company functions on both sides of the Hudson River. Without full reliance on this critical inter-regional connection, the anticipated developments in Lower Manhattan, which would result in an increase in land use and density, may not come to fruition as quickly or intensely as would be expected under the Preferred Alternative.

Overall neighborhood character would not change substantially as a result of the No Action Alternative. Along with PATH commuters traveling to and from the temporary station, the newly opened Fulton Street Transit Center across Church Street from the Project Site and the existing and planned developments at the WTC site and on the blocks surrounding the Project

Site will generate substantial pedestrian and vehicular traffic throughout the area. The area would remain a bustling business district.

Public Policy

The No Action Alternative would not support the existing city, state, and federal policies that promote the recovery and growth of Lower Manhattan as both a central business district and an evolving 24-hour community. Those policies that support the revitalization of the Lower Manhattan central business district will undoubtedly continue well beyond 2009. The lack of the Preferred Alternative, which restores and improves upon the level of PATH train service that existed prior to September 11, 2001, would hinder the achievement of these policies' goals.

For example, as discussed above, LMDC was created to help plan and coordinate the rebuilding and revitalization of Lower Manhattan so that it will re-emerge as a stronger and more vibrant community. A comprehensive local and regional transportation infrastructure system is a vital part of meeting that objective. One of the stated purposes of New York City's *Vision* is to connect Lower Manhattan to the world around it. The policy includes recommendations to create new regional transportation links to help revitalize and improve Lower Manhattan. The continued operation of the temporary PATH station in 2009 may result in reduced service or restricted access, as discussed in Chapter 2, "Project Alternatives," making it difficult to meet the goals of these policies. Therefore, the No Action Alternative would have an adverse effect on public policy.

PREFERRED ALTERNATIVE

The Preferred Alternative would consist of a track and platform level, a mezzanine/fare-zone level, and a street-level terminal building incorporating sub-grade pedestrian connections to adjacent streets, NYCT subways, and on and off-site developments, including the WFC. The PATH tunnels, tracks, platforms, and mezzanine would be located within the WTC "bathtub" as they were prior to September 11, 2001.

The Preferred Alternative would provide added passenger capacity and pedestrian linkages to surrounding buildings and transit services that the temporary WTC PATH station could not accommodate, and would provide better service to its riders. The opening of the proposed Preferred Alternative would be compatible with the office, retail, cultural, and residential land uses in the surrounding area, benefiting area businesses, office workers, tourists, and residents, and improving the overall character of the Project Site and the surrounding blocks. The Preferred Alternative would be consistent with existing public policy aimed at reviving the Lower Manhattan office market to retain and attract both large corporations and small businesses in conjunction with the developments at the WTC site (see Chapter 5, "Socioeconomic Conditions"). These businesses would have access to the New Jersey workforce as they did before September 11, 2001, while businesses across the Hudson River in Jersey City could depend on a quick and direct commute to Lower Manhattan for the long-term. The new facility would also provide regional connections for potential visitors and patrons who wish to visit the Memorial or any of the new cultural uses developed at the WTC site and surrounding area.

The new facility would not conflict with other land uses or public policies in effect for the area, and would be compatible with the overall character of the neighborhood. No change to land use would result from the Preferred Alternative since it would replace the existing temporary WTC PATH station with the same use in a larger configuration. Overall, the Preferred Alternative would support other public policies that previously existed in Lower Manhattan with the

intention of creating a 24-hours-a-day, seven-days-a-week community. As a result, no adverse impacts to land use or public policy would result.

The new Terminal building, along with the surrounding WTC developments, would benefit overall neighborhood character since the Project Site would change from a blighted construction site to an area with built form and visual identity. PANYNJ owns the WTC site; therefore, the majority of the Terminal's components could be constructed without easements. However, PANYNJ would require easements from NYSDOT and Brookfield Properties for the construction of a Route 9A connection and its proposed entrance adjacent to the Winter Garden. PANYNJ has been coordinating with these property owners for their planning of the Route 9A connection, but the formal execution of these easements would likely not occur until final design of the connection is completed. Since the necessary easements would be negotiated directly with the property owners, their execution is not expected to result in adverse impacts to public policy.

DESIGN YEAR (2025)

FUTURE COMMON TO ALL ALTERNATIVES

Land Use and Neighborhood Character

The 2025 land uses described below assume all projects for the 2009 opening year have been completed. Additional developments, potential or proposed, that have no specific build year have been assumed to occur between 2010 and 2025 and are described below (see Appendix A, Table A-3). In addition, several developments have been identified that could potentially be developed in the future but do not have a defined program associated with a definite site at this time. Specifically, New York City's *Vision* may bring changes that are not yet programmed or approved.

Overall, land use in the study area is expected to follow existing trends toward increasing residential, cultural, and other uses while restoring the office space lost at the WTC and maintaining a strong commercial presence. The distribution of uses is expected to remain much the same as it is today, with commercial development clustered at the WTC site, the blocks immediately north of the WTC site, the Broadway Corridor, and the WFC in BPC, and residential development concentrated in the Greenwich South Corridor, BPC, and North of WTC site subareas. Development of soft sites (i.e., sites not built out to the maximum allowable FAR) may lead to a greater intensity of land uses, with higher-density office and residential uses in the future.

These developments will be in keeping with the traditional character of the Project Site and study area as a densely developed urban setting. The area surrounding the Project Site will continue to function as a bustling business district. In addition, it will contain a greater mix of uses with better transportation connections that will help to create a livelier environment, not only during the workday but during evening hours and on weekends. All of these uses will be compatible with those land uses that exist throughout the study area and will help to make Lower Manhattan a more attractive and welcoming place to live, work, and visit.

WTC Redevelopment Sites. By 2025, it is assumed that the developments for the WTC Memorial and Redevelopment Plan will be complete. In addition to the Memorial, Memorial Center, cultural facilities, retail uses, and open space, full development will bring the total office space to 10 msf and add a hotel with conference facilities. This office space will be in towers above the bases and below-grade areas with up to 1 msf of retail space. There will be five large, modern office towers ranging in area from 1.6 msf to 2.6 msf, each with between approximately

56 and 70 stories of office space. The hotel will provide up to approximately 800 rooms and up to 150,000 square feet of conference facilities. The additional office space, hotel, and their associated populations will support and benefit the retail and cultural uses developed in the initial phase of the plan.

North of WTC Site. No specific development projects have been identified for completion between 2010 and 2025 in the North of WTC Site subarea. It is likely that residential conversions will continue.

Broadway Corridor. New York City's *Vision* includes residential construction in the Broadway Corridor. Other potential future development in the Broadway Corridor includes three complete residential conversions and the conversion of the upper floors of a large office building on Broad Street to residential use.

Greenwich South Corridor. New York City's *Vision* will create a public open space, Greenwich Square, over the Brooklyn Battery Tunnel ramps with the intention of stimulating new residential development or residential conversions in the area.

Battery Park City. All of BPC is expected to be developed by 2009. No additional developments have been identified for completion between 2010 and 2025.

Remaining Subareas. Commercial and residential development is expected to continue in the remainder of the study area between 2010 and 2025 as a continuation of trends foreseen for 2009. Residential projects, both conversions and new construction, are proposed throughout the study area with the majority concentrated in the Tribeca and Brooklyn Bridge to Battery Park subareas.

In addition, two major transportation projects are also anticipated for completion before 2025. Under consideration for decades, the FTA recently issued a Record of Decision for the Second Avenue Subway. The project is proposed to provide much needed transit access to residents, workers, and visitors on the east side to reduce excess crowding on the Lexington Avenue subway and to improve overall mobility. The project consists of a new, two-track, 8.5-mile subway extending from Lexington Avenue at 125th Street in Harlem to Water Street at Hanover Square in the Brooklyn Bridge to Battery Park subarea.

Finally, the city proposes to provide direct, one-seat airport access to JFK and Newark International Airports. The project involves extending the JFK AirTrain system from the airport through a new tunnel to Lower Manhattan and by extending the PATH train from Newark's Penn Station to Newark Liberty Airport. The new tunnel between downtown and JFK would also connect the area to any Long Island Rail Road (LIRR) train at Jamaica Station. It is anticipated that the Lower Manhattan Terminal would be in the vicinity of the proposed Fulton Street Transit Center and the Permanent WTC PATH Terminal.

Public Policy

The developments described above that are expected to be completed between 2010 and 2025 will continue to be consistent with public policy for the area. These developments demonstrate the city and state's long-term interests in both rebuilding and promoting the continuous success of Lower Manhattan.

NO ACTION ALTERNATIVE

Land Use and Neighborhood Character

The existing temporary WTC PATH station was constructed for use on an interim basis, and therefore would be retired from service and no longer in operation long before the 2025 design year. At the same time, developments planned as part of the WTC Memorial Redevelopment Plan will be complete and fully occupied, as described above. Without the Preferred Alternative, the above- and below-grade portions of the Project Site may be incorporated into other WTC site developments. Land use on those portions of the Project Site located at Liberty Park Plaza and the WFC are not expected to change by 2025 under this alternative.

At this time it is unknown what, if anything, would occupy the former footprints of the temporary WTC PATH station after it ceases operations. In any event, the No Action Alternative would leave Lower Manhattan without an important regional transportation connection at a time when such a use will be critical. The WTC PATH Terminal served over 67,000 commuters a day prior to September 11, 2001, the events of which left the PATH system without a large portion of its capacity to serve commuters throughout the New York and New Jersey region. With a substantial increase in commercial office, retail, cultural, and residential uses expected by 2025 at the WTC Redevelopment Sites and in the surrounding neighborhoods, New Jersey residents will require convenient access to the Lower Manhattan business district, and without PATH no direct connection would exist. As discussed in Chapter 8A, "PATH," over 167,000 weekday passengers who would have used the Permanent WTC PATH Terminal in year 2025 would be required to divert to alternate modes of transportation to access Lower Manhattan.

The No Action Alternative would reduce the desirability and marketability of those independent developments planned for the study area, including those at the WTC site itself. Existing Lower Manhattan businesses may relocate to other areas of Manhattan or leave New York City altogether. As a result, the revitalization of Lower Manhattan may not be as robust as would otherwise be expected and any benefits to neighborhood character would not be realized.

Public Policy

The No Action Alternative would be inconsistent with public policies in place for Lower Manhattan, as discussed above for the 2009 opening year. No PATH train service would exist between New Jersey and the central business district. At the same time, the WTC Redevelopment Sites and the surrounding blocks would be fully developed and occupied. A major part of the infrastructure needed to support the Lower Manhattan office and retail markets would not exist. The lack of an important regional transportation connection—one that existed prior to September 11, 2001—would frustrate existing public policies that aim to better integrate and serve the Lower Manhattan business district with New Jersey, Long Island, Midtown Manhattan, and other boroughs, as well as nearby neighborhoods. Therefore, this alternative would result in an adverse impact on public policy.

PREFERRED ALTERNATIVE

Land Use and Neighborhood Character

In 2025, the Preferred Alternative would contribute to the creation of a more active Project Site and would benefit land use and neighborhood character. The Preferred Alternative would be compatible with and supportive of surrounding land uses. By 2025 PATH service into Lower Manhattan would be even more important than it is today, or is expected to be in 2009, due to

the increased intensity of land uses that are expected at the WTC Redevelopment Sites and throughout the land use study area, as described above. PATH service would again become an integral part of the Lower Manhattan central business district, as it was prior to September 11, 2001.

The Preferred Alternative would bring workers and visitors who, by purchasing goods and services, would support the existing businesses in the surrounding study areas, enlivening the surrounding study area. This alternative would support the increased office development and new cultural uses in the area. The influx of commuters associated with this alternative would benefit area businesses, particularly restaurants and shops, well beyond the Project Site, improving neighborhood character. Therefore, the Preferred Alternative would have beneficial effects on the surrounding areas, and no adverse impacts to land use or neighborhood character would result from this alternative. All other uses and their effects on land use and neighborhood character would be similar to conditions described in 2009.

Public Policy

This alternative is part of a major public policy initiative led by PANYNJ in cooperation with other federal, state, and city agencies to restore the Project Site as a functioning part of Lower Manhattan and maintain its place as a transportation hub for the Downtown area. The Preferred Alternative would be consistent with plans and efforts to maintain Lower Manhattan as a prosperous business district and to make the area more attractive to retain existing and attract new businesses in the long term. The project would be consistent with and help to meet the goals of public policies for Lower Manhattan, and no adverse impacts to public policy would result.

E. MITIGATION

During the construction period, activities associated with the Preferred Alternative may result in adverse impacts related to socioeconomic conditions, traffic, air quality, and noise and vibrations (see Chapter 5, "Socioeconomic Conditions," Chapter 8, "Transportation," Chapter 9, "Air Quality," and Chapter 10, "Noise and Vibration"). As a result, these activities would have an adverse effect on neighborhood character in the immediate vicinity of the Project Site. The mitigation measures proposed for each of the technical areas discussed above would also minimize the adverse effects to neighborhood character during the construction period.

Since the project would not have long-term (opening or design year) adverse impacts, as described above, mitigation would not be required once the Terminal is operational. ✷

A. INTRODUCTION

This chapter assesses the potential impacts of the Preferred Alternative on the socioeconomic characteristics of Lower Manhattan, including population and housing profiles, commercial office and retail activity, and employment trends.

B. METHODOLOGY

FRAMEWORK OF ANALYSES

A socioeconomic analysis describes whether and how a proposed action will impact the population, housing stock, or economic activities in a geographic area. Projects are examined for their potential to influence these socioeconomic characteristics (either directly or indirectly), and any anticipated changes are evaluated based on both their magnitude and character.

Typically, a proposed action should be examined for its potential to affect change through direct residential or business displacement, indirect residential or business displacement, and effects on a particular industry. The Preferred Alternative would not directly or indirectly displace businesses or residents nor would it adversely affect a specific industry. Thus, this assessment focuses on the Preferred Alternative's potential for social and economic impacts and benefits to Lower Manhattan.

As described in Chapter 2, "Project Alternatives" and Chapter 15, "Cumulative Effects," PANYNJ has coordinated with the other sponsors of the Lower Manhattan Recovery Efforts (Lower Manhattan Development Corporation, Metropolitan Transportation Authority, and New York State Department of Transportation) to develop a consistent approach to the evaluation of potential environmental effects for their respective projects. The methodology described below for the social and economic conditions analysis follows this guidance, and the development of baseline and future conditions has been closely coordinated between the project sponsors.

BASELINE CONDITIONS

As described in Chapter 2, "Project Alternatives," the Preferred Alternative is analyzed under current, and pre-September 11, 2001 conditions. This chapter presents two baselines. The first summarizes population, housing, employment, and commercial real estate characteristics as they existed prior to September 11, 2001, and the second presents those characteristics for the study areas today.

Following the baseline discussion is an assessment of future conditions in the study areas for three different analysis years: 2006 (which falls within the construction period), 2009 (the opening year) and 2025 (the design year). For each year, future socioeconomic conditions are described for the Future Common to All Alternatives as well as the No Action and Preferred Alternative.

STUDY AREA DEFINITIONS

The socioeconomic study area is Lower Manhattan, south of Canal Street. Study area subareas vary by subject matter, depending on the level of detail appropriate for the analyses and the types of data available. Subareas for each section of the socioeconomic analysis are defined below.

POPULATION AND HOUSING

There are nine Population and Housing subareas, including the World Trade Center (WTC) site. Those subareas immediately surrounding the WTC site include: North of WTC Site, Battery Park City, Greenwich South Corridor, and Broadway Corridor. Those on the periphery include: Tribeca, Civic Center, Chinatown, and Brooklyn Bridge to Battery Park (see Figure 5-1).

COMMERCIAL OFFICE MARKET

The study area for the Commercial Office Market analysis has been divided into five submarkets, which conform to data collected by the real estate services firm Cushman & Wakefield. These submarkets are mapped in Figure 5-2, and are further described below:

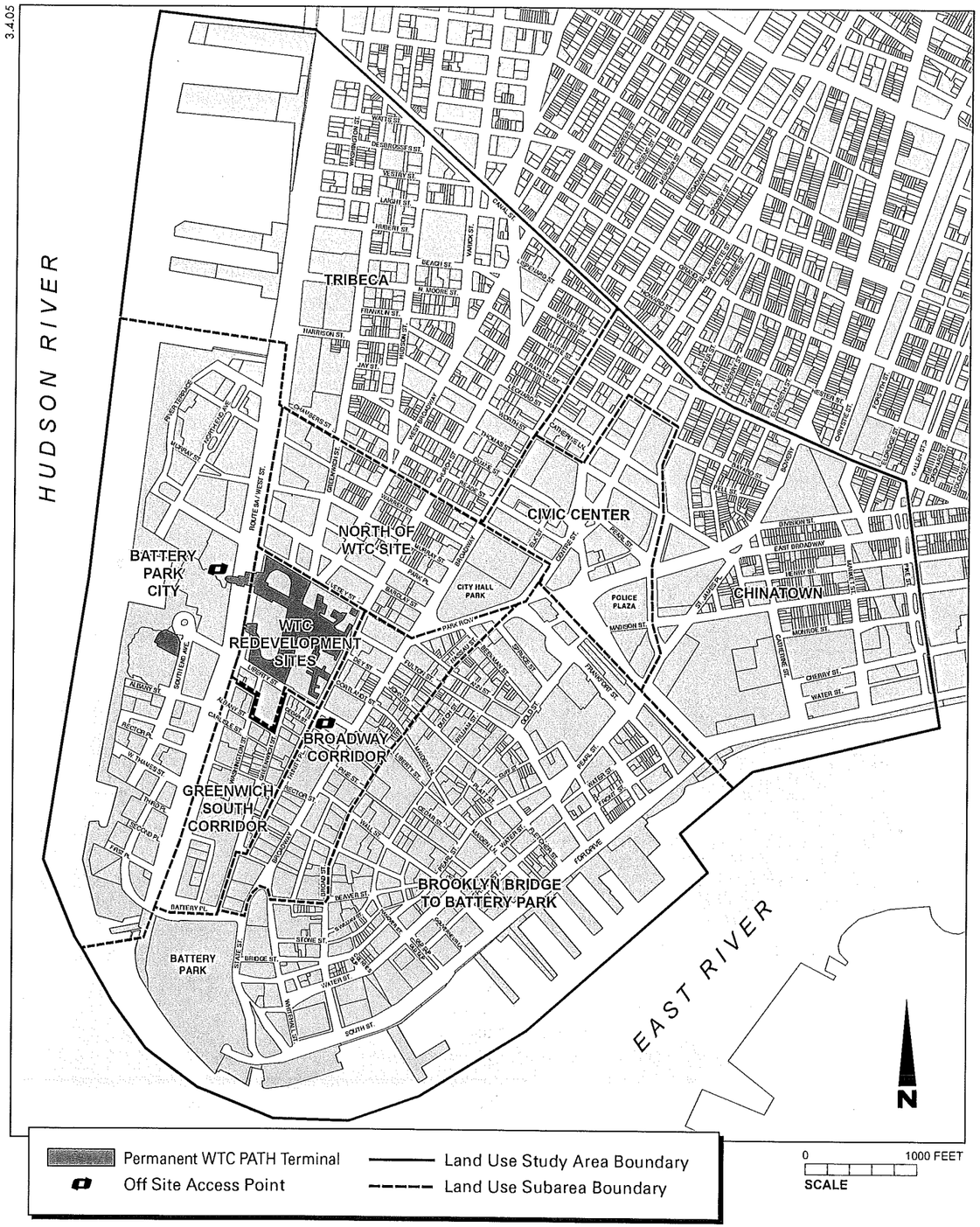
- City Hall: Bound by the Brooklyn Bridge, Park Row, Vesey Street, Chambers Street, Hudson River, Canal Street, and the East River.
- World Financial: Bound by Albany Street, Hudson River, Chambers Street, Church Street, Vesey Street, Broadway, Liberty Street, and Greenwich Street.
- Insurance: Bound by Pine Street, William Street, Liberty Street, Broadway, Park Row, and the Brooklyn Bridge.
- Financial West: Bound by Battery Park, Hudson River, Albany Street, Greenwich Street, Liberty Street, and Broadway.
- Financial East: Bound by Battery Park, Broadway, Liberty Street, William Street, Pine Street, and the East River.

In order to contextualize the Lower Manhattan office market data, it is compared to data describing other Manhattan submarkets, including Midtown South and Midtown. The three major Manhattan submarkets are mapped in Figure 5-3.

COMMERCIAL RETAIL MARKET

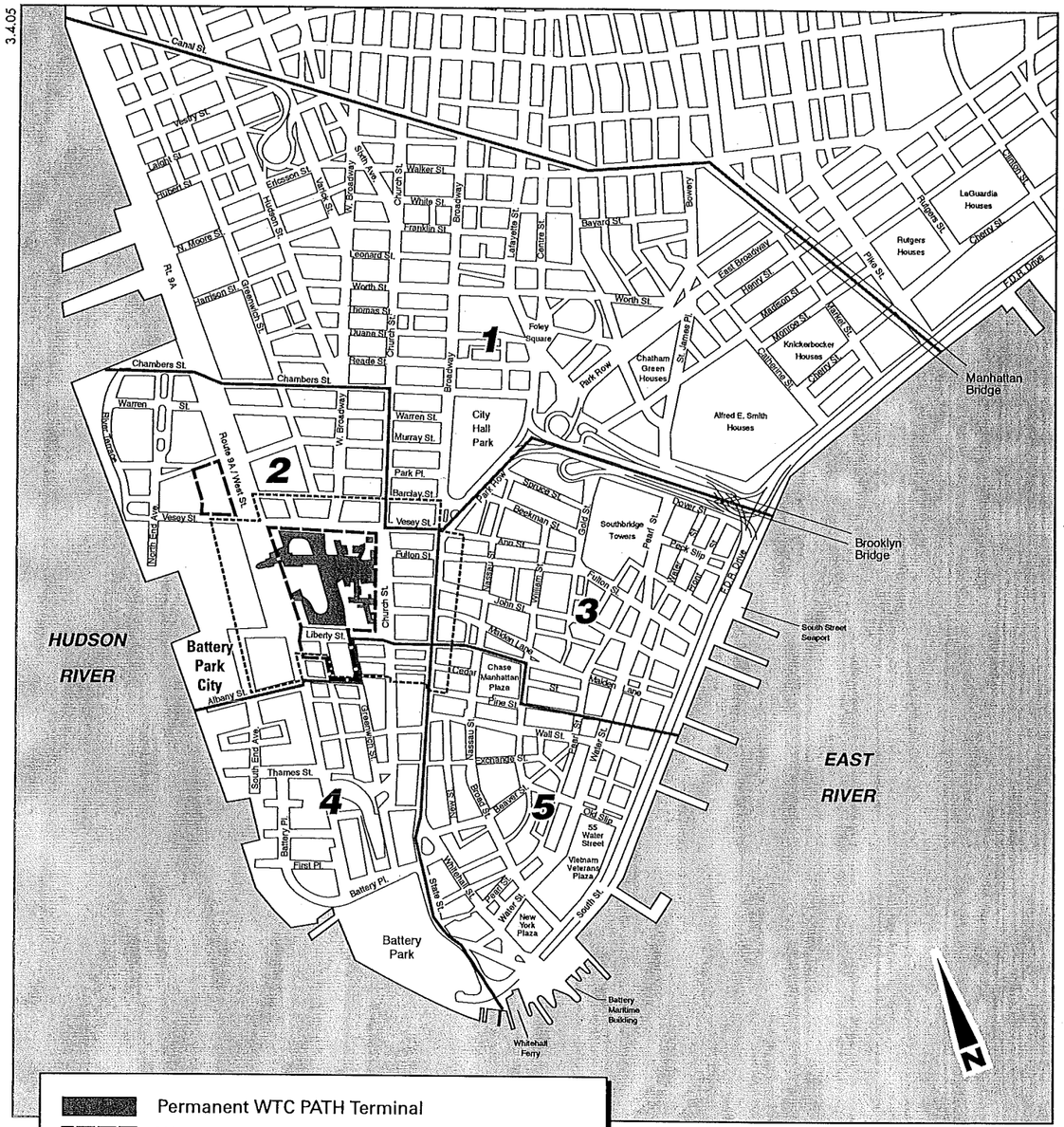
The Commercial Retail Market has not been divided into submarkets. However, because the Preferred Alternative could have an effect on retail establishments located on blocks immediately surrounding the proposed entrances to the Terminal, a smaller study area has been defined for the Retail analysis. This "Immediate Study Area" consists of the blocks immediately surrounding the WTC site, along with buildings lining the east side of Broadway from Pine Street to Ann Street (see Figure 5-2). More specifically, the Immediate Study Area includes:

- The World Financial Center on the west side of the WTC site;
- Blocks between Route 9A and Broadway, Vesey, and Barclay Streets;
- Blocks between Vesey and Thames Streets, Church Street, and Broadway;



PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 5-1
Land Use Study Area



Permanent WTC PATH Terminal
WTC Redevelopment Site Boundary
Retail Market Immediate Study Area Boundary
Office Market Subarea Boundary
1 City Hall
2 World Financial
3 Insurance
4 Financial West
5 Financial East

Figure 5-2
Lower Manhattan Office and Retail Market Subareas

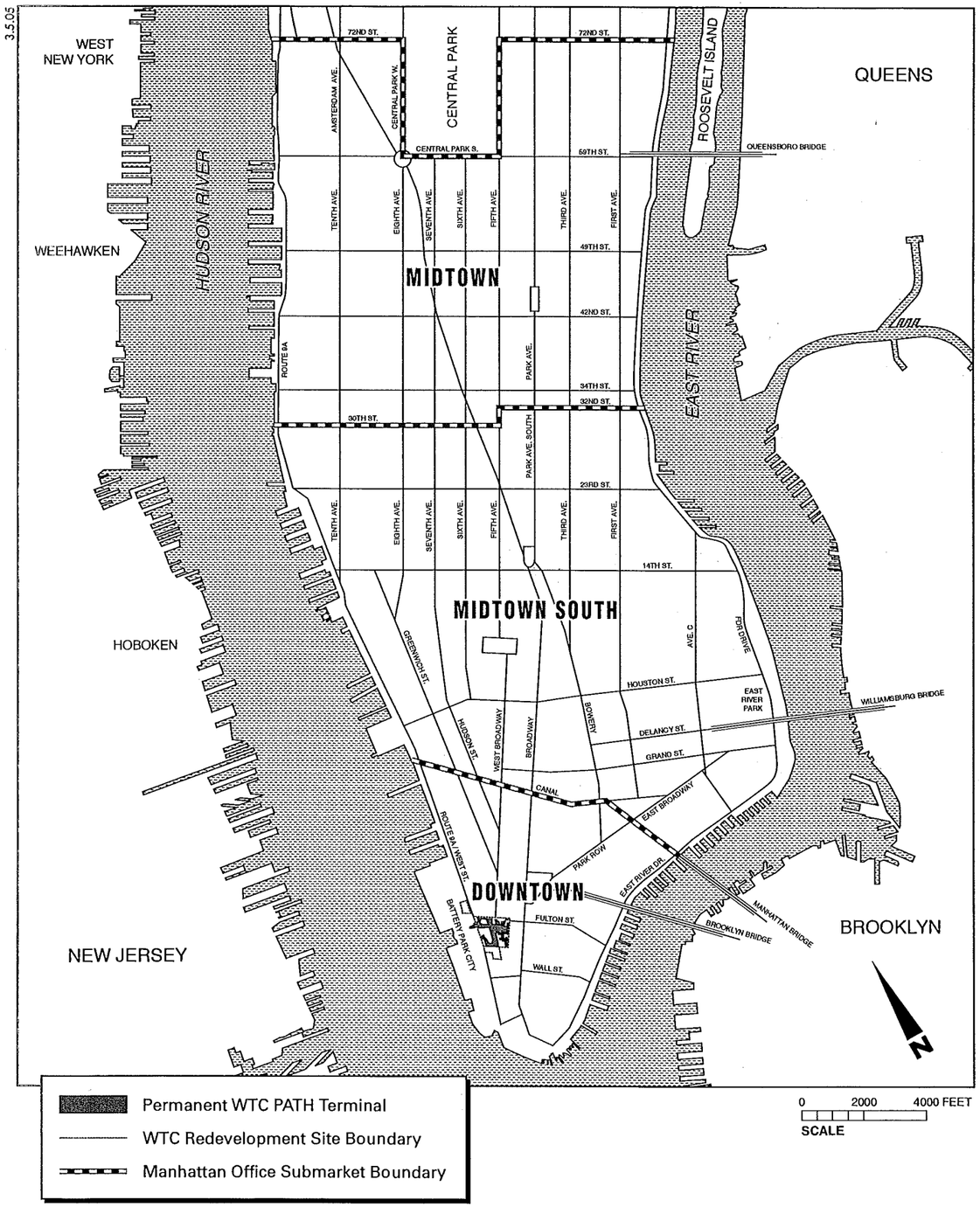


Figure 5-3
Manhattan Office Submarkets

- Buildings facing Broadway on the east side of Broadway, between Ann Street on the north and Pine Street on the south; and
- Blocks on the south side of Liberty Street, from West Street to Church Street.

EMPLOYMENT

The Employment study area, which includes all of Lower Manhattan south of Canal Street, has not been divided into submarkets.

DATA SOURCES

POPULATION AND HOUSING

The assessment of population and housing trends in the Primary and Secondary Study Areas is based on data from the 1990 and 2000 Census. The information was grouped into three content areas:

- Population characteristics, including total number, race, and median age;
- Housing characteristics, including number of units, vacancy and tenure (owner versus renter occupied), median contract rent, and median home value; and
- Household characteristics, including number of households, average size and income, and percent below poverty.

The data have been organized by subarea. However, because the subareas were defined according to land use patterns and commonly used neighborhood definitions, boundaries do not always conform to Census geography (Tract, Block Group, or Block). Where Census units overlap subarea boundaries, a judgment was made regarding the extents of the Census unit to include in the subarea based on land uses in the area and the potential for the characteristic being examined to cross the Census unit in question.

There is some discrepancy between the precision with which the 1990 and 2000 data conforms to subarea boundaries. Because much of the 1990 data is reported only by Tract and Block Group levels (not at the level of the Census Block, the smallest geographic unit), the 1990 data is not as precise as the 2000 data for some demographic and housing characteristics. However, every effort was made to ensure a consistent comparison between these data.

The pre-September 11, 2001 condition is based primarily on 2000 Census data. Because the Census is dicennial, it is impossible to obtain an accurate 2003 demographic and housing profile of the study areas. Thus, the current condition is based largely on 2000 data updated with information and survey data compiled from various agencies and organizations involved in the redevelopment of Lower Manhattan, such as the Alliance for Downtown New York (Downtown Alliance) and the Lower Manhattan Development Corporation (LMDC). Much of the 2003 housing and population data is based on an assessment of units built in the study areas between 2000 and 2003 and corresponding population estimates based on 2000 average household sizes by subarea. The list of recent housing development was compiled from a variety of sources including real estate firms, newspaper articles, Community Board 1, Downtown Alliance, and the New York City Department of City Planning (NYCDCP).

OFFICE

Office market trends and current conditions for Lower Manhattan and Manhattan, as a whole, are presented using data from Cushman & Wakefield. Four main indicators were used to depict market conditions: total inventory, average rent, vacancies, and absorption. Wherever possible, these indicators were reported separately by class of office space. Office class definitions are as follows:*

- *Class A*: Most prestigious buildings competing for premier office users with above average rents for the area. Buildings have high quality standard finishes, state-of-the-art systems, exceptional accessibility and suggest a definitive market presence.
- *Class B*: Buildings competing for a wide range of users with average rents for the area. Building finishes are fair to good for the area and systems are adequate, but the buildings do not compete with Class A at the same price.
- *Class C*: Buildings competing for tenants requiring functional space at below average rents for the area.

The post-September 11, 2001 condition is portrayed using data from the second quarter of 2003, and the pre-September 11, 2001 condition reflects data from the second quarter of 2001.

RETAIL

Data on the Manhattan and Lower Manhattan Retail markets was obtained primarily from the Retail Report series published by the Real Estate Board of New York and the Fulton Corridor study commissioned by LMDC.** In addition, a field survey was conducted in September 2003 to develop a comprehensive list of businesses in the "Immediate Study Area."

EMPLOYMENT

Employment data for Manhattan and New York City are from the New York State Department of Labor (NYSDOL). The discussion of employment trends is based on data from 1990, 1995, 2000, and 2002. Second quarter 2000 data were used for the pre-September 11, 2001 conditions and second quarter 2002 data (the most recent data available) were used for the post-September 11, 2001 conditions.

Employment data for Lower Manhattan is based on employment estimates from the New York Metropolitan Transportation Council (NYMTC) supplemented with industry-specific data from NYSDOL. It is difficult to accurately quantify employment in Lower Manhattan using NYSDOL data because it is available only by zip code, and zip code 10013 is bisected by Canal Street, the northern boundary of the Study Area. Although the NYMTC data in its original form is county-based, it has been adjusted to the Census Tract level and used for several transportation projects in Manhattan with the endorsement of a variety of City agencies. Thus, the NYMTC data was used to quantify employment in Lower Manhattan. (It should be noted

---

* Cushman and Wakefield. *Market Beat Series*. Individual reports from Cushman and Wakefield are referenced in text and tables presented later in this document.

** LMDC. *Fulton Corridor: Creating a Vision for Enhanced Retail+Arts+Cultural Activities in Lower Manhattan*, June 12, 2003

that overall, the NYMTC-based private sector employment estimate is approximately 6 percent higher than the NYSDOL-based estimate.)

To estimate employment by industry (or Standard Industrial Code—SIC) for Lower Manhattan, the NYSDOL employment distribution was applied to the NYMTC employment estimates for 2000 and 2002. For example: if, according to the NYSDOL, 35 percent of Lower Manhattan employment in 2000 was in the Services sector, then this distribution was applied to the NYMTC.

The NYMTC employment figures include both public and private sector employment, with subtotals by sector. While private sector employment is based on 2000 data, the public sector employment estimate is based on 1990 data—the most recent year for which data is available. However, government employment for New York City, as a whole, changed only modestly from 1990 to 2000 (decreasing by about 5 percent in magnitude).

ENVIRONMENTAL JUSTICE

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires that every federal agency identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.

As discussed in the existing conditions portion of this chapter, the primary study area population is over 75 percent white, with a median household income that is over twice the median for New York City and a poverty level that is well below the citywide average. The secondary study area includes two subareas with populations that are over 50 percent minority: Chinatown (approximately 86 percent minority) and Civic Center (approximately 65 percent minority). These communities also have a relatively high proportion of persons living in poverty—37.5 percent in Civic Center and 33.4 percent in Chinatown, as compared to 20.8 percent in New York City. However, these communities are geographically further removed from the proposed project and would not suffer disproportionately high and adverse impacts from the proposed project. Therefore, a more detailed environmental justice analysis was deemed unnecessary. Nevertheless, as more fully discussed in Chapter 18, "Agency Coordination, Process, and Public Participation," FTA and PANYNJ reached out to low-income and minority populations in an effort to include them as part of the project's public participation program.

C. DESCRIPTION OF THE AFFECTED ENVIRONMENT

PRE-SEPTEMBER 11, 2001 BASELINE CONDITIONS

POPULATION AND HOUSING

Population

Table 5-1 presents characteristics of the Lower Manhattan population in 1990 and 2000. In 2000, there were approximately 58,620 people living in Lower Manhattan. About 44 percent of the total population lived in Chinatown. Approximately 48 percent of the study area population was White, almost 40 percent was Asian, and only 6.4 percent was Black. This contrasts with the racial profile of Manhattan as a whole, which was approximately 54 percent White,

Table 5-1
Pre-September 11, 2001 Population Characteristics in Lower Manhattan (1990 and 2000)

Primary Study Area	Total Population					Median Age[4]
	Total	Race and Ethnicity (Percent)[1,2]				
		White	Black	Asian	Other	
1990						
North of WTC Site[3]	1,218	84.1	4.2	9.9	1.8	N/A
Broadway Corridor[3]	497	70.9	10.1	16.2	2.8	N/A
Greenwich South Corridor	122	91.8	2.5	4.1	1.6	N/A
Battery Park City	5,574	80.6	3.5	14.9	0.9	N/A
Tribeca[3]	7,508	80.9	11.9	4.5	2.7	N/A
Civic Center	1,536	33.4	39.5	5.2	21.9	N/A
Chinatown[3]	23,939	17.3	6.6	69.2	6.9	N/A
Brooklyn Bridge to Battery Park[3]	5,635	73.3	10.2	13.7	2.4	N/A
Lower Manhattan Total	**46,030**	**46.0**	**8.5**	**40.4**	**5.1**	**N/A**
Manhattan	1,487,536	58.3	22.0	7.4	12.3	N/A
New York City	7,322,564	52.3	28.7	7.0	12.0	N/A
2000						
North of WTC Site	1,601	75.8	3.8	13.9	6.5	36.0
Broadway Corridor	1,385	75.7	3.1	16.2	5.0	32.2
Greenwich South Corridor	1,142	75.4	7.7	9.5	7.4	32.4
Battery Park City	7,951	75.0	3.0	18.0	4.1	35.4
Tribeca	8,797	83.5	5.1	6.9	4.5	39.8
Civic Center	2,051	34.9	45.4	8.4	11.3	33.1
Chinatown	25,691	14.0	4.9	74.2	6.9	39.6
Brooklyn Bridge to Battery Park	10,000	68.5	5.9	18.2	7.4	36.0
Lower Manhattan Total	**58,618**	**47.8**	**6.4**	**39.4**	**6.4**	**37.2**
Manhattan	1,537,195	54.4	17.4	9.4	18.9	35.7
New York City	8,008,278	44.7	26.6	9.8	18.9	34.2

Notes:

1 White, Black, Asian, and Other population may also be Hispanic.

2 Race categories were reported differently in the 1990 and 2000 Census. In order to draw comparisons, the 2000 Census categories of "Asian Alone" and "Native Hawaiian and Other Pacific Islander Alone" were combined into "Asian" and the categories of "American Indian and Alaska Native Alone," "Some Other race alone," and "Two or more races" were combined into "Other." For 1990 data, the "Other" category combines the categories of "American Indian, Eskimo, or Aleut" and "Other race."

3 Because the 1990 census data is not reported by block, and neighborhood boundaries do not conform with block group boundaries, it was not possible to calculate the exact population or population by race within neighborhood boundaries. The population was derived by calculating the percent of population in each block group living within the neighborhood boundaries in year 2000 and applying that same percent to the 1990 block group population figures. The race percentage is based on racial breakdown of entire block groups into which the neighborhood falls.

4 Median age is the weighted average of the median ages for each census tract, block group, or block falling within the subarea. Median age can not be calculated for 1990.

Source: U.S. Department of Commerce, Bureau of the Census, 2000 Census, Summary File 1 and 1990, Summary File 1.

17 percent Black, and 9 percent Asian. As illustrated in Table 5-1, the uncharacteristically high Asian representation in Lower Manhattan is due to the high number of people living in Chinatown, which is nearly 75 percent Asian.

Of all subareas in Lower Manhattan, Brooklyn Bridge to Battery Park experienced the greatest net increase in population between 1990 and 2000 (growing by approximately 4,365 people), and Greenwich South Corridor had the greatest percentage increase (growing from 122 to 1,142 residents). For all subareas, the Asian population constituted a larger percent of total population in 2000 than it did in 1990. At the same time, the White and Black populations in most subareas shrunk as a percent of total population.

The average median age in 2000 was eldest in Chinatown and Tribeca (almost 40 in both subareas) and youngest in the Broadway Corridor and Greenwich South Corridor subareas.

Housing

As illustrated in Table 5-2, there were approximately 27,143 housing units in Lower Manhattan in 2000. Overall, about 20 percent were owner-occupied and 80 percent were renter-occupied, which mirrors the overall Manhattan housing market. The study area's vacancy rate was only moderately higher than in Manhattan (9.4 as compared to 7.5) but the rate varied substantially across subareas. At 17.9 percent, Battery Park City had the highest vacancy rate, which may be attributable to the substantial number of newly constructed but not yet occupied units that were built late in the 1990s.

The 2000 median home value in Lower Manhattan was $411,040, approximately 14 percent higher than the median for Manhattan, and 86 percent higher than the median for New York City. The area's median contract rent (or weighted average of median contract rents for all subareas) of $1,130 per month was over 50 percent higher than the median rent for Manhattan. It is worth nothing that the median home value and median contract rent for Chinatown were substantially lower than in many other Lower Manhattan subareas; which deflates the overall averages for the study area.

Between 1990 and 2000, the housing stock in Lower Manhattan increased much faster than it did in Manhattan or New York City. While the number of units in the study area increased by 30 percent, the Manhattan housing market grew by only 1.6 percent and the New York City market by 6.9 percent. The majority of growth occurred in the Battery Park City, Tribeca, and Brooklyn Bridge to Battery Park subareas, having a total of 4,480 new units between 1990 and 2000.

While the number of units increased from 1990 to 2000, the overall ratio of owner- to renter-occupied housing units remained almost constant and the vacancy rate increased by only 1.7 percent. Median contract rent increased by approximately $434 between 1990 and 2000.

Households and Income

There were approximately 24,615 households in Lower Manhattan in 2000 with an average size of 2.2 people. The vast majority of households (22,464 in number) were located in four subareas: Chinatown, Brooklyn Bridge to Battery Park, Battery Park City, and Tribeca. The study area's median household income of approximately $65,090 was about 38 percent higher than for Manhattan and 70 percent higher than for New York City. The poverty rate, however, was roughly equal to that of Manhattan—primarily due to the high poverty rate in Chinatown (33.4 percent). The North of WTC site subarea had the highest median income and lowest poverty rate in the study area. Table 5-3 presents income characteristics for Lower Manhattan.

Table 5-2
Pre-September 11, 2001 Housing Characteristics in Lower Manhattan, (1990 and 2000)

Primary Study Area	Total Housing Units	Housing Vacancy (Percent)	Housing Tenure (Percent)		Median Contract Rent[1, 3]	Median House Value[1, 2, 3]
			Owner	Renter		
1990						
North of WTC Site	672	18.1	51.2	48.8	$1,199	N/A
Broadway Corridor	590	7.9	29.4	70.6	$1,237	N/A
Greenwich South Corridor	89	10.1	0.0	100.0	$670	N/A
Battery Park City	4,032	16.3	19.6	80.4	$1,319	N/A
Tribeca	3,479	7.3	27.6	72.4	$707	N/A
Civic Center	60	5.0	40.4	59.6	$750	N/A
Chinatown	8,723	3.8	7.4	92.6	$392	N/A
Brooklyn Bridge to Battery Park	3,255	5.7	35.7	64.3	$701	N/A
Lower Manhattan Total	**20,900**	**7.7**	**19.8**	**80.2**	**$696**	**N/A**
Manhattan	785,127	8.8	17.9	82.1	$630	N/A
New York City	2,992,169	5.8	26.6	71.4	$590	N/A
2000						
North of WTC Site	761	8.3	58.9	41.1	$1,510	$548,133
Broadway Corridor	841	11.8	16.7	83.3	$1,220	$478,080
Greenwich South Corridor	739	15.8	0.8	99.2	$2,000	$187,500
Battery Park City	5,382	17.9	17.7	82.3	$1,873	$318,600
Tribeca	4,786	8.3	32.7	67.3	$1,254	$782,455
Civic Center	91	2.2	1.1	98.9	$170	N/A
Chinatown	9,465	5.4	11.0	89.0	$449	$203,094
Brooklyn Bridge to Battery Park	5,078	8.0	25.0	75.0	$1,413	$548,058
Lower Manhattan Total	**27,143**	**9.4**	**20.5**	**79.5**	**$1,130**	**$411,040**
Manhattan	798,144	7.5	20.1	79.9	$740	$361,100
New York City	3,200,912	5.6	30.2	69.8	$646	$221,200

Notes:

1 Values were calculated by taking the weighted average of median number of rooms, median contract rent, and median house value of all the census block groups in a given study area. Because this data is available only at the block group level and block group boundaries do not always align with subarea boundaries, the medians are not exact. Block groups were included or excluded depending on how much of the block group lay within the subarea and whether the housing in the block group was consistent in character with housing in other parts of the subarea.

2 The 1990 median home value is not reported because the 1990 value was based on "specified owner-occupied housing units" only, while the 2000 median was based on all owner-occupied housing units. The two data sets are not comparable.

3 All 1990 values were converted to 2000 constant dollars using the U.S. Department of Labor's Consumer Price Index for the "New York-Northern New Jersey-Long Island" area.

Source: U.S. Department of Commerce, Bureau of Census, 1990 and 2000 Census, Summary File 1 and Summary File 3.

Table 5-3
Pre-September 11, 2001 Household and Income Characteristics in Lower Manhattan (1990 and 2000)

Primary Study Area	Housing Characteristics		Income Profile[3]	
	Total House-holds	Average Household Size	Median Household Income[1]	Persons Below Poverty (Percent)[2]
1990				
North of WTC Site	541	2.1	$94,505	5.3
Broadway Corridor	235	1.9	$67,101	11.3
Greenwich South Corridor	80	1.5	$33,175	0.0
Battery Park City	3,373	1.7	$94,828	3.9
Tribeca	3,479	2.0	$71,876	7.9
Civic Center	57	2.2	$60,943	12.5
Chinatown	8,392	2.8	$23,936	27.0
Brooklyn Bridge to Battery Park	2,885	1.7	$47,961	14.4
Lower Manhattan Total	**19,042**	**2.3**	**$51,580**	**18.2**
Manhattan	716,811	2.0	$42,511	20.5
New York City	2,816,274	2.5	$39,297	19.3
2000				
North of WTC Site	698	2.1	$127,262	3.7
Broadway Corridor	742	1.9	$88,949	9.6
Greenwich South Corridor	622	1.7	$94,809	15.2
Battery Park City	4,419	1.8	$107,611	5.5
Tribeca	4,420	2.0	$97,228	4.4
Civic Center	89	1.4	$8,833	37.5
Chinatown	8,955	2.7	$23,867	33.4
Brooklyn Bridge to Battery Park	4,670	1.7	$57,525	10.4
Lower Manhattan Total	**24,615**	**2.2**	**$65,090**	**19.8**
Manhattan	738,644	2.0	$47,030	19.4
New York City	3,021,588	2.6	$38,293	20.8

Notes:

1 The median income represents a weighted average of the median incomes of all the census blocks or block groups in the subarea.

2 The U.S. Census Bureau uses a set of money income thresholds that vary by family size and composition to detect who is poor. If the total income for a family or unrelated individual falls below the relevant poverty threshold, then the family or unrelated individual is classified as being "below the poverty level."

3 All 1990 values were converted to 2000 constant dollars using the US Department of Labor's Consumer Price Index for the "New York-Northern New Jersey-Long Island" area.

Source: U.S. Department of Commerce Bureau of the Census, 1990 and 2000 Census, Summary Files 1 and 3.

Table 5-4
Pre-September 11, 2001 Manhattan Office Market Characteristics (Year-End 2000)

Submarket	Total Inventory (sq. ft.)	Total Average Rent	Class A Average Rent	Total Vacancy Rate
Midtown	224,320,504	$54.65	$67.11	3.6 percent
Midtown South	60,614,279	$46.70	$50.23	3.6 percent
Lower Manhattan	107,512,756	$43.29	$52.37	3.6 percent
Total	392,447,539	$50.12	$64.51	3.7 percent

Source: Cushman & Wakefield, second quarter 2003.

Between 1990 and 2000, the study area gained a total of 5,573 households, an increase of 29.3 percent. Median household income increased by 26 percent, from $51,580 to $65,090. The most substantial increase in income occurred in the Greenwich South Corridor, the subarea, which also experienced the most dramatic growth in the number of households.

COMMERCIAL OFFICE MARKET

At year-end 2000, Manhattan's office inventory totaled 392,447,539 square feet. Approximately 57 percent was located in Midtown, 27 percent in Lower Manhattan, and 15 percent in Midtown South. As indicated in Table 5-4, vacancy rates were low, absorption was high, and total average rents ranged from $43.29 per square foot (psf) to $54.65 psf.

During the second quarter of 2001, Lower Manhattan contained approximately 107.8 million square feet (msf) of office space. Over half was considered Class A, which was generally distributed between two submarkets: World Financial and Financial East. Class B space was concentrated in the Financial East area, and the City Hall submarket contained 40 percent of all Class C space.

The WTC site itself contained over 10 msf of office space in five buildings. The Twin Towers, (One and Two World Trade Center) were 110 stories each and contained approximately 4.7 msf of Class A office space per building.

Table 5-5 shows inventory and average rents for each of the submarkets in Lower Manhattan in the months immediately preceding September 11, 2001. As shown, the average rent for Lower Manhattan office space in 2001 was $41.17 psf. Class A space rented at approximately $47.50 psf, Class B at $37.70 psf, and Class C at $37.08 psf.

Table 5-5
Pre-September 11, 2001 Lower Manhattan Office Inventory and Rents (2001)

	Class A		Class B		Class C		Total	
Submarket	Inventory (sq.ft.)	Total Avg. Rent	Inventory (sq.ft.)	Total Avg. Rent	Inventory (sq.ft.)	Total Avg. Rent	Inventory (sq.ft.)	Total Avg. Rent
World Financial	24,331,521	$51.20	3,144,677	$38.86	1,396,150	$0.00	28,872,348	$46.50
City Hall	5,181,465	$54.57	4,920,258	$35.97	5,823,613	$34.46	15,925,336	$39.63
Insurance	5,178,179	$42.03	7,170,386	$38.86	4,393,706	$38.32	16,742,271	$39.04
Financial West	663,315	$45.61	4,256,528	$33.96	1,569,242	$36.79	6,489,085	$34.82
Financial East	23,410,332	$45.86	14,836,586	$40.99	1,533,966	$39.75	39,780,884	$43.57
Total	58,764,812	$47.51	34,328,435	$37.70	14,716,677	$37.08	107,809,924	$41.17
Percent of Total Study Area	54.5%	115.4%	31.8%	91.6%	13.7%	90.1%	100.0%	

Source: Cushman & Wakefield, second quarter 2001.

The office vacancy rate in Lower Manhattan was fairly low immediately preceding the September 11, 2001 attacks. As indicated in Table 5-6, the vacancy rate was 6.5 percent, with vacancies in all submarkets except for Financial West ranging between 3.4 and 7.3 percent. The vacancy rate for the Financial West subarea was 21.5 percent.

Table 5-6
Pre-September 11, 2001 Lower Manhattan Office Vacancy (2001)

Submarket	Class A		Class B		Class C		Total Study Area	
	Total Available Space	Total Vacancy Rate	Total Available Space	Total Vacancy Rate	Total Available Space	Total Vacancy Rate	Total Available Space	Total Vacancy Rate
World Financial	663,549	2.7%	330,220	14.8%	0	0.0%	993,769	3.4%
City Hall	149,998	2.9%	218,869	4.4%	278,784	4.8%	647,651	4.1%
Insurance	146,682	2.8%	465,472	6.5%	495,076	11.3%	1,107,230	6.6%
Financial West	76,650	11.6%	1,087,106	25.5%	231,959	14.8%	1,395,715	21.5%
Financial East	1,549,005	6.6%	1,270,859	8.6%	70,738	46.0%	2,890,602	7.3%
Total	2,585,884	4.4%	3,372,526	9.8%	1,076,557	7.3%	7,034,967	6.5%
Percent of Total Study Area	36.8%	67.7%	47.9%	150.8%	15.3%	112.3%	112.3%	

Source: Cushman & Wakefield, second quarter 2001.

COMMERCIAL RETAIL MARKET

At the end of March 2001, Manhattan had a total of 10.6 million square feet (msf) of available retail space (or 1,850 stores) with an average rent of $98 psf. By the end of September 2001, Manhattan had 11.3 msf of available retail space (1,744 stores), with an average asking rent of $84 psf. Though some of this drop can be attributed to the attacks of September 11, 2001, much of the decrease was underway in the months prior to September 11, 2001, as regional and national economies began to slow.

In Lower Manhattan, a total of 1.6 msf of retail space was available as of March 2001, and the average asking rent was $60 psf. Like the overall Manhattan retail market, the Lower Manhattan market was showing signs of weakness prior to September 11, 2001, evidenced by the drop in average asking rents from $67 psf in September 2000 to $60 psf in March 2001.

EMPLOYMENT

New York City and Manhattan

Approximately 3.1 million people were employed in New York City's private sector in 2000, and almost two thirds (1.9 million) worked in Manhattan. In both Manhattan and New York City as a whole, the greatest concentration of employment was in the Services industry. The largest proportion of all Services employment was in the Business Services and Health Services subsectors. In Manhattan, 31 percent of all Services employment was in Business Services, and 14 percent was in Health Services. In New York City, 24 percent was in Business Services and 23 percent in Health Services. Public Sector employment in New York City totaled approximately 549,100 in 2000, comprising about 15 percent of all employment in the City. Of those employees, approximately 66,700 worked for the federal government, 42,100 for the state, and 440,300 for local government agencies.

In Manhattan, 418,236 employees (22 percent of the private labor force) worked in the Finance, Insurance and Real Estate (FIRE) sector, and another 18 percent worked in retail or wholesale

trade. By comparison, New York City's workers were less concentrated in the FIRE industries (16 percent of private sector employees) and somewhat more concentrated in the trade industries (20 percent of private sector employees).

Between 1990 and 2000, private sector employment in Manhattan grew by about 3.4 percent, or 64,400 workers. The largest absolute growth occurred in the Services sector, which gained 161,525 employees, growing by 22 percent. Retail Trade also experienced substantial growth, adding about 34.8 thousand employees to its 1990 base of 198,273. Employment in Wholesale Trade declined by 29,000 workers. Employment in the FIRE industries decreased by over 7 percent, from 451,400 to 418,200 employees.

Lower Manhattan

In 2000, there were approximately 426,008 employees in Lower Manhattan. As shown in Table 5-7, approximately 40 percent were working in the FIRE sector and another 36 percent worked in the Services sector. Within the Services sector, 36 percent worked in "Business Services," and within FIRE, 65 percent worked in the "Security and commodity brokers, dealers, exchanges, and services" subsector as a whole.

Table 5-7
Pre-September 11, 2001 Lower Manhattan Employment (2000)

Industry	Number	Percent
Private Sector Employment	331,841	100.0 %
Agriculture, Forestry, Fishing, and Hunting	164	0.0 %
Mining	2	0.0 %
Construction Industries	4,486	1.4 %
Manufacturing	16,826	5.1 %
Transportation, Communication, and Utilities	13,385	4.0 %
Wholesale Trade	9,633	2.9 %
Retail Trade	34,990	10.5 %
Financial, Insurance, Real Estate	130,370	39.3 %
Services Industries	120,887	36.4 %
Unclassified Establishments	1,097	0.3 %
Public Sector Employment	94,168	22.1 %
Total Employment	426,009	100.0 %

Notes:

1. Due to NYSDOL data suppression practices, the sum of employment by industry did not exactly match the total private sector employment figure. Employment that was unaccounted for in the industry breakdown was added to "Unclassified Establishments."
2. For private sector employment industry subcategories, "Percent" represents percent of private sector employment, not total employment. For main public and private Sector headings, "Percent" represents the relative contribution of private and public employment to total employment.

Sources: Number of firms was obtained from NYSDOL 2002 employment data. Employment was estimated using NYSDOL data to generate an employment estimate that is consistent with NYMTC employment estimates.

Compared to Manhattan, Lower Manhattan had a high concentration of FIRE sector employment. About 38 percent of all FIRE employment in Manhattan and 32 percent of all New York City FIRE employment was located within Lower Manhattan, making it more than twice

as concentrated in the FIRE industries as Manhattan and about three times more concentrated than the City as a whole.

CHANGES IN THE AFFECTED ENVIRONMENT SINCE SEPTEMBER 11, 2001

POPULATION AND HOUSING

Population

The Lower Manhattan population has gone through some dramatic changes since the 2000 Census. Following September 11, 2001, the population in Lower Manhattan (particularly in those subareas surrounding the WTC site) dropped, as people were forced to leave their homes during the beginning phases of the WTC site cleanup. While some of the area's residents returned when conditions permitted, others chose to relocate elsewhere, driving vacancy rates upward and keeping the population below its pre-September 11, 2001 level. However, residential grant programs were successful in convincing many to remain, return, or relocate to Lower Manhattan. Thus, vacancy rates have decreased and population has grown.

According to the Downtown Alliance, residential vacancy rates in Lower Manhattan have now returned to their pre-September 11, 2001 levels.* Assuming a) an overall vacancy rate of 5 percent in residential buildings that existed in 2000 as well as those built between 2000 and 2003 (see Housing sections below for more detail) and b) that the average housing size remains the same as in 2000, the population in Lower Manhattan has grown by approximately 10,077 (17 percent) since the 2000 Census, resulting in a total of approximately 68,695. The majority of this growth occurred in the Greenwich South Corridor and Brooklyn Bridge to Battery Park subareas, where populations increased by approximately 2,730 and 3,400 people respectively.

Information on the current racial composition of subarea populations is not available. Judging from the modest changes that occurred between 1990 and 2000, it is assumed that the racial composition has not changed markedly since the 2000 Census.

Housing

Lower Manhattan included approximately 27,140 housing units in 2000. Since then, the area has gained approximately 5,774 housing units, growing by 21 percent. Approximately 36 percent of the new units were built in the Brooklyn Bridge to Battery Park subarea; another 1,690 units were added to the Greenwich South Corridor subarea, and 835 units to Battery Park City. With the exception of Battery Park City, which has new construction, many new units in the Study Area are in buildings converted from commercial use. Most new units are upscale, with rents equal to or higher than the median for their respective subareas.

Households and Income

Current information on household and income characteristics is not available. However, judging from rental rates and general size of apartments constructed between 2000 and 2003, it is assumed that median income and average household size in Lower Manhattan have not changed greatly since 2000.

---

* Downtown Alliance. *The Downtown Report.* Winter 2003.

COMMERCIAL OFFICE MARKET

Manhattan Office Market

Since the end of 2000, the Manhattan office market has lost approximately 3.2 msf of space, and average rental rates have decreased by approximately 18 percent. Vacancy rates have increased from 3.7 to 12.5 percent.

According to second quarter 2003 data, the Manhattan office market currently contains approximately 390 million square feet (msf) of office space. Of that space, 58 percent (approximately 227 msf) is considered Class A, and 27 percent (about 104 msf) is considered Class B. The vast majority (75 percent) of Class A space is located in Midtown. Class B and C space is more evenly dispersed across the submarkets, with Midtown containing the largest portion of Class B space, and Midtown South the greatest amount of Class C.

Table 5-8 presents the inventory and average rent by class of space for the Manhattan submarkets. The total average rent for Manhattan office space in 2003 is approximately $41 psf. Class A space commands an average rent of $48.50 psf and Class C, $26.75 psf. Class A rents are much higher in Midtown than in Downtown or Midtown South—about $10 psf higher than Downtown and $17 psf higher than Midtown South. The average rental rate for Downtown as a whole ($36.36 psf) is notably lower than the average rent for all of Manhattan ($41.12 psf).

Table 5-8
Post September 11, 2001 Midtown Office Inventory and Rents (2003)

Submarket	Class A		Class B		Class C		Total	
	Inventory (sq.ft.)	Total Avg. Rent	Inventory (sq.ft.)	Total Avg. Rent	Inventory (sq.ft.)	Total Avg. Rent	Inventory (sq.ft.)	Total Avg. Rent
Midtown	171,977,201	$51.50	41,780,038	$35.94	17,442,468	$24.49	231,199,707	$46.56
Midtown South	9,943,982	$34.37	30,241,234	$32.82	24,993,692	$27.37	65,178,908	$31.09
Downtown	45,375,476	$41.57	32,249,155	$30.58	15,266,018	$28.49	92,890,649	$36.36
Total	227,296,659	$48.48	104,270,427	$33.37	57,702,178	$36.75	389,269,264	$41.12
Percent of Total Study Area	58.4%	117.9%	26.8%	81.2%	14.8%	65.1%	100.0%	

Source: Cushman & Wakefield, second quarter 2003.

As indicated in Table 5-9, the vacancy rate for office space in Manhattan is currently 12.5 percent. Of the three submarkets, Midtown South has the highest vacancy rate (14.5 percent). Overall, Class B space has a slightly higher vacancy rate (13.1 percent) than Classes A (12.4 percent) or C (12.2 percent). The vacancy rate for Class A buildings is higher Downtown than in other submarkets.

Table 5-9
Post September 11, 2001 Manhattan Office Vacancy (2003)

Submarket	Class A		Class B		Class C		Total	
	Total Available Space	Total Vacancy Rate	Total Available Space	Total Vacancy Rate	Total Available Space	Total Vacancy Rate	Total Available Space	Total Vacancy Rate
Midtown	20,430,860	11.9%	5,104,073	12.2%	2,122,232	12.2%	27,657,165	12.0%
Midtown South	1,198,558	12.1%	4,897,171	16.2%	3,341,074	13.4%	9,436,803	14.5%
Downtown	6,473,383	14.3%	3,709,101	11.5%	1,559,526	10.2%	11,742,010	12.6%
Total	28,102,801	12.4%	13,710,345	13.1%	7,022,832	12.2%	48,835,978	12.5%
Percent of Total Study Area	57.5%	99.2%	28.1%	104.8%	14.4%	97.6%	100.0%	

Source: Cushman & Wakefield. Downtown New York Office Market Data, second quarter 2003.

Lower Manhattan Office Market

The Lower Manhattan office market has changed in many ways since 2001 (see Table 5-10). The total inventory in 2003 is about 14 percent less than it was in 2001—a difference of about 15 msf. The most dramatic change occurred in Class A inventory, which decreased by approximately 23 percent. The decrease in Class A space occurred primarily from the loss of the WTC and surrounding buildings. A small fraction of that loss was countered by an increase of 0.75 msf of Class A space in Financial West between 2001 and 2003.

Table 5-10
Post September 11, 2001 Lower Manhattan Office Inventory and Rents (2003)

Submarket	Class A		Class B		Class C		Total	
	Inventory (sq.ft.)	Total Avg. Rent	Inventory (sq.ft.)	Total Avg. Rent	Inventory (sq.ft.)	Total Avg. Rent	Inventory (sq.ft.)	Total Avg. Rent
World Financial	10,202,802	$44.13	2,447,114	$29.27	1,396,150	$32.00	14,046,066	$40.58
City Hall	5,181,465	$40.99	3,492,656	$29.23	5,904,094	$30.60	14,578,215	$33.02
Insurance	5,202,929	$33.25	7,170,386	$27.90	4,393,706	$26.95	16,767,021	$29.85
Financial West	1,438,315	$34.51	3,433,528	$32.56	1,569,242	$29.24	6,441,085	$33.72
Financial East	23,349,965	$42.42	15,705,471	$31.16	2,002,826	$23.87	41,058,262	$36.98
Total	45,375,476	$41.57	32,249,155	$30.58	15,266,018	$28.49	92,890,649	$36.36

Source: Cushman & Wakefield. Downtown New York Office Market Data, second quarter 2003.

Average rents in Lower Manhattan have decreased dramatically since 2000. Overall, rent dropped by 13.2 percent from $41.17 psf to $36.36 psf. Class C rents dropped by the greatest percentage (23 percent) and Class A the least (13 percent). Among Downtown submarkets, rents in the Insurance area experienced the most drastic decrease (dropping by 24 percent).

Data from the second quarter of 2003 indicates that Lower Manhattan now has a total inventory of approximately 93 msf of office space. Of that space, 49 percent is considered Class A. Over 50 percent of Class A space is located in the Financial East submarket. Class B space is also concentrated in Financial East, while the City Hall and Insurance submarkets contain the majority (a combined 67 percent) of Class C space.

As illustrated in Table 5-11, vacancy rates in Lower Manhattan vary across submarkets and class of space. The World Financial and Financial West submarkets have the highest vacancy rates (24.7 percent and 22.9 percent respectively). Vacancies are most common in Class A space at approximately 14.3 percent as compared to 11.5 percent of Class B space and 10.2 percent of Class C space.

Table 5-11
Post September 11, 2001 Lower Manhattan Office Vacancy (2003)

Submarket	Class A		Class B		Class C		Total	
	Total Available Space	Total Vacancy Rate	Total Available Space	Total Vacancy Rate	Total Available Space	Total Vacancy Rate	Total Available Space	Total Vacancy Rate
World Financial	2,616,297	25.6%	702,556	28.7%	156,153	11.2%	3,475,006	24.7%
City Hall	248,557	4.8%	205,936	5.9%	495,539	8.4%	950,032	6.5%
Insurance	567,267	10.9%	414,298	5.8%	387,080	8.8%	1,368,645	8.2%
Financial West	561,506	39.0%	655,240	19.1%	261,037	16.6%	1,477,783	22.9%
Financial East	2,479,756	10.6%	1,731,071	11.0%	259,717	13.0%	4,470,544	10.9%
Total	6,473,383	14.3%	3,709,101	11.5%	1,559,526	10.2%	11,742,010	12.6%

Source: Cushman & Wakefield. Downtown New York Office Market Data, second quarter 2003.

COMMERCIAL RETAIL MARKET

According to the New York City Department of Finance, Manhattan has a total of 108.6 msf of retail space. Approximately 41 percent (44.4 msf) is located in Midtown South, 31 percent (33.9 msf) in Midtown, and 6.5 percent Downtown.

The average asking rent varies considerably among submarkets. Average asking rents are highest in the East Side and are lowest in Upper Manhattan. The average asking rent dropped dramatically between Spring 2001 and Spring 2003, from $98 psf to $88 psf. The amount of available retail space increased only modestly over that same period from 10.6 msf to 11.3 msf. The amount of available space was 14.5 msf in Spring 2003.

Lower Manhattan contains approximately 7.1 msf of retail space and comprises approximately 6.5 percent of the retail space in Manhattan. According to the Real Estate Board of New York (REBNY), almost 2.3 msf of Lower Manhattan's retail space was available in Spring 2003. The average asking price is $58 psf, which is markedly lower than the $88 psf average asking rent for Manhattan as a whole.

September 11, 2001 had considerable negative impacts on the Lower Manhattan retail market. Approximately 325,000 sf of retail space was destroyed at the World Trade Center, and many retail establishments in the area were closed for several months following the attacks. Retailers reported a dramatic drop in sales after the attacks, resulting both from a decline in office and tourist populations and from the temporary decline in the residential population. The vacancy rate below Chambers Street increased from 10 percent in August 2001 to 17 percent in May 2002, and the average asking rent decreased from $60 psf to $58 psf.

Retail activity improved as people and businesses returned to Lower Manhattan. Major Downtown stores such as Century 21 and J&R Computer World have reopened, and new stores such as Ann Taylor Loft, Nine West, and Crunch Gym have appeared in Lower Manhattan. However, the average asking rent is still $2 psf lower than in Spring 2001 and $9 psf less than in Fall 2000.

The retail market in Lower Manhattan includes a broad range of services, but is heavily concentrated in the food industries. A survey conducted by Wall Street Rising in August 2002 indicated that approximately one third of the retail establishments south of Chambers Street were food-oriented, with 20 percent falling into the Deli/Fast Food/Take-Out category and 11 percent in the Restaurant category. Roughly another third of the retail base was in the GAFO (general merchandise, apparel and accessories, furniture and home furnishings, and other comparison goods) category, with approximately 11 percent of all retail stores selling apparel and accessories. Neighborhood services such as nail and hair salons, cleaners/tailors, and shoe repair shops constituted another 15 to 20 percent of the retail south of Chambers. *

Immediate Study Area Retail Market

The Immediate Study Area includes the blocks immediately surrounding the Project Site. The retail mix in the Immediate Study Area reflects the composition of the retail market in Lower Manhattan as a whole with a heavy concentration of food-oriented and GAFO businesses. (Refer to Figure 5-4, later in this chapter.)

---

* Wall Street Rising. *Downtown Retail Attraction Program*. March 2003. Section 3.

The World Financial Center currently contains a total of 33 retail establishments on two floors. Twelve are eating or drinking places, 10 are GAFO stores, 9 sell convenience goods, and 2 offer neighborhood services. As of March 2003, there were 19 available stores in the World Financial Center, ranging from 574 to 13,620 square feet.

The remainder of the study area contains 70 retail establishments. Most are street level. A few have street-level entrances with second floor space, and others are located slightly below street level. Of the 70 stores, 24 are GAFO, 21 are eating or drinking establishments, 14 sell convenience goods (with 4 focusing on food items), and 7 provide neighborhood services. At the time of this field inspection, the area included four vacant storefronts, one on the northeast corner of Church and Vesey Streets, two along Liberty between Greenwich and Trinity Streets, and one on the northeast corner of Broadway and Maiden Lane.

EMPLOYMENT

New York City and Manhattan

Between 2000 and 2002, employment in every private sector industry except for "Unclassified" decreased. The Services industry lost the greatest number of employees (about 51,000) while the Wholesale Trade and Manufacturing industries lost the greatest percent of employees (10 and 16 percent, respectively).

According to second quarter 2002 employment data from the NYSDOL, there were approximately 2.9 million individuals working in the private sector in New York City. Over 60 percent were employed in Manhattan. (See Table 5-12.) Service industries—which include a wide variety of jobs in hotel, educational services, legal services, automotive repair, and health services—employed the largest number of people and the greatest percentage of the total private sector workforce in both New York City and Manhattan. In Manhattan, employment in service industries was approximately 850,140, or 47 percent of the overall private sector market. In New York City, 46 percent of the private sector workforce was employed in Services. After Services, the industry employing the greatest number of Manhattan workers was FIRE. These workers comprised over 21 percent of Manhattan's private sector workforce. In New York City as a whole, however, FIRE constituted only 16 percent of total employment. Outside Manhattan, Trade, particularly Retail Trade, was the second-highest employer, comprising approximately 20 percent of the private sector workforce.

Public sector employment represented 16 percent of all employment in New York City in 2002. Of the 553,887 public sector employees, approximately 60,700 worked for the federal government, 42,600 for the State, and 450,600 for local government.

Lower Manhattan Employment

The September 11, 2001 attacks and the economic downturn that followed had a dramatic impact on employment in Lower Manhattan. The attack destroyed seven buildings and damaged approximately 23 others.* According to TenantWise.com, the buildings that were destroyed and damaged contained 608 tenants (450 tenants in destroyed buildings and 158 tenants in damaged buildings). Approximately 137,920 jobs were initially displaced.

---

* New York Metropolitan Transportation Council. *Demographic and Socioeconomic Forecasting Post September 11th Impacts.* Technical Memorandum Prepared by Urbanomics.

Table 5-12
Post-September 11, 2001 Manhattan and New York City Private Sector Insured Employment (2002)

Industry	Manhattan		NYC	
	Employment	Percent of Total	Employment	Percent of Total
Manufacturing	118,341	6.6%	201,982	7.0%
Agriculture and Mining	2,273	0.1%	4,756	0.2%
Construction	31,284	1.7%	111,575	3.9%
Transportation and Public Utilities	82,896	4.6%	182,542	6.3%
Trade	321,689	17.8%	570,515	19.7%
Wholesale Trade	99,117	5.5%	162,124	5.6%
Retail Trade	222,572	12.3%	408,391	14.1%
FIRE	386,348	21.4%	452,072	15.6%
Services	850,137	47.2%	1,330,701	46.0%
Unclassified	9,536	0.5%	36,987	1.3%
Total Private Sector Employment	1,802,510	100.0%	2,891,130	100.0%

Source: New York State Department of Labor, second quarter 2002.

As of March 2002, 55.3 percent of displaced jobs had returned to Lower Manhattan. Another 27 percent had relocated to Midtown, 11 percent to New Jersey, and 5 percent to other locations. TenantWise.com reports that as of September 2003, only 91 of the 186 large corporate tenants (those occupying over 10,000 sf of office space) forced to relocate following the attacks had returned to Lower Manhattan.

In light of these displacement and relocation estimates, it is not surprising that Lower Manhattan lost approximately 71,256 employees, representing 17 percent of its 2000 workforce. The greatest loss was in the FIRE sector, which decreased by approximately 25 percent. Retail was also hit hard, losing approximately 11 percent of its 2000 base.

In 2002, there were 354,753 private and public sector jobs in Lower Manhattan. As shown in Table 5-13, almost 40 percent of the private sector employees worked in service industries and another 35 percent worked in the FIRE sector. Within the FIRE industries, over 60 percent were in the "Security and commodity brokers, dealers, exchanges, and services" subsector and another 14 percent were at banks, in the "Depository institutions" subsector. The greatest percentage of employees in the Services Industry (31 percent) were in "Business Services."

Table 5-13
Post-September 11, 2001 Lower Manhattan Employment (2002)

Industry	Number	Percent
Private Sector Employment	276,336	77.9 %
Agriculture, Forestry, Fishing, and Hunting	174	0.1 %
Mining	2	0.0 %
Construction Industries	3,478	1.3 %
Manufacturing	12,012	4.3 %
Transportation, Communication, and Utilities	10,627	3.8 %
Wholesale Trade	7,658	2.8 %
Retail Trade	29,520	10.7 %
Financial, Insurance, Real Estate	96,004	34.7 %
Services Industries	107,444	38.9 %
Unclassified Establishments	9,395	3.4 %
Public Sector Employment	78,417	22.1 %
Total Employment	354,753	100.0 %

Notes:

1. Due to NYSDOL data suppression practices, the sum of employment by industry did not exactly match the total private sector employment figure. Employment that was unaccounted for in the industry breakdown was added to "Unclassified Establishments."
2. For private sector employment industry subcategories, "Percent" represents percent of private sector employment, not total employment. For main public and private sector headings, "Percent" represents the relative contribution of private and public employment to total employment.

Sources: Number of firms was obtained from NYSDOL 2002 employment data. Employment was estimated using NYSDOL data to generate an employment estimate that is consistent with NYMTC employment estimates.

D. PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

CONSTRUCTION PERIOD (2006)

FUTURE COMMON TO ALL ALTERNATIVES

By 2006, Lower Manhattan will gain an estimated 6,023 housing units, an increase of 18 percent over its 2000 base, and an estimated 10,856 residents (see Table 5-14). Accounting for these additional housing units and those known to have been constructed between 2000 and 2003, Lower Manhattan will have 38,581 housing units and approximately 78,929 residents by 2006.

Lower Manhattan will gain approximately 3.55 msf of office space. When added to the 92.9 msf of space in Lower Manhattan in 2003, the total space will be approximately 96.45 msf by 2006. Retail area will increase by 110,400 sf between 2003 and 2006, resulting in a total of approximately 7.21 msf of space. The projected retail employment, office employment, and other employment (from hotel and institutional uses) are added to the 2002 base of 354,753, it yields an estimated 2006 figure of approximately 369,966 jobs.

Table 5-14
Projected Housing, Population, and Employment in Lower Manhattan in the Construction Period (2006)

Estimate	Residential (DU)	Office (sf)	Retail (sf)	Population	
				Residential	Employee
Post-September 11, 2001	32,558	92,900,000	7,100,000	68,073	354,753
Incremental Growth	6,023	3,550,800	110,400	10,856	15,213
Total 2006	38,581	96,450,800	7,210,400	78,929	369,966

Notes: Population estimates were generated by multiplying the number of housing units (DU) by the 2000 average household size for each subarea. Employment estimates were generated by applying standard employee/square foot ratios to anticipated development.

In addition to the jobs that would be created by new development in Lower Manhattan, the major, federally-sponsored recovery efforts that are independent of the Preferred Alternative are anticipated to result in significant numbers of construction jobs in 2006. As will be described below for the Preferred Alternative, these workers will provide for substantial increases in spending and tax revenues within Lower Manhattan.

NO ACTION ALTERNATIVE

Under the No Action Alternative, the temporary WTC PATH station would continue to operate as it does today with a single entry/exit at the intersection of Fulton and Church Streets. There would be construction activity on the WTC site associated with the WTC Memorial and Redevelopment Plan. Although access to the temporary WTC PATH station would be retained at all times, certain routes to and from the Fulton Street entrance may be restricted to allow for construction staging and other activities. However, since there would be no active uses on the WTC site during the construction period, these restrictions would not have a direct economic effect.

As will be described in Chapter 15, "Cumulative Effects," the simultaneous construction of transportation and development projects in Lower Manhattan may have impacts to local residents and businesses. Temporary road closures, trucking activities, and construction noise may temporarily affect the quality of life for employees and residents in the vicinity of the WTC site.

PREFERRED ALTERNATIVE

Construction of the Preferred Alternative would not displace residents or businesses since no such uses are currently located on the WTC site. The plans for the Preferred Alternative have been closely coordinated into the WTC Memorial and Redevelopment Plan; thus, its construction would also not preclude future cultural, office, and retail projects on the WTC site. Off-site construction is limited to portions of Route 9A and the Winter Garden at the World Financial Center. In their planning for these off-site activities, PANYNJ has ensured that no commercial or residential spaces would be directly displaced.

The majority of the Preferred Alternative's construction would occur within the WTC site. Where off-site construction would be required, PANYNJ would prepare a Maintenance and Protection of Traffic (MPT) plan to ensure that residents, employees, and visitors to Lower Manhattan can access destinations throughout the study area (see Chapter 8, "Transportation").

Environmental Performance Commitments (EPCs) would be undertaken to communicate with local businesses regarding construction activities and to provide for signage and advertising to promote businesses directly impacted by construction activities. Thus, the Preferred Alternative would not eliminate access to existing residential, business, or retail establishments during the construction period.

Access to the temporary WTC PATH station would be retained throughout the construction period. However, as certain components are completed, additional entrances and exits would be provided. As described below, the anticipated changes in pedestrian flows associated with the Preferred Alternative would not result in adverse impacts to businesses in the Immediate Study Area.

The construction of the Preferred Alternative would be coordinated with the overall redevelopment of the WTC site. Although additional construction equipment and labor would be required for the Terminal's construction, the types of activities and their potential effects on local populations would occur with or without the Preferred Alternative since the WTC Memorial and Redevelopment Plan would occur independently. However, to minimize any potential adverse effects associated with the construction of the Preferred Alternative, PANYNJ would implement EPCs as described in Chapter 2, "Project Alternatives," and later in this chapter under Section E, "Mitigation."

As described in Chapter 2, "Project Alternatives," the Draft Environmental Impact Statement evaluated a Permanent WTC PATH Terminal both with and without a sub-grade connection beneath Church Street to Liberty Plaza. The alternative with the concourse was projected to cost $81 million more than the alternative without the concourse. However, since publication of the DEIS, PANYNJ has advanced the design of the Preferred Alternative, which does not include this sub-grade concourse, and has determined that certain components would be more costly than originally estimated. Thus, the Preferred Alternative would have a higher construction cost ($2.138 billion) than the "Terminal with Liberty Plaza Connection Alternative" presented in the DEIS.

The construction of the Preferred Alternative would generate new construction jobs and resultant economic benefits for Lower Manhattan. The principal model used to estimate the effect of constructing the Terminal on the city's economy is the Regional Input-Output Modeling System (RIMS II), developed by the U.S. Department of Commerce, Bureau of Economic Analysis. The model contains data for New York City on 490 economic sectors, showing how each sector affects every other sector as a result of a change in the quantity of its product or service. A similar RIMS II model for New York State, also developed by the U.S. Department of Commerce, has been used to trace the effects on the State economy. The models have been adjusted to reflect the most recent changes in the New York metropolitan area price level. Using these models and the specific characteristics of the project, the total effect has been projected for New York City and State.

The development of this alternative would be undertaken by the investment of funds into the area. Based on preliminary estimates, the capital investment for construction of the Preferred Alternative is estimated to equal about $2.138 billion. This amount includes site preparation and hard costs (actual construction), and design, legal, and related costs. The total estimated amount of $2.138 billion reflects the cost of physical improvements to the site, and therefore excludes other values (such as financing) that are not directly a part of the expenditures for construction.

The $2.138 billion represents the direct expenditures during the construction period. As a result of the direct expenditures, the direct employment is estimated at about 10,533 person-years of employment. (A person-year is the equivalent of one employee working full-time for a year.) In addition to direct employment, total employment resulting from construction expenditures would include jobs in business establishments providing goods and services to the contractors and resulting indirect and generated employment. Based on the model's economic multipliers for New York City industrial sectors, the Preferred Alternative would generate an additional 5,779 person-years of employment within New York City, bringing the total direct and generated jobs from the construction to 16,312 person-years (see Table 5-15). In the larger New York State economy, the model estimates that this alternative would generate 9,432 person-years of indirect employment, bringing the total direct and generated jobs from construction to 19,965 person-years of employment.

The direct wages and salaries during the construction period are estimated at $661.50 million (see Table 5-15). Total direct and generated wages and salaries resulting in New York City from construction are estimated at $988.94 million. In the broader New York State economy, total direct and generated wages and salaries from construction of the Preferred Alternative are estimated at $1.18 billion ($1,184.88 million).

Based on the RIMS II model for New York City and State, the total economic activity, including indirect expenditures (those generated by the direct expenditures), that would result from construction is estimated at $3.97 billion in New York State, of which $3.10 billion would occur in New York City (see Table 5-15).

The construction activity would have associated with it tax revenues for New York City, the Metropolitan Transportation Authority (MTA), and New York State. Based on aggregate data on economic activity and tax receipts for the New York City and State economies, it is estimated that, in total, the construction of the Terminal would generate approximately $146 million in tax revenues for New York City, MTA, and New York State. Of these tax revenues, the largest portion would come from personal income taxes, corporate and business taxes, sales tax on indirect expenditures, and related taxes on direct and induced economic activity. New York State would receive about $96.81 million from construction of the Preferred Alternative. The MTA (which collects a 0.25 percent sales tax and tax surcharges on business and utilities taxes within the city and the MTA 12-county region) would receive about $2.96 million. New York City would receive about $46.5 million.

OPENING YEAR (2009)

FUTURE COMMON TO ALL ALTERNATIVES

Table 5-16 summarizes the development and population growth anticipated in Lower Manhattan by 2009. The combined new construction of dwelling units, offices, and retail between 2003 and 2009 will increase both the residential and employee populations of Lower Manhattan. In total, the area is expected to gain 10,060 dwelling units, 6.15 msf of office space, and 1.38 msf of retail space between 2003 and 2009. This will result in a total of 42,618 dwelling units, 99.05 msf of office space, and 8.48 msf of retail space.

In total, the area's residential population will increase by 28 percent between 2003 and 2009 from 68,073 to 86,893. The combined development of offices, retail, hotels, and institutional uses in Lower Manhattan is expected to increase its employment by nearly 9 percent over the same six year period from 354,753 to 386,081.

Table 5-15
Employment and Fiscal Benefits from Construction of the Preferred Alternative

	Portion in New York City	Total New York City And State
Employment (Person-years)*		
Direct (Construction)	10,533	10,533
Indirect (Secondary and Induced)	5,779	9,432
Total	16,312	19,965
Wages and Salaries (Millions)		
Direct (Construction)	$661.50	$661.50
Indirect (Secondary and Induced)	$327.44	$523.38
Total	$988.94	$1,184.88
Total Economic Output or Demand** (Millions)		
Direct (Construction)	$2,138.0	$2,138.0
Indirect (Secondary and Induced)	$957.7	$1,832.6
Total	$3,095.7	$3,970.6
	Fiscal	
Tax Revenues*** (Constant 2003 dollars)		
New York City Taxes	$46,485,500	
MTA Taxes	$2,963,000	
New York State Taxes	$96,809,500	
Total	$146,258,000	

Notes:
* A person-year is the equivalent of one person working full-time for a year.
** The economic output or total effect on the local economy derived from the direct construction spending.
*** Includes personal income taxes, corporate and business taxes, sales tax on indirect expenditures, and numerous other taxes on construction and secondary expenditures.
Sources: The characteristics and construction cost of the Preferred Alternative; the Regional Input-Output Modeling System (RIMS II), U.S. Department of Commerce, Bureau of Economic Analysis; and the tax rates by applicable jurisdiction.

Table 5-16
Projected Housing, Population, and Employment in Lower Manhattan in the Opening Year (2009)

Estimate	Residential (DU)	Office (sf)	Retail (sf)	Population	
				Residential	Employee
Post-September 11, 2001	32,558	92,900,000	7,100,000	68,073	354,753
Incremental Growth	10,060	6,150,800	1,380,400	18,820	31,328
Total 2009	42,618	99,050,800	8,480,400	86,893	386,081

Notes: Population estimates were generated by multiplying the number of housing units by the 2000 average household size for each subarea. Employment estimates were generated by applying standard employee/square foot ratios to anticipated development.

NO ACTION ALTERNATIVE

Under the No Action Alternative, the temporary WTC PATH station would continue to operate in the opening year. As described in Chapter 8, Section A, "PATH," PANYNJ anticipates that the temporary station can fully accommodate the anticipated increase in workers and residents in Lower Manhattan in the 2009 opening year.

PREFERRED ALTERNATIVE

Upon its completion, the Preferred Alternative would have positive impacts to the residential and business populations of Lower Manhattan. As described in Chapter 8, Section A "PATH," the Preferred Alternative would serve approximately 67,000 passengers on an average weekday. The transportation link between New Jersey and Lower Manhattan would improve the marketability of office space in the study area and would support the growing residential population of Lower Manhattan.

The Preferred Alternative would include a small retail component (less than 5,000 sf), but there would be no residential or office uses within the project limits. Thus, the Preferred Alternative would not alter the 2009 projected employment or population characteristics described above.

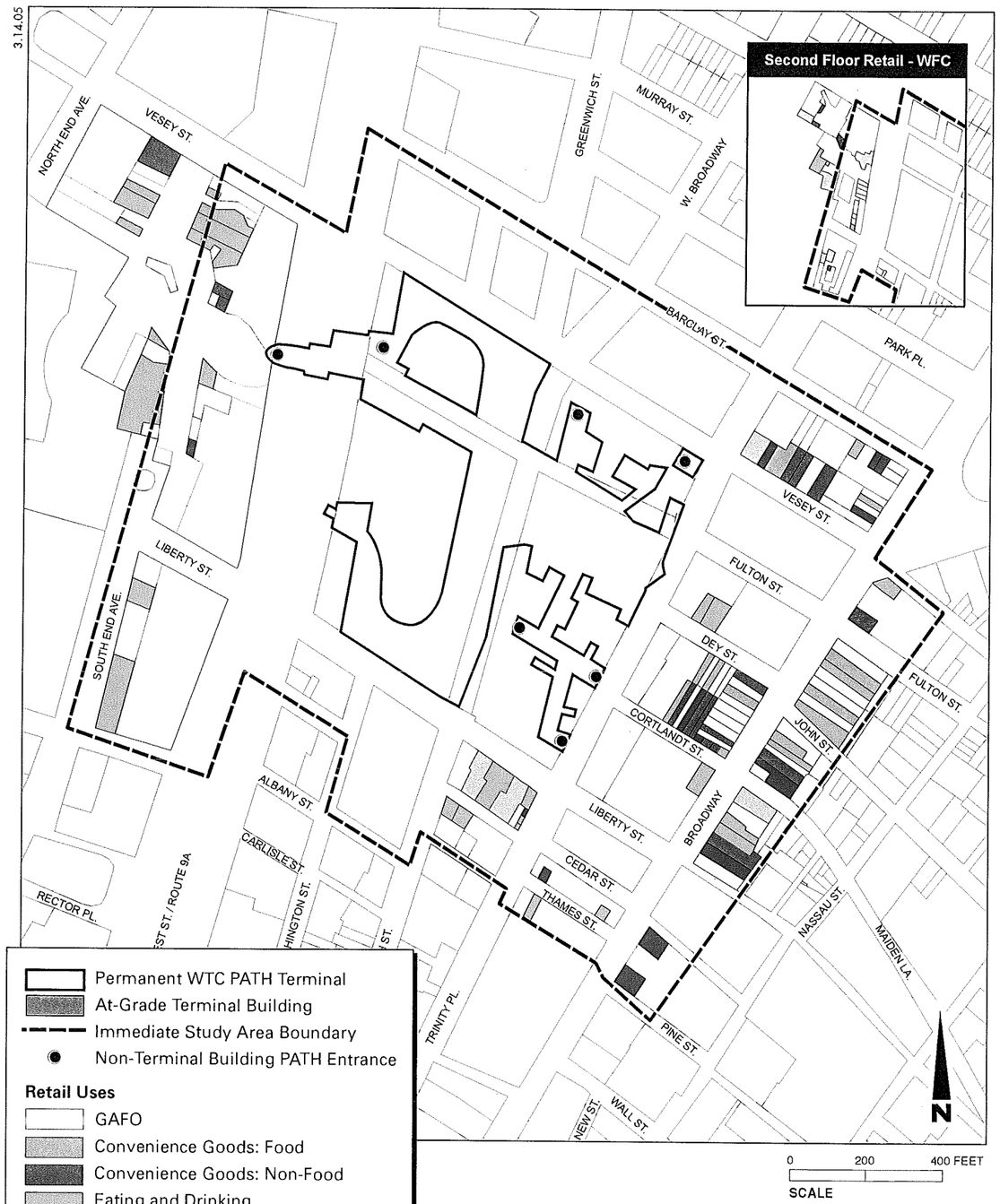
Although the Preferred Alternative may increase the desirability of Lower Manhattan's residential market, its effects would not be powerful enough to alter the existing demographic or housing profile nor would it alter existing trends. Over the past two decades, Lower Manhattan has experienced residential growth that is unmatched by most parts of the city. Between 1990 and 2000, the housing stock in the subareas immediately surrounding the WTC site increased by 44 percent as compared to 1.6 and 6.9 percent for Manhattan and the city as a whole, respectively. As described under the Future Common to All Alternatives, this trend is expected to continue. Based on current and anticipated statistics, the area would not contain a substantial population that would be vulnerable to indirect displacement. Thus, any upward pressures in real estate resulting from the development of the Preferred Alternative would not result in adverse impacts from the displacement of local residents.

The Preferred Alternative would not directly displace business or residents, would not introduce major new economic activities, and would not replace property that has a blighting effect on existing commercial development. Therefore, the Preferred Alternative would not result in indirect business displacement. If anything, it would have a positive indirect effect to the Lower Manhattan office market by providing improved access to existing and proposed developments.

Prior to September 11, 2001, approximately 140,000 people used the WTC PATH Terminal on a daily basis, generating a reliable stream of foot traffic for retail establishments in the Immediate Study Area. Figure 5-4 shows existing retail uses in the Immediate Study Area by category along with the proposed access points to the Terminal, which would be generally positioned in the same location as before September 11, 2001 with two exceptions: 1) a sub-grade connection to the Winter Garden at the World Financial Center, and 2) connection to Fulton Street Transit Center's Dey Street Concourse.

The proposed Winter Garden entrance would replace the second-level pedestrian bridge that existed before September 11, 2001. This entrance may alter pedestrian patterns within the World Financial Center as compared to the pre-September 11, 2001 condition, but any changes would be modest and would not substantially impact existing businesses in the World Financial Center. The new Dey Street concourse, which is being constructed independent of the Preferred Alternative, would allow a direct, sub-grade connection between subways located along

3.14.05



PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 5-4
Retail Uses

Broadway, Fulton, Nassau, and William Streets and the WTC site and Permanent WTC PATH Terminal. This new transfer may attract some pedestrians from street-level; however, the businesses located en route would not be substantially impacted by these diversions. Thus, the Preferred Alternative would not have adverse indirect effects to retail establishments in the Immediate Study Area.

The Preferred Alternative would not directly alter the employment characteristics of the study area since it would not include an office component or substantial commercial development. The small amount of retail that is proposed would be comparable to that which existed prior to September 11, 2001. This retail would employ up to 15 people, representing a small addition to the more than 382,800 jobs that would be located south of Canal Street in 2009. Any potential impacts to employment would be positive since the Preferred Alternative would improve access to jobs for both residents of New Jersey and Lower Manhattan.

DESIGN YEAR (2025)

FUTURE COMMON TO ALL ALTERNATIVES

Table 5-17 summarizes the development and population growth anticipated in Lower Manhattan by 2025. In total from 2003 to 2025, Lower Manhattan is expected to gain 12,217 new housing units, nearly 15 msf of new and reoccupied office space, and nearly 1.5 msf of new and reoccupied retail space. In total the area will house 90,775 residents and will employ 421,873 in offices, retail, hotels, and cultural and institutional facilities.

Table 5-17
Projected Housing, Population, and Employment in Lower Manhattan in the Design Year (2025)

Estimate	Residential (DU)	Office (sf)	Retail (sf)	Population	
				Residential	Employee
Post-September 11, 2001	32,558	92,900,000	7,100,000	68,073	354,753
Incremental Growth	12,217	14,912,850	1,470,700	22,702	67,120
Total 2025	44,775	107,812,850	8,570,700	90,775	421,873
Pre-September 11, 2001	27,143	107,512,756	7,450,000	58,618	426,000

Notes: Population estimates were generated by multiplying the number of housing units by the 2000 average household size for each subarea. Employment estimates were generated by applying standard employee/square foot ratios to anticipated development.

The residential population of Lower Manhattan is expected to increase substantially as compared to before September 11, 2001. By 2025, the area will house 90,775 residents, representing a 79 percent increase over the 25 year period. Although the area will realize a net gain in retail and office spaces, the total employment in 2025 is expected to be quite similar to pre-September 11, 2001 conditions. By 2025, employment will be within 1 percent of its pre-September 11, 2001 levels. The estimates presented in Table 5-18 indicate that while the office and retail markets in Lower Manhattan will have recovered from the terrorist attacks by 2025, the area's drastic increase in its residential population exemplify Lower Manhattan's changing focus from a 9 to 5 business center to a 24-hour neighborhood.

NO ACTION ALTERNATIVE

By 2025, the temporary WTC PATH station would be retired from service since it would have reached the end of its useful service life. Absent the Preferred Alternative, PATH operations would be suspended between New Jersey and the WTC site. As described in Chapter 1, "Purpose and Need," Chapter 8, "Transportation," and previously in this chapter, the aftermath of September 11, 2001 had devastating affects to the economy of Lower Manhattan. Access to the area was limited by the loss of PATH service between New Jersey and the WTC. It is anticipated that if this connection was again lost, growth in population and employment would not be as robust as currently projected.

This assertion is supported by surveys and studies involving businesses currently located in Lower Manhattan. For example, the "Executive Survey" performed by the Downtown Alliance in April 2003 revealed that transportation access to Lower Manhattan is an issue of high importance to senior executives at leading Downtown companies. The survey indicates that for many leading businesses, the decision to remain in or relocate to Lower Manhattan is heavily based on the convenience and ease with which their employees and clients can reach their facilities. Thus, the absence of a WTC PATH Terminal under the No Action Alternative may contribute to an out-migration of some existing firms, and discourage other firms from locating in Lower Manhattan.

As discussed in Chapter 8, Section B ("Vehicular Traffic and Parking"), vehicular traffic during AM and PM peak hours is expected to increase by more than 1,200 trips under the No Action Alternative. This addition would represent a considerable increase in congestion and could have adverse impacts at key locations, especially near the major portals such as the Holland Tunnel and along the Route 9A corridor. These new vehicle trips could negatively impact businesses in Lower Manhattan, making it more difficult for trucks to deliver goods, for employees to reach their workplaces, and for customers to reach retailers.

Thus, the combination of increased vehicle traffic and decreased transportation access under the No Action Alternative could have a serious adverse impact on the long-term vitality of the Lower Manhattan economy.

PREFERRED ALTERNATIVE

As previously described, the Preferred Alternative would not include a residential or office component. The proposed retail component would be comparable to what existed prior to September 11, 2001 and would not have an effect on employment in Lower Manhattan. Thus, the Preferred Alternative would not alter the development, population, or employment characteristics described above for the Future Common to All Alternatives.

Furthermore, the Preferred Alternative would have no adverse direct or indirect effects on residents or businesses in the design year. While ridership would increase between 2009 and 2025, this change would have positive impacts to businesses within the Immediate Study Area. It is expected that any effects of the Preferred Alternative would be beneficial as compared to existing and No Action conditions and that there would be no adverse impacts to social or economic conditions in Lower Manhattan.

E. MITIGATION

During the construction period, activities associated with the Permanent WTC PATH Terminal may restrict access or limit the visibility of certain businesses in the immediate vicinity of the Project Site. To minimize adverse effects to these businesses, PANYNJ would undertake EPCs that both promote the business climate and Lower Manhattan and retain access to businesses, to the extent possible. These EPCs and the proposed implementation plans are described in Table 5-18.

Table 5-18
Environmental Performance Commitments

Proposed Commitment	Implementation Plan
Coordinate with LMDC, Downtown Alliance or other entities to minimize residential and retail impacts as required through: a) relocation assistance, as applicable, to persons to businesses physically displaced by the project; and b) focus on essential business and amenities to remain in Lower Manhattan.	This would be implemented as part of the Maintenance and Protection of Traffic (MPT) Plan and the coordinated Transportation Management Plan (TMP) among the Lower Manhattan Project sponsors. All businesses in the affected area would be mapped, in conjunction with the MPT and construction staging plans, to determine conflicts on business access. The MPT Plan and TMP would then identify solutions to these conflicts.
Add appropriate signage for affected businesses and amenities.	This would be implemented as part of the project's MPT Plan.

As described in Chapter 2, "Project Alternatives," PANYNJ has and continues to coordinate with the sponsors of the other Lower Manhattan recovery efforts to further refine the EPCs and protocols for their implementation. This includes public outreach planning to inform businesses and residents of issues during the construction period. This plan will employ a variety of methods to communicate with the public during construction of the Preferred Alternative including targeted outreach to residents and businesses adjacent to the Project Site as well as a wider campaign for Lower Manhattan through community and interest groups, media, and other public relations tools. Refer to Chapter 18, "Agency Coordination, Process, and Public Participation," for a description of outreach activities to date.

Since the Preferred Alternative would not have long-term (opening or design year) adverse impacts, as described above, mitigation would not be required once the Terminal is operational. ✱

A. INTRODUCTION

Lower Manhattan is home to many of New York City's most important historic resources and some of its finest architecture. It is the oldest and one of the most culturally rich sections of the city. Thus, numerous buildings, street fixtures and other structures have been identified as historically significant. This chapter assesses the potential impacts of the Preferred Alternative on archaeological and historic resources.

B. METHODOLOGY

In general, potential effects on archaeological or historic resources can include both direct physical effects (e.g., demolition, alteration, or damage from construction on nearby sites) and indirect, contextual effects, such as the isolation of a property from its surrounding environment, or the introduction of visual, audible, or atmospheric elements that are out of character with a property or that alter its setting. To assess the potential effect of a project, an Area of Potential Effect (APE) is defined and an inventory of archaeological and historic resources located in the APE is compiled.

This section describes the delineation of the APE, the inventory, and the assessment of potential effects of the Preferred Alternative.

REGULATORY CONTEXT

The National Environmental Policy Act (NEPA) requires the consideration of potential impacts to historic resources. In addition, potential effects on historic resources are considered in conformance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), Section 4(f) of the United States Department of Transportation Act of 1966 (Section 4[f]), and the New York State Historic Preservation Act of 1980 (SHPA). In addition, the New York City Landmarks Law and potential impacts to New York City Landmarks (NYCLs) and New York City Historic Districts (NYCHDs) have been considered.

NATIONAL HISTORIC PRESERVATION ACT (SECTION 106)

NHPA requires federal agencies to take into account the effects of their undertakings on historic properties. This process, commonly referred to as Section 106 process, provides for review of any federally licensed, financed, or assisted undertaking. Because funds from a federal agency (the United States Department of Transportation, Federal Transit Administration [FTA]) would be used to achieve the project, this assessment of cultural resources was prepared pursuant to Section 106 of NHPA.

Due to the WTC Site being within and near the project locations of their respective proposed undertakings, FTA, Federal Highway Administration (FHWA) and Lower Manhattan Development Corporation (LMDC) coordinated the Section 106 process in determining the

eligibility of the WTC Site for inclusion in the National Register of Historic Places. The coordinated process concluded on March 31, 2004 with the issuance of the Coordinated Determination of National Register Eligibility (Coordinated DOE) finding the WTC Site eligible for listing. As the State Register of Historic Places has the same criteria for evaluation as the National Register, the WTC Site is also eligible for inclusion in the State Register. Each project sponsor is performing its own assessment of its project's effects and identifying mitigation measures, as necessary.

Section 106, as implemented by federal regulations appearing at 36 CFR 800, mandates that federal agencies take into account the effect of their actions on any properties listed on or determined eligible for listing on the National Register of Historic Places (NR) and afford the federal Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings. Federal agencies, in consultation with the State Historic Preservation Officer (SHPO), as well as other consulting parties where appropriate, must determine whether the Preferred Alternative would have any effects on the characteristics of a resource that qualify it for the National Register of Historic Places (NR) and seek ways to avoid, minimize, or mitigate any adverse effects. The Section 106 process includes the following:

- All properties within the APE that are included in or eligible for the National Register must be identified in consultation with SHPO. If properties are found that may be eligible for the National Register, but for which no determination has yet been made, the agency consults with SHPO to determine eligibility or ineligibility.
- If there are listed or eligible properties, the potential effect of the proposed project on each property must be evaluated, in consultation with SHPO, to determine if the project would have adverse effects on them by applying the criteria of adverse effect (36 CFR § 800.5(a)). In general, a proposed project is deemed to have an adverse effect if it would diminish the characteristics of the property that qualify it for inclusion in the National Register.
- If the analysis indicates that the proposed project would have an adverse effect, ACHP is notified, and SHPO and other consulting parties are consulted to seek concurrence on ways to avoid, minimize, or mitigate effects. This mitigation is typically implemented through either a Memorandum of Agreement (MOA) or Programmatic Agreement. ACHP may choose to participate in the consultation when there are substantial effects on important historic properties, when a case presents important questions of policy or interpretation, when there is a potential for procedural problems, or when there are issues of concern to Native Americans. ACHP must be invited to participate when the federal agency sponsoring the project requests ACHP's involvement, when the project would have an adverse effect on a National Historic Landmark (NHL), or when a Programmatic Agreement will be prepared. Programmatic Agreements may be used when effects on historic properties are similar and repetitive or are multi-state or regional in scope, when effects on historic properties cannot be fully determined prior to approval of an undertaking, or where other circumstances warrant a departure from the normal Section 106 process, among other reasons. In addition, the federal agency sponsoring the project may request an advisory opinion if it wishes.
- Execution of the MOA or Programmatic Agreement and implementation of the terms therein demonstrate that the federal agency has taken into account the effects of the action.

The review under Section 106 can be conducted in coordination with analyses conducted for NEPA, and where consistent with the procedures set forth in 36 CFR 800, information developed for the NEPA environmental review may be used to meet the requirements of Section

106. The views of the public are essential to inform federal decision-making in the Section 106 process and, therefore, the public should be made aware of, and given the opportunity to comment on, the project and its effects on historic properties. An agency may use its procedures for public involvement under NEPA to satisfy the requirements of Section 106, if those procedures provide adequate opportunities for public involvement consistent with 36 CFR 800. In the case of the Permanent WTC PATH Terminal, the FTA is coordinating its Section 106 process with the other federal agencies carrying out Lower Manhattan Recovery Projects and is using this NEPA review to provide additional opportunities for comment by the public, SHPO, ACHP, and a broad range of consulting parties. As described in Section E, "Mitigation," the Section 106 process is ongoing for this project.

In addition, Section 110 of NHPA addresses federal agencies' responsibility to preserve historic properties. Section 110(f) mandates additional protection for NHLs by requiring that federal agencies exercise a higher standard of care when considering undertakings that may directly and adversely affect NHLs.

SECTION 4(F) OF THE U.S. DEPARTMENT OF TRANSPORTATION ACT

Historic properties are also protected under Section 4(f) of the Department of Transportation Act of 1966.[1] Section 4(f) prohibits actions by the Secretary of Transportation that require "use" of a historic property that is listed on or eligible for inclusion on the National Register, unless a determination is made that there is no feasible and prudent alternative to the use of such land and all possible planning has been undertaken to minimize harm to the 4(f) property. For historic properties, "use" includes direct physical impacts, such as demolition or removal of part of a historic property. It also includes adverse contextual impacts (these can result in "constructive use," when changes caused by the project that are near the historic structure cause a substantial impairment in the historic resource's important qualities). Constructive use could occur from such changes as noise, visual intrusion, or other such elements that would significantly alter the setting of the historic resource. A Section 4(f) Evaluation has been prepared and is included in Volume I of this Environmental Impact Statement (EIS).

STATE HISTORIC PRESERVATION ACT

SHPA closely resembles NHPA, and requires that state agencies consider the effect of their actions on properties listed on or determined eligible for listing on the State Register of Historic Places. Compliance with Section 106 satisfies the requirements of SHPA, set forth in Section 14.09 of the New York State Parks, Recreation and Historic Preservation Law.

NEW YORK CITY LANDMARKS LAW

The New York City Landmarks Preservation Commission (LPC) designates historically significant properties in New York City as NYCLs and/or NYCHDs, following the criteria provided in the *Local Laws of the City of New York, New York City Charter, Administrative Code, Title 25, Chapter 3*. Properties designated as NYCLs or NYCHDs are protected under the New York City Landmarks Law, which requires LPC review and approval before any alterations or demolition can occur. Although the New York City Landmarks Law is not applicable to the

[1] Section 4(f) has been recodified as Section 303 of Title 49 of the United States Code as well Section 138 of Title 23, although it is commonly referred to as Section 4(f).

Permanent WTC PATH Terminal, potential impacts to NYCLs and NYCHDs have been considered.

AREA OF POTENTIAL EFFECT

SHPO has concurred with the APEs defined below for archaeological and historic resources (see Appendix B).

ARCHAEOLOGICAL RESOURCES

For archaeological resources, the APE is generally the area to be excavated by the Preferred Alternative, since this is the area where any artifacts or features could be disturbed (see Figure 6-1). For the Preferred Alternative, the APE for archaeological resources includes a portion of the eastern half of the WTC site (east of the 1 and 9 subway line). The western half of the WTC site (the bathtub), where the proposed tracks, platforms, and mezzanine would be located, was excavated down to bedrock during construction of the WTC, and again during the recent demolition and debris removal as part of the recovery from the attacks. As a result, the bathtub has no potential for archaeological resources.

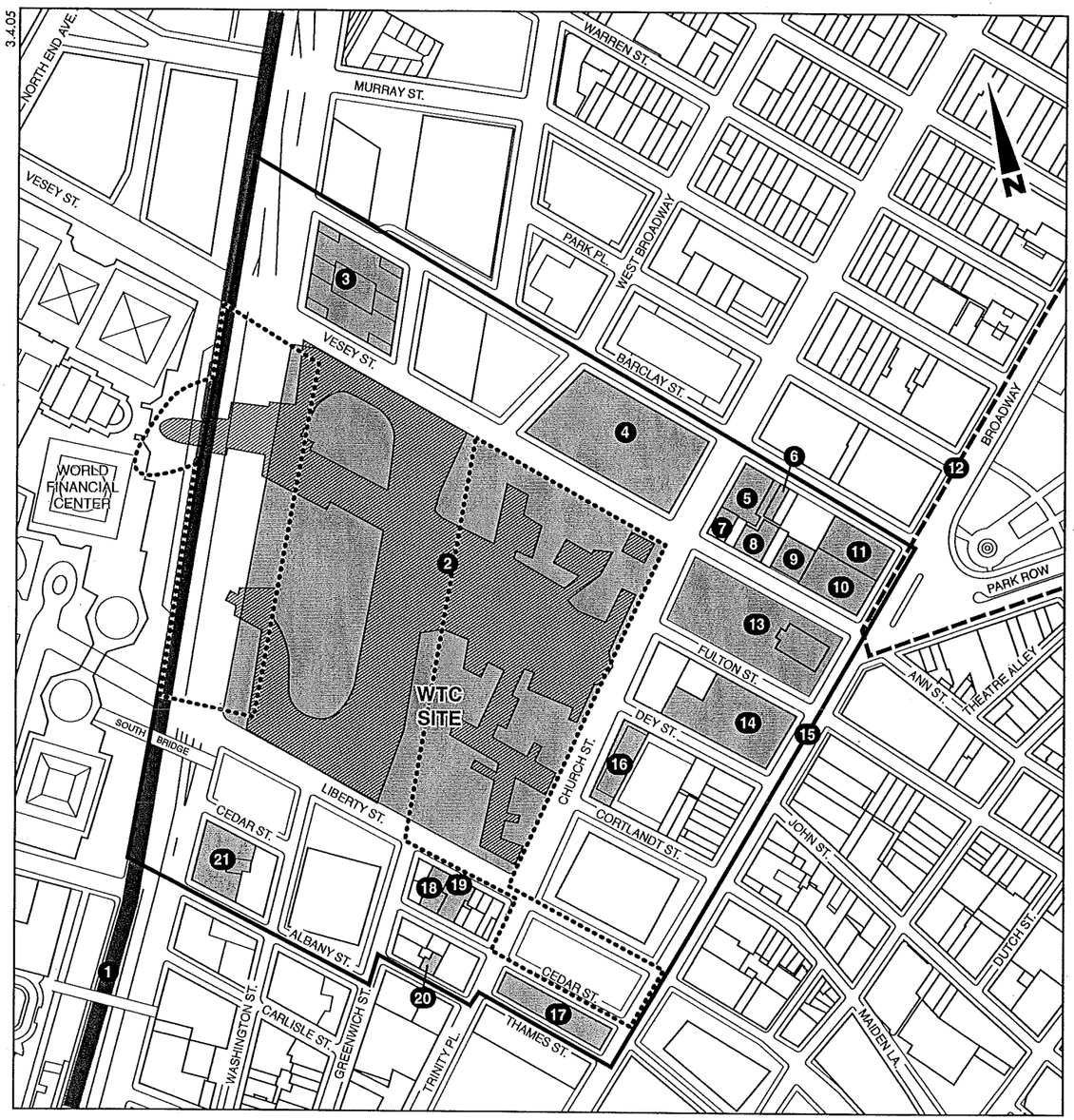
The APE for archaeological resources also includes the location where a below-grade pedestrian concourse would extend beyond the boundary of the WTC site and cross beneath Route 9A to the World Financial Center (WFC) in Battery Park City (BPC). As described in Chapter 2, "Project Alternatives," the Draft EIS (DEIS) considered an alternative (since dismissed) that would have involved the construction of a below-grade pedestrian concourse beneath Church and Liberty Streets, terminating within Liberty Plaza. The APE for archaeological resources therefore was originally delineated to include portions of Church and Liberty Streets and Liberty Plaza.

Archaeological resources are evaluated through a three-step process. The first step, Phase 1, consisted of documentary research into the history of the site to determine the likelihood that archaeological resources may be present within the APE. This step was divided into two phases: Phase 1A, which required identifying areas that may contain archaeological resources, and Phase 1B, which would involve subsurface testing to try to determine whether any resources are actually present. Phase 1A documentary research has been complete, while Phase 1B subsurface testing has been recommended for certain areas of the Project Site. If the Phase 1B testing indicates that resources are present, then Phase 2 investigations would take place. Phase 2 would consist of more extensive subsurface investigations and additional research to establish the age, integrity and research potential of the resources, and whether they may be eligible for the Registers. A third step, Phase 3, would be considered the mitigation phase; mitigation may consist of either avoidance of the resource or data recovery in the form of a full-scale excavation and documentation.

HISTORIC RESOURCES

To account for contextual and visual effects, as well as possible construction-related structural damage, the APE for historic resources was defined as the Project Site and the adjacent area within approximately two blocks of the Project Site. Thus, the APE is generally bounded by Barclay Street to the north, Albany and Thames Streets to the south, the limits of the Route 9A right-of-way to the west and Broadway to the east (see Figure 6-1).

3.4.05



Permanent WTC PATH Terminal

Area of Potential Effect for Archaeological Resources

Area of Potential Effect for Historic Resources

Known Historic Resource

Known Historic District

0 200 500 FEET

SCALE

PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 6-1
Area of Potential Effect

Identification of Historic Resources

Once the APE was defined, a list of officially recognized historic resources within the APE was compiled. This included NHLs; other properties or districts listed on the State and National Registers of Historic Places (S/NR) or properties determined eligible for such listing; and New York City Landmarks (NYCL) or Historic Districts (NYCHD), or properties pending NYCL or NYCHD designation. A list of potential historic resources within the APE was also compiled. These were identified based on field surveys of the APE and, where available, information from historical societies or preservation organizations with knowledge of the area. Potential historic resources comprise properties that may be eligible for listing on the S/NR and/or designation as NYCLs.

The National Register Criteria for Evaluation are found in 36 CFR 60. Following these criteria, districts, sites, buildings, structures, and objects are eligible for the S/NR if they possess integrity of location, design, setting, materials workmanship, feeling, and association, and:

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or

B. that are associated with the lives of significant persons in our past; or

C. that embody the distinctive characteristics of a type, period, or method of construction; that represent the work of a master; that possess high artistic values; that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. that have yielded, or may be likely to yield, information important in history or prehistory.

Properties that have been constructed within the last 50 years are ordinarily not eligible. Determinations of eligibility are made by SHPO. Generally, all properties that are listed on the National Register are listed on the State Register, which has the same criteria for evaluation as the National Register.

Buildings, properties, or objects are eligible for designation as a NYCL or NYCHD when a part is at least 30 years old. Landmarks have a special character or special historical or aesthetic interest or value as part of the development, heritage, or cultural characteristics of the city, state, or nation. There are four types of landmarks: individual, interior, historic district, and scenic.

The identification of historic resources for this project was unique due to the historic events of September 11, 2001. As described above, FTA, FHWA, and LMDC issued a Coordinated DOE regarding the WTC site's eligibility for inclusion in the National Register. SHPO concurred with this determination and found the WTC site eligible for listing in the National Register (see Appendix B). As the State and National Registers have the same criteria for evaluation, the WTC Site is also eligible for inclusion in the State Register.

In addition to the resources with official designation or status, a number of other potential historic resources have been identified by the Lower Manhattan Emergency Preservation Fund (LMEPF), a consortium of historic preservation organizations that was formed in response to the terrorist attacks of September 11, 2001. This consortium includes the Municipal Art Society, the National Trust for Historic Preservation, the New York Landmarks Conservancy, the Preservation League of New York State, and the World Monuments Fund. The LMEPF produced a map, entitled *Corridors of Concern*, which shows potential historic resources in addition to the officially recognized (or known) resources. Information obtained from this map was used to assist in the identification of potential historic resources. SHPO and LPC have

determined that some of these resources are S/NR-eligible and NYCL-eligible, and these resources have been included in Table 6-1.

ASSESSMENT OF EFFECTS ON HISTORIC RESOURCES

Once the historic resources in the APE are identified, the effects of the project on those resources are assessed. As described above, potential effects may include both direct physical effects and indirect contextual effects. Direct effects could include physical destruction, damage, or alteration of a historic resource. In addition, indirect effects, such as changes in the appearance of a historic resource or in its setting—including introduction of incompatible visual, audible, or atmospheric elements to a resource's setting—are considered.

FTA began its Section 106 process in September 2003, concurrent with scoping for the Permanent WTC PATH Terminal. In December 2003, FTA began its coordinated Section 106 process with FHWA (lead agency for the Route 9A Project and LMDC (lead agency for the WTC Memorial and Redevelopment Plan). In December 2003, the three federal agencies jointly notified the SHPO and ACHP concerning these three Lower Manhattan undertakings and identified potential consulting parties to the Section 106 process. In January and February 2004, FTA, FHWA and LMDC jointly hosted two meetings with consulting parties to discuss the projects and in particular the evaluation of the WTC Site for eligibility for inclusion in the National Register of Historic Places. Consulting parties were also offered opportunities to comment on draft versions of the Coordinated DOE, which was issued in final form on March 31, 2004. At this point, the coordinated process effectively ended, with each lead agency to meet the remainder of its Section 106 responsibilities separately as appropriate to its respective undertaking.

FTA identified the APE for the Permanent WTC PATH Terminal and by letter of February 25, 2004 requested SHPO concurrence with its proposed APE. The SHPO indicated its concurrence through its letter of March 19, 2004. FTA has identified 21 historic properties within the APE as described below, and as shown on Figure 6-1 and Table 6-1. Areas of potential archaeological sensitivity within the APE are shown on Figure 6-2.

As discussed in Section D, "Probable Impacts of the Project Alternatives," FTA finds that the Preferred Alternative will have adverse effects on historic properties. FTA has coordinated extensively with SHPO, ACHP, and consulting parties in the identification of measures to resolve these adverse effects (see Section E, "Mitigation," for more information). Results of this coordination and consultation form the basis for the MOA executed among FTA, SHPO, ACHP, and PANYNJ for the Permanent WTC PATH Terminal (see Appendix B).

C. DESCRIPTION OF THE AFFECTED ENVIRONMENT

PRE-SEPTEMBER 11, 2001 BASELINE CONDITIONS

ARCHAEOLOGICAL RESOURCES

It is assumed that the potential for archaeological resources would be the same in the pre-September 11, 2001 conditions analysis as described below in "Changes in the Affected Environment Since September 11, 2001." The potential for archaeological resources was limited due to construction activity that took place on the Project Site and surrounding area prior to September 11, 2001.

Figure 6-2

PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Areas of Potential Archaeological Sensitivity

HISTORIC RESOURCES

Project Site

Prior to September 11, 2001, the Project Site was occupied by a WTC PATH Terminal, which included a track and platform level, an associated mezzanine/fare-zone level, and sub-grade pedestrian connections to adjacent streets, subways, and the buildings of the WTC. Access to the mezzanine and platform levels was located on the eastern portion of the Project Site within the WTC concourse. The track and platform and mezzanine levels were located on the western half of the site (west of the 1 and 9 subway line), below the WTC Towers 1 and 2. The tracks connected to the Hudson River tunnels beneath Route 9A and extended west under the Hudson River to New Jersey. Below ground, remnants of the former Hudson and Manhattan (H&M) Terminal existed in an altered state. Used as truck ramps and for storage, they were not publicly accessible.

As of September 11, 2001, none of the PATH facilities or WTC buildings on the Project Site were listed on or determined eligible for listing on the S/NR or designated as a NYCL.

Area of Potential Effect

In the pre-September 11, 2001 conditions analysis, the approximately 16-acre WTC, built by the Port Authority of New York and New Jersey (PANYNJ) between 1966 and 1981, comprised six buildings, including the 110-story Twin Towers (1 and 2 WTC). These 1,350-foot-tall aluminum-clad towers (excluding the 345.1-foot antenna) were the tallest buildings in the world when completed in 1972 and 1973. Other buildings located on the WTC site included a 22-story hotel (3 WTC), two nine-story buildings (4 and 5 WTC), and an eight-story U.S. Customs House (6 WTC). These buildings were situated around the Austin J. Tobin Plaza, which was decorated with several sculptures by prominent artists. A concourse was located directly below the plaza and consisted of a retail mall and transportation hub. A pedestrian bridge over Route 9A connected the northern part of the WTC with the commercial core of BPC. As of September 11, 2001, there were no known historic resources located on the WTC Site.

Prior to September 11, 2001, the block at the corner of Liberty Street and Route 9A was an active parking lot and the site of the St. Nicholas Greek Orthodox Church, destroyed on September 11, 2001. This small Greek Orthodox church stood at 155 Cedar Street, south of the WTC. Established in 1916 by Greek immigrants, it was only 35 feet tall with a rooftop bell cote. The church was notable for its small scale and its icons, which were a gift from the last czar of Russia, Nicholas II. The block to the east was occupied by a 39-story office building at 130 Liberty Street. Located directly across Liberty Street from 2 WTC, it was a fully occupied office tower with ground-floor retail. It had a plaza with a fountain, above which was an additional plaza level that was originally intended to connect to the plaza level at the WTC.

It is assumed that all historic buildings that were damaged on September 11, 2001 would not have been damaged and would still be occupied as they were on September 11, 2001. The Federal Office Building/U.S. Post Office would be occupied with office tenants and the Church Street Station of the post office would be open and serving its customers. The Barclay-Vesey Building would be undamaged.

It is assumed that the identification of known and potential resources would be the same in the pre-September 11, 2001 conditions analysis as described below in "Changes in the Affected Environment Since September 11, 2001." Although several resources were listed on or determined eligible for listing on the National Register or designated as a NYCL or NYCHD after Septem-

ber 11, 2001, these resources would have been determined eligible or designated in any event because their characteristics that qualify them for listing were not altered.

CHANGES IN THE AFFECTED ENVIRONMENT SINCE SEPTEMBER 11, 2001

ARCHAEOLOGICAL RESOURCES

The following analysis regarding the potential for archaeological resources on the WTC site was based on data obtained from a Phase IA Archaeological Assessment of the WTC, prepared in October 2003 and a Topic Intensive Study of the WTC Site, prepared in March 2004. Information regarding the potential for archaeological resources in the Route 9A roadbed was obtained from prior documentation for the *Route 9A Reconstruction FEIS*. Copies of these reports, as well as relevant SHPO correspondence, are included in Appendix B.

Project Site

Prehistoric Resources. Prior to European contact in the early 17th century, Native Americans speaking a Munsee dialect of the Eastern Algonquin language inhabited Manhattan Island. Native Americans referred to the island of Manhattan as "Minna-atn" which meant "Island of Hills." The first contacts between Native Americans and Europeans occurred when early explorers began to trade with the native population. Dutch trading expeditions had been visiting the Hudson River for many years prior to the founding of New Amsterdam at the southern tip of Manhattan in 1626. These groups made contact with the native population; Robert Juet, who traveled with Henry Hudson on his 1609 voyage, provides in his journal a description of the native population and their trading practices. Dutch colonization in Manhattan began in earnest in 1625 when an expedition of farmers from the Dutch West India Company arrived at the southern tip of Manhattan with the purpose of building a fort and laying out nine Company farms.

Prior to landfilling activities in the 18th and early 19th centuries, the Hudson River shoreline originally ran approximately along the path of Greenwich Street. Research on the Paleo-shoreline indicates the possibility of a bay from Cedar Street to north of the WTC and an irregular shoreline forming a spit of land near Vesey Street at about 40 feet below current sea level.

There is little likelihood that precontact archaeological resources have survived within the Project Site. West of Greenwich Street, excavation for the bathtub extends about 70 feet below grade, below the lowest level that precontact deposits could have survived (about 40 feet below grade). East of Greenwich Street, it is likely that precontact resources would have been destroyed by basement construction in these areas as well as construction activities associated with the WTC.

Therefore, the Project Site is not considered sensitive for prehistoric archaeological resources.

Historic Period. Prior to 1700, a large portion of the Project Site was either under water or was undeveloped farmland. During the Dutch period, a wooden ship called the *Tyjger* burned and was abandoned along the shoreline in 1613.

The first known structures on the Project Site were a house and windmill belonging to Peter Mesier. Shown on the Miller Plan (1696), they were located in the area that is now west of Church Street between Liberty and Cortlandt Streets. Landfilling along the Hudson River shoreline began around the turn of the 18th century. Between 1699 and 1701 several entrepreneurs

built docks on the three blocks between Cedar and Cortlandt Streets and Greenwich Street and Washington Street.

Activity along the Hudson River waterfront accelerated in the 18th century and continued through the 19th century. Many streets were planned and developed during this period and the busy waterfront supported many successful business ventures. By 1852 all the streetfronts within the APE had been solidly filled with buildings.

The Project Site was disturbed by construction of the 1 and 9 subway lines and the Hudson & Manhattan (H&M) Railroad and its Terminal on the west side of Church Street between Cortlandt and Fulton Streets. During construction of the subway (1916), the remains of a wooden ship thought to be the *Tyjger* were found in the excavation of Greenwich Street at Dey Street.

During the 1960s, the Project Site was extensively disturbed by construction of the WTC. The entire area west of Greenwich Street and the 1 and 9 subway was excavated to bedrock, 70 feet below grade to create the so-called bathtub where the Twin Towers along with the hotel and 6 WTC stood. In 1967 during excavation for the WTC, archaeologists attempted to find the rest of the *Tyjger*, but their efforts were unsuccessful.

Areas of Potential Sensitivity. A Phase IA Archaeological Assessment for the Project Site (included in Appendix B) found the following areas to be sensitive and warrant further consideration:

- At the northeast corner of the Project Site: former Lots 8-17 on former Block 85 (south side of Vesey Street between Greenwich and Church Streets, see Figure 6-2).
- At the southeast corner of the Project Site: Former lots 5, 6, and 10 on former Block 60 (north side of Liberty Street between Greenwich and Church Streets, see Figure 6-2).

The Topic Intensive Study for the WTC Site (included in Appendix B) concluded that the three lots on Liberty Street and the 10 lots on Vesey Street appear to possess potential archaeological significance. Each of the lots was occupied by a household or business for an extended period of time spanning the 1750s through the 1850s. The lots were used for both residences, businesses, and a combination of residences and businesses, where the proprietor lived and worked at the same location. Archaeological resources associated with occupations on these 13 historic lots have the potential to answer a variety of research questions pertaining to use and occupation of home lots by different types of individuals and businesses in Lower Manhattan during the second half of the 18th and first half of the 19th century.

These areas were located outside the former WTC construction footprint and have the potential to contain shaft features (such as privies, cisterns, wells, and cesspools) predating the 1850s that may have survived under former basements. Lots with basements 20 feet or more below grade have a lesser likelihood of shaft feature preservation.

Route 9A Connection

There is one known archaeological resource in the area where the pedestrian concourse to the WFC would be located—the Hudson River Bulkhead (S/NR-eligible). The bulkhead and its associated structural systems were built between 1871 and 1936 by the New York City Department of Docks. The majority of the construction consisted of masonry walls on a variety of foundation systems, with quarry-faced ashlar granite block forming the visible face along most of the armored frontage. Design of the bulkhead was the responsibility of George B.

McClellan, a Civil War general, who became the first Engineer-in-Chief of the Department of Docks. McClellan's plans contemplated the creation of a 250-foot-wide marginal street, from which 60- to 100-foot-wide piers with cargo sheds would project 400 to 500 feet around 150- to 200-foot-wide slips. Initiated to respond to the deteriorated, congested, and silt-filled condition of the waterfront, the carefully built granite walls created a consistent monumental surface to the waterfront that reinforced an image of New York City's commercial prominence. As property was acquired and as commerce warranted, the city built the bulkheads, built or rebuilt pier substructures, and leased redeveloped areas to private companies, which were usually responsible for piershed and headhouse construction. The bulkhead runs from the Battery to West 59th Street. The portion of the bulkhead located within the study area is below-grade along the western edge of Route 9A.

In the area between Dey and Fulton Streets, where the pedestrian concourse to the WFC would be located, 16 potential historic-period archaeological sites were identified in documentation prepared for the *Route 9A Reconstruction FEIS* (see Appendix B). No potential prehistoric sites were identified in this area. (This number includes sites listed as Cortlandt-Dey on the south and Fulton-Vesey on the north.) Of these, 15 were piers, wharves and pier sheds; all of these were eliminated from further consideration due to lack of archaeological visibility and lack of research potential (SHPO letter 8/12/92). The other site was a crib bulkhead at Dey Street, which was eliminated due to lack of research potential (SHPO letter 8/12/92).

HISTORIC RESOURCES

Project Site

The Project Site is located within and near the limits of the approximately 16-acre WTC site, which has been found to be S/NR-eligible. A street level access point and a below-grade pedestrian concourse would extend beyond the Project Site, connecting to the Winter Garden at the WFC. The WFC is located in BPC, west of Route 9A, opposite the WTC site. The Winter Garden is a large glass-enclosed public atrium and is one of several modern structures included in the WFC. It was severely damaged on September 11, 2001 and has since been reconstructed.

The temporary WTC PATH station opened in November 2003. Its entrance is located at the northeast portion of the WTC site. At Fulton Street, the canopy of the temporary WTC PATH station has a sculptural form, with two wings rising from a central truss supported on two vertical trusses. The tracks of the temporary WTC PATH station curve around the south end of the bathtub, passing into the new structure of the temporary station. The temporary WTC PATH station's mezzanine level, station platforms, and rail tracks are located on the western portion of the site. The 1 and 9 subway line also bisects the Project Site. Additionally, a wide area along the east side of the Project Site is paved with concrete. Sidewalk viewing areas are located along Church Street south of the PATH entrance and on Liberty Street. Aside from the viewing areas and the temporary WTC PATH station, the remainder of the Project Site remains excavated or under construction and is not accessible to the public.

Limited portions of the former H&M Terminal still exist below grade on the WTC site. Designed by Clinton & Russell, and constructed in 1908–09, it consisted of two 19-story Renaissance Revival towers that were linked together below ground by a three-level rail terminal. It occupied a two-block-long site on Church Street between Cortlandt and Fulton Streets. The terminal was linked to the Hudson Tubes—two cast-iron ring tunnels built under the Hudson River. In connection with the construction of the WTC, a new PATH terminal was built west of the H&M Terminal. Although the H&M Terminal office towers were demolished, the Hudson

Tubes were still used, but were redirected to swing out farther apart from each other to accommodate the longer length of the new terminal. As the terminal was located west of the H&M Terminal and at a lower grade, the H&M Terminal was able to maintain normal service during construction of the new facility. The WTC PATH Terminal opened in 1971, at which time the H&M Terminal was closed. Unused remnants of the Hudson Tubes were converted to truck ramps, and portions of the former terminal were used for truck loading, parking, and storage.

The WTC PATH Terminal and the PATH tunnels were catastrophically destroyed as a result of the terrorist attacks on September 11, 2001. Some portions of the underground levels of the former H&M Terminal were damaged but remained intact. SHPO determined that the remaining portions of the former H&M Terminal and the cast-iron tubes leading from the station do not meet the criteria for listing on the National Register due to a loss of historic integrity (letter dated October 16, 2003).

Area of Potential Effect

Known Resources

There are several known historic resources located in the APE. These resources are described below. They are also listed in Table 6-1 and mapped on Figure 6-1.

WTC Site (S/NR-eligible)

The WTC Site is an approximately 16-acre parcel bounded by Vesey, Church and Liberty Streets and Route 9A. As detailed in the Coordinated DOE (see Appendix B), the WTC Site is significant as the locus of the events of September 11 and the significance of those events and their aftermath to American history makes the WTC Site eligible for listing on the State and National Registers, even at this early date. Some elements remaining on the site help convey the events of September 11 and their aftermath. The Coordinated DOE identifies the following elements in particular as contributing to the significance of the WTC Site: the truncated box-beam column bases that help define the perimeter or "footprints" of the former Twin Towers; the slurry walls that form the sides of the underground bathtub for the Twin Towers; the remnants of the parking garage, containing slabs and interior columns charred with smoke; the beams forming a cross erected by recovery workers; the portion of the concrete steps and escalator ramp from Vesey Street to the subway; and the remaining portion of the passageway to the E subway line.

Artifacts recovered from the WTC Site following the attacks currently exist at off-site locations, including the New York State Museum in Albany and Hangar 17 at John F. Kennedy International Airport. Because these off-site artifacts are not physically located on the WTC Site and do not convey the significance of the site, they are not included in the Coordinated DOE. However, the Keeper of the National Register of Historic Places has indicated in a letter to the ACHP (dated July 18, 2004), that artifacts returned to the WTC Site in the future could be considered contributing elements of this historic property if they are returned and found to convey significance (see the Coordinated DOE in Appendix B for a discussion of off-site artifacts).

Table 6-1
Known Resources in the Area of Potential Effect

Ref. No.	Name	Address	NHL	S/NR	S/NR-eligible	NYCL	NYCL-eligible
1.	Hudson River Bulkhead	Battery to West 59th Street			X		
2.	WTC Site	Bounded by Vesey, Church and Liberty Streets, and Route 9A			X		
3.	Barclay-Vesey Building	140 West Street			X	X	
4.	Federal Office Building/ U.S. Post Office	90 Church Street		X			
5.	St. Peter's Roman Catholic Church	22 Barclay Street		X		X	
6.	Former St. Peter's School	16 Barclay Street			X		
7.	30 Vesey Street	30 Vesey Street			X		
8.	Old New York Evening Post Building	20 Vesey Street		X		X	
9.	New York County Lawyer's Association	14 Vesey Street		X		X	
10.	Astor Building	217 Broadway			X		
11.	Transportation Building	225 Broadway			X		
12.	African Burial Ground and the Commons Historic District	Bounded by Duane Street, Park Row, Broadway and Centre Street	X	X		X	
13.	St. Paul's Chapel and Graveyard	Broadway and Fulton Street	X	X		X	
14	Former American Telephone & Telegraph (AT&T) Company Building	195 Broadway			X		X
15.	Fulton Street IRT Station	Fulton Street and Broadway			X	X	
16.	Former East River Savings Bank	26 Cortlandt Street			X		X
17.	United States Realty Building*	115 Broadway		X	X	X	
18.	Beard Building	125 Cedar Street			X		X
19.	114-118 Liberty Street	114-118 Liberty Street			X		
20.	21-23 Thames Street	21-23 Thames Street			X		
21.	90 West Street	90 West Street			X	X	

Notes: Corresponds to Figure 6-1.
NHL: National Historic Landmark.
SR: New York State Register of Historic Places.
NR: National Register of Historic Places.
S/NR-eligible: Site has been found eligible for listing on the New York State and National Registers of Historic Places.
NYCL: New York City Landmark.
NYCL-eligible: LPC has determined that the site appears eligible for NYCL designation.
* The United States Realty Building is listed on the SR only. It is eligible for listing on the NR.

In addition, the Coalition of 9/11 Families has requested that the National Park Service (NPS), which administers the NHL program, consider the WTC Site for NHL status. The NHL program was authorized by the Historic Sites Act of 1935 (Public Law 74-292). NHL criteria (36 CFR § 65.4[a] and [b]) differ from National Register criteria and establish a stringent test for national significance and high historical integrity. NPS has indicated that they will not consider this request until the Project's Section 106 review process and other Section 106 processes related to the WTC Site are completed.

Barclay-Vesey Building (S/NR-Eligible, NYCL)

Built between 1923 and 1927, the Art Deco Barclay-Vesey Building (140 West Street) occupies the full block bounded by Barclay Street, Washington Street, Vesey Sreet, and Route 9A, and overlooks the WTC Site. It is considered one of the most significant structures in the history of skyscraper design, since it was the first building in New York City to make the most of the requirements of the 1916 Zoning Resolution, leading to the tower's dramatic massing. Designed by Ralph Walker of McKenzie, Voorhees & Gmelin as an office building and switching center for the New York Telephone Company, this 32-story brick, limestone, and terra cotta structure consists of an 18-story parallelogram base and an 11-story square tower (see Figure 6-3). For 10 stories, the base rises flush with the lot lines. Above the 10th floor, there are setbacks on the north and south façades and light courts on the east and west façades. Above the base, the tower is oriented to the Manhattan grid street pattern. Multiple setbacks above the 10th floor serve to further relieve the building's bulk. Flat piers provide verticality and on the tower they create buttresses that cap the structure. There are limestone cornices on each setback, and on the first two floors there are terra cotta spandrel panels, and window and door enframements of intricately carved reliefs of people, animals, and vegetation. The ground floor of the Vesey Street façade is an arcade.

The Barclay-Vesey Building suffered façade and structural damage as a result of the collapse of 1 WTC and 7 WTC. Repair work is ongoing and it is partially reoccupied.

Federal Office Building/U.S. Post Office (S/NR)

This building, located at 90 Church Street, was designed by Cross & Cross and Pennington, Lewis & Mills and was constructed in 1934–38. The massive limestone building is 15 stories tall and combines Classical Revival and Art Deco details, as well as exterior sculptural reliefs by Carl Paul Jennewein (see Figure 6-3). It occupies the full block bounded by West Broadway and Barclay, Vesey, and Church Streets, and also overlooks the WTC Site across Vesey Street. The building has been closed for repair, cleaning, remediation of potentially hazardous materials, and interior reconstruction.

St. Peter's Roman Catholic Church (S/NR, NYCL)

Located at 22 Barclay Street, this Greek Revival granite church is home to the oldest Roman Catholic parish in New York City. It was designed by John R. Haggerty and Thomas Thomas in 1836-40, replacing an earlier building dating from 1785. It has a temple-like front with six Ionic columns (see Figure 6-4).

Former St. Peter's School (S/NR-eligible)

East of St. Peter's Church at 16 Barclay Street, a five-story brick Greek Revival school building was erected for St. Peter's School ca. 1838. It is three bays wide and is topped with a mansard roof with three pediment dormers (see Figure 6-4).

30 Vesey Street (S/NR-eligible)

The 18-story brick Renaissance Revival building at 30 Vesey Street has a tripartite design of base, shaft, and capital. Fluted pilasters embellish its two-story base, and additional ornamentation is found at the upper stories. It was constructed in 1914.

Old New York Evening Post Building (S/NR, NYCL)

Robert D. Kohn designed this 13-story limestone-faced building, located at 20 Vesey Street, in 1906–07. It was erected as the offices and printing plant of the *New York Evening Post*. It is a rare example of a New York City building inspired by the early 20th-century Central European artistic reform movement known as the Vienna Secession. Its refined classicism, rational expression of structure, and stylized ornament are suggestive of Viennese precedents. Notable features of the building include four statues on the 10th floor known as the *Four Periods of Publicity*—two are by Gutzon Borglum, the sculptor of Mount Rushmore, and two are by Estelle Rumbold Kohn, the architect's wife.

New York County Lawyer's Association (S/NR, NYCL)

An example of the 18th-century English Georgian Revival style, this four-story white limestone building is a late work of Cass Gilbert, having been designed in 1929–30. It is located at 14 Vesey Street and was commissioned by the New York County Lawyer's Association, an organization that had been founded in 1908 to serve the public interest and the legal profession.

Astor Building (S/NR-eligible)

The seven-story Renaissance Revival commercial building at 217 Broadway was designed by Charles Platt in 1915. It has a stone façade and lacks ornamentation. The building is crowned by a bracketed cornice.

Transportation Building (S/NR-eligible)

Designed by York & Sawyer in 1926–27, this 44-story skyscraper is located at 225 Broadway. It rises straight to the 23rd floor, continues eight stories with narrow setbacks, then a rectangular tower rises an additional 13 floors. It has a four-story stone base with tan brick upper stories and Lombardic details.

African Burial Ground and the Commons Historic District (NHL, S/NR, NYCHD)

Bounded by Duane Street, Park Row, Broadway, and Centre Street, this district incorporates both the Commons—pastureland set aside by the Dutch government in colonial New Amsterdam—and the 18th-century African Burial Ground. The Commons later became a site for parading troops, public gatherings, celebrations, and executions. A portion of the Commons became a public park in the 1780s and was later incorporated into a park setting for City Hall. The section of the Commons between Chambers and Duane Streets became a burial ground for African slaves and freed men and women in the 18th century and possibly earlier. The cemetery was uncovered during investigations for the construction of a federal office building. Portions of the burial ground were completely excavated to construct the government building, but other sections were preserved in situ as a memorial to New York's earliest African residents.

St. Paul's Chapel and Graveyard (NHL, S/NR, NYCL)

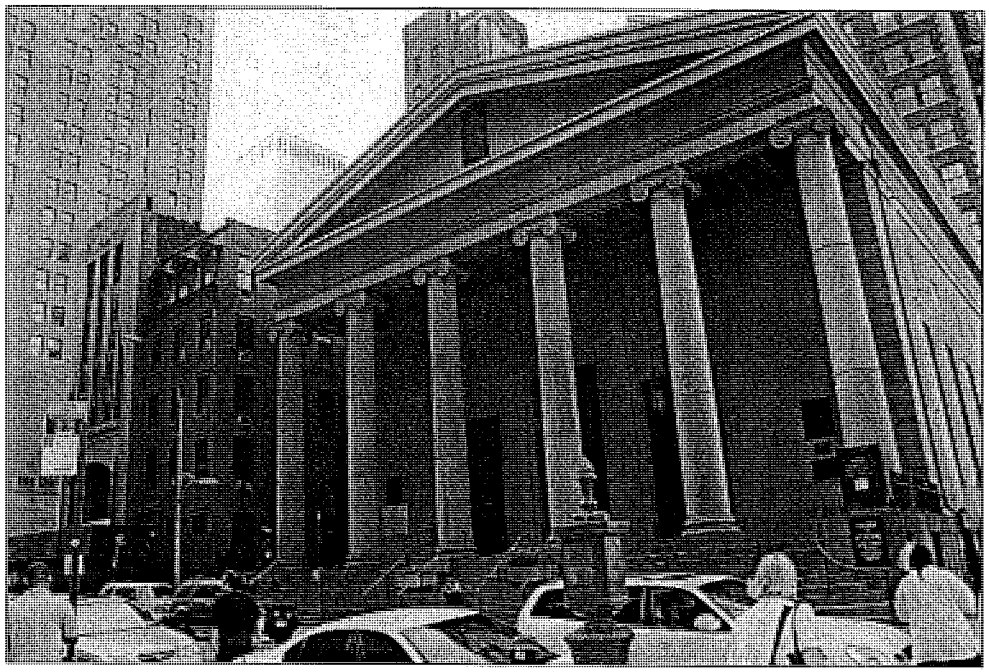
St. Paul's Chapel, located at Broadway and Fulton Street, was erected between 1764 and 1766; its porch was built in 1767–68 and its tower was designed by James C. Lawrence in 1794. It is Manhattan's oldest surviving church and is also considered one of the finest Georgian buildings in the nation. It is a simplified version of James Gibbs's Saint Martin-in-the-Fields on Trafalgar Square in London. It was built of local stone with brownstone trim. It has a modest portico on its towered west façade, which faces the adjacent 18th-century graveyard. The Broadway elevation features an imposing brownstone Ionic porch, which was part of the original plan but was not built until 1767–68 (see Figure 6-4). Although the design of the church is often ascribed to

3.8.04

Barclay-Vesey Building, 140 West Street

Federal Office Building/U.S. Post Office, 90 Church Street

Figure 6-3
Known Historic Resources



St. Peter's Roman Catholic Church and former school (left of church), 16-22 Barclay Street

St. Paul's Chapel (Broadway and Fulton)
and the former AT&T Company Building (195 Broadway)

Figure 6-4
Known Historic Resources

Thomas McBean, there is no evidence to support this theory. George Washington worshipped at the church during the brief period when New York was the nation's capital. During the recovery effort at the WTC Site, the chapel served as a refuge for rescue workers.

Former American Telephone & Telegraph (AT&T) Company Building (S/NR-eligible, NYCL-eligible)

Designed by William Welles Bosworth and built in three sections between 1912 and 1923, this 29-story neo-Classical Revival commercial office building is located at 195 Broadway. It has been described as a square-topped layer cake, as its façade consists of eight Ionic colonnades, with three stories located within each set (see Figure 6-4). It is clad with Vermont granite and has a Doric colonnade at the lower story. It is reported to have more classical columns than any other façade in the world. Its tower rises to a stepped crown modeled on the Mausoleum of Halicarnassus. Bronze panels above the Broadway entrances were designed by the sculptor Paul Manship. It has a notable lobby with Greek Temple-like rows of Doric columns.

Fulton Street Station (S/NR-eligible, NYCL)

The underground subway station at Fulton Street is one of several under- and above-ground stations built as part of Contract 1 of the Interborough Rapid Transit Company's first subway in Manhattan. This first section of the subway, which ran from City Hall to Grand Central Terminal and then ran west and along Broadway to the Bronx, was built between 1899 and 1904 under the direction of Chief Engineer William B. Parsons. The ornamentation of the stations, consisting primarily of white tile with light-colored brick and decorative mosaic sign panels and terra cotta and faience plaques, was designed by Heins & La Farge. The Fulton Street Station was restored in 1987 by Lee Harris Pomeroy & Associates. It features ceramic tile plaques of Robert Fulton's steamboat the *Clermont*.

Former East River Savings Bank (S/NR-eligible, NYCL-eligible)

Currently occupied by a department store, the five-story former bank building located at 26 Cortlandt Street was designed by Walker & Gillette in 1931–1934. It has Classical and Art Deco details with stainless-steel winged eagles over the entrances (see Figure 6-5).

United States Realty Building (SR, NR-eligible, NYCL)

Designed by Francis H. Kimball in 1904–07, this skyscraper at 115 Broadway, as well as the Trinity Building at 111 Broadway, were designed with Gothic details to harmonize with Trinity Church, located to the south. Both buildings are faced with limestone and feature towers, gables, and delicately carved ornament. Construction of both buildings was a major undertaking, causing the relocation of Thames Street as well as the construction of caissons 80 feet into the marshy subsoil.

Beard Building (S/NR-eligible, NYCL-eligible)

Oswald Wirz designed the 12-story Beard Building at 125 Cedar Street (a.k.a. 120 Liberty Street) as an office building. Constructed in 1895–97, it is a through-block, brick and stone building with Romanesque Revival-style façades (see Figure 6-5). It has a two-story stone base composed of pilasters and deeply recessed window bays; the north façade of the base is clad in limestone, while the south façade appears to be clad in sandstone. On the shaft, wide piers frame corner window bays and create a wide central bay broken up by thin, closely spaced mullions. An entablature caps the shaft. The two-story building capital contains pedimented windows. A

bracketed cornice crowns the building. Converted to residential use long before September 11, 2001, it has been restored and reoccupied except for the ground floor on Liberty Street.

114-118 Liberty Street (S/NR-eligible)

This 11-story Renaissance Revival-style building was constructed in 1900–01 and designed by John T. Williams (see Figure 6-5). Due to the irregular lot shape, the through-block loft building is three bays wide on Liberty Street and two bays wide on Cedar Street. The main façade fronts Liberty Street overlooking the WTC Site. It has a two-story rusticated stone base and a brick shaft crowned with a modillioned cornice. The base contains an entrance porch, arched show windows with keystones, and a frieze. Projecting cartouches and an entablature mark the mezzanine (third) story. The upper floors are articulated with brick pilasters, spandrels, and mullions. At the two-story capital, swags crown the double-height piers, and the top-floor windows are arched. The Cedar Street façade is divided into a rusticated base, a shaft composed of piers and window bays, and a cornice-crowned capital, but it is less ornate. Converted to residential use prior to September 11, 2001, it is currently being restored to residential use.

21-23 Thames Street (S/NR-eligible)

This five-story brick tenement was built in 1872 by John Lerscher. It features a galvanized iron cornice and was originally designed to house three families on each of its upper stories.

90 West Street (S/NR-eligible, NYCL)

Designed by Cass Gilbert and built in 1905–07, the 90 West Street Building is among the most important early 20th century skyscrapers in New York City, and the aesthetic precursor of Gilbert's Woolworth Building from 1910–13. The 23-story former commercial office building is also the earliest example of the use of Gothic detail on a skyscraper with distinctly vertical massing. It has a C-shaped plan with a light court facing east and its primary façade fronting on Route 9A. Its north elevation faces the WTC Site across Liberty Street. Above a two-story granite base, the façades of the shaft are clad in white terra cotta with modest marble and polychromed terra cotta trim. The shaft is articulated with recessed window bays and clustered columns that form piers. These piers, along with colonettes between the windows, rise uninterrupted for most of the building's height, creating vertical emphasis. The building's heavy three-story capital is ornately designed as an arcade with engaged columns. A mansard roof with dormers and pinnacles crowns the building. The building was covered in scaffolding for ongoing façade repair on September 11. It was heavily damaged due to burning debris from the WTC. It is being restored and renovated for residential use.

D. PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

This section describes conditions that are or would be expected to exist under the No Action and Preferred Alternatives for the three analysis scenarios (construction period, opening year and design year).

CONSTRUCTION PERIOD (2006)

FUTURE COMMON TO ALL ALTERNATIVES

Initial reconstruction activities associated with the WTC Memorial and Redevelopment Plan would be taking place. It is anticipated that St. Nicholas Church will be reconstructed on the

Former East River Savings Bank, 26 Cortlandt Street

114-118 Liberty Street (left) and the Beard Building at 125 Cedar Street

Figure 6-5
Known Historic Resources

block south of the WTC site. In addition, reconstruction of Route 9A between West Thames Street and Chambers Street will be underway.

As part of the Section 106 process for each of their respective projects, LMDC and NYSDOT have prepared and executed Programmatic Agreements that will continue to guide the design and construction of their projects with respect to potential impacts to historic resources. Furthermore, the Northwest Remnant Subgrade Structures, which were identified in the coordinated DOE for the WTC site, will be removed as part of Freedom Tower's construction. The removal of these structures is being undertaken in accordance with the Programmatic Agreement by LMDC, SHPO, and ACHP.

Both the Barclay-Vesey Building and the Federal Office Building/U.S. Post Office, north of the Project Site, will be repaired, renovated, and reopened. Between these two buildings, 7 WTC will be complete along with its triangular open space on the north side of Vesey Street. A residential building is expected to be complete along Barclay Street, between Broadway and Church Street. The proposed building is expected to be taller than the adjacent small-scale buildings.

NO ACTION ALTERNATIVE

Project Site

Under the No Action Alternative, the temporary WTC PATH station would remain in service. There would be no project-generated construction activities that would affect historic resources.

Area of Potential Effect

It is not expected that this alternative would have any adverse effects on historic resources.

PREFERRED ALTERNATIVE

Project Site

Construction of the Preferred Alternative would begin in 2005 concurrent with other sub-grade work for the proposed redevelopment of the WTC site. Components of the terminal, including the platforms, mezzanine, and certain pedestrian connections, would be completed by the end of 2009. A pedestrian concourse to the WFC would also be constructed.

Construction of the Preferred Alternative may affect potential archaeological resources located on the Project Site. In order to avoid, minimize, or mitigate any adverse effects to potential archaeological resources on the Project Site, PANYNJ would coordinate with LMDC and SHPO prior to the start of construction to determine whether any potentially sensitive areas have already been tested as part of the WTC Memorial and Redevelopment Plan. As described in the MOA executed for the Permanent WTC PATH Terminal, prior to any disturbance of potentially sensitive areas, PANYNJ would—in consultation with SHPO and LMDC, as appropriate—locate, identify, and evaluate the National Register eligibility of archaeological resources in these potentially sensitive areas. If National Register-eligible archaeological resources would be adversely affected by construction of the Preferred Alternative, PANYNJ, in consultation with FTA, SHPO, and LMDC, as appropriate, and the Section 106 consulting parties, would develop and implement an Archaeological Resource Treatment Plan

Construction of a below-grade pedestrian concourse to the WFC may require removal of short segments of the Hudson River Bulkhead between Fulton and Vesey Streets. At this time it is

anticipated that an approximately 40-foot wide segment of the bulkhead would be affected. As described in the executed MOA, PANYNJ would coordinate treatment of the bulkhead with NYSDOT, as appropriate. A plan would be developed to locate and identify intact portions of the bulkhead that would be affected by construction of the below-grade pedestrian concourse. If intact portions of the bulkhead are identified, PANYNJ would, in consultation with SHPO and NYSDOT, prepare a treatment plan for the portions of the Hudson River Bulkhead that would be affected by the Preferred Alternative. The plan would be submitted to SHPO and the Section 106 consulting parties for review and comment prior to its implementation.

Area of Potential Effect

WTC Site

Adverse effects to the WTC site are expected under this alternative, although the extent of these adverse effects has not yet been fully determined. Construction of the Preferred Alternative would not alter the location or setting of the WTC site. However, because it will result in the removal or alteration of remaining remnants and structures on the site, it could diminish the site's integrity of feeling, association, and materials. The following describes the specific impacts of the Preferred Alternative on the various elements of this historic resource. Each of these elements has been addressed in the MOA and specific stipulations regarding the documentation and treatment of the WTC site have been defined (see Appendix B).

- ***Tower Perimeter Column Bases with Other Column Bases and Infrastructure*** (constructed pre-September 11, 2001): There were 84 perimeter columns extending into the bedrock that would outline the North Tower façade, and 73 perimeter columns extending into bedrock that would outline the South Tower façade. The original subgrade column grid in the WTC bathtub was configured to span above the former Hudson & Manhattan tunnels traversing the bathtub, as well as then new PATH tracks (there were 84 perimeter columns for the South Tower appearing above grade). In addition, approximately 34 of the South Tower columns were within the PATH right-of-way area (interspersed with tracks, electrical equipment, and other infrastructure), and 39 were outside the PATH right-of-way area. During the post-September 11, 2001 emergency recovery operations conducted by the City of New York, all of these Tower perimeter columns were truncated such that only the bases remain. During subsequent construction of the temporary WTC PATH station, all of the column bases within the existing PATH right-of-way were either obscured to some extent or removed for installation of the temporary WTC PATH station's track sheds, utilities, duct banks, conduits, and other PATH infrastructure.

  As described in the project's Memorandum of Agreement (MOA), PANYNJ shall, to the maximum extent feasible, preserve in place 84 column base remnants in the North Tower and 39 column base remnants in the South Tower at the existing floor at elevation 242 (58 feet below Sea Level) that outline the footprints of the former Twin Towers at the WTC site and are not located in the PATH right-of-way. However, up to 16 column bases in the North Tower and 3 column bases in the South Tower would be temporarily or permanently removed.

  There would be various site infrastructure elements supporting the Preferred Alternative within the PATH right-of-way, including utility lines traversing the outline of the Tower perimeter column bases, and utility rooms and structures located within the area outlined by the perimeter column bases. Although these would not disturb the perimeter column bases themselves, these elements may somewhat impact visibility and accessibility to the Tower

perimeter column bases. The Preferred Alternative may also include utility lines that cross the footprints of the former North and South Towers at an elevation above the existing floor of the WTC site (Elevation 242 or 58 feet below Sea Level). Under current plans, these utilities would be at Elevation 264 (36 feet below Sea Level). These utility lines could serve the joint infrastructure needs of both the Permanent WTC PATH Terminal and the WTC Memorial and Redevelopment Plan.

The total extent of the North Tower footprint at the lowest level, at approximately elevation 242 (58 feet below sea level) to be permanently occupied by any portion of the Project will be approximately 1,600 square feet and will not exceed 4 percent of the North Tower footprint area. The total extent of the South Tower footprint at the lowest level, at approximately elevation 242 (58 feet below sea level) to be permanently occupied by any portion of the Project will be approximately 21,615 square feet currently occupied by the WTC PATH facility, plus an additional 2,000 square feet required by the Project, and will not exceed 53 percent of the South Tower footprint area.

During the construction of the Preferred Alternative, PANYNJ would construct a temporary track west of the existing Track 5. This temporary track would be used to maintain PATH operations while rehabilitation work is undertaken on other PATH tracks. The temporary track would cover column bases and footprint areas outside the existing PATH right-of-way during the construction period, but this track would be removed upon completion of the permanent tracks.

- ***Bathtub Walls*** (constructed pre-September 11) and Tiebacks (constructed post-September 11/temporary): All four of the slurry walls forming the "bathtub" would require some modification in order to ensure their continued structural function, which is to secure the "basement" of this portion of the WTC site from the high water table resulting from the site's proximity to the Hudson River.

  The Preferred Alternative includes the reinforcement of portions of the basement walls to ensure their structural integrity and to support future redevelopment of the WTC site, including the Permanent WTC PATH Terminal. A portion of the approximately 70 foot high west slurry wall, with tieback caps exposed, is proposed to remain visible and accessible to the public (a separate undertaking), and another portion of the west wall would be pierced (in a location away from the proposed exposed section) for the east-west pedestrian concourse below Route 9A. The remainder of the west wall would be protectively lined as part of the Preferred Alternative. PANYNJ would also reinforce portions of the east bathtub wall abutting NYCT's 1 and 9 line that were not previously reinforced. If other development on the WTC site does not move forward according to current schedules or plans, it may also be necessary to reinforce portions of the north bathtub wall east of Freedom Tower and portions of the south bathtub wall above the existing PATH substation. Where liners are installed, existing tieback caps would remain although their projections would be subsumed within the concrete of the liners.

- ***Recovery and Construction Ramp*** (constructed post-September 11/temporary): The support foundation for the ramp would be relocated to allow for construction of a temporary track. The ramp would remain during early construction of the Preferred Alternative and would then be removed.

- ***North and South Tunnel Projections from West Wall*** (constructed pre-September 11): Structural modifications would be made to the projections to accommodate the temporary Track 6.
- ***H&M Remnants*** (constructed pre-September 11): The cast-iron ring tubes in the east slurry wall of the bathtub would be removed for construction of the Preferred Alternative. On the eastern portion of the WTC site, all or portions of the remnants of the former H&M Terminal building and its powerhouse would be removed to construct a north-south concourse for the Preferred Alternative. Other remnants of these tubes (under the Hudson River) would still remain in service.
- ***Other Vehicular Ramps*** (constructed pre-September 11): Several of these ramps would be removed or sealed off, as they would have no function under the Preferred Alternative. This would also accommodate construction of new pedestrian concourses.
- ***PATH Tracks and Substation*** (reconstructed post-September 11): The PATH tracks that are part of the temporary WTC PATH station, would remain but would be further modified for permanent operation and to install a switch to the temporary Track 6. The wiring at the existing substation, also installed as part of the temporary PATH facility, would be modified for the permanent operation.
- ***Existing WTC PATH Station Main Entrance and Concourse, Sidewalks, Fencing, Existing PATH Platforms/Mezzanine*** (constructed post-September 11/temporary): Portions of these elements would be removed for construction of a permanent entry facility, main transit hall, concourses, PATH mezzanine, and platform levels.
- ***Passageway to the NYCT WTC Subway Station (E-Train)*** (constructed pre-September 11): The passageway between the Terminal and the MTA/NYCT E Subway would be designed to incorporate the existing E Subway entrance in its current location. Certain elements and materials of this passageway, which were retained as part of the construction of the temporary station, would be preserved as part of the Preferred Alternative. However, it may be necessary to remove the doors during construction for their protection. They would be stored until they could be returned to the reconstructed passageway.
- ***Steel Beams in Cross Form*** (post-September 11): The "steel cross" was moved from the area of 6 WTC to its current location in the eastern portion of the WTC site near the intersection of Church and Cortlandt Streets for public viewing. The cross structure would be removed from this location to accommodate the new north-south pedestrian concourse construction at-grade. The steel beam in cross form would remain in the custody of PANYNJ pending its disposition in accordance with the rights of its respective owners.
- ***Plaza and Subway Access from Vesey Street*** (constructed pre-September 11): The structural remnants of this access from Vesey Street are not permanently stable or functional. However, construction of the Preferred Alternative would not directly impact these elements. Furthermore, as described in the Project's MOA, a Resource Plan would be prepared to include these structures with measures to protect them from potential indirect effects during the Terminal's construction.
- ***Cooling Water Pipes*** (constructed pre-September 11): The Preferred Alternative would have no impact on the cooling water pipes. However, sections of the existing cooling water pipes may be reconstructed or rerouted under a separate undertaking.

Historic Resources Outside the WTC Site

Sub-grade work associated with construction of the Preferred Alternative could affect historic resources located within 90 feet of the Project Site. Based on the analysis described in Chapter 10, "Noise and Vibration," construction of the Terminal may cause damage to these buildings from ground-borne vibrations and dewatering. Specifically, historic buildings or sites located within 90 feet of the Project Site include the Barclay-Vesey Building at 140 West Street, St. Paul's Chapel and Graveyard, the former East River Savings Bank at 26 Cortlandt Street, the Beard Building at 125 Cedar Street, and 114-118 Liberty Street. (Other historic resources are more distant from the Project Site and are not within the area that is expected to be affected by construction.)

These potential adverse effects would be mitigated by Construction Protection Plan(s), the protocol and stipulations of which have been addressed in the MOA (see Appendix B).

OPENING YEAR (2009)

FUTURE COMMON TO ALL ALTERNATIVES

Portions of the WTC Memorial and Redevelopment plan would be complete while other construction activity would continue. The Greenwich Street view corridor and possibly the street itself will be open north into Tribeca. In addition, reconstruction of Route 9A between West Thames and Chambers Streets would be complete. As described earlier, the Programmatic Agreements executed by LMDC and NYSDOT for their respective undertakings will continue to guide the design and construction of those projects with respect to potential impacts to historic resources. In BPC, Site 26 is slated for commercial development and may be opened. The Fulton Street Transit Center would be open, east of the Permanent WTC PATH Terminal.

NO ACTION ALTERNATIVE

Project Site

In 2009 without the Preferred Alternative, the temporary WTC PATH station would remain in service. Some construction activities associated with the WTC Memorial and Redevelopment Plan would continue.

Area of Potential Effect

It is not expected that this alternative would have any adverse effects on historic resources.

PREFERRED ALTERNATIVE

Project Site

The tracks, platforms, mezzanine, concourses, and street-level terminal building would be located on the WTC site. The terminal building would provide street-level access to the WTC site and Greenwich and Church Streets. The terminal building would be designed by Santiago Calatrava, an award-winning architect, artist and engineer. His works include the Olympic Sports Complex (Athens, 2001), the Milwaukee Art Museum (1994), several railway stations (Liege, 1996; Lisbon, 1993; and Alameda, 1991), and several bridges (Buenos Aires, 1998; Orleans, 1996; Venice, 1996; Bilbao, 1994; and Merida, 1988). The terminal would be modern in design and would be lower in height than the WTC buildings adjacent to it on the south and to

the north of it across Fulton Street. Underground pedestrian concourses connecting to other transit systems would also be complete by 2009.

Two ventilation structures would be within the Route 9A median. As these locations have no potential for archaeological sensitivity, construction of the ventilation structures would have no adverse effect on archaeological resources.

Area of Potential Effect

In terms of contextual or visual effects, the APE is developed with a mix of historic and modern structures that range in height from one to 60 stories. The size and architectural styles of these buildings vary greatly, reflecting the architectural styles of the eras in which they were designed and constructed. The APE is composed of historic structures near more modern structures, where many streets contain a mixture of historic structures in immediate proximity to contemporary glass and metal structures. The historic context of the APE was dramatically changed during the 1960s with the construction of the WTC. Redevelopment of the WTC site, which will be underway by 2009 independent of the Preferred Alternative, will again introduce modern skyscrapers to the immediate area. By 2009, Freedom Tower will be completed on the northwest quadrant of the WTC site and will be a tall, modern structure. In contrast, the Terminal planned under the Preferred Alternative would be of a lower height and scale than existing buildings in the immediate area, as well as adjacent structures completed and/or development on the WTC site.

It is anticipated that Calatrava's design for the proposed terminal building would be constructed of glass, steel and concrete, and would be similar to the materials used in Wedge of Light Plaza that would be constructed along Church Street as part of the WTC Memorial and Redevelopment Plan. It would also be in keeping with modern structures that exist in the study area, such as the Winter Garden and other buildings in the WFC and BPC. It would continue the tradition in the downtown area where technologically advanced modern buildings have been constructed near older, historic structures, thus continuing the existing trend of modern buildings juxtaposed against the historic fabric of Lower Manhattan. It is also anticipated that Calatrava's design would be modern and unique to the area, and that the new terminal may become an important architectural resource. It is expected that the proposed terminal building would be an improvement over current conditions and would introduce an important architectural resource to the APE.

The proposed development would not alter the historic context of the surrounding area, as this context was significantly altered with the completion of the WTC and subsequent modern office buildings that were (and will be) erected in the APE.

It is not anticipated that the street level access to the below-grade pedestrian concourse at the WFC would have any contextual or visual effects on historic resources. Several street level subway entrances already exist within the APE, in close proximity to historic resources. It is anticipated that this entrance would be similar to other subway entrances located throughout the APE.

It is not anticipated that the vent structures would have any contextual or visual effects on historic resources. The vent structures within the Route 9A median would be long and slender in massing and would stand 40 feet tall. It is anticipated that the vent structures would be clad in reflective material that would be in keeping with modern materials used on buildings in the immediate area. This reflective material would also help the vent structures to blend in with their natural surroundings. Surrounding each vent structure, trees would be planted in the median as part of greening improvements to Route 9A. It is anticipated that these trees would be 35 feet in

height within five years, thus obscuring views of the vent structures from historic resources located in the APE. Although the vent structures would be located west of the WTC site, it is not anticipated that these structures would affect the WTC site, as they would not block views towards the site and tall trees would obscure views of these structures from the WTC site. Overall, it is not anticipated that the vent structures would have any adverse contextual or visual effects on historic resources, as they would be consistent with modern buildings in the surrounding area and would be obscured by tall trees that would be planted in the Route 9A median.

DESIGN YEAR (2025)

FUTURE COMMON TO ALL ALTERNATIVES

By 2025, it is assumed that the full program for the WTC site would be developed, with the completion of the three towers on the east side of the WTC site and a fifth tower south of Liberty Street. A 65-story office building (Tower 2) and a 25-story hotel would be completed in the northeast quadrant. In the southeast quadrant, a 62-story office building (Tower 3) and a 58-story office building (Tower 4) would be completed. A 57-story office building (Tower 5) would be completed south of Liberty Street. Two office towers will also be developed at 130 and 140 Liberty Street.

NO ACTION ALTERNATIVE

Project Site

In 2025 absent the Preferred Alternative, it is assumed that PATH service would no longer operate at the Project Site. The temporary WTC PATH station would still be located on the Project Site, unless removed by a separate undertaking, but would not be operational. Construction activities associated with the WTC Memorial and Redevelopment Plan would be complete, and it is anticipated that there would be increased pedestrian traffic on the Project Site.

Area of Potential Effect

It is not expected that this alternative would have any adverse effects on historic resources.

PREFERRED ALTERNATIVE

Project Site

All work associated with the Preferred Alternative would have been completed for a period of 16 years after its initial operation. It is anticipated that there would be increased pedestrian traffic on the Project Site as a result of the Preferred Alternative.

Area of Potential Effect

In 2025, it is anticipated that there would be increased pedestrian traffic in the area immediately surrounding the Project Site. However, this would not change the character of historic resources located in the APE as the context of the Project Site and surrounding area has historically been defined by transportation uses, first with the H&M Terminal, then with the pre-September 11, 2001 WTC PATH Terminal and currently with the temporary WTC PATH station. Thus, the APE has been characterized by transportation uses and pedestrian traffic and it is not anticipated that an increase in pedestrian traffic would have an adverse effect on historic resources.

E. MITIGATION

PROJECT-SPECIFIC COMMITMENTS

As described in Chapter 18, "Agency Coordination, Process, and Public Participation," FTA and PANYNJ have solicited and fully considered comments from consulting parties and other interested members of the public regarding measures to minimize or mitigate adverse effects of the construction and operation of the Permanent WTC PATH Terminal. The agreed upon measures are contained in an MOA that has been executed among FTA, SHPO, ACHP, and PANYNJ (see Appendix B). This MOA for the Permanent WTC PATH Terminal has been prepared pursuant to the finding that the Preferred Alternative would have adverse effects on the WTC site and the Hudson River Bulkhead. The MOA also addresses the potential effects of the Preferred Alternative on as yet undetermined archaeological resources on the WTC site and on off-site historic resources during construction.

WTC SITE

The executed MOA provides for specific measures to mitigate impacts on the remaining remnants and structures on the WTC site. Specifically, it includes measures pertaining to the tower perimeter column bases and footprint areas, the passageway to the NYCT E WTC subway station, the steel beam in cross form, and the east and west slurry walls. Furthermore, the MOA has general provisions for the documentation of the WTC site, and protection of remaining remnants and structures during construction. The MOA also provides stipulations for the treatment of cumulative effects, which is described in Chapter 15, "Cumulative Effects," of this FEIS.

WTC Site Documentation

As stated in the MOA, PANYNJ would document the WTC site and its historic features to Level II standards of the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) prior to the removal or alteration of any historic features from the WTC site in connection with the undertaking of the Permanent WTC PATH Terminal. This documentation would consist of large-format, black-and-white photography of the site and its historic features as they currently exist; large-format photographic reproduction of selected existing drawings of current conditions and of pre-September 11, 2001 conditions; and a written history and description of the site and its historic features using information previously generated for the Coordinated DOE for the WTC site as well as the Permanent WTC PATH Terminal's DEIS and FEIS. PANYNJ would coordinate the photographic effort with the photographic efforts related to LMDC's fulfillment of Stipulation 1 as set forth in the April 22, 2004 Programmatic Agreement among the ACHP, LMDC, and SHPO for the WTC Memorial and Redevelopment Plan.

PANYNJ would consult with SHPO and HABS/HAER to determine whether particular features warrant measured drawings, and any such drawings would be prepared by an individual with demonstrated experience in the preparation of measured drawings to HABS/HAER standards.

The completed documentation would be submitted to SHPO and HABS/HAER for consideration. The large-format photographs prepared to HABS/HAER standards would consist of the views itemized in Exhibit H, "Schedule of Photographs" of the Project's MOA (see Appendix B).

Tower Perimeter Column Bases

Up to a total of 5 column bases in the North Tower and up to a total of 3 column bases in the South Tower may be temporarily or permanently removed to construct PATH Platform D. Where Platform D would intersect the northeast corner of the North Tower footprint, the platform would be clear of vertical obstructions and architectural treatments would be used to symbolically represent the location of the footprint. A minimum of 5 to a maximum of 7 column bases of the east column line of the North Tower would be visible from Platform D. The viewing area would consist of a glass wall tilted inward from the platform combined with a mirrored wall to the west to provide a view of the column bases from this area of the platform. Appropriate signage, graphics, and lighting would complete the viewing area.

The locations of column remnants of the South Tower that may be removed or permanently obscured by PATH platforms B, C, and D would be symbolically represented on these platforms through architectural treatments that define and differentiate the portions of the infrastructure that are within the Tower footprint areas. These treatments may include color differentiation, texture differentiation, symbolic representation of Tower perimeter column remnants, and/or an emblematic marker designating the location of the historic resource.

In addition to the column bases described above, up to 4 column bases in the North Tower could be temporarily removed by work to install other Project structures and infrastructure. Of the 4 column bases that could be affected by the Project foundation, those column bases that remain in situ undisturbed or are temporarily removed and returned to their original locations would be accessible following the completion of these foundations.

Removing column bases, on either a temporary or permanent basis, would be considered only after practical engineering design options pursuant to Stipulations I.B., 2a and 2b, to preserve column bases in place have been exhausted. Column bases that are removed would be returned to their original locations if practical engineering design permits. Permanent removal of column bases would only take place as a last resort, and these column bases would be removed and stored in accordance with the stipulations of the MOA.

The east-west pedestrian concourse to the World Financial Center would be designed and built in a manner that avoids the column remnants projecting above the concrete slab that outline the north perimeter of the North Tower and places this corridor at least five (5) feet outside the North Tower footprint as measured from the center line of each projecting column base to the face of the nearest structural support wall.

The temporary PATH track (in addition to the existing 5 tracks) and associated ballast that would be installed on a temporary basis during construction of the Project tracks and platforms and would be removed upon completion of the permanent tracks and platforms to re-expose the North and South Tower perimeter column remnants and portions of the North and South Tower footprints that may be covered by the temporary track and ballast.

The construction fill currently on the footprints has been temporarily removed for the purposes of documentation of the footprints pursuant to Stipulation I.A. of the MOA, and would be replaced with clean rounded gravel as required after the documentation in order to protect the footprints and column remnants from ongoing construction. Further treatments may be specified in the Project's Resource Protection Plan.

Passageway to the NYCT Subway Station (E Train)

The new pedestrian connection between the Permanent WTC PATH Terminal and the MTA/NYCT WTC E Subway Station would incorporate the existing E subway entrance, in its current location, in a manner that retains existing materials and features of this entrance, including, but not limited to, the handrails, the travertine flooring, the steps and doors separating the E train from the pedestrian connection, and overhead signage, to the extent possible and in accordance with current building codes and Americans with Disabilities Act requirements. The design would include, at a minimum, a plaque identifying the historic features of the E subway entrance. During construction of the new pedestrian connection between the Permanent WTC PATH Terminal and the E Subway Entrance, doors may need to be carefully removed and stored until they can be reinstalled within the new connection.

East and West Slurry Walls

The design for the Preferred Alternative would provide visibility from within the Terminal to a portion of the east or west slurry wall if the following criteria are met: the condition of the slurry wall evokes the image now understood to represent the historic nature of the wall (e.g. tiebacks are part of the area to be exposed, tiebacks project beyond the re-stabilized slurry wall); the exposure provided would enable a view of the slurry wall that is clear, recognizable, and respectful of the slurry wall; and the exposure would not pose a safety hazard to the public from exposed finishes of the wall or its components. The design for the east-west pedestrian concourse shall include a location from which the members of the public may view a plaque and photograph of the west slurry wall.

Steel Beams in Cross Form

PANYNJ would relocate the steel column and crossbeam mounted on a concrete pedestal and currently situated within the WTC site near Church Street in accordance with Stipulation VI of the MOA (see Appendix B). The object would remain in the custody and control of PANYNJ pending final disposition of these artifacts in accordance with the rights of the respective owners.

Resource Protection Plan for the WTC Site

PANYNJ, in consultation with SHPO and in coordination with LMDC and MTA/NYCT, as appropriate, shall develop a WTC Resource Protection Plan for the Permanent WTC PATH Terminal. The plan would be prepared to protect elements of the WTC site that are to remain in situ from inadvertent damage during the Terminal's construction. It would detail the Project's construction procedures and other construction plans for the site. It would provide for an inspection and reporting of the existing condition of elements, establish protection procedures, establish a monitoring program, and establish methods and materials to be used for any repairs. A historic architect, who meets the Secretary of the Interior's professional qualifications standards (48 FR 44716) in historic preservation, would be part of the design/construction team and would have the opportunity to review design drawing and specifications prior to construction. The plan would empower the Project's historic architect in consultation with the Chief Engineer of PANYNJ to issue "stop work" orders to prevent any unanticipated damage to historic properties. Recommencement of work would only be permitted once the Chief Engineer of PANYNJ and the historic architect are assured that appropriate modifications have been made to construction techniques to assure that no further damage would occur.

PANYNJ will furnish copies of the Plan to SHPO, ACHP, NPS, and the Section 106 consulting parties for review and comment prior to its implementation.

ARCHAEOLOGICAL TREATMENT PLANS

The executed MOA includes the process to address the Preferred Alternative's impacts on the Hudson River Bulkhead and its potential impacts to as yet determined archaeological resources that may be located within the eastern potion of the WTC site. Because the Hudson River Bulkhead is also located within the APE for the Route 9A Project, PANYNJ would coordinate its treatment plan with NYSDOT. Similarly because the potential archaeological resources within the WTC site are also located within the APE for the WTC Memorial and Redevelopment Plan, PANYNJ would coordinate its treatment plan, if necessary, with LMDC.

In consultation with SHPO, and, as appropriate, NYSDOT, PANYNJ would develop and implement a plan to locate and identify intact portions of the Hudson River Bulkhead that would be affected by construction of the Permanent WTC PATH Terminal's east-west pedestrian connection. In the event that the intact portions of the Hudson River Bulkhead are identified, PANYNJ would, in consultation with the SHPO and NYSDOT, prepare a treatment plan for those portions of the Hudson River Bulkhead to be affected by the Project. The plan would be submitted to SHPO and Section 106 consulting parties for their review and comment prior to implementation.

Prior to any Project-related subsurface disturbance at any of the locations that have been determined to be sensitive for historic archaeological resources, PANYNJ will, in consultation with the SHPO, and LMDC as appropriate identify and evaluate the National Register eligibility of any archaeological resources at these locations in accordance with 36 CFR 800.4.

In the event that FTA, in consultation with SHPO, determines that National Register-eligible archaeological resources will be adversely affected by construction of the Preferred Alternative, PANYNJ would, in consultation with FTA, SHPO, and LMDC as appropriate, and the Section 106 consulting parties, develop and implement an Archaeological Resource Treatment Plan for the Project. The Archaeological Resource Treatment Plan and documentation will adhere to the standards established by the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716), including the standards therein for professional qualifications. The plan will be submitted to SHPO and Section 106 consulting parties for their review and comment prior to implementation.

CONSTRUCTION PROTECTION PLANS

The MOA includes protocols for developing and implementing a CPP to avoid, minimize, or mitigate the project's potential construction-period vibration impacts on the Barcley-Vesey Building, Former East River Savings Bank, the Beard Building, 114-118 Liberty Street, and St. Paul's Chapel and Graveyard.

PANYNJ, in consultation with SHPO and Section 106 consulting parties, and in coordination with LMDC, NYSDOT, and MTA/NYCT, where appropriate, shall develop a Construction Protection Plan (CPP) for the Preferred Alternative. The CPP would set forth measures for the protection and avoidance of structural and architectural damage for these historic properties. The CPP would be based on requirements in the "New York City Department of Buildings Technical Policy and Procedure Notice (PPN) #10/88" regarding procedures for the avoidance of damage to historic structures resulting from adjacent construction. The PPN defines adjacent historic structures as being contiguous or within a lateral disturbance of 90 feet from a lot under development or alteration.

The CPP would describe in detail the construction procedures of the Preferred Alternative, as well as the construction procedures associated with other projects under construction in the vicinity of each of these historic properties. It would also provide for the inspecting and reporting of existing conditions at these properties, establish protection procedures, establish a monitoring program to measure vertical and lateral movement and vibration, establish and monitor construction methods to limit vibration; and establish methods and materials to be used for any repairs. The plan shall also specify the implementation of special vibration protection measures to protect these historic properties from increased vibration levels associated with construction activities. The CPP would provide for a historical architect meeting the Secretary of Interior's Standards to supervise implementation of the CPP.

The CPP would empower the historical architect, in consultation with the Chief Engineer of PANYNJ to issue "stop work" orders to prevent any damage to historic properties, and any recommencement of work shall only be permitted at such time that the Chief Engineer and historical architect have assurance that the appropriate modifications have been made to the construction technique to assure that no damage would occur to historic properties.

ENVIRONMENTAL PERFORMANCE COMMITTMENTS

As described in Chapter 2, "Project Alternatives," and Chapter 3, "Construction Methods and Materials," PANYNJ, in cooperation with the sponsors of the other Lower Manhattan recovery projects, has developed Environmental Performance Commitments (EPCs) to protect historic resources during construction of the Preferred Alternative. Table 6-2 describes the EPCs that pertain to historic resources as well as current plans for their implementation.

Table 6-2
Environmental Performance Commitments

Commitment	Implementation Plan
Establish coordination among projects to avoid or minimize interruption in access to cultural and historic sites.	Access to cultural sites within the APE for the Preferred Alternative will be maintained, to the maximum extent feasible given public safety considerations, as part of the Preferred Alternative's Maintenance and Protection of Traffic (MPT) Plan. The TMP for all of the Lower Manhattan Recovery Projects will also coordinate access to cultural sites.
Initiate public information and involvement outreach with sensitivity to local cultural resources.	PANYNJ has coordinated with the Project's Section 106 consulting parties to develop and execute a Memorandum of Agreement pursuant to Section 106 of the National Historic Preservation Act. The executed Memorandum of Agreement includes stipulations for ongoing coordination and consultation as the Preferred Alternative's design and construction moves forward. Materials pertaining to the Project's effects on cultural resources will made available on the project's website in accordance with the stipulations of the executed Memorandum of Agreement.
Identify public information outlets that will receive and provide current information about access during construction.	This EPC will be implemented through the Lower Manhattan Construction Command Center pursuant to Governor Pataki's Executive Order.
Consult with SHPO and LPC regarding potentially impacted, culturally significant sites. Monitor noise and vibration during construction at such sites as appropriate.	PANYNJ has and will continue to coordinate with the ACHP, SHPO, LPC, and the Section 106 consulting parties pursuant to the stipulations of the executed Memorandum of Agreement. As specified in the executed Memorandum of Agreement, PANYNJ will consult with SHPO and LPC to develop construction protection plans to monitor fragile buildings within the Preferred Alternative's APE and to stipulate measures to avert impacts to these structures. As described in the executed Memorandum of Agreement, PANYNJ will coordinate its CPPs with LMDC, MTA/NYCT, and/or NYSDOT, as appropriate, for those structures that may be cumulatively affected by construction vibrations.

*

Chapter 7: Urban Design and Visual Resources

A. INTRODUCTION

Lower Manhattan is developed with a dense concentration of historic and modern buildings that range in size from small-scale, low-rise structures to large-scale, high-rise structures. They reflect a variety of architectural styles that have been built over the years as commerce in Lower Manhattan has flourished and expressed its success in built form. The streets and open spaces surrounding this rich collection of buildings provide unique views that are distinguished from the views of other cities.

For 30 years, the World Trade Center's (WTC) Twin Towers were the tallest elements of those views and readily identifiable from miles around. Prior to September 11, 2001 the WTC complex occupied a superblock site and had a strong presence on the urban design of the area. A WTC PATH Terminal was located at the WTC and was an important transportation hub for the area. Following the events of September 11, 2001 and the subsequent recovery efforts, the WTC site had lost its transportation hub as well as the other aspects of the WTC. Construction activities have continued on the site as part of various phases of recovery and stabilization and included the construction of the temporary WTC PATH station, which opened for public use in November 2003.

The Preferred Alternative would introduce a visually important terminal building to the study area and would contribute to the larger redevelopment of Lower Manhattan. The modern design of the new terminal would create a new gateway to Lower Manhattan and would re-establish the site as an important transportation center.

This chapter considers the impact of the Preferred Alternative on the urban design character and visual resources of the study area from nearby locations from which the project would be visible. The study area has been delineated as the area generally bounded by Barclay Street to the north, Cedar and Thames Streets to the south, Battery Park City (BPC) to the west and Broadway to the east (see Figure 7-1). This study area was developed to be consistent with the study area defined for Cultural Resources (see Chapter 6).

Urban design characteristics and visual resources create the "look" of a neighborhood—its physical appearance, including the size and shape of buildings, their arrangement on blocks, the street pattern, and noteworthy views that may give an area a distinctive character and contribute to its unique sense of place. Urban design characteristics of a neighborhood are composed of the various components in the buildings and streets of the area and include building bulk, use and height, block forms and street patterns, streetscape elements, and natural features. An area's visual resources are its unique or important public view corridors, vistas, or natural or built features. They include views from public and publicly accessible locations only.*

---

* As defined in the *City Environmental Quality Review* (CEQR) *Technical Manual*, page 3G-1.

B. METHODOLOGY

Three analysis years—2006 (construction year), 2009 (opening year), and 2025 (design year)—are considered. While the analysis is primarily based upon conditions that exist today at the Project Site and in the surrounding study area, a discussion of the study area prior to the events of September 11, 2001 is included in this chapter to provide an overall context for the analysis which follows. Anticipated changes in the urban design and visual resources of the study area that are expected to occur independently of the Preferred Alternative by each analysis year are identified and potential impacts associated with each of the Preferred Alternatives are assessed.

The analysis of potential impacts to urban design and visual resources was conducted using the guidance set forth in the 2001 *City Environmental Quality Review* (CEQR) *Technical Manual.* Once the study area was established, the urban design characteristics and significant visual resources were described. Field visits were conducted to obtain information about the urban design and visual resources located within the study area. The information gathered in the field was supplemented with data obtained from Sanborn maps. Once this information was gathered, an assessment was prepared, focusing on urban design elements and visual resources that could be impacted.

C. DESCRIPTION OF THE AFFECTED ENVIRONMENT

PRE-SEPTEMBER 11, 2001 BASELINE CONDITIONS

PROJECT SITE

Urban Design

Prior to September 11, 2001, the Project Site was occupied by a WTC PATH Terminal, which included a track and platform level, an associated mezzanine/fare-zone level, and sub-grade pedestrian connections to adjacent streets, subways, and the WTC. There were no above-ground features of the terminal, as it was accessed through the WTC buildings (see Figure 7-2).

Visual Resources and View Corridors

Prior to September 11, 2001, the Twin Towers were important visual resources. Buildings associated with the WTC blocked views across the Project Site from other portions of the study area.

STUDY AREA

Comprising important parts of Lower Manhattan, the study area prior to September 11, 2001, was densely developed with office buildings, a number of which have been converted to residential use in recent years. The discussion below focuses first on the study area's urban design—its basic layout and structures—and then describes its visual resources.

Urban Design

Natural Features, Street Patterns, and Block Shapes. The topography of the study area sloped slightly to the south and west. Street patterns were slightly irregular. Route 9A and Greenwich Street generally traveled in a north-south direction, while West Broadway, Church Street, and Broadway traveled in a northeast-southwest direction. As a result, the blocks west of West

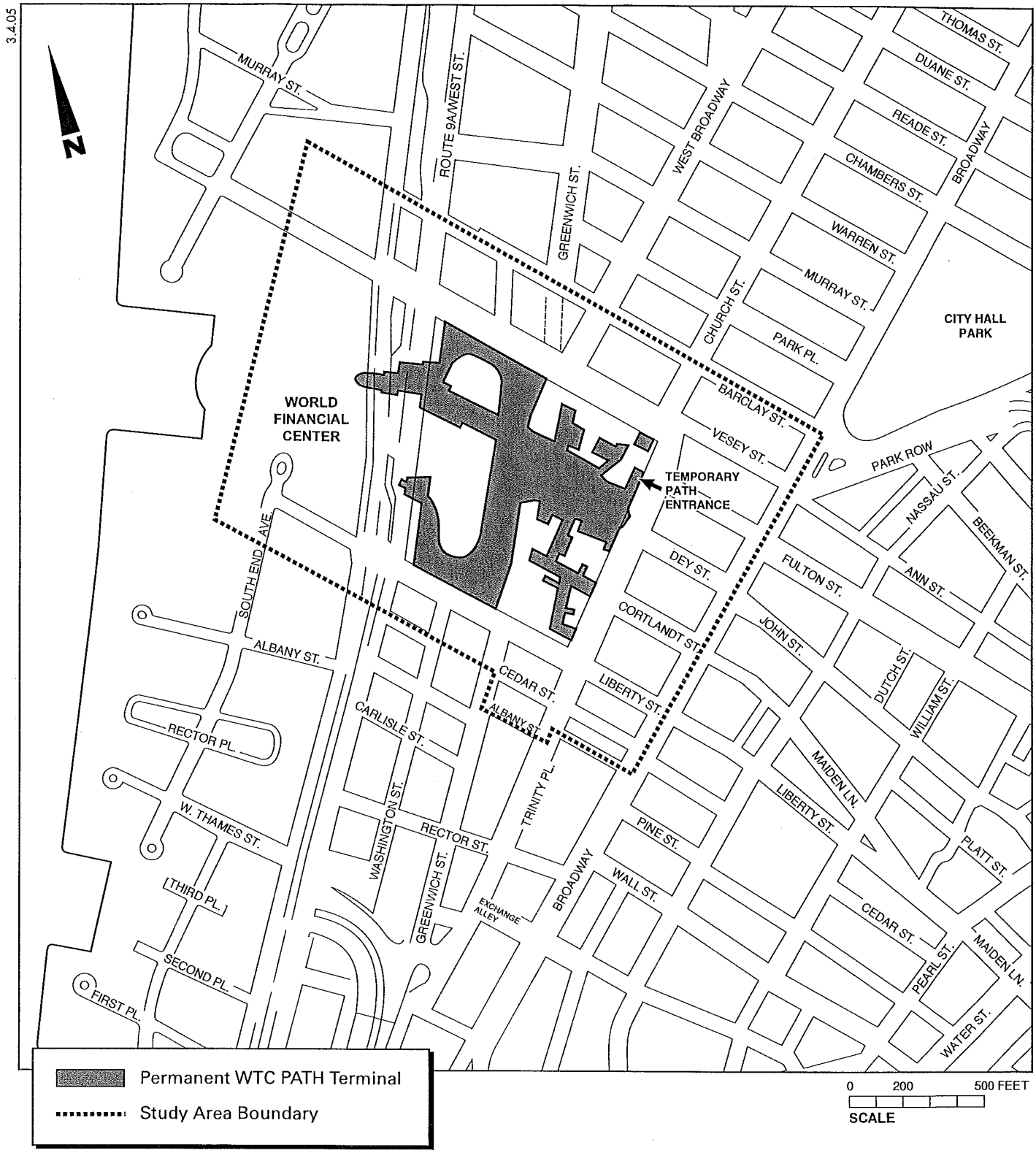
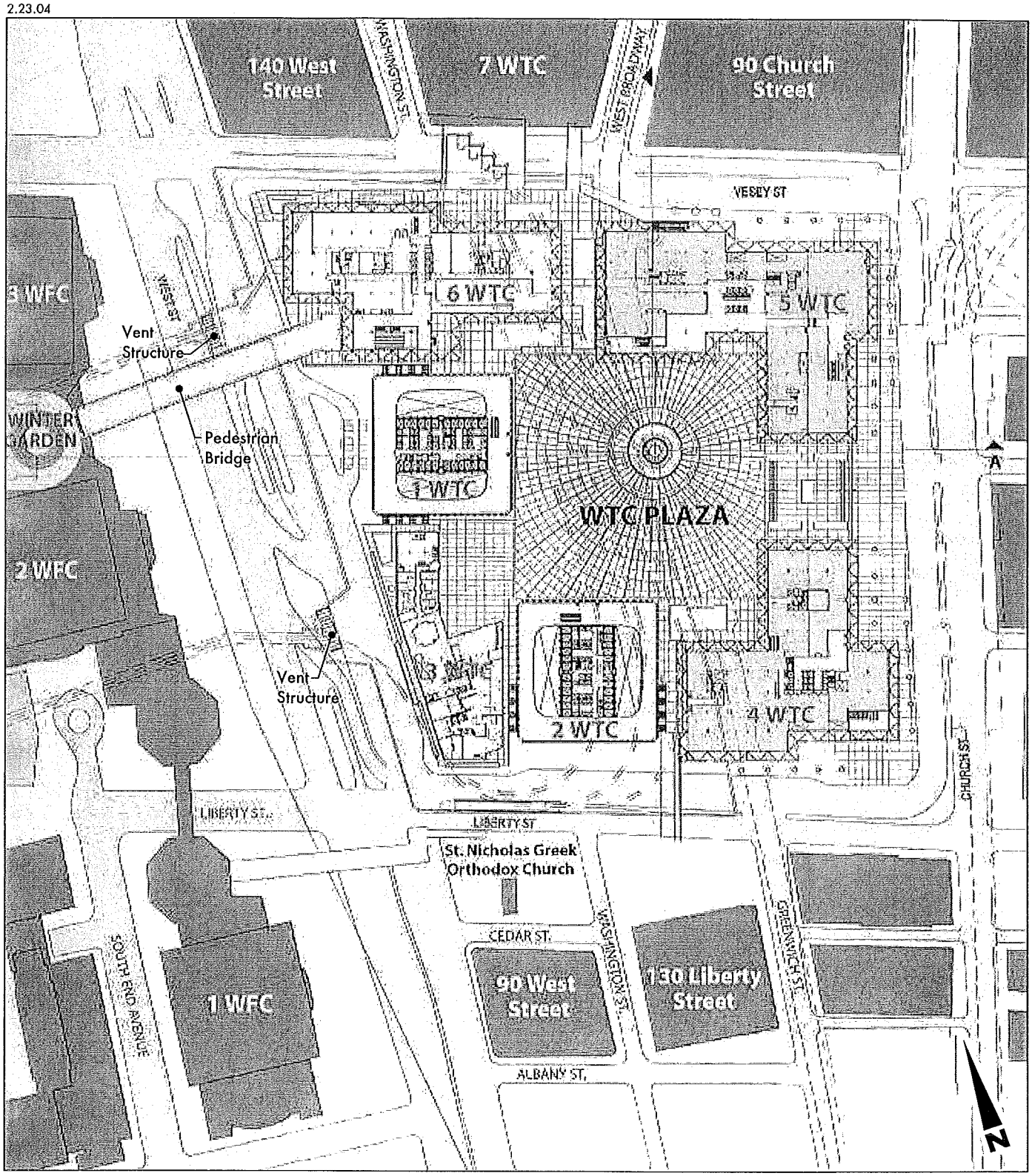


Figure 7-1

Urban Design and Visual Resources Study Area

2.23.04



Source: PANYNJ

Figure 7-2

Urban Design and Visual Resources Pre-September 11, 2001 Conditions

Broadway had irregular shapes. Route 9A, Broadway and Church Street were the primary roadways in the study area carrying multiple lanes of vehicular traffic.

Greenwich Street terminated at Barclay Street as Seven World Trade Center (7 WTC) occupied the entire area between Washington Street on the west and West Broadway on the east. West Broadway was open to Vesey Street where it ended at the WTC site. The WTC occupied a superblock site and had a strong impact on the street patterns and block shapes in the study area.

Large office buildings—including the Barclay-Vesey Building, the Federal Office Building/U.S. Post Office and One Liberty Plaza—occupied full blocks. St. Paul's Chapel, with its adjoining graveyard, also occupied a full block. Liberty Plaza occupied the full block bounded by Liberty and Cedar Street, Trinity Place and Broadway.

In BPC, there were no streets through the World Financial Center (WFC) between Liberty Street on the south and Vesey Street on the north. South End Avenue was the north-south roadway south of Liberty Street as was North End Avenue north of Vesey Street. Block shapes were not regular, and most structures were not built to the lot line.

Streetscape. The study area was urban in character, with streets flanked by concrete sidewalks. Most buildings extended to the lot line. Parked cars lined most streets. Various kinds of street furniture were found throughout study area, including fire hydrants, mailboxes, newsstands, lampposts and vendor carts. Most lampposts located along Route 9A were reproductions of historic lampposts, while others were of more modern design. Historic fire alarm call boxes were unique urban artifacts also found in the study area.

While still very urban in character, BPC was visually distinct from the rest of the study area. It was physically divided from the study area by Route 9A, the only multi-lane highway in the area. The WFC was set back from Route 9A's bikeway/walkway by a wide concrete sidewalk along the building front and a green lawn beyond that. Open space, both paved plazas and landscaped areas, was far more prevalent in BPC than elsewhere in the study area. BPC also had a great variety of attractive, well-designed street furniture, including benches, tables, and lampposts.

The streetscape on the north side of 7 WTC was the location of the wide truck ramp off Barclay Street that provided service access to the underground levels of the WTC. To reach this ramp, trucks were lined up on the west side of West Broadway for several blocks. The WTC as well as the wide and busy Route 9A roadway separated the WFC from the streets of Lower Manhattan. Two twelve-foot-tall vent structures for the WTC PATH Terminal were also located in the Route 9A median, opposite the WTC. Liberty and Vesey Streets were both open, providing vehicular access.

Building Uses, Shapes, and Forms. Prior to September 11, 2001, six buildings were located on the WTC superblock, most notably the 110-story Twin Towers (One and Two World Trade Center). These 1,350-foot-tall aluminum-clad skyscrapers (excluding the 345.1-foot antenna) were the tallest buildings in New York and had a dominating presence on the New York City skyline (see Figure 7-3). The Twin Towers were important visual resources due to their height and modern design. Other buildings on the site were more modest in scale. These included a 22-story hotel (Three World Trade Center), two nine-story buildings (Four and Five World Trade Center), and the eight-story U.S. Customs House (Six World Trade Center). These buildings were situated around the Austin J. Tobin Plaza, which was decorated with several sculptures. An enclosed pedestrian bridge over Route 9A connected the WTC with the Winter Garden in the WFC and was wider than the bridge that still crosses Route 9A at Liberty Street. Another shorter

pedestrian bridge crossed over Vesey Street from the WTC plaza to 7 WTC. The building at 7 WTC occupied the full block between Barclay, Vesey and Washington Streets and West Broadway.

A 39-story office building stood at 130 Liberty Street. Located directly across Liberty Street from 2 WTC, it had a plaza with a fountain.

The remainder of the study area was developed with a mix of historic and modern, low- and high-rise buildings. Almost all the buildings were originally constructed as office buildings, although several had been converted to residential use. Three churches were located in the study area—St. Paul's Chapel, St. Peter's Roman Catholic Church and St. Nicholas Greek Orthodox Church. Aside from the WTC, buildings in the study area ranged in height from two to 54 stories. Several tall office buildings were located in the study area and included the Barclay-Vesey Building with its dramatic setbacks, the Transportation Building at 225 Broadway, the former AT&T Company Building at 195 Broadway and One Liberty Plaza. Most buildings were built to the lot line, except for One Liberty Plaza, which was set back from its lot line and was surrounded by a plaza.

BPC was primarily developed with modern high-rise office and residential buildings. The WFC was a group of office towers clad in pink granite. They varied in height from 33 to 51 stories. Each structure was designed with a different geometric form at its roofline—mastaba, dome, pyramid, and stepped pyramid. The residential buildings west and south of the WFC varied in height from four to 28 stories.

Visual Resources and View Corridors

Prior to September 11, 2001, the Twin Towers were considered important visual features for the study area. The Austin J. Tobin Plaza and the plaza area along Church Street were visual and urban design amenities.

Despite its amenities, the WTC blocked view corridors. It cut off views north and south on Greenwich and Washington Streets, views south on West Broadway, and views west on Fulton, Dey, and Cortlandt Streets. The building at 130 Liberty Street blocked views east and west on Cedar Street.

7 WTC blocked views of the east side of the Art Deco Barclay-Vesey Building. Views from the south of the Barclay-Vesey Building were limited by 6 WTC and 1 WTC. 7 WTC blocked views south on Greenwich Street and views south on West Broadway ended at 5 WTC. A shorter structure and set back from the street, 5 WTC allowed more light up West Broadway than 7 WTC allowed up Greenwich Street.

Broadway, Church Street and Route 9A provided long north-south view corridors; however, the view corridor along Route 9A was partially blocked by the pedestrian bridges above the highway at Liberty and Vesey Streets. Views west on Barclay, Vesey, Liberty and Cedar Streets continued to BPC, while views east on these streets continued uninterrupted along narrow street corridors. The view corridors north along Washington and Greenwich Streets were blocked by 2 WTC and 4 WTC. In addition, the view east and west on Cedar Street was blocked by 130 Liberty Street—a building with dark glass windows that towered over the narrow streets to the east, south, and west of it.

In BPC, the buildings of the WFC were designed to harmonize with the size and design of the Twin Towers (see Figure 7-3). In views of Manhattan from the Hudson River or New Jersey, the WFC buildings stepped up the height of the built environment toward the WTC towers. On the

2.23.04

Source: PANYNJ

Pre-September 11, 2001 photo showing the Twin Towers in the New York City skyline

Figure 7-3

Urban Design and Visual Resources Pre-September 11, 2001 Conditions

other hand, because of the WTC the whole façade of the WFC along Route 9A could only be seen at an oblique angle. It was also not possible to see St. Paul's Chapel and the East River Savings Bank from the WFC prior to September 11, 2001.

Historic office buildings are frequently among the important visual resources of Lower Manhattan (see Chapter 6, "Cultural Resources"). Due to their heights, distinctive forms and decorative features, the Art Deco Barclay-Vesey Building (140 West Street/Route 9A), the neo-Gothic Woolworth Building (233 Broadway), the neo-Gothic building at 90 West Street, the Beaux Arts Equitable Building (120 Broadway) and the Art Deco Irving Trust Company Building (1 Wall Street) were unique visual resources that could be seen from throughout the study area.

Trinity Church was an important visual resource that was visible from the southern portion of the study area. Set between its graveyard and a small yard area, it was a relatively small neo-Gothic structure located at the head of Wall Street. Similarly, St. Paul's Chapel, opposite the northeast corner of the Project Site, was a visual resource along with its graveyard and large trees. The steeples of both churches were visible from blocks away, and the juxtaposition of their steeples against high-rise buildings, both sleek modern and more ornate older ones, was a defining feature of Lower Manhattan.

Another visual resource was Liberty Plaza. It was a paved full block with eight metal benches; a life-sized sculpture of a man with a briefcase and umbrella sat on one. Across the plaza there were views of the WTC but not the WFC. On Cortlandt, Dey, and Fulton Streets, the structures of the WTC blocked views west. Looking west on Cortlandt Street, 4 WTC was in front of 2 WTC. The view west across Fulton Street was to 5 WTC.

The modern granite-clad structures of the WFC and the glass walls of the Winter Garden were visible from Route 9A and adjoining side streets. While very attractive, the most important visual resources of BPC were the Hudson River and the many varied open spaces of BPC.

CHANGES IN THE AFFECTED ENVIRONMENT SINCE SEPTEMBER 11, 2001

This section provides a detailed description of urban design characteristics and visual resources in the study area which have changed since September 11, 2001. These differences are largely concentrated on the Project Site, the WTC site and the immediate area. This section highlights changes in urban design and visual resources which occurred as a direct result of the terrorist attacks along with any other changes which have occurred.

PROJECT SITE

Urban Design

The attacks of September 11, 2001 destroyed the WTC PATH Terminal along with the Twin Towers and the rest of the WTC. Today, the temporary WTC PATH station, which opened in November 2003, is located at the northeast portion of the Project Site (see Figure 7-4). The tracks of the temporary WTC PATH station curve around the south end of the bathtub, passing into the new structure of the temporary station. The temporary WTC PATH station's mezzanine level, station platforms, and rail tracks are located on the western portion of the site. The New York City Transit (NYCT) 1 and 9 subway line also bisects the Project Site. Additionally, a wide area along the east side of the Project Site is paved with concrete. The entrance to the temporary WTC PATH station is located here opposite Fulton Street. Sidewalk viewing areas are located along Church Street south of the WTC PATH entrance and on Liberty Street.

Portions of the former Hudson & Manhattan (H&M) Terminal exist on site; however, these portions are below grade and are not visible from street level. Damaged portions of the tunnels that traveled under the Hudson River—known as the Hudson Tubes—are located in the east wall. Only the south tube is visible (see Figure 7-4). Aside from the viewing areas and the temporary WTC PATH station, the remainder of the Project Site remains undeveloped and is fenced off and not accessible to the public (see Figure 7-5).

Visual Resources and View Corridors

On the Project Site at Fulton Street, the canopy of the temporary WTC PATH station has a sculptural form, with two wings rising from a central truss supported on two vertical trusses (see Figure 7-4). The fence, which stands along the public viewing area, allows visitors to see through it to the WTC site. The Port Authority of New York and New Jersey (PANYNJ) has posted informational boards telling the history of the site and high-rise buildings in Lower Manhattan.

As no other structures exist on the Project Site, the site is open and more sunlight reaches the Project Site and surrounding streets. View corridors are open across the site to other portions of the study area.

STUDY AREA

Urban Design

Natural Features, Street Patterns, and Block Shapes. Following the events of September 11, 2001, street patterns and block shapes changed slightly in the study area. The area south of Barclay Street and west of Greenwich Street is now closed to traffic by fencing and construction activity at 7 WTC. Greenwich Street, at least as a view corridor, is being reopened to Vesey Street by the new configuration of 7 WTC. Aside from the temporary WTC PATH station, the superblock of the WTC remains an undeveloped lot.

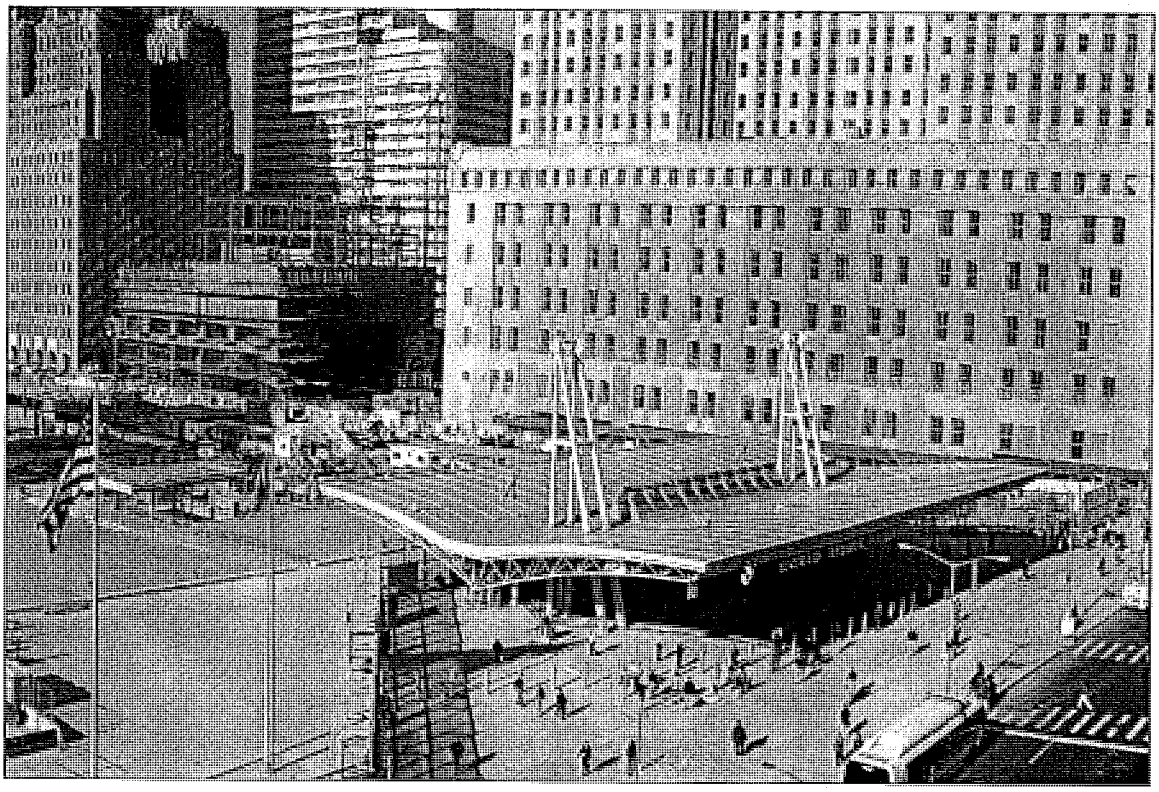
Many street segments were closed after the terrorist attacks and for the recovery activities. Closed streets include portions of Barclay, Vesey, Liberty and Cedar Streets, and the northern portions of Washington and Greenwich Streets.

Streetscape. Today, much of the streetscape surrounding the WTC site is dominated by construction. Otherwise, streetscape features in the study area are generally unchanged.

Building Uses, Shapes, and Forms. St. Nicholas Greek Orthodox Church, located south of the WTC site, was destroyed as a result of the events of September 11, 2001. The large block south of the WTC, bounded by Liberty, Greenwich, Albany, and Washington Streets, is occupied by a vacant office building at 130 Liberty Street. Its north façade (facing the WTC) was severely damaged in the attacks of September 11, 2001, and its two-level plaza was completely destroyed. The plaza area has been excavated, leaving a large hole in the ground surrounded mostly by a high construction wall. The large size of its lot, as well as the damaged and abandoned condition of the building, creates a strong presence on the adjoining streets.

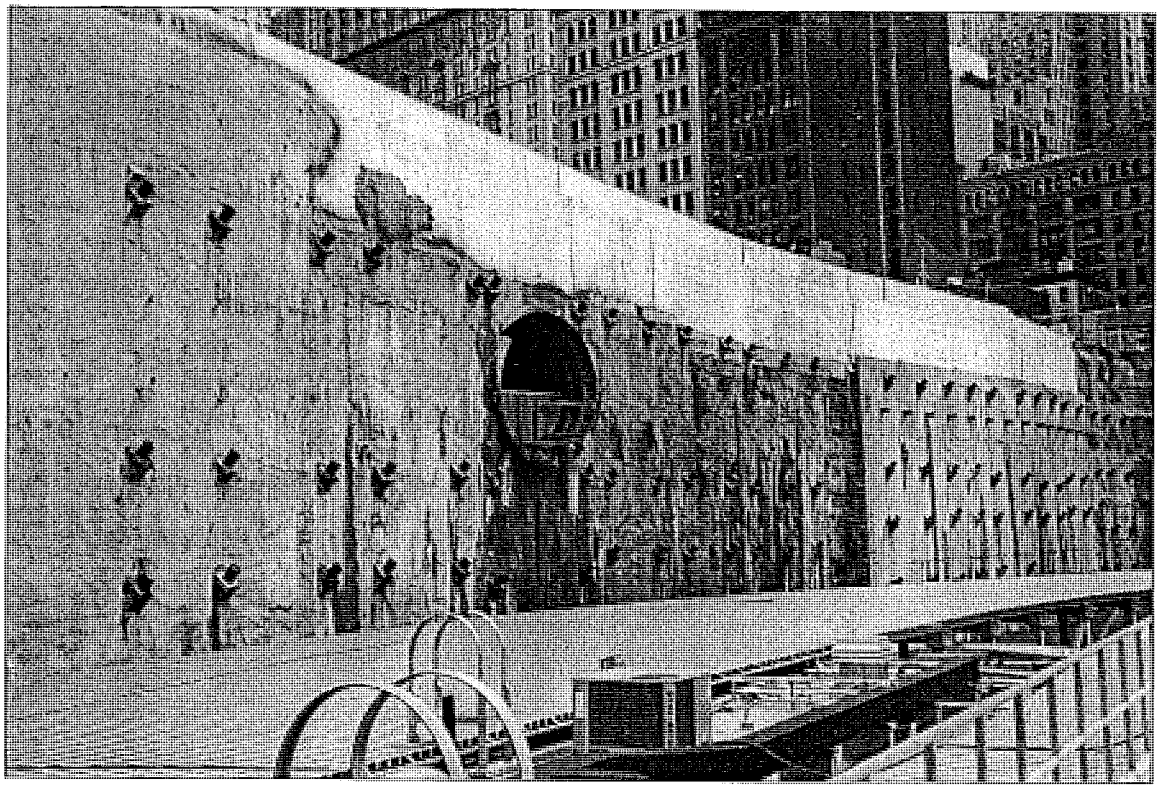
Visual Resources and View Corridors

The WTC site in its current condition has opened view corridors to the north, south, west, and east (see Figure 7-6). The openness allows visual resources located in the study area to be seen from and across the WTC site. The Barclay-Vesey Building and the Federal Office Building/U.S. Post Office are now visible in views north, from south of the site. From locations



Source: PANYNJ

View northwest of the Project Site showing the temporary WTC PATH station. 7 WTC is under construction in the background



View showing one of the Hudson Tubes in the eastern slurry wall

Figure 7-4

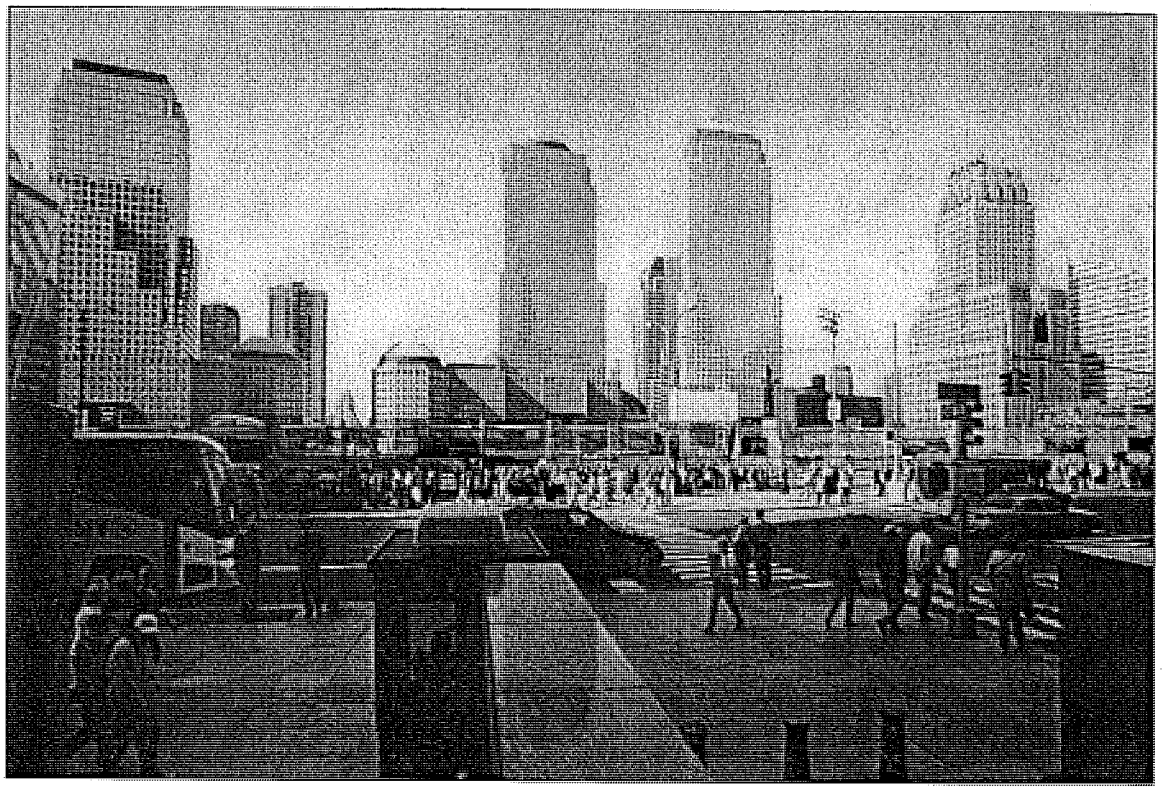
Urban Design and Visual Resources
Post-September 11, 2001 (Current) Conditions

View southeast of the WTC site, showing the temporary WTC PATH station on the site

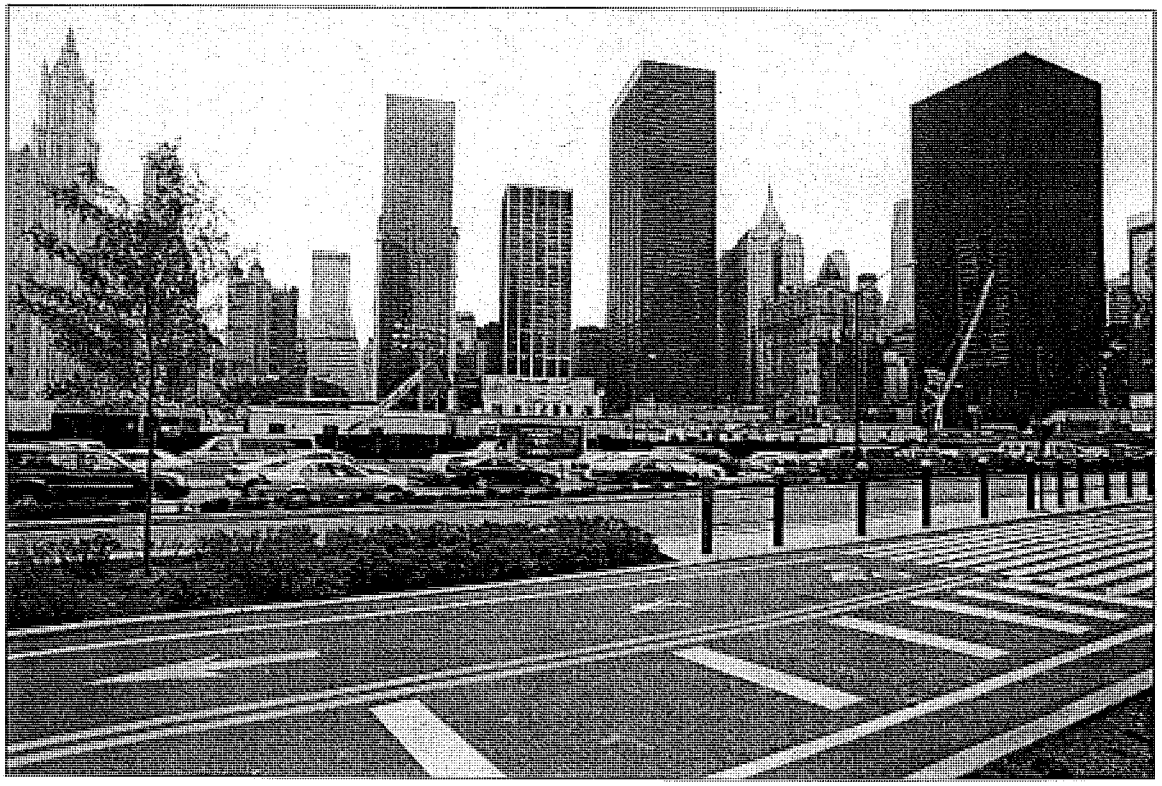
View southwest of the WTC site

Figure 7-5

Urban Design and Visual Resources
Post-September 11, 2001 (Current) Conditions



View west across the WTC site



View southeast across the WTC site

Figure 7-6

Urban Design and Visual Resources
Post-September 11, 2001 (Current) Conditions

west of the site, views of St. Paul's Chapel and the East River Savings Bank are available. From east of the site, views of the modern office towers of the WFC as well as views toward the Hudson River are available. Due to the undeveloped condition of the WTC site, the streets and buildings immediately surrounding it receive additional light.

Views west on Barclay, Vesey, Liberty and Cedar Streets are partially blocked by construction activity. Liberty Plaza was damaged on September 11, 2001 and has been partially restored. It remains a full-block open space with benches, planters, and lighting.

D. PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

This section describes conditions that are or would be expected to exist under the project alternatives for three analysis scenarios (construction period, opening year, and design year).

CONSTRUCTION PERIOD (2006)

FUTURE COMMON TO ALL ALTERNATIVES

Initial reconstruction activities associated with the WTC Memorial and Redevelopment Plan would be taking place. St. Nicholas Church is expected to be reconstructed south of the WTC site by 2006.

Both the Barclay-Vesey Building and the Federal Office Building/U.S. Post Office, north of the Project Site, will be repaired, renovated, and reopened. Between these two buildings, 7 WTC will be complete along with its triangular open space on the north side of Vesey Street. A residential building is expected to be complete along Barclay Street, between Broadway and Church Street. The proposed building is expected to be taller than the adjacent small-scale buildings. In addition, reconstruction of Route 9A between West Thames and Chambers Streets will be taking place.

NO ACTION ALTERNATIVE

Project Site

Under the No Action Alternative, the temporary WTC PATH station would remain in service. Construction activities associated with the WTC Memorial and Redevelopment Plan would be occurring on site.

Study Area

It is not expected that this alternative would have any adverse impact to urban design features or visual resources.

PREFERRED ALTERNATIVE

Project Site

Construction of the Preferred Alternative would begin in 2005 concurrent with other sub-grade work for the proposed redevelopment of the WTC site. Components of the terminal, including the platforms, mezzanine, and certain pedestrian connections, would be completed by the end of 2006.

Study Area

It is not anticipated that this alternative would have any impact on natural features, street patterns, or block shapes in the study area, as none of these features would be altered. Construction activities associated with this alternative may temporarily impact streetscape features. As all work would take place below grade and there would be no above-ground features of this alternative completed by 2006, there is no anticipated adverse impact to building uses, shapes, and forms in the study area. Although there would be some above-grade construction activities as well as potential staging areas associated with this alternative, these construction activities would be temporary. As these construction activities would be temporary and would not have a permanent visual impact on the study area, it is not anticipated that there would be an adverse impact to visual resources and view corridors in the study area.

OPENING YEAR (2009)

FUTURE COMMON TO ALL ALTERNATIVES

Portions of the WTC Memorial and Redevelopment Plan would be complete while other construction activity would continue. The Greenwich Street view corridor and possibly the street itself will be open north into Tribeca. In addition, reconstruction of Route 9A between West Thames and Chambers Streets would be complete. In BPC, Site 26 is slated for commercial development. The Fulton Street Transit Center would be open, east of the Project Site.

NO ACTION ALTERNATIVE

Project Site

In 2009 without the Preferred Alternative, it is assumed that the temporary WTC PATH station would remain in service. Some construction activities associated with the WTC Memorial and Redevelopment Plan would continue while some would be complete on site.

Study Area

It is not expected that this alternative would have any adverse impact to urban design features or visual resources.

PREFERRED ALTERNATIVE

Project Site

The remaining portions of the Preferred Alternative would be completed in phases from 2007 to 2009. The terminal building would be located on the WTC site south of Fulton Street between Greenwich and Church Streets.

The terminal building would provide street-level access to the WTC site and Greenwich and Church Streets. It would be modern in design and would be lower in height than the WTC buildings adjacent to it on the south and to the north of it across Fulton Street. The terminal building would be designed by Santiago Calatrava, an award-winning architect, artist, and engineer. His works include the Olympic Sports Complex (Athens, 2001), the Milwaukee Art Museum (1994), several railway stations (Liege, 1996; Lisbon, 1993; and Alameda, 1991), and several bridges (Buenos Aires, 1998; Orleans, 1996; Venice, 1996; Bilbao, 1994; and Merida, 1988).

Calatrava's modern design for the terminal would incorporate two wing-like canopies that would run the length of the glass and steel shell of the terminal concourse (see Figures 7-7 and 7-8). These wings would be approximately 100 feet high and could pivot aside to create an opening to the sky along the main axis of the terminal. The terminal's design would complement the modern structures planned for the WTC site, such as Freedom Tower and Wedge of Light Plaza. The terminal would likely become an important visual resource for Lower Manhattan, and would create a grand point of entry for the new transportation center.

Underground pedestrian concourses connecting to New York City subways would also be complete by 2009. An above-ground entrance to the concourse would be located next to the World Financial Center. The Terminal would also include certain ancillary facilities and systems, including mechanical, ventilation, communications, and security.

In addition, two vent structures would be located in the Route 9A median, west of the WTC site. Both the north vent and the south vent would be of a long and slender massing and would stand 40 feet tall. It is anticipated that the structures would be clad in reflective material, in keeping with modern material used on buildings in the immediate area.

Study Area

In 2009, it is not anticipated that this alternative would have any impact on natural features, street patterns, or block shapes in the study area, as none of these features would be altered. It is not anticipated that there would be an adverse impact on streetscape features since existing elements would not be altered by the proposed development. The Project Site is expected to be developed with streetscape elements that would be in keeping with those found throughout the study area. Although the entrance to the temporary WTC PATH station would be replaced by the new entrance to the Permanent WTC PATH Terminal, it is expected that the new entrance would be developed with streetscape elements that would be in keeping with those found in the study area and would be an improvement over current conditions.

It is anticipated that Calatrava's design for the proposed terminal building would be constructed of glass, steel and concrete, and would be similar to the materials used in Wedge of Light Plaza that would be constructed along Church Street as part of the WTC Memorial and Redevelopment Plan. It would also be in keeping with modern structures that exist in the study area, such as the Winter Garden and other buildings in the WFC and BPC. It would continue the tradition in the downtown area where technologically advanced modern buildings have been constructed near older, historic structures. It is also anticipated that Calatrava's design would be modern and unique to the area, and that the new terminal may become an important visual resource for the study area. In addition, its use would be consistent with the historic transportation uses associated with the Project Site. The terminal building would not block any unique views or view corridors, as views across the Project Site will be blocked by construction associated with redevelopment of the WTC site. As it is expected that the proposed terminal building would be an improvement over current conditions and would introduce an important architectural resource to the study area, it is not expected to have an adverse impact on the urban design or visual resources of the study area.

It is anticipated that the underground concourse to the WFC would be an improvement over existing conditions because its construction would allow for the removal of the temporary bridge over Route 9A at Vesey Street. The removal of this bridge would improve view corridors along Route 9A and surrounding streets in the study area. A new headhouse would be located in front of the Winter Garden. The headhouse would provide access to and from the Route 9A

connection. It would be a canopy of steel and glass and would be similar in scale to the temporary WTC PATH Station entrance. It is anticipated that the headhouse would complement the modern style of the Winter Garden. Figure 7-9 is a schematic of the proposed headhouse.

It is not anticipated that the vent structures would block any views or view corridors. The vent structures would be located in the Route 9A median, west of the WTC site. The location of the north vent structure would not block the Fulton Street view corridor, while the south vent structure would not block the Liberty Street view corridor. The vent structures would not block views north or south on Route 9A, as they would be slender in massing and would be located within the roadway median. Surrounding each vent structure, trees would be planted in the median as part of greening improvements to Route 9A. It is expected that this landscaping would occur concurrent with landscaping for the Route 9A Project in or around 2007.

It is anticipated that these trees would be 35 feet in height within five years of planting, thus obscuring views of the vent structures from pedestrians and vehicular traffic (see Figures 7-10 and 7-11). It is anticipated that the vent structures would be clad in reflective material that would be in keeping with modern materials used on buildings in the immediate area. This reflective material would also help the vent structures to blend in with their natural surroundings. Although the vent structures would be located west of the WTC site, it is not anticipated that these structures would impact the WTC site, as they would not block views towards the site and tall trees would obscure views of these structures from the WTC site. Likewise, it is not anticipated that these vent structures would have any impact on the WFC. Overall, it is not anticipated that the vent structures would have an adverse impact on view corridors or visual resources located within the study area, as they would not block any view corridors or views to visual resources and would be further obscured by tall trees that would be planted in the Route 9A median.

DESIGN YEAR (2025)

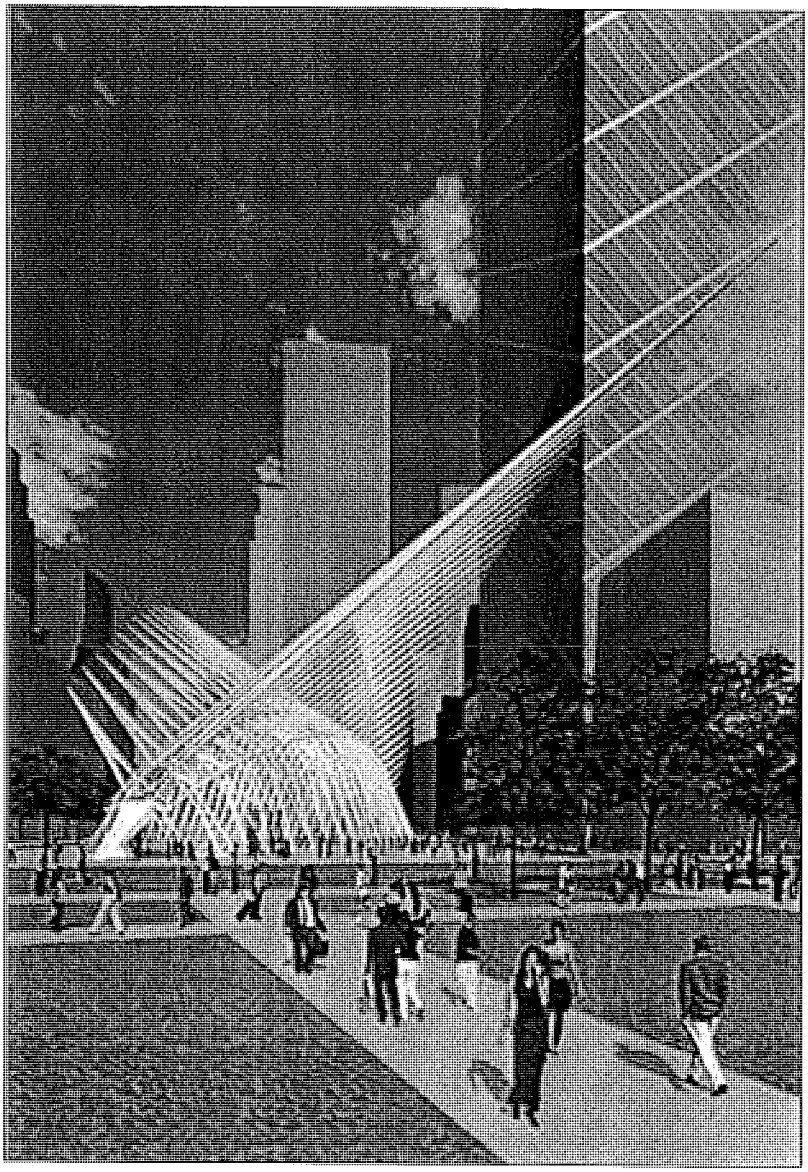
FUTURE COMMON TO ALL ALTERNATIVES

By 2015, it is assumed that the full program for the WTC site would be developed, with the completion of the three towers on the east side of the WTC site and a fifth tower south of Liberty Street. A 65-story office building (Tower 2) and a 25-story hotel would be completed in the northeast quadrant. In the southeast quadrant, a 62-story office building (Tower 3) and a 58-story office building (Tower 4) would be completed. A 57-story office building (Tower 5) would be completed south of Liberty Street. Two office towers would also be developed at 130 and 140 Liberty Street. The Fulton Street Transit Center would be complete, east of the Project Site. It is expected that these new developments would create shadows typical of the urban context of Lower Manhattan.

NO ACTION ALTERNATIVE

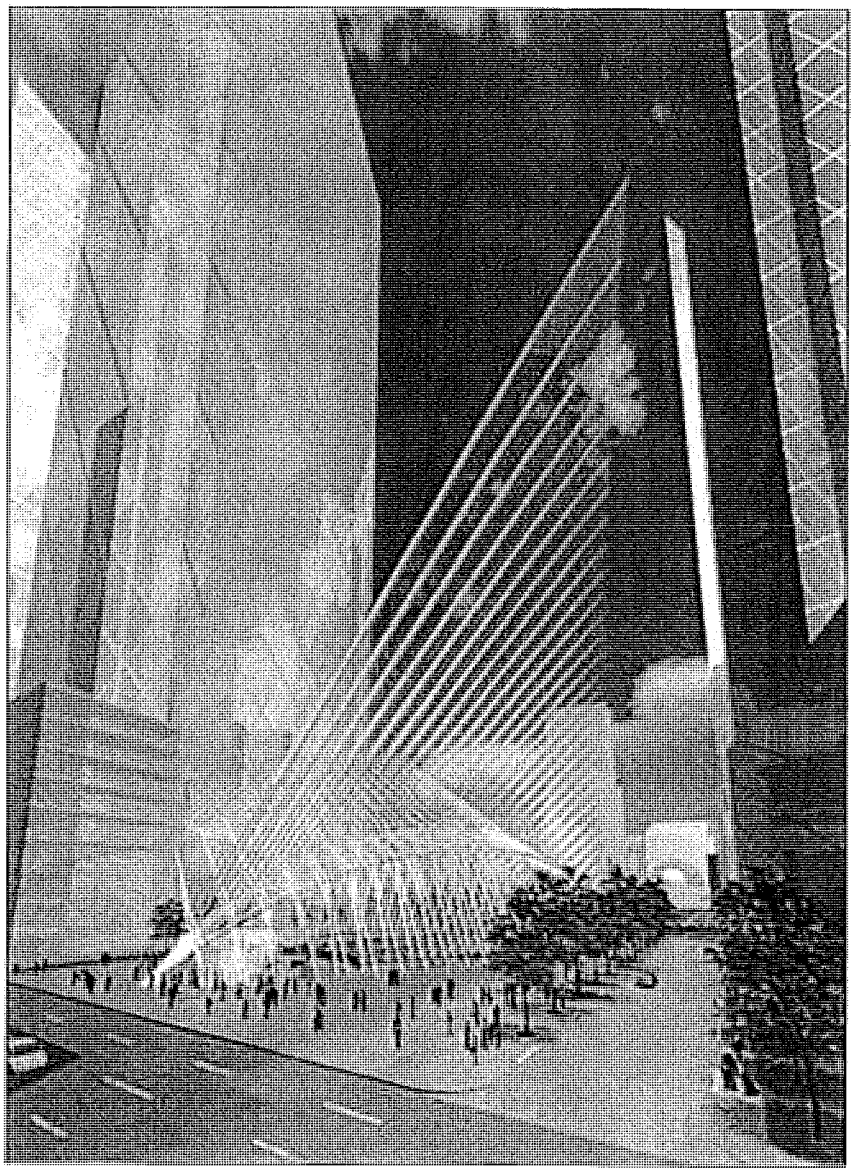
Project Site

In 2025 without the Preferred Alternative, it is assumed that the temporary WTC PATH station would still be located on the Project Site, unless removed by a separate undertaking and would not be operational. Construction activities associated with the WTC Memorial and Redevelopment Plan would be complete on site.



View southeast from WTC Memorial

Figure 7-7
Proposed Terminal Design



View southwest from Church and Fulton Streets

Figure 7-8
Proposed Terminal Design

2.24.05

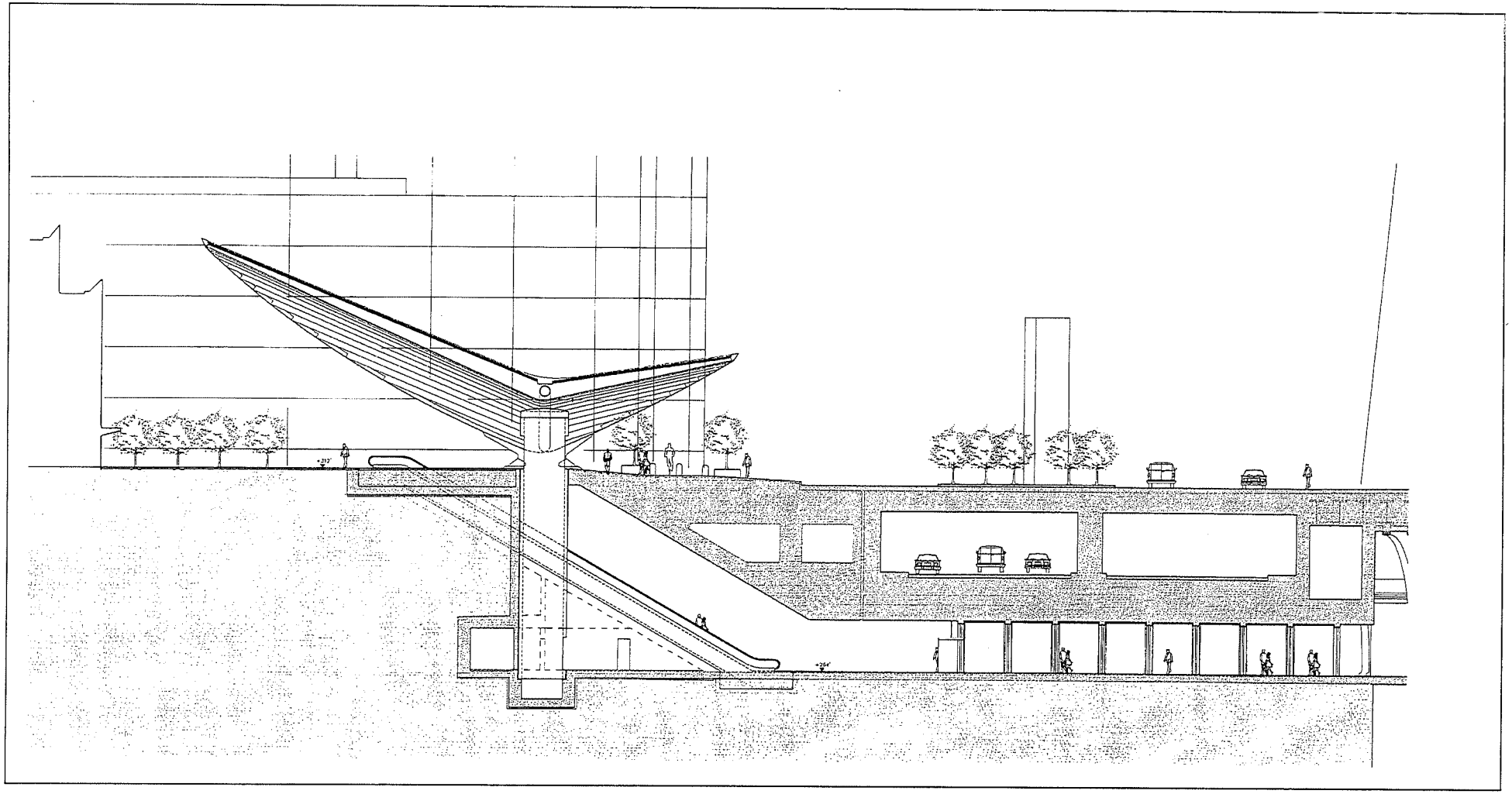
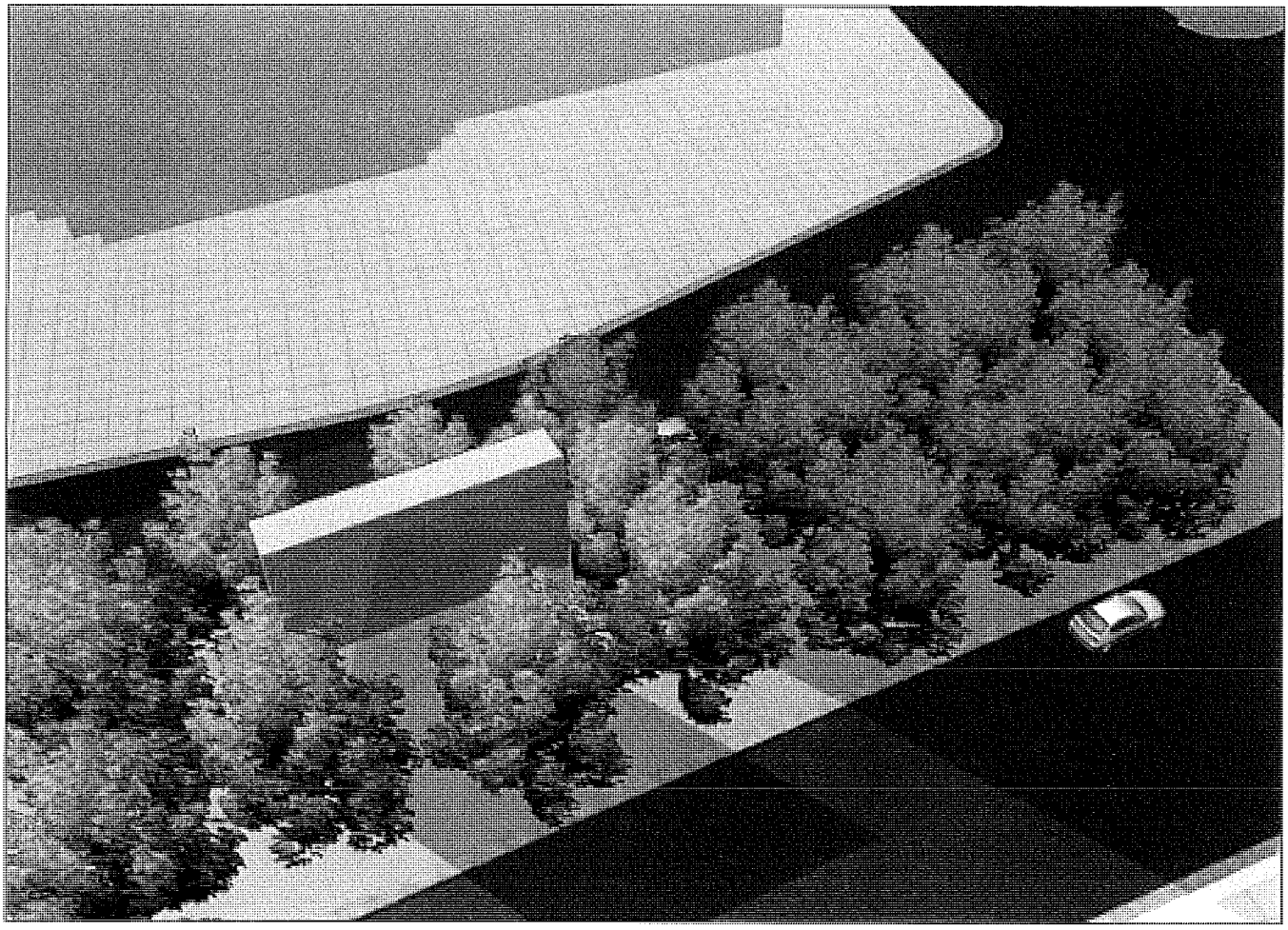
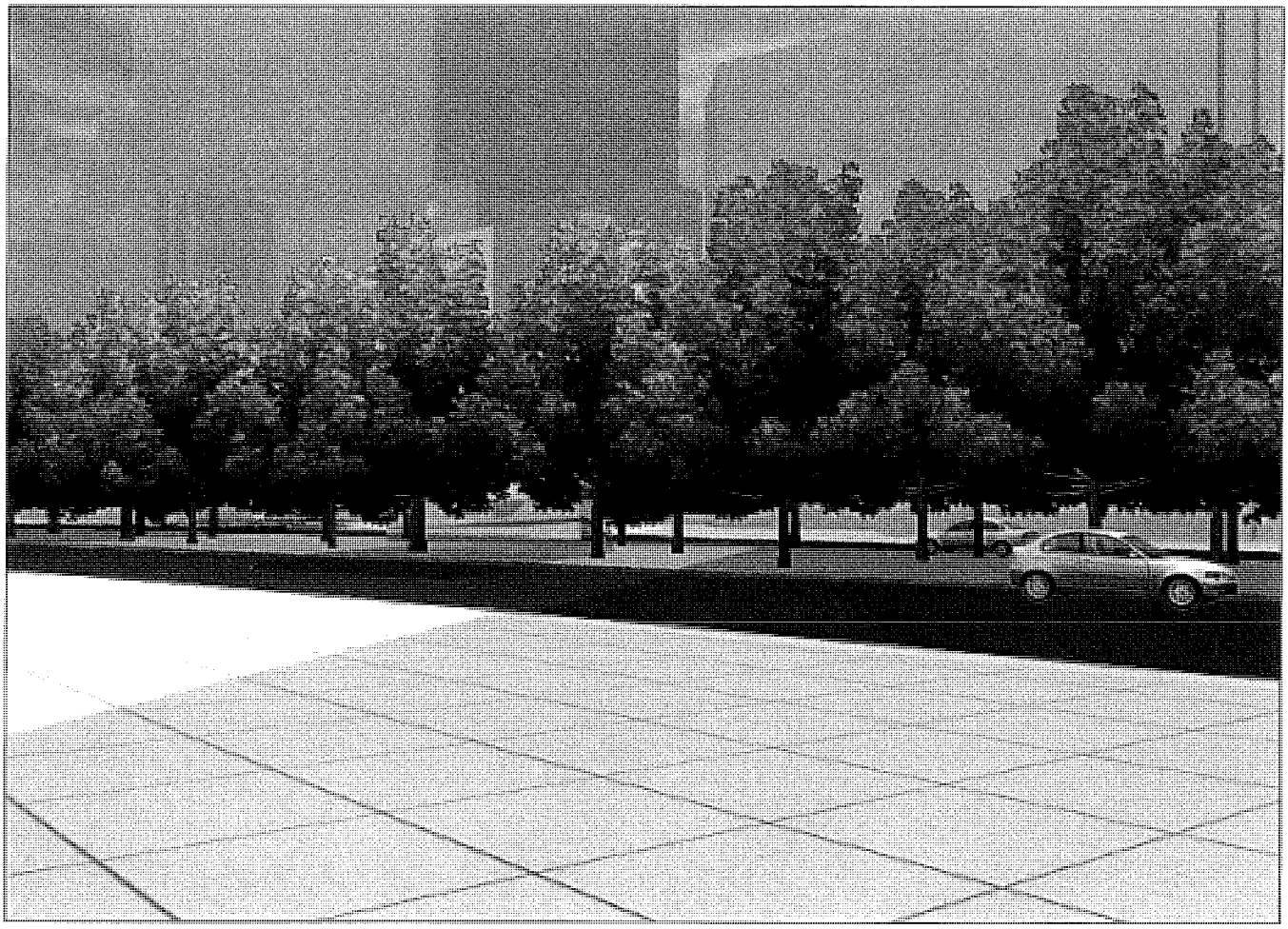


Figure 7-9
Proposed Winter Garden Entrance



Aerial view showing proposed north vent structure
(facing northwest from WTC memorial)

Figure 7-10
Proposed Route 9A Vent



Pedestrian view showing proposed north vent structure
(facing east from the Winter Garden)

Figure 7-11
Proposed Route 9A Vent

Study Area

It is not expected that this alternative would have any adverse impact to urban design features or visual resources.

PREFERRED ALTERNATIVE

Project Site

All work associated with this alternative would have been completed for a period of 16 years after its initial operation. It is assumed that in 2025, the Preferred Alternative would be in operation and would continue to be compatible with and supportive of urban design features and visual resources on the WTC site. This alternative would bring workers and visitors who would enliven the Project Site and surrounding neighborhood by bringing increased pedestrian traffic. Therefore, it is not anticipated that this alternative would have an adverse impact on the urban design or visual resources of the Project Site.

Study Area

In the future, urban design characteristics of the study area may change. Changes to urban design features, visual resources, or to their settings may occur irrespective of this alternative.

In 2025, it is assumed that the Preferred Alternative would continue to be compatible with and supportive of urban design features and visual resources of the study area. It is anticipated that Calatrava's modern design for the Preferred Alternative would be unique to the study area and that the Terminal may become an important visual resource. It is expected that this alternative would be an improvement over current conditions and, therefore, would not result in any adverse impact to the urban design or visual resources of the study area.

E. MITIGATION

The Preferred Alternative would not result in adverse impacts to urban design or visual resources. Specific measures have been proposed that would minimize or avoid adverse impacts to the urban design and visual resources of the study area. The north and south vent structures would be slender in massing and trees would be planted around them. It is expected that this landscaping would occur concurrent with landscaping for the Route 9A Project. It is anticipated that these trees would be 35 feet in height within five years of planting and would thus obscure views of the vent structures from pedestrians and vehicular traffic. It is also anticipated that the vent structures would be clad in reflective material that would help them blend in with their natural surroundings. ✷

A. INTRODUCTION

The assessment of potential impacts to transportation facilities associated with the Preferred Alternative has been divided into four sections as follows:

- Chapter 8, Section A, "PATH";
- Chapter 8, Section B, "Vehicular Traffic and Parking";
- Chapter 8, Section C, "Transit," which includes non-PATH transit modes such as subway, bus, and ferry; and
- Chapter 8, Section D, "Pedestrians."

These sections describe transportation conditions in the vicinity of the Project Site and identify the potential for significant impacts of the Preferred Alternative. The analyses address conditions in the area once the Permanent World Trade Center (WTC) PATH Terminal is fully operational in 2009, further in the future in its 2025 design year, and when the Terminal is under construction. Chapter 15, "Cumulative Effects," includes an assessment of cumulative impacts when several proposed Lower Manhattan projects including the Permanent WTC PATH Terminal, the World Trade Center Memorial and Redevelopment Plan, Fulton Street Transit Center, Route 9A Project, and South Ferry Terminal, are in simultaneous construction and operation.

B. ANALYSIS FRAMEWORK FOR THE PROJECT ALTERNATIVES

NO ACTION ALTERNATIVE

As described in Chapter 2, "Project Alternatives," the No Action Alternative could result in the closure of the temporary station and full disruption of PATH service to Lower Manhattan at some point between the 2009 opening year and 2025 design year. The Port Authority of New York and New Jersey (PANYNJ) would work to maintain service to the extent possible, but as passenger volumes increase, the temporary station would have severe operating constraints that would limit its ability to safely and efficiently process riders. For analysis purposes, it has been assumed that absent the Preferred Alternative, those traveling between New Jersey and Lower Manhattan would be diverted to other modes of travel in the design year. In order to assess the probable impacts of this diversion to the regional and Lower Manhattan transportation networks, it was necessary to estimate the percentage of former PATH riders that would divert to each mode. To estimate this modal diversion from the temporary WTC PATH station, a number of assumptions were required, including:

- The WTC area would be redeveloped to accommodate the volume of workers similar to pre-September 11, 2001 levels, as current redevelopment plans indicate.
- All PATH stations would be fully operational, excluding the WTC PATH Terminal.

- Waterway ferry services between Lower Manhattan and west-of-Hudson locations would provide service, frequency, and passenger capacity levels similar to post-September 11, 2001 and prior to the opening of the temporary WTC PATH station.
- Some express bus service from west-of-Hudson locations would be implemented or would be diverted from the Port Authority Bus Terminal (PABT) to Lower Manhattan.

Based on these assumptions, west-of-Hudson travelers wishing to reach the Lower Manhattan area would have several mode options to cross the Hudson River including:

- Auto
- Bus to Lower Manhattan
- Bus to PABT, and then connect to Lower Manhattan-bound New York City Transit (NYCT) subway
- Commuter rail, and then connect to Lower Manhattan-bound NYCT subway
- Commuter van
- Ferry
- PATH to a Manhattan station other than WTC, such as Christopher Street or 9th Street, and then walk or connect to the NYCT subway to Lower Manhattan

Several resources were used to estimate the percentage of PATH riders that would divert to these modes, absent the Preferred Alternative. These sources included ridership data for both pre- and post- September 11, 2001, PATH passenger surveys conducted in June 2001, and the 2002 survey at PATH's Christopher and 9th Street stations.

The results of this modal diversion analysis are provided in Table 8-1. The estimates presented in Table 8-1 are integral components of the "Probable Impacts" portion in each of the four sections of this chapter, "PATH," "Traffic and Parking," "Transit," and "Pedestrians." Table 8-1 also provides an estimate of the number of former alighting and boarding WTC PATH passengers that would utilize each mode on an average weekday in 2025.

Table 8-1
No Action Alternative: Diversion of WTC PATH Riders

Mode	Percent	Year 2025 Diverted Weekday Passenger Trips
Auto	5	8,086
Bus to Lower Manhattan	21	33,961
Bus to PABT / NYCT Subway	5	8,086
Commuter Railroad / NYCT Subway	18	29,109
Commuter Van	1	1,617
Ferry	35	56,601
Uptown PATH / NYCT Subway	15	24,258
Total	100	161,718

Note: The "Diverted Weekday Passenger Trips" are a worst-case scenario as they were derived using the projected number of trips anticipated for the Permanent WTC PATH Terminal. Without this investment in public transportation infrastructure, the number of trips to Lower Manhattan from west-of-Hudson locations would be somewhat less.

PREFERRED ALTERNATIVE

The number of future trips to Lower Manhattan is expected to increase from today through the Permanent WTC PATH Terminal's 2025 design year. Some of these trips would be attributed to private development projects planned for the area. Others would be the direct result of newly constructed buildings and uses on the WTC site, including office towers, retail, cultural facilities, and a memorial.

The Preferred Alternative would be an enhancement to a travel mode that existed both prior to September 11, 2001 and in a temporary capacity today. However, the long-term operation of the Preferred Alternative is not expected to result in a shift in the modal distribution of trips to and from Lower Manhattan as compared to pre-September 11, 2001 conditions. Thus, the Terminal itself would not induce new ridership. Rather, it would provide for the additional capacity and enhanced passenger amenities needed to support the independent growth in trips to and from Lower Manhattan.

C. EVALUATION OF PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

Not all of the travel modes (PATH, vehicles, subway, bus, ferry, and pedestrians) are critical in terms of their potential for significant impacts. For example, the Preferred Alternative is not expected to create adverse vehicular traffic impacts in its operational phase since the Terminal that was destroyed on September 11, 2001 generated a minimal volume of auto and taxi trips. Based on surveys conducted by PANYNJ, 1 percent of connecting trips to or from the PATH were made by auto and less than ½ percent were made by taxi. Thus, the vehicular traffic analyses that follow focus principally on potential impacts during construction, identifying the volume of construction traffic generated by the project and the routes to be used by trucks accessing the site.

The Preferred Alternative would provide greater capacity than the Terminal that was destroyed on September 11, 2001, but its construction is not expected to induce new PATH ridership beyond levels that were forecasted prior to the terrorist attacks. Although PANYNJ projections show an increase in ridership through the project's design year, these new riders would be attributed to private development that was anticipated prior to September 11 2001 or from redevelopment efforts that are independent of the Permanent WTC PATH Terminal but are in response to the terrorist attacks. Since the Preferred Alternative is not expected to induce new riders, it would not increase subway patronage above that which would have occurred otherwise. It is possible that different access/egress points to the street network above could affect pedestrian crossing locations and create impacts or benefits to levels of service for on-street facilities, which is addressed in Chapter 8, Section D.

The analyses of each mode begin with a description of existing conditions both pre- and post-September 11, 2001 and proceed with an assessment of projected conditions during the construction period, design year, and opening year. ✳

A. INTRODUCTION

This section describes the pre- and post-September 11, 2001 PATH system, the original World Trade Center (WTC) PATH Terminal, the temporary WTC PATH station, and the Permanent WTC PATH Terminal. This section also identifies whether the No Action and Preferred Alternatives would create impacts to the PATH system in terms of operations and ridership. The analyses that follow provide an overview of existing conditions, pre- and post-September 11, 2001, in order to establish a baseline from which future conditions may be assessed. Additional information on PATH's ridership projections and planning and design requirements for a new terminal are presented in Appendix C.

The Port Authority of New York and New Jersey (PANYNJ) does not expect the Permanent WTC PATH Terminal itself to induce PATH ridership beyond growth that was projected prior to September 11, 2001. Rather, the Preferred Alternative seeks to serve customers who previously used the PATH system and the former WTC PATH Terminal, and to accommodate the growing ridership that PATH had experienced in the past and would have continued to occur in the future absent the events of September 11, 2001. Other land uses surrounding the Project Site, such as the WTC Memorial, will induce additional trips to Lower Manhattan which will need to be accommodated.

The Preferred Alternative would be designed to adequately serve projected ridership levels through its 2025 design year. Shortcomings of the original WTC PATH Terminal, such as its difficulty in accommodating reverse passenger flows, will be addressed in the design of the Preferred Alternative, thereby improving the level of service that existed previously.

The Preferred Alternative would also result in improved connections to subway service and Hudson River ferries as compared to the pre-September 11, 2001 and temporary PATH facilities at the WTC site. The potential effects of these improved connections are described later in this chapter as well as in Chapter 8, Section C, "Transit."

The Preferred Alternative is a functional replacement and improvement of the WTC PATH Terminal that previously existed on the WTC site. In time, as the WTC site is redeveloped, and other previously planned or anticipated development occurs in Lower Manhattan, a fully functioning PATH system would be a necessary component in the public transportation system and the overall transportation network for the region in terms of both capacity and redundancy. Due to the substantial capacity, pedestrian, and component service life limitations of the temporary WTC PATH station that is currently in service, the only means by which to return the PATH rail system to its former capacity and service capabilities, and to accommodate projected future ridership, is to implement the Preferred Alternative, for the Permanent WTC PATH Terminal.

B. METHODOLOGY

The analyses begin with a description of the WTC PATH Terminal and the operation of the PATH system both pre- and post-September 11, 2001. System operations were reviewed in terms of train frequencies and system capacity.

Historical ridership data was compared and analyzed. This analysis included a review of total PATH system demand and WTC PATH Terminal demand from year to year, and a comparison of average weekday ridership trends for the system as a whole and for the WTC PATH Terminal over time. Peak period demands were also assessed for the WTC PATH Terminal.

"Existing conditions" service and ridership information, which comprise both historical (pre-September 11) and current (post-September 11) data, was then compared to the expected system operations and ridership once the Preferred Alternative would open in 2009 and to the Terminal's 2025 design year. The analyses presented in this section were performed using available historical ridership data, ridership projections, and system operations information.

If the Preferred Alternative is not constructed, it is expected that the temporary WTC PATH station that is presently operating would continue to maintain service to the extent possible. This is the No Action Alternative, which was fully described in Chapter 2, "Project Alternatives." However, increasing passenger volumes over time would substantially surpass the safe and efficient design capacity of the temporary WTC PATH station prior to the 2025 design year. Once the design capacity of the temporary WTC PATH station is reached, PANYNJ would need to implement restrictive measures to ensure passenger safety and reliable PATH rail operations. One such measure may include restricting passengers from entering the WTC station during AM peak hours as was done at the Christopher Street station following September 11, 2001. Another measure may be to reduce the number of trains serving the WTC station so as to allow sufficient station egress prior to another train discharging passengers. Such measures would not only fail to serve passenger demand, but they would also have operational repercussions throughout the PATH rail system. Due to these impacts, for analysis purposes, it was assumed that absent the Preferred Alternative, those traveling between New Jersey and Lower Manhattan would be diverted to other modes of travel as described in the "Introduction" to this Transportation Chapter.

C. DESCRIPTION OF THE AFFECTED ENVIRONMENT

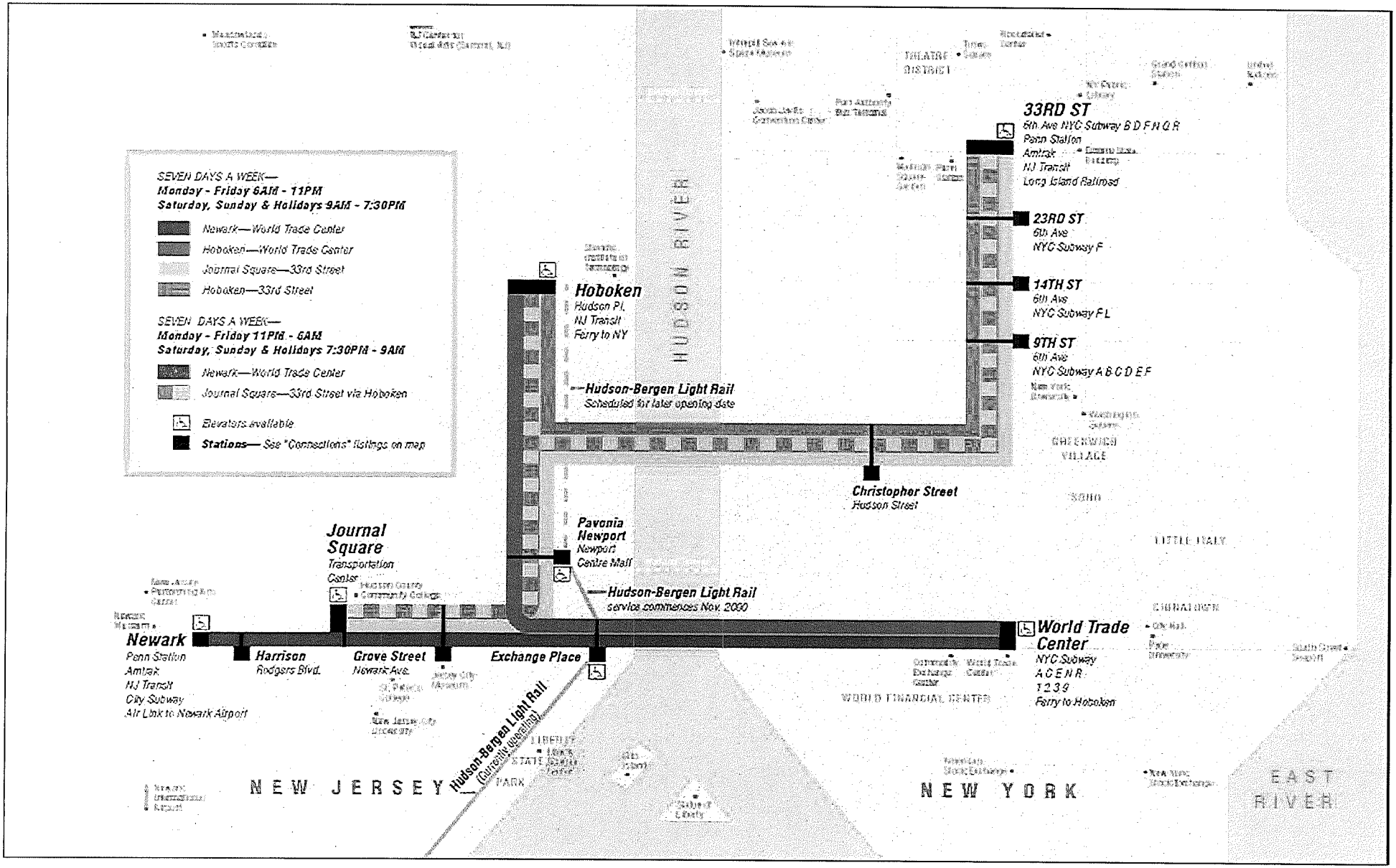
PRE-SEPTEMBER 11, 2001 BASELINE CONDITIONS

OPERATIONS

Prior to September 11, 2001, the PATH system operated 24 hours per day, seven days per week. Figure 8A-1 provides a map of the PATH system as it then operated. Service was provided along the following four lines:

- Newark-World Trade Center;
- Hoboken-World Trade Center;
- Journal Square-33rd Street; and
- Hoboken-33rd Street

During the late night hours and weekends, some of the routes were combined.



PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 8A-1
PATH System

The PATH system encompassed a total of 13 stations, six of which were located within New York City and seven in New Jersey. Table 8A-1 provides the locations of each of these stations and the connecting transportation services that were available.

Table 8A-1
PATH Stations and Nearby Connecting Transit Services

Station	Location	Connecting Service
World Trade Center	Fulton Street at Church Street New York, NY	NYCT Subway; NY Waterway and Water Taxi ferries; NYCT and private bus service
Christopher Street	Christopher St. between Greenwich and Hudson Streets, New York, NY	NYCT Subway; NYCT bus service
9th Street	Sixth Ave. at 9th St., New York, NY	NYCT Subway; NYCT bus service
14th Street	Sixth Ave. at 14th St., New York, NY	NYCT Subway; NYCT bus service
23rd Street	Sixth Ave. at 23rd St., New York, NY	NYCT Subway; NYCT bus service
33rd Street	Sixth Ave. between 30th and 33rd Streets, New York, NY	Amtrak; NJ Transit and LIRR commuter rail; NYCT Subway; NYCT and private bus service
Exchange Place	Montgomery St. at Hudson River, Jersey City, NJ	Hudson-Bergen Light Rail; NY Waterway ferry; NJ Transit and local bus service
Grove Street	Newark Ave. between Grove St. and Luis Muniz Marin Boulevard, Jersey City, NJ	NJ Transit and local bus service
Harrison	Frank E. Rodgers Boulevard between Somerset and Cape May Streets, Harrison, NJ	NJ Transit bus service
Hoboken	Hudson Place at River Street, Hoboken, NJ	NJ Transit commuter rail; NY Waterway ferry; NJ Transit and local bus service
Journal Square	Kennedy Boulevard between Pavonia and Sip Avenues, Jersey City, NJ	NJ Transit and local bus service
Newark	1 Penn Plaza West, Newark, NJ	Amtrak and NJ Transit commuter rail; Newark City Subway; Greyhound and NJ Transit and local bus service
Pavonia/Newport	Washington Blvd. at Pavonia Ave., Jersey City, NJ	Hudson-Bergen Light Rail; NY Waterway ferry; NJ Transit and local bus service

PATH directly served communities in Manhattan, Jersey City, Newark, Harrison, Hoboken, and also provided connections for other west-of-Hudson residents. At Newark-Penn Station, PATH customers could access Amtrak; New Jersey Transit's (NJ Transit) Northeast Corridor, Raritan Valley, and North Jersey Coast commuter rail lines; the Newark City Subway; and bus and rail service to Newark Liberty International Airport. At Hoboken, PATH connected with NJ Transit Boonton, Morris & Essex, Main/Bergen County, Pascack Valley, North Jersey Coast and Port Jervis commuter rail lines; numerous NJ Transit bus routes; and NY Waterway ferry service. In New York, PATH stations were located in close proximity to New York City Transit (NYCT) subway stations on the Broadway, Sixth, Seventh, and Eighth Avenue lines. Connections to NYCT and privately operated bus routes, ferries, and commuter rail service were also available.

Prior to September 11, 2001, PATH maintained a fleet of 334 cars. A total of 288 cars would be required for AM peak period revenue operation. In addition, PATH maintained two 7-car gap trains—one, 7-car consist on the Newark-WTC Line and one, 7-car consist on the Journal Square-33rd Street Line. Thus, PATH's AM peak period operating fleet consisted of 302 cars. The remaining 32-cars were rotated with the operating fleet to facilitate car inspection and maintenance.

PATH would operate its peak schedules between 7:30AM to 9AM (AM peak period) and from 4:30PM to 6:00PM (PM peak period). Headways would fluctuate during this period with a maximum operation in the hours from 8AM to 9AM (AM peak hour) and 5PM to 6PM (PM peak hour). In the AM peak period, PATH was operating a total of 39 train consists through the system. Train consists ranged in length from 7-cars to 8-cars. Headways on the system ranged from 3 minutes on the Newark-WTC Line to 6 minutes on the Hoboken-33rd Street Line. Table 8A-2 summarizes the pre-September 11, 2001 operations for the PATH system.

Table 8A-2
Pre-September 11, 2001 PATH Train Operations

Route	Consists for Revenue Operation	Consist Length	Operating Headway
Newark-WTC	15 consists	8-cars	3 to 4 minutes
Hoboken-WTC	7 consists	7-cars	3 to 4 minutes
Journal Square-33rd Street	11 consists	7-cars	4 to 5 minutes
Hoboken-33rd Street	6 consists	7-cars	6 minutes
Notes: PATH maintained 1, 7-car gap train for use on the Newark-WTC Line and 1, 7-car gap train for use on the Journal Square-33rd Street Line.			

When accounting for run times, the total of 22 consists operating on the Newark-WTC and Hoboken-WTC Lines translated to 31 runs through the WTC Terminal in the AM peak hour. There were 16 runs in each direction on the Newark-WTC Line and 15 runs in each direction on the Hoboken-WTC Line. At the peak commuter period within the peak hour, PATH would maintain 3 minute headways on both routes, as required to support ridership system-wide.

During midday and evening periods, PATH would operate all four with 10- to 15-minute headways, depending upon the route. During overnight hours, weekends, and holidays, PATH would suspend Hoboken-WTC service and would modify its Journal Square-33rd Street Line to stop at Hoboken-Terminal. The Newark-WTC Line would operate at all times. The headways during these periods ranged from 15-minutes to 60-minutes.

During non-peak periods, PATH would store trains at 4 locations: Journal Square Yard; Harrison Yard; Newark South Street Yard; and the World Trade Center Terminal. The later of these storage locations was used only for trains operating on the Hoboken-WTC Line. The other yards would store trains that operated on all four PATH routes. In addition, PATH would store one train at the 33rd Street station.

WTC PATH TERMINAL

The WTC PATH Terminal opened in 1971. It was constructed in the portion of the WTC site referred to as the "bathtub" and was located beneath the WTC's office and retail space. The Terminal was fully compliant with the Americans with Disabilities Act (ADA), and it was the first station in the world to be fully air-conditioned.

The platform level contained three 10-car platforms and five tracks. The tracks and platforms of the station formed a "loop" with the projections of the Hudson River tunnels. Trains entered the station from New Jersey via the south Hudson River tunnel (Tunnel F) and exited to New Jersey via the north Hudson River tunnel (Tunnel E). Thus, trains entered and left Manhattan without changing the location of the train's engineer or conductor, resulting in a short dwell time at the Terminal.

The easternmost platform (Platform A) served Track 1 and was used in the event of an equipment failure, for train storage, and for alighting trains that terminated revenue service at the WTC Terminal. Platform B and Tracks 2 and 3 and served the Hoboken-WTC Line. Platform C and Tracks 4 and 5 and was used for the Newark-WTC Line.

A mezzanine level was located above the platforms, which housed fare equipment, vertical circulation between the platform level and other levels above, and accessory retail and food stalls. The principle access between the mezzanine and the WTC retail concourse was a bank of escalators that traveled underneath NYCT's 1 and 9 line. The escalators terminated in an area of the WTC retail concourse known as PATH Square.

PATH Square was located in the northeast section of the WTC retail concourse. The retail concourse provided weather-protected connections between PATH, the office buildings on the WTC site, the World Financial Center, three NYCT subway stations, and the streets adjacent to the WTC. Within the retail concourse, PATH passengers could access the Cortlandt Street Station on NYCT's 1 and 9, and N and R lines, and the WTC Station on the E line. A circuitous connection was also available to both the Park Place Station for the 2 and 3 lines and the Chambers Street Station for the A and C lines. The retail concourse had street-level access from Church, Vesey, West, and Liberty Streets. Two pedestrian overpasses over Route 9A provided access between the World Financial Center and the WTC.

The WTC PATH Terminal, which served as the only station on the New York side of the Hudson for two of PATH's four routes, was destroyed during the terrorist attacks of September 11, 2001. As a result, the PATH system lost a substantial portion of its capacity to serve commuters throughout the region, and public transit access to Lower Manhattan was substantially impacted as other transit providers sought to serve former PATH customers.

RIDERSHIP

Prior to September 11, 2001, the PATH system had approximately 257,000 boardings on an average weekday. Table 8A-3 provides historical average weekday boardings for the PATH's major stations and for the PATH system as a whole for the years 1992 to 1999. As shown in the table, ridership for the PATH system increased over time, as did boardings at the former WTC PATH Terminal itself.

Table 8A-3
Average Weekday Ridership for Selected PATH Stations: 1992 to 1999

Station	1992	1993	1994	1995	1996	1997	1998	1999
WTC	54,160	52,771	55,053	51,319	52,980	55,893	58,110	60,385
Newark	25,639	25,580	26,570	25,660	27,143	28,725	29,910	31,065
Journal Sq.	21,508	21,336	21,630	21,271	22,204	23,279	23,821	25,237
Hoboken	30,337	30,962	32,952	32,389	30,126	30,583	31,223	33,323
33rd Street	20,502	21,633	22,731	24,430	22,979	22,176	23,149	22,604
System Total	195,682	197,923	206,887	206,304	207,990	215,170	223,164	232,351

The original WTC PATH Terminal was the busiest station in the PATH system with approximately 67,000 average weekday boardings, or an average two-way ridership of approximately 142,300 weekday riders.

Volumes at the former WTC PATH Terminal were heaviest during the AM and PM peak hours. During these periods, the principal direction of travel would be inbound to Manhattan in the morning and outbound to New Jersey in the evening; however, approximately 15 percent of the ridership would commute in the reverse direction. During the morning peak hour (8 AM to 9 AM), a total of approximately 26,600 riders used the terminal, with 22,500 alighting the system and 4,100 boarding. During the evening peak hour (5 PM to 6 PM), the terminal handled 20,400 riders, of which approximately 16,100 boarded PATH and 4,300 alighted.

Table 8A-4 shows the origins and destinations of PATH riders within Lower Manhattan during the AM and PM peak hours based on surveys conducted by the PANYNJ in 1996. For those commuting to Lower Manhattan from New Jersey in the AM peak hour, the majority (61 percent) were destined to buildings beyond the WTC site, 24 percent were destined to the WTC site itself, and the remaining 15 percent connected to NYCT subways. Figure 8A-2 illustrates the above and the associated passenger flow distribution in Lower Manhattan. For those leaving Lower Manhattan via PATH in the AM peak hour, 65 percent accessed the system from NYCT subways, 3 percent from the WTC site itself, and another 32 percent from other locations in Lower Manhattan. Similar origins and destinations were observed for the PM peak hour.

Table 8A-4
Pre-September 11, 2001 Origins and Destinations of Riders at the WTC PATH Terminal

Origin/Destination	Commuters to Lower Manhattan		Commuters from Lower Manhattan	
	AM Peak (Exit PATH)	PM Peak (Enter PATH)	AM Peak (Enter PATH)	PM Peak (Exit PATH)
NYCT Subways	15%	19%	65%	65%
WTC Site	24%	25%	3%	4%
Other Lower Manhattan	61%	56%	32%	31%

Table 8A-5 shows the origins/destinations for those traveling between the WTC PATH Terminal and off-site developments. For those commuting to Lower Manhattan from New Jersey in the AM peak hour, the primary off-site destination was southeast from the WTC site toward the Financial District, representing about 40 percent of the total off-site trips (see Figure 8A-2). Trips to the north (Tribeca), northeast (Civic Center), and west (World Financial Center and Battery Park City) were fairly evenly distributed, each representing about 16 to 20 percent of the total off site trips. In the PM peak hour, there were a lower percentage of trips entering PATH from off site; however, the distribution of these trips was similar to the AM peak hour.

For those commuting from Lower Manhattan to New Jersey in the AM peak hour, the majority (62 percent of the total off-site trips) entered the WTC PATH Terminal from the northeast. Another 19 percent entered from the north (Tribeca), 13 percent from the southeast (Financial District), 5 percent from the west (World Financial Center and Battery Park City), and 1 percent from the south. A similar pattern of off-site trips was observed during the PM peak hour.

Approximately 5,900 and 5,700 commuters transferred between PATH and NYCT's subways during the AM and PM peak hours, respectively. The transfer to/from NYCT's WTC Station (A,

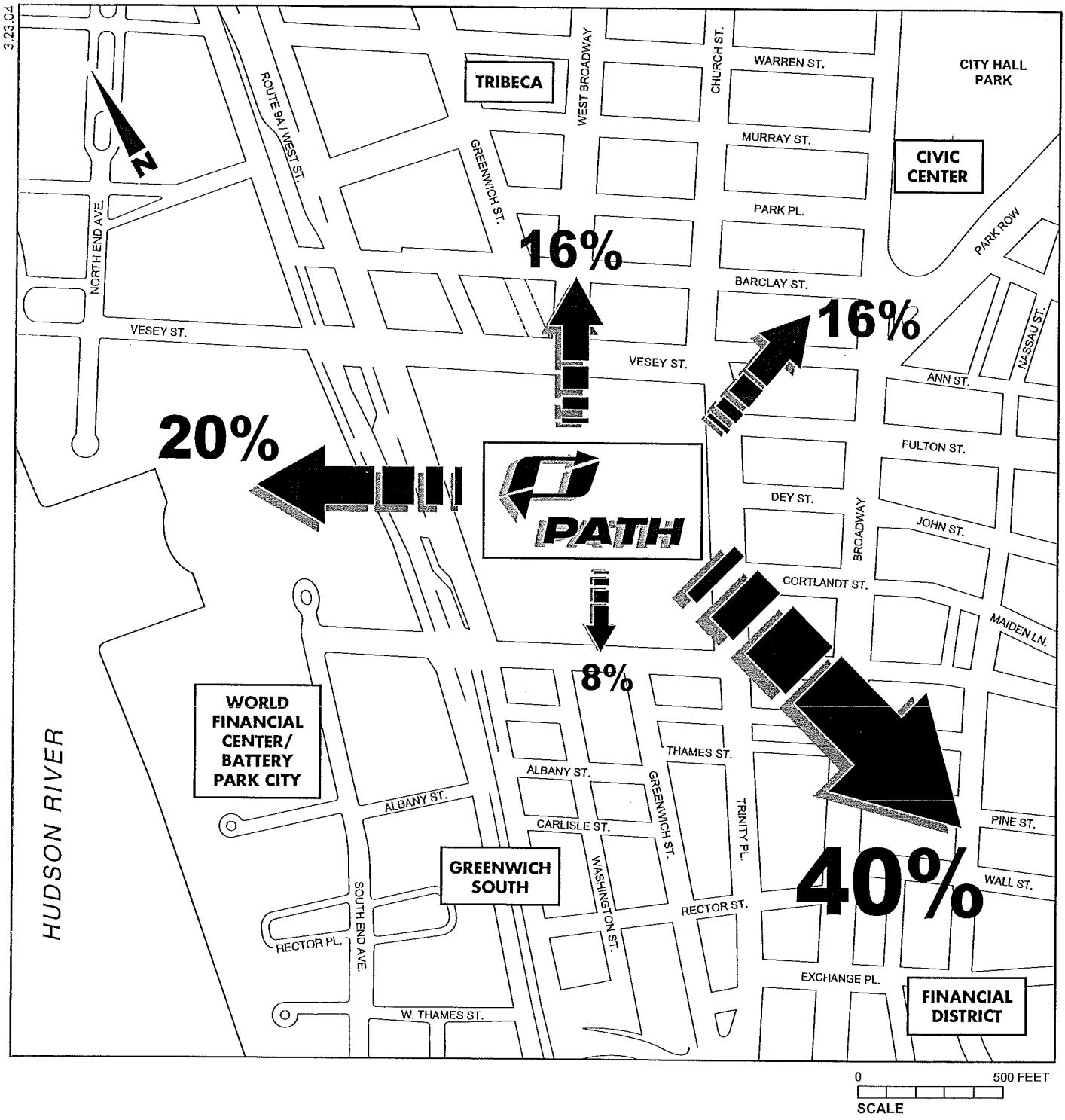


Figure 8A-2

Pre-September 11, 2001 Conditions Off-Site Destinations of AM Peak Hour PATH Riders

C, E, 2, and 3 trains) was the most heavily used, representing approximately 55 percent of the transfer volume. One-third of the transfers were between PATH and NYCT's N and R trains and the remaining 12 percent transferred to or from NYCT's 1 and 9 trains.

Table 8A-5
Pre-September 11, 2001 Off-Site Origins and Destinations of Riders at the WTC PATH Terminal

To/From	Commuters to Lower Manhattan		Commuters from Lower Manhattan	
	AM Peak (Exit PATH)	PM Peak (Enter PATH)	AM Peak (Enter PATH)	PM Peak (Exit PATH)
West (World Financial Center and Battery Park City)	20%	17%	5%	6%
North (Tribeca)	16%	21%	19%	28%
Northeast (Civic Center)	16%	22%	62%	53%
Southeast (Financial District)	40%	32%	13%	13%
South (Greenwich South)	8%	6%	1%	1%

CHANGES IN THE AFFECTED ENVIRONMENT SINCE SEPTEMBER 11, 2001

CHANGES IN THE PATH SYSTEM

The WTC PATH Terminal and a seven-car PATH train were destroyed during the terrorist attacks of September 11, 2001. Subsequently, Tunnels E and F were flooded, and PATH's Exchange Place Station in Jersey City, New Jersey, was damaged and rendered inoperable because the track configuration would not permit trains to reverse direction before entering the Hudson River tunnels. As a result, the PATH system lost a substantial portion of its capacity to serve commuters throughout the New York and New Jersey region, which substantially hindered public transit access to Lower Manhattan. All remaining PATH service following September 11, 2001 and prior to the opening of the temporary WTC PATH station was rerouted to terminate in New Jersey or at the 33rd Street PATH station.

CHANGES IN PATH RIDERSHIP

Before September 11, 2001, the PATH system served approximately 257,000 passengers each weekday. Prior to the reopening of the Exchange Place Station, which occurred on June 29, 2003, and the opening of the temporary WTC PATH station on November 23, 2003, approximately 160,000 passengers used the system each weekday, a reduction of about 97,000 passengers, or almost 38 percent.

Ridership fell precipitously on the Newark-WTC and Hoboken-WTC lines as access to Manhattan was no longer available on these routes. Some riders chose to divert to the Journal Square-33rd Street or Hoboken-33rd Street lines, thereby increasing ridership on these uptown-bound trains. PATH passengers destined for Lower Manhattan would exit at Christopher or 9th Street and transfer to nearby NYCT subway lines. Severe crowding occurred at both of these stations, which each have only one entry/exit location, At Christopher Street, passengers were barred from entering this station on weekdays from 7 AM to 9:45 AM. In addition, trains operating from Journal Square and Hoboken to 33rd Street would not stop at Christopher Street on weekdays from 4:30 PM to 7 PM.

EFFECTS ON OTHER TRANSIT SERVICES

Due to system capacity and service reductions caused by the events of September 11, 2001, many former PATH riders were required to divert to other transportation services in order to access destinations in Lower Manhattan. Most former PATH riders chose to divert to NJ Transit commuter rail (which increased ridership approximately 30 percent system-wide), NJ Transit buses, or to trans-Hudson ferries, which increased ridership by more than 100 percent. A more extensive discussion of impacts to these other transit providers is presented in Chapter 8, Section C, "Transit."

TEMPORARY WTC PATH SERVICE

Temporary WTC PATH Station

The temporary WTC PATH station opened on November 23, 2003. The temporary WTC PATH station was designed and constructed with the primary objective of restoring PATH service to Lower Manhattan as quickly as possible following September 11, 2001. It was designed to accommodate 80 percent of the users of the original WTC PATH Terminal in 2000. This reflects the fact that 20 percent of the original WTC PATH Terminal users were bound for the WTC buildings themselves, which were destroyed on September 11, 2001.

Although the temporary WTC PATH station has allowed service to be restored, its operating capacity and functionality are limited. For example, vertical circulation elements within the terminal have a limited service life. If this station were to remain in service, various elements may require replacement before 2010. The design of the station does not easily allow for new construction above, as planned for the WTC redevelopment. Thus, as the site is redeveloped, station elements will need to be rebuilt to accommodate its construction. The temporary WTC PATH station would also not easily support connections to future buildings on the WTC site.

The temporary WTC PATH station has substantially the same operating configuration as the terminal that existed on the WTC site prior to September 11, 2001. As before, trains enter the station from New Jersey via the south Hudson River tunnel and exit to New Jersey via the north tunnel thereby forming a loop in the PATH system that allows trains to enter and leave Manhattan without requiring the train operator to change positions. Also like the original terminal, the temporary station has five tracks and three platforms. The new platforms, however, accommodate eight-car PATH trains as compared to the 10-car platforms that existed before September 11, 2001, a 20 percent reduction in capacity.

The temporary WTC PATH station includes security and fire protection equipment, but advanced passenger amenities are not provided. It is accessible to people with disabilities in accordance with the ADA, but its configuration requires four separate elevator rides to reach street level.

The temporary WTC PATH station consists of five levels—platform, mezzanine, 1 and 9 underpass, concourse, and street level. Passengers must use a series of escalators and/or elevators to travel between the platform and the street- and concourse-level entrances. Pedestrian access to the temporary WTC PATH station is limited due to the anticipated continued construction at the WTC site. All patrons must enter and exit the station at street level near the intersection of Church and Fulton Streets at the eastern boundary of the WTC site or from NYCT's WTC (E) or Cortlandt Street (R and W) subway stations.

Operations

With the reopening of PATH's Exchange Place and WTC stations in 2003, the system is now operating much as it did prior to September 11, 2001. Service frequencies are similar to pre-September 11, 2001 levels with trains running every 4 to 6 minutes during peak periods, every 10 to 15 minutes throughout the day, and every half-hour overnight. On weekends and holidays, trains operate every 15 to 30 minutes depending on the route and time of day.

With the restoration of service to the World Trade Center, PATH has resumed operations similar to the pre-September 11, 2001 condition. However, physical damage endured by the terrorist attacks and changes in ridership have resulted in the following changes:

- PATH currently maintains a fleet of 327 cars because one, 7-car train was destroyed on September 11, 2001.
- PATH currently operates 7-car trains on both the Hoboken-WTC and Newark-WTC Lines. Thus, the AM peak hour car requirement for revenue service is 252. Additionally, PATH maintains two 7-car gap trains. Thus, PATH's AM peak period operating fleet consists of 266 cars. PATH anticipates the restoration of 8-car service on the Newark-WTC Line in 2006, which would increase its AM peak hour car requirement to 278.
- Because ridership is lower than before September 11, 2001, PATH operates fewer trains per hour between Hoboken and Newark and the World Trade Center. Currently, PATH runs 15 trains on the Newark-WTC Line and 5 on the Hoboken-WTC Line in the AM peak period.

During non-peak periods, PATH stores trains as it did prior to September 11, 2001 at Journal Square Yard, Harrison Yard, Newark South Street Yard, World Trade Center, and 33rd Street.

Ridership

With PATH operations essentially restored, ridership at the temporary WTC PATH station has reached approximately 80 percent of pre-September 11, 2001 levels. As shown in Appendix C-1, the temporary WTC PATH station serves approximately 52,500 daily two-way trips.

D. PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

CONSTRUCTION PERIOD (2006)

FUTURE COMMON TO ALL ALTERNATIVES

PANYNJ will continue or will begin upgrades to other portions of the PATH system, independent of the Preferred Alternative. Although these projects are planned independently, the outcome of this environmental review process and subsequent construction schedule for the Preferred Alternative may affect the implementation of the PATH system improvements described below.

- ***9th Street and Grove Street Station Rehabilitation.*** Due in part to substantial increases in station usage following September 11, 2001, the PANYNJ will renovate the 9th Street and Grove Street PATH Stations to include an additional entrance/exit. Currently, these stations operate with only one point of entry/exit. Other improvements such as station modernization and platform lengthening will also be performed. These projects will provide better customer convenience and safer operations at these stations.

- ***10-Car Operation.*** The PANYNJ will continue to prepare the PATH's Newark-WTC Line for 10-car operation, a program that pre-dates the terrorist attacks of September 11, 2001. PATH also eventually plans to lengthen its Hoboken-WTC train consists from 7 to 8 cars. Since September 11, 2001, PANYNJ lengthened the platforms at the Exchange Place station in tandem with the emergency repairs to the system that were required to restore service following the attacks. However, to fully implement 10-car operations, additional rolling stock must be acquired and the Harrison and Grove Street stations must be rehabilitated to lengthen platforms. It is anticipated that these improvements would be funded as part of the 2008 to 2013 Capital Plan with implementation by 2015.

- ***Signal System Upgrade.*** PANYNJ will continue a program to modernize its signals system-wide. Currently, PATH operates with a fixed-block signal system but plans to upgrade to a Communication Based Train Control (CBTC) system. The CBTC system is more flexible than the fixed-block system because it continuously updates train positions, distances, and travel speeds. This allows the system to recover more quickly from delays, because a train can follow a "delayed" train more closely without having to come to a complete stop. CBTC results in a more efficient operation that produces regular travel speed because it:

  - Allows for consistent trip times in closer conformance to the operating schedule;
  - Allows for a precise strategy for stopping accuracy;
  - Optimizes headways, which increases capacity by allowing the trains to closely follow the safe braking distance; and
  - Improves ride quality.

  Under both the fixed-block and CBTC signal systems, PATH's capacity is controlled by the track junction at Exchange Place and the throughput of the Hudson River tunnels. Prior to September 11, 2001, PATH operated 31 trains in each direction through the World Trade Center tunnels (Tunnels E and F) in the AM peak hour; thus, trains had approximately 116-second headways. PATH operated 16 trains on the Newark-WTC Line and 15 trains on the Hoboken-WTC Line. With the CBTC system, it is possible that headways could decrease to 90 seconds through the tunnels, resulting in up to 40 trains per hour. However, given projected ridership demand and other limitations within the system, PATH plans to operate fewer trains than 40 trains per hour.

  PATH will begin planning the implementation of CBTC concurrent with its contracts for fleet replacement. This arrangement will ensure consistency in the design of signal and train systems. It is anticipated that CBTC would be in place sometime between 2010 and 2015.

- ***Fleet Replacement.*** PATH currently maintains a fleet of 327 cars, much of which are more than 30 or more years old. In order to meet future ridership needs, PATH must maximize its peak hour service plan with a high degree of reliability. However, as the fleet ages, equipment failures increase; thereby, reducing PATH's ability to adhere to scheduled headways. Furthermore, PATH plans to implement 10-car train service cannot be realized without an expansion of its fleet.

  On June 17, 2004, PANYNJ announced a request for proposals to design and fabricate 246 new rail cars and to rehabilitate or replace an additional 94 cars. The new cars will have improved lighting, air conditioning and heating; cantilevered seats with room for passengers to store items under them; prerecorded station announcements; better signs; and three doors

on each side. This proposal allows PATH an option to purchase additional rolling stock to meet future demands.

- ***Fare Integration.*** When the temporary WTC PATH station opened on November 23, 2003, it was the first station in the PATH system to accept pay-per-ride MetroCards sold by the Metropolitan Transit Authority (MTA). The PANYNJ will continue to work with the MTA to integrate the PATH fare equipment throughout its rail system with the MetroCard system. The fare integration program will allow transit riders to transfer between NYCT subways and buses and PATH with a single fare card.

Furthermore, PATH will continue to increase service on its WTC Lines to meet ridership demand. In the very near future, the length of Newark-WTC trains will be increased from seven to eight cars. PATH will also increase the number of peak period runs on both routes as demand warrants.

It is assumed that some or all of these projects will be completed or will commence during the construction period for the Preferred Alternative.

NO ACTION ALTERNATIVE

The temporary WTC PATH station was designed to accommodate anticipated passenger volumes during the construction period. No impacts to PATH service are expected to either PATH passengers or to the operation of the PATH system during this period given the No Action Alternative.

PREFERRED ALTERNATIVE

It is anticipated that the Preferred Alternative can be constructed with minimal impacts to PATH's normal weekday train operations. PATH service to the temporary WTC PATH station may have to be suspended sporadically during the overnight hours on weekdays and all day on weekends to accommodate heavy construction activities.

Throughout the construction period, pedestrian access may be hindered due to sporadic closing, rerouting or narrowing of sidewalks used to access the sole entrance/exit of the temporary WTC PATH station. Pedestrian connections between PATH and the NYCT subway system may also be impacted due to rerouted or narrowed passageways. Otherwise, no construction-related impacts are anticipated for PATH riders or operations.

OPENING YEAR (2009)

FUTURE COMMON TO ALL ALTERNATIVES

In the opening year of the Preferred Alternative, it is assumed that the PANYNJ will have completed or will continue work on the system improvements described above for the construction period. These system enhancements will improve operations and will provide for enhanced customer convenience as compared to today.

As shown in Table 8A-6, projected opening year demand on an average weekday for trans-Hudson PATH service between New Jersey and the WTC site will be 125,286, approximately 12 percent less than the 142,300 daily boardings recorded in year 2000. The projected AM peak hour demand in 2009, both boardings and alightings, is approximately 23,423 passengers, or 12 percent less than in year 2000 (see Appendix C).

Table 8A-6
PATH Ridership Forecast for WTC Service in the Opening Year (2009)

Year	Average Weekday Trips			AM Peak Hour		
	Terminal Users	Weekday Boardings	Weekday Alightings	Terminal Users	Weekday Boardings	Weekday Alightings
2000	142,300	67,000	75,300	26,604	4,107	22,497
2009	125,286	58,989	66,297	23,423	3,749	19,674

NO ACTION ALTERNATIVE

If the Preferred Alternative is not constructed, then the temporary WTC PATH station that is currently in service would remain in service through the opening year. The temporary WTC PATH station was designed and constructed with the primary objective of restoring PATH service to Lower Manhattan as quickly as possible following September 11, 2001. Thus, its capacity, functionality, and equipment are limited over time, but its systems could support the anticipated opening year ridership.

PREFERRED ALTERNATIVE

The Preferred Alternative would consist of a track and platform level, a mezzanine/fare-zone level, and a street-level terminal building incorporating sub-grade pedestrian connections to adjacent streets, NYCT subways, and on- and off-site developments. The PATH tunnels, tracks, platforms, and mezzanine would be located within the WTC "bathtub" as they were prior to September 11, 2001.

The Preferred Alternative is being planned to support the PATH's system-wide improvements identified above, PATH's operating requirements, and future ridership demand. Each of these factors results in specific requirements for the design of the Terminal's platforms and tracks, and as such, it has been determined that a 5-track, 4-platform station is needed. Further details on the selection of 5-track, 4-platform configuration as well as alternative track and platform schemes evaluated in conjunction with project planning are provided in Appendix C.

System-Wide Improvements

PATH will implement improvements to increase capacity on trains operating between Newark and the WTC, by increasing their length from 8 to 10 cars. Not only will this improvement require that the WTC Terminal support 10-car operations but a consequence will be that more people will use the WTC PATH Terminal's platforms during peak travel periods.

All new PATH cars will have 3-doors per side allowing PATH to retire the portions of its current fleet with 2-doors per side. Three-door cars will decrease the boarding/alighting times of trains by 50 percent, which will improve dwell times at intermediate stations along the PATH route and could reduce the overall run time of trains. However, the new cars are not expected to improve the platform clearance time for passengers since they will not directly affect platform area or the provision or operation of stairways and escalators.

While PATH currently maintains 3-minute headways on its Newark-WTC Line and 4-minute headways on its Hoboken-WTC Line during portions of the peak hour, CBTC will facilitate such headways over a longer period with greater reliability and less potential for delays. CBTC in conjunction with the 10-car train program will have the ability to increase the throughput of the

PATH system, resulting in more passengers and a higher frequency of service at the WTC Terminal than before September 11, 2001. As such, platforms at the WTC Terminal will need to clear more swiftly in the future in order to maintain safe and efficient operations.

Operational Requirements

PATH must plan for failure management to maintain reliable, on-time peak period service. Because the WTC is a terminal station, trains dwell for short periods to maintain the operating schedule. Thus, to maintain the headway and allow for the arrival of a subsequent train, PATH requires two tracks for each the Hoboken-WTC and Newark-WTC Lines. In the event that a train becomes disabled, a fifth track is needed. The fifth track allows the disabled train to remain in the Terminal while the remaining four actives tracks can be used to continue service.

PATH has limited capacity for train storage at its Newark, Harrison, and Journal Square Yards. Therefore, PATH would use the WTC Terminal for the overnight storage of 6 Hoboken-WTC trains. Four tracks are required for this overnight storage and a 5th track is needed for revenue service on the Newark-WTC Line. The overnight storage of Hoboken-WTC trains at the WTC Terminal would allow for a more efficient ramp-up to AM peak period revenue service and decreases the potential for weather-related delays on the Hoboken-WTC Line.

Ridership Requirements

A principal consideration for the planning of the Terminal is the ability of platforms to safely accommodate peak period ridership. Because PATH is primarily a commuter system, the platform design must accommodate both AM and PM peak patterns of travel.

In the AM peak hour, trains unload passengers to the platform who must then ascend to mezzanine level. For this condition, the principal design criterion is the targeted time period within which all passengers exiting a train alight from the platform. As stairways and escalators become congested, passengers queue at the foot before they can ascend. Therefore, to avoid a lengthening of this back-up, it is important that all passengers clear the platform before arrival of the next train. The *Transit Capacity and Quality of Service Manual* states that a platform (and vertical circulation) should be planned to ensure full clearance of the platform before the next train arrives. However given that passengers may not use or may not be able to use all available exits, a safety factor of 20 to 30 percent is applied. Thus, a platform should clear fully within 70 to 80 percent of the scheduled headway.

The proposed frequency of Newark-WTC Line service requires that its platform clear within 126 to 144 seconds. However, based on projected ridership, a single Newark-WTC platform would require 213 seconds to clear. Thus, two Newark-WTC Line platforms are needed to meet platform clearance guidelines. A single Hoboken-WTC platform is sufficient to meet platform clearance criteria.

For the PM peak period, the planning of the platforms must also consider failure management in the event of a missed headway and subsequent delay in service. Thus, the platform must provide for adequate room to queue passengers waiting for the next arriving train.

Given ridership levels in 2025 and level of service standards, a minimum 15,264 square feet of platform area would be required for the Newark-WTC service in the event of a missed headway while 10,385 square feet would be required for the Hoboken-WTC service. However, accounting for the unusable areas of the platform (e.g., spaces occupied by escalators and elevators and the safety buffer along the platform edge), the Terminal's platforms would each provide for an

effective area of 10,416 square feet. Thus, a single platform would be adequate for the Hoboken-WTC Line but more than one platform would be needed for Newark-WTC Line.

In order to maintain temporary PATH service during construction of the Preferred Alternative, PANYNJ would not relocate the existing PATH tracks. As such, Platform A cannot be widened beyond its current configuration, which is not adequate for normal revenue service. Since three full-size platforms are needed for peak period service, the Preferred Alternative would include a total of 4 Platforms. The 5 tracks that are currently part of the temporary station would be retained in their current alignment, which is adequate to meet PATH's operating requirements.

The platform and mezzanine levels would have a north-south orientation and would be located immediately west of NYCT's 1 and 9 train tunnel and the proposed Greenwich Street extension. The four platforms would be long enough to accommodate 10-car trains in accordance with PATH's long-range goal to increase the operational capacity of the system, and five tracks will allow for increased queuing capacity during peak periods. Fare equipment would be located on the mezzanine level. The platforms and mezzanine would be fully enclosed with heating, air conditioning, and advanced communication and security systems.

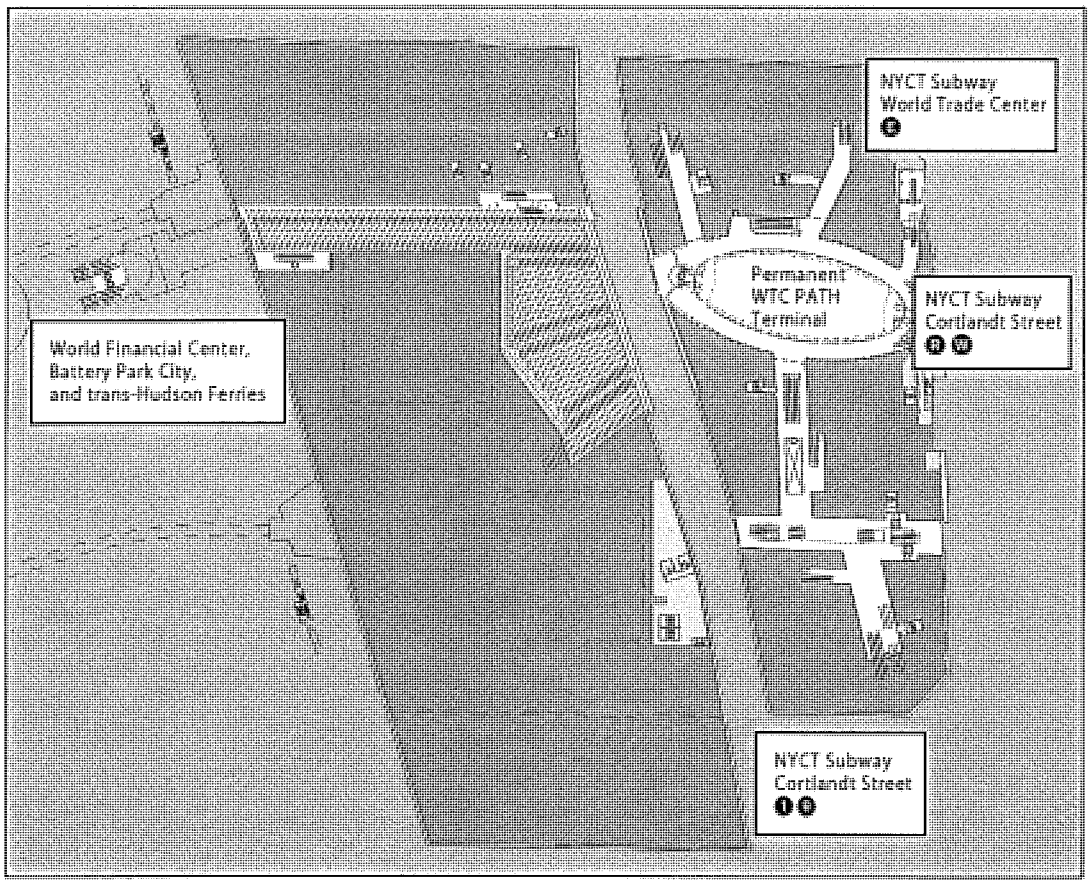
The concourse and street-level terminal building would be located on the eastern section of the WTC site extending from Greenwich to Church Streets. The mezzanine and lower concourse levels would connect via a passage under the NYCT's 1 and 9 train tunnel and over to the western side of the site. The concourse would have pedestrian passageways to the north, south, and west. The west passageway would cross beneath Route 9A to the World Financial Center. These passageways would also provide access to the proposed towers on the WTC site.

As shown in Figure 8A-3, the concourse level would also provide access to NYCT's Cortlandt Street Station on the 1 and 9, and R and W lines; the WTC Station on the E line; the existing corridor to One Liberty Plaza; and street-level at the intersections of Fulton and Greenwich Streets and Vesey and Church Streets. The passageway to the R and W Cortlandt Street Station would also link with the proposed pedestrian connection to the Fulton Street Transit Center. All circulatory elements within the Permanent WTC PATH Terminal would be designed to fully accommodate the expected volumes of passengers through its 2025 design year, with passenger corridors varying in width between 10 and 30 feet, and to comply with ADA requirements.

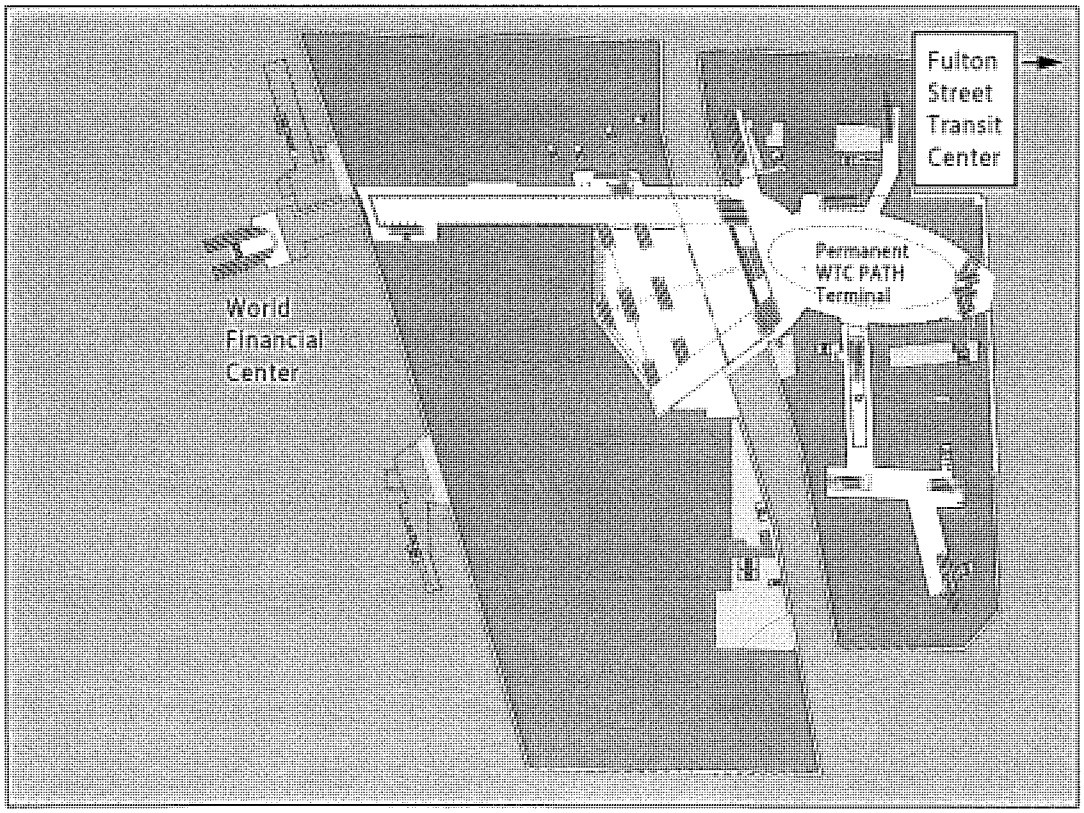
The Preferred Alternative would provide the PATH system with greater operational flexibility in meeting growing passenger demand over time. The new terminal itself would be able to accommodate larger passenger flows and reverse passenger flows than the original terminal or the current temporary WTC PATH station. It would also provide more convenient passenger connections to surrounding buildings, nearby NYCT subway stations, and trans-Hudson ferries. The Preferred Alternative is not expected to induce additional PATH ridership beyond the levels that would have existed had the events of September 11, 2001 not occurred, but it would be designed to accommodate passengers induced by the WTC redevelopment itself.

No impacts to PATH riders or its operations are expected once the Preferred Alternative is fully opened in 2009. Rather, the terminal would provide added passenger capacity that would be required given the redevelopment of the WTC site. The Preferred Alternative would accommodate elements that the temporary WTC PATH station could not, including pedestrian linkages to surrounding buildings, all area NYCT subways lines, and more convenient access to trans-Hudson ferries. Multiple entrances and exits would reduce walking times to access and egress the new terminal, which would lead to shorter walking distances and commute times for

3.14.05



Concourse Level (Balcony)



Concourse Level (Main)

Figure 8A-3

Pedestrian Connections

many users. Thus, any potential impacts of the Preferred Alternative to its users and to PATH operations would be beneficial.

DESIGN YEAR (2025)

FUTURE COMMON TO ALL ALTERNATIVES

In addition to the PATH system improvements described above under "Construction Period", PANYNJ is considering extending the PATH system from its current terminal at Newark Penn Station to connect with the Newark Liberty International Airport AirTrain rail system. When constructed, PATH would provide a direct rail connection between Lower Manhattan and the airport. The Newark Liberty International Airport extension will be undertaken independent of the Preferred Alternative.

As shown in Table 8A-7, by the design year, average weekday PATH usage to the WTC site is projected to be 167,718, an increase of 13.6 percent from 2000 levels. The AM peak hour usage is estimated to be 29,001, which is a 9 percent increase over 2000 ridership (see Appendix C).

Table 8A-7
PATH Ridership Forecast for WTC Service in the Design Year (2025)

Year	Average Weekday Trips			AM Peak Hour		
	Terminal Users	Weekday Boardings	Weekday Alightings	Terminal Users	Weekday Boardings	Weekday Alightings
2000	142,300	67,000	75,300	26,604	4,107	22,497
2025	161,718	76,143	85,575	29,001	5,660	23,341

Absent a Preferred Alternative, those demanding trans-Hudson service to and from the WTC site may be diverted to other modes of travel as the temporary WTC PATH stations nears or exceeds in reasonable capacity. However, for analysis purposes, it is assumed that these trips would continue to be made in some capacity.

NO ACTION ALTERNATIVE

Under the No Action Alternative, PATH service to Lower Manhattan would be eliminated by the design year since the temporary station would exceed its useful life. Over 162,000 weekday passengers who would have used the Permanent WTC PATH Terminal in year 2025 would be required to divert to alternate modes of transportation to access Lower Manhattan. These passenger diversions would require a more expensive and time-consuming commute for PATH riders and may involve additional transfers. Adverse impacts on vehicular traffic, other transit services, and the pedestrian network in the area are addressed in subsequent sections of this chapter.

Fifteen percent of PATH passengers who would have used the Permanent WTC Terminal if it were available would still use PATH as one leg of a multi-modal commute to Lower Manhattan. These passengers would instead use the Christopher Street or 9th Street PATH Station and then either walk or transfer to the NYCT subway. In year 2025, 24,258 total passengers would be diverted to these two stations each weekday, and 4,350 passengers would be diverted during the AM peak hour. It is anticipated that each station would attract half of these riders. Although both stations will have been renovated to include an additional exit/entrance than exist today, the

addition of almost 2,200 passengers to each of these stations during the AM peak hour would substantially impact the safe and efficient operation of each station.

PREFERRED ALTERNATIVE

No impacts to PATH riders or its operations are expected in 2025, the design year for the Preferred Alternative, if the terminal is constructed. Rather, the terminal would provide added passenger capacity that would be required given the completed redevelopment of the WTC site. The Preferred Alternative would accommodate elements that the temporary WTC PATH station could not, including pedestrian linkages to surrounding buildings, all area NYCT subways lines, and more convenient access to trans-Hudson ferries. Multiple entrances and exits would reduce walking times to access and egress the new terminal, which would lead to shorter walking distances and commute times for many users. Thus, any potential impacts of the Preferred Alternative to its users and to PATH operations would be beneficial.

E. MITIGATION

The Preferred Alternative would have positive benefits to PATH system operations and the convenience of its passengers. Since the Preferred Alternative would not adversely impact PATH operations, mitigation is not required. ✳

A. INTRODUCTION

This section of Chapter 8 describes vehicular traffic and parking conditions in the area and assesses whether the Preferred Alternative for a Permanent World Trade Center (WTC) PATH Terminal would be expected to create adverse impacts. The analyses that follow provide an overview of existing conditions, both before the events of September 11, 2001 and post-September 11, 2001 (i.e., current conditions) to establish a baseline from which future conditions are developed.

The traffic analyses focus on a study area and representative intersections at which adverse impacts could occur during construction of the Preferred Alternative. Adverse impacts are not expected once the Terminal is operational. The Port Authority of New York and New Jersey (PANYNJ) surveys indicate that PATH service does not generate a substantial level of connecting trips by either auto or taxi. The original PATH Terminal that was destroyed on September 11, 2001 generated a minimal volume of auto and taxi trips—just 1 percent of connecting trips to or from PATH were made by auto and less than ½ percent were made by taxi. With no new or induced riders directly resulting from the proposed Terminal, as compared to pre-September 11, 2001 projections, new auto and taxi trips are not expected. There is potential for the Terminal to create impacts resulting from construction vehicles traveling to and from the site. However, the analyses described below indicate that the volume of construction-related traffic is very low and has a limited potential for impacts that would require mitigation. There would be an adverse impact at only one location—Route 9A and Liberty Street in the PM peak hour—which can be mitigated via signal timing changes.

The parking analyses provide a summary of parking facilities in the area—either to accommodate construction staff who might drive to the area (although the vast majority can be expected to use public transportation) and potential impacts on blocks along which on-street parking may be prohibited to accommodate construction work zones or to facilitate the movement of vehicles into or out of the area during construction.

Additional data pertaining to the discussion that follows is presented in Appendix C of this Environmental Impact Statement (EIS).

B. METHODOLOGY

The analyses begin with a presentation of traffic and parking conditions pre- and post-September 11, 2001 based on available traffic data accumulated as part of several ongoing transportation and redevelopment proposals in Lower Manhattan, including the WTC Memorial and Redevelopment Plan and Fulton Street Transit Center. Future baseline (i.e., No Build) conditions are presented based on background traffic growth in the area and using analysis assumptions developed for other Lower Manhattan projects. Future Build conditions during construction of the Preferred Alternative were established based on current plans and estimates provided by

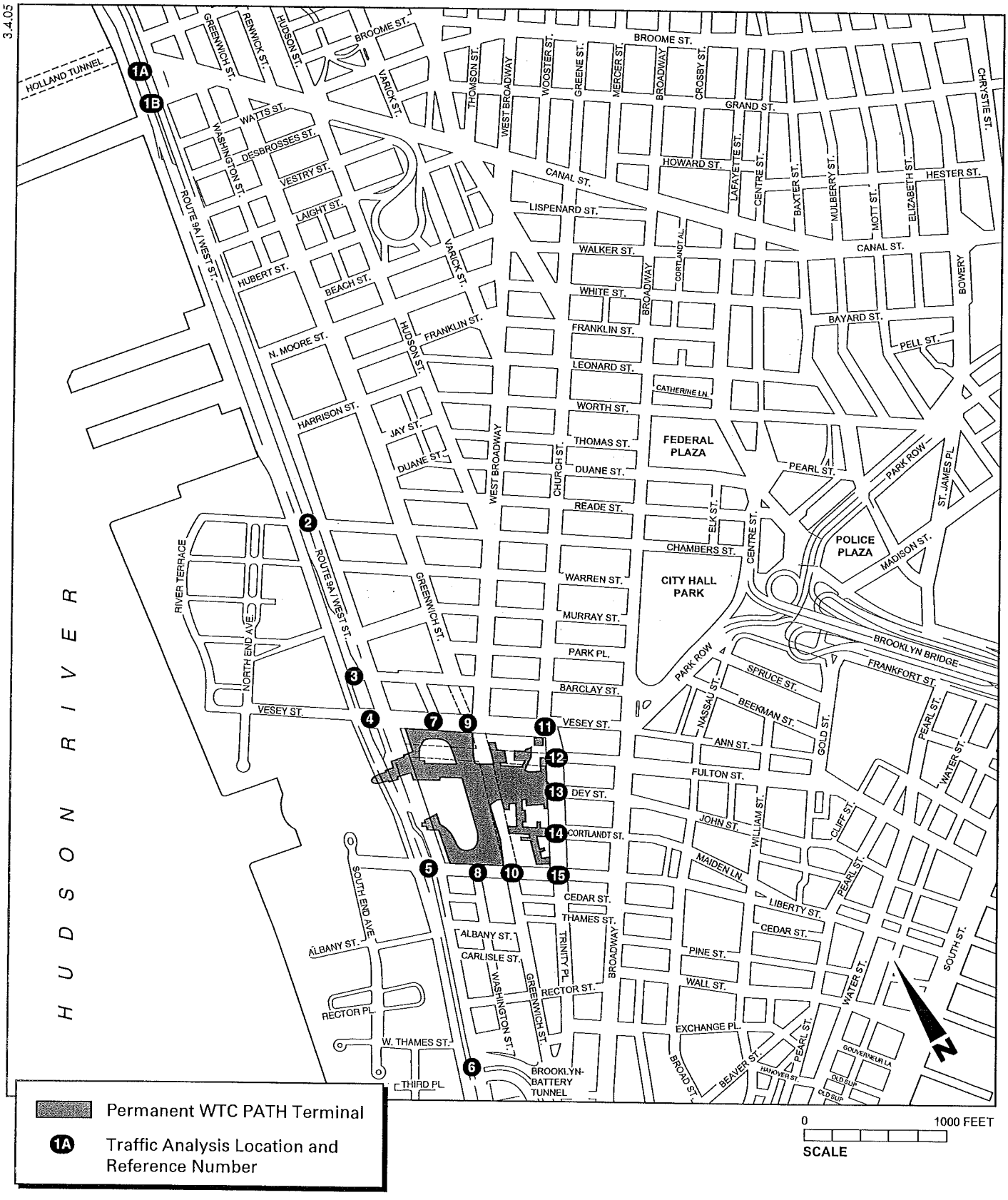
PANYNJ—projections of construction vehicles, construction employees, days and hours of construction activity, and currently anticipated street and/or lane closures to safely complete construction of the Terminal and facilitate the flow of traffic in the area. As noted above, the cumulative effects of PATH and other Lower Manhattan recovery projects construction is addressed in Chapter 15, "Cumulative Effects."

The traffic study area and analysis locations focus on the perimeter of the Project Site and on other intersections away from the site through which construction vehicles are expected to pass. These include key intersections along Route 9A leading to and from the Holland Tunnel (for trips to and from New Jersey) and the Brooklyn-Battery Tunnel (for trips to and from Brooklyn and Staten Island), and along Church Street and Broadway (for trips that could be made to/from parts of Brooklyn, Queens, Long Island, the Bronx, or Westchester). Commercial vehicle/truck traffic is not permitted on several major arterial roadways and bridges in the area, such as the FDR Drive, the Henry Hudson Parkway (Route 9A north of 57th Street), and the Brooklyn Bridge, and it is therefore expected that the vast majority of construction vehicle activity will approach and leave the Project Site via Route 9A en route to the Holland Tunnel and the Brooklyn-Battery Tunnel (BBT).

Eighteen intersections were initially considered for analysis as the traffic study area. These locations, which are listed below, were considered to represent key intersections where project-generated impacts may occur.

- Route 9A and Canal Street
- Route 9A and Chambers Street
- Route 9A and Barclay Street
- Route 9A and Vesey Street
- Route 9A and Liberty Street
- Route 9A and the BBT entrance/exit
- Washington Street and Vesey Street
- Greenwich Street/West Broadway and Vesey Street
- Church Street and Vesey Street
- Washington Street and Liberty Street
- Greenwich Street and Liberty Street
- Church Street and Liberty Street
- Church Street and Fulton Street
- Church Street and Dey Street
- Church Street and Cortlandt Street
- West Broadway and Chambers Street
- Broadway and Canal Street
- Broadway and the Bowery

The construction vehicle traffic assignment determined that a very minimal amount of traffic would pass through the West Broadway/Chambers Street, Broadway/Canal Street, and Broadway/Bowery intersections (two construction vehicles or less in each of the peak hours), so conditions at these intersections have not been analyzed since it is unlikely that they would be adversely impacted. Therefore, the remaining 15 intersections, shown in Figure 8B-1, comprise the traffic study area and were the focus of quantitative levels of service that follow later in this section.



PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 8B-1
Traffic Analysis Locations

The analysis of traffic conditions is based on level of service (LOS) criteria defined for signalized intersections in the *2000 Highway Capacity Manual (HCM)*:

- LOS A describes operations with very low delays, i.e., 10.0 seconds or less per vehicle. This occurs when signal progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all.
- LOS B describes operations with delays in the range of 10.1 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. Again, most vehicles do not stop at the intersection.
- LOS C describes operations with delays in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. The number of vehicles stopping is noticeable at this level, although many still pass through the intersection without stopping.
- LOS D describes operations with delays in the range of 35.1 to 55.0 seconds per vehicle. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity (v/c) ratios. Many vehicles stop, and the proportion of vehicles not stopping declines.
- LOS E describes operations with delays in the range of 55.1 to 80.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios.
- LOS F describes operations with delays in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios with cycle failures. Poor progression and long cycle lengths may also be contribute to such delays. Often, vehicles do not pass through the intersection in one signal cycle.

Based on guidance in the *New York City Environmental Quality Review Technical Manual*, in New York City, LOSs A, B, and C are considered acceptable, LOS D is generally considered marginally acceptable up to mid-LOS D (45 seconds of delay for signalized intersections) and unacceptable above mid-LOS D, and LOS E and F indicate congestion.

For unsignalized intersections (such as Route 9A and Barclay Street), delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the Stop line: LOS A describes operations with very low delay, i.e., 10.0 seconds or less per vehicle; LOS B describes operations with delays in the range of 10.1 to 15.0 seconds; LOS C has delays in the range of 15.1 to 25.0 seconds; LOS D, 25.1 to 35.0 seconds per vehicle; and LOS E, 35.1 to 50.0 seconds per vehicle, which is considered to be the limit of acceptable delay. LOS F describes operation with delays in excess of 50.0 seconds per vehicle, which is considered problematic to most drivers. This condition exists when there are insufficient gaps of suitable duration to allow side street traffic to cross safely through a major vehicular traffic stream.

The definition of an adverse traffic impacts is based on the following criteria, which have been used for other major transportation improvement projects such as this (e.g., the Second Avenue Subway): deterioration in level of service from below mid-LOS D (less than 45 seconds of

delay) to above mid-LOS D (greater than 45 seconds of delay) or to LOS E or F as long as the increase in delay is 10 seconds or more; deterioration from LOS E to LOS F, or within LOS E or within LOS F, as long as the increase in delay is 10 seconds or more.

Since the Preferred Alternative is not expected to induce new PATH ridership nor new vehicular traffic, detailed analyses were not needed to conclude that there would be no traffic impacts in the 2009 opening and 2025 design years, which is documented in this section of the EIS. However, detailed traffic level of service analyses are presented for the year 2006 peak construction condition. A No Action Alternative without PATH service to the WTC site, on the other hand, would result in substantial increases in vehicular traffic in Lower Manhattan.

C. DESCRIPTION OF THE AFFECTED ENVIRONMENT

PRE-SEPTEMBER 11, 2001 BASELINE CONDITIONS

STREET NETWORK AND TRAFFIC VOLUMES

The study area and most of Lower Manhattan's street network follow a grid pattern that is typical of most of Manhattan. The major north-south roadways in the area include Route 9A which is two-way, and Church Street and Broadway, which function as a one-way pair (Church Street northbound, Broadway southbound). Each of these north-south roadways carries several traffic lanes and possesses substantial capacity. The east-west roadways in the area have more limited traffic-carrying capacity. These roadways include Chambers Street, which is two-directional, carrying one to two lanes of traffic per direction; Vesey Street, which is two-way (when open before the events of September 11, 2001) between Route 9A on the west and Church Street on the east and generally carrying two traffic lanes per direction; and one-way eastbound between Church Street and Broadway with generally two moving lanes (sometimes three) of traffic although three striped lanes exist. South of the Project Site, Liberty Street was the primary east-west street. Pre-September 11, 2001, Liberty Street served as a primarily eastbound street with two to three lanes of traffic, and also included a westbound "service road" around the southern periphery of the WTC site.

Route 9A is the major traffic carrier in the area with the predominant traffic flows being northbound in the morning and southbound in the evening. In the AM peak hour, northbound Route 9A carried approximately 3,200 vehicles per hour (vph) at Liberty Street and 2,800 vph at Vesey Street, and about 2,150 vph southbound at Vesey Street and 2,350 vph at Liberty Street. During the midday peak hour, northbound volumes were about 2,200 vph at Liberty Street and 2,050 vph at Vesey Street, while southbound volumes were approximately 1,800 vph at Vesey Street and 2,000 vph at Liberty Street. During the PM peak hour, northbound volumes were about 2,250 to 2,300 vph at both locations, and southbound volumes were about 2,400 vph at Vesey Street and 2,850 vph at Liberty Street. Route 9A carries both through traffic that bypasses the area and local traffic destined to the WTC vicinity and Lower Manhattan.

Other than Route 9A, Trinity Place/Church Street is the major northbound traffic route in the western half of Lower Manhattan. Pre-September 11, 2001, traffic volumes were generally about 1,250 vph in the AM peak hour at Liberty Street and 1,850 vph farther north at Vesey Street. Midday peak hour volumes were considerably lower, about 950 vph at Liberty Street and 1,400 vph at Vesey Street. PM peak hour volumes were about 900 vph at Liberty Street and 1,500 vph at Vesey Street.

Broadway is the southbound counterpart to Church Street, carrying generally two to four moving lanes. Before September 11, 2001, AM peak hour traffic volumes were generally about 1,400 vph at Vesey Street and 1,000 vph at Liberty Street. Midday peak hour volumes were approximately 1,200 vph at Vesey Street and 900 vph at Liberty Street, while PM peak hour volumes were generally 1,500 vph at Vesey Street and 850 vph at Liberty Street.

Before the terrorist attacks of September 11, 2001, Vesey Street operated two ways between Battery Park City/World Financial Center and Church Street, and one-way eastbound east of Church Street. Pre-September 11, 2001, eastbound Vesey Street carried about 900 vph approaching Church Street; in the midday, it carried about 500 vph, and in the PM peak hour, it carried about 350 vph at this location. Westbound volumes were generally about 400 to 450 vph approaching Route 9A.

Detailed traffic volume data are provided in Appendix C. These volumes were developed by several state and local agencies, including PANYNJ, Lower Manhattan Development Corporation (LMDC), New York Metropolitan Transportation Council (NYMTC), New York State Department of Transportation (NYSDOT), Metropolitan Transportation Authority (MTA), the New York City Department of Transportation (NYCDOT), and the New York City Department of City Planning (NYCDCP). Working cooperatively as part of the Lower Manhattan Working Group, their efforts focused on the range of major transportation projects proposed and being studied in Lower Manhattan to ensure that all of the Lower Manhattan recovery projects use a consistent set of baseline traffic volumes for their individual analyses.

TRAFFIC LEVELS OF SERVICE

Each of the intersections defined previously as analysis locations were analyzed using *2000 HCM* procedures. For pre-September 11, 2001 conditions, Table 8B-1 presents an overview of the "existing" levels of service, showing each intersection's "overall" level of service for signalized intersections (the overall intersection LOS is a weighted average of all of the individual traffic movements); for the unsignalized Route 9A/Barclay Street intersection, the critical traffic movement's level of service is shown. Detailed intersection-by-intersection level of service data is provided in Appendix C.

As shown above, the majority of the intersections being studied operated at overall acceptable levels of service, with the notable exception of the intersection of Route 9A at the entrance/exit of the BBT. Even though the "overall" intersection levels of service are generally acceptable, several specific traffic movements operated at congested levels of service E or F (i.e., westbound Vesey Street approaching Route 9A during all three traffic analysis hours, southbound left turns from Route 9A onto Liberty Street during all three traffic analysis hours, and a select number of others). Detailed traffic level of service summaries are presented in Appendix C.

PARKING

An inventory of pre-September 11, 2001 public parking facilities was conducted as part of the PANYNJ and LMDC's *Lower Manhattan Transportation Report Phase One* in early- to-mid-2002. The information presented here is primarily taken from that report and from work being conducted as part of LMDC's *World Trade Center Memorial and Redevelopment Plan Generic Environmental Impact Statement (GEIS).*

Table 8B-1
Pre-September 11, 2001 Conditions: Intersection Levels of Service

Intersection	Ref. No.	AM Peak Hour	Midday Peak Hour	PM Peak Hour
Route 9A and Canal Street	1A/1B	C	B	E
Route 9A and Chambers Street	2	C	C	D
Route 9A and Barclay Street (critical approach)	3	C	C	C
Route 9A and Vesey Street	4	D	D	D
Route 9A and Liberty Street	5	D	C	C
Route 9A and BBT Entrance/Exit	6	F	F	F
Washington Street and Vesey Street	7	A	A	A
Washington Street and Liberty Street	8	A	A	A
Greenwich Street/West Broadway and Vesey Street	9	D	B	C
Greenwich Street and Liberty Street	10	B	A	B
Church Street and Vesey Street	11	C	D	D
Church Street and Fulton Street	12	B	B	B
Church Street and Dey Street	13	A	B	A
Church Street and Cortlandt Street	14	C	B	B
Church Street and Liberty Street	15	B	B	B

Note: Refer to Figure 8B-1.

Prior to the events of September 11, 2001, there were 20 identified off-street parking facilities within ¼ mile of the WTC containing over 7,000 spaces, and an additional 46 facilities between ¼ mile and ½ mile of the site with an additional 6,800 spaces. Occupancy of these spaces at midday, generally considered peak utilization time, was approximately 86 percent for the former and 90 percent for the latter.

Legal on-street parking is much more limited. Although data is not available for the entire area pre-September 11, 2001, post-September 11, 2001 surveys conducted for LMDC's *World Trade Center Memorial and Redevelopment Plan GEIS* indicate that within a ½-mile walking distance of the WTC site, occupancy of legal on-street spaces was 85 to 90 percent, or about one available space for every 11 blockfaces.

CHANGES IN THE AFFECTED ENVIRONMENT SINCE SEPTEMBER 11, 2001

STREET NETWORK AND TRAFFIC VOLUMES

Traffic volumes in Lower Manhattan have generally decreased by about 20 percent since September 11, 2001. However, this areawide overview does not mean that such decreases have occurred uniformly throughout Lower Manhattan or that all streets have experienced lower volumes. For example, due to the closures of Vesey and Liberty Streets near the WTC site, which previously enabled traffic to proceed from Route 9A to streets more centrally located within Lower Manhattan, some traffic has diverted from Route 9A to Broadway, thus increasing Broadway's traffic volumes over its pre-September 11, 2001 levels. An overview of general traffic volumes on some of the area's major streets follows and detailed volumes are provided in Appendix C.

Route 9A remains the major traffic carrier in the area with the predominant traffic flows still being northbound in the morning and southbound in the evening. In the AM peak hour, northbound Route 9A carries approximately 2,450 vph at Liberty and Vesey Streets, and about 1,850 vph southbound at both of these cross-street locations, which is considerably lower than pre-September 11, 2001 volumes. During the midday peak hour, northbound volumes are 1,650 vph at both Liberty and Vesey Streets, while southbound volumes are approximately 1,550 to 1,600 vph at both locations, also considerably lower than before September 11, 2001. During the PM peak hour, northbound volumes are 1,900 to 1,950 vph at both locations, and southbound volumes are 2,300 to 2,350 vph at the two cross-street locations, with just the northbound volume being considerably lower.

Northbound Trinity Place/Church Street traffic volumes are generally about 750 vph in the AM peak hour at Liberty Street and 1,100 vph farther north at Vesey Street, about two-thirds their levels pre-September 11, 2001. Midday peak hour volumes are similar to AM levels, with approximately 650 vph at Liberty Street and 1,050 vph at Vesey Street. PM peak hour volumes are 500 vph at Liberty Street and 800 vph at Vesey Street, just over half of their pre-September 11, 2001 levels.

Broadway is the southbound counterpart to Church Street. Post-September 11, 2001, AM peak hour traffic volumes are generally about 1,650 vph at Vesey Street and 1,000 vph at Liberty Street. Midday peak hour volumes are approximately 1,300 vph at Vesey Street and 700 vph at Liberty Street. PM peak hour volumes are generally about 1,350 vph at Vesey Street and 600 vph at Liberty Street.

Before September 11, 2001, Vesey Street operated as an east-west connector street between Route 9A and interior destinations in Lower Manhattan. However, Vesey Street is currently closed to regular vehicle traffic between Route 9A and Church Street.

Peak hour traffic volumes at representative locations are presented in Appendix C. These volumes were also developed by several local and state agencies working cooperatively as part of the Lower Manhattan Working Group on the range of major transportation projects proposed and being studied in Lower Manhattan, as described above.

TRAFFIC LEVELS OF SERVICE

Table 8B-2 presents an overview of the post-September 11, 2001 traffic levels of service, showing each signalized intersection's "overall" level of service (again, the overall intersection LOS is a weighted average of all the individual traffic movements); for the unsignalized Route 9A/Barclay Street intersection, the critical traffic movement's level of service is shown. Detailed intersection-by-intersection level of service data is provided in Appendix C.

The majority of the analysis locations continue to operate at overall acceptable levels of service. The notable exception of the intersection of Route 9A at the entrance/exit of the BBT, as was also true prior to September 11, 2001. Even though the "overall" intersection levels of service are generally acceptable, several specific traffic movements operate at unacceptable levels of service E or F (i.e., northbound left turns from Route 9A onto Liberty Street into the Battery Park City area during all three traffic analysis hours, and a select number of others). Detailed traffic level of service summaries are presented in the Appendix C.

Table 8B-2
Comparison of Pre- and Post-September 11, 2001 Intersection Levels of Service

Intersection	Ref. No.	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		Pre-Sep 11	Post-Sep 11	Pre-Sep 11	Post-Sep 11	Pre-Sep 11	Post-Sep 11
Route 9A and Canal Street	1A/ 1B	C	C	B	B	E	B
Route 9A and Chambers Street	2	C	C	C	B	D	C
Route 9A and Barclay Street	3	C	N/A	C	N/A	C	N/A
Route 9A and Vesey Street	4	D	F	D	D	D	D
Route 9A and Liberty Street	5	D	C	C	B	C	D
Route 9A and BBT Entrance/Exit	6	F	F	F	F	F	F
Washington Street and Vesey Street	7	A	N/A	A	N/A	A	N/A
Washington Street and Liberty Street	8	A	N/A	A	N/A	A	N/A
Greenwich Street/West Broadway and Vesey Street	9	D	N/A	B	N/A	C	N/A
Greenwich Street and Liberty Street	10	B	N/A	A	N/A	B	N/A
Church Street and Vesey Street	11	C	B	D	B	D	A
Church Street and Fulton Street	12	B	B	B	B	B	B
Church Street and Dey Street	13	A	A	B	A	A	A
Church Street and Cortlandt Street	14	C	A	B	B	B	B
Church Street and Liberty Street	15	B	A	B	A	B	A

Note: Refer to Figure 8B-1

PARKING

An inventory of current parking conditions was conducted as part of LMDC's *World Trade Center Memorial and Redevelopment Plan GEIS* in September 2003 for all off-street public parking facilities within ¼ mile and ½ mile radii of the WTC site.

There are 19 off-street parking facilities within ¼ mile of the WTC site containing close to 5,150 spaces, and an additional 48 facilities between ¼ mile and ½ mile of the site with an additional 8,000 spaces. The surveyed occupancy of these spaces at midday was approximately 82 percent for the former and 55 percent for the latter. This 55 percent level includes the 2,000-space parking garage at 2 Morris Street which is currently closed. When this facility is not accounted for, there are 6,000 spaces available within ¼ mile and ½ mile from the WTC site, with an overall midday utilization of about 73 percent.

Legal on-street parking is very limited. Surveys conducted for LMDC indicate that within a ½-mile walking distance of the WTC site, occupancy of legal on-street spaces was 85 to 90 percent, or about one unoccupied space for every 11 blockfaces.

D. PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

This section addresses the potential for adverse traffic impacts for three analysis years—the construction year, the opening year, and the design year for the Permanent WTC PATH Terminal. As stated previously, the Terminal is not expected to induce new riders as compared to pre-September 11, 2001 forecasts. Furthermore, new riders to the system would be attributed

to residential and commercial development in the area rather than to the operation of the Preferred Alternative.

CONSTRUCTION PERIOD (2006)

FUTURE COMMON TO ALL ALTERNATIVES

The detailed construction year analyses were conducted for several Lower Manhattan projects (i.e., the Fulton Street Transit Center, South Ferry Terminal, Route 9A Project, and the World Trade Center Memorial and Redevelopment Plan). The anticipated traffic levels of service at the 15 traffic study area intersections are shown in Table 8B-3 below. These analyses assume that Liberty and Vesey Streets remain closed to through traffic in 2006. The operation of other area streets was assumed to be the same as today.

Table 8B-3
2006 No Action Alternative: Intersection Levels of Service

Intersection	Ref. No.	AM Peak Hour	Midday Peak Hour	PM Peak Hour
Route 9A and Canal Street	1A/1B	C	C	C
Route 9A and Chambers Street	2	C	B	C
Route 9A and Barclay Street (critical approach)	3	C	B	B
Route 9A and Vesey Street	4	F	E	E
Route 9A and Liberty Street	5	A	A	B
Route 9A and BBT Entrance/Exit	6	F	F	F
Washington Street and Vesey Street	7	NA	NA	NA
Washington Street and Liberty Street	8	NA	NA	NA
Greenwich Street/West Broadway and Vesey Street	9	NA	NA	NA
Greenwich Street and Liberty Street	10	NA	NA	NA
Church Street and Vesey Street	11	B	B	A
Church Street and Fulton Street	12	C	C	B
Church Street and Dey Street	13	B	B	A
Church Street and Cortlandt Street	14	C	D	C
Church Street and Liberty Street	15	B	A	A

Note: NA = Not applicable; closed for construction or security reasons.

The findings of these analyses show that there would be some modest change in traffic conditions as compared to 2003. The results shown in Table 8B-3 represent the baseline against which potential impacts of construction vehicles generated by the Preferred Alternative is compared.

NO ACTION ALTERNATIVE

Since the No Action Alternative itself would not generate construction period traffic, this alternative would not result in any adverse traffic impacts during the construction period.

PREFERRED ALTERNATIVE

The Preferred Alternative would generate approximately 15 construction vehicles in each of the weekday peak hours, with a relatively even distribution of incoming and outgoing traffic. (Refer to Chapter 3, "Construction Methods and Materials," for a description of the volumes and hours of the day.)

The projected construction vehicle trips were assigned to the traffic study area's streets, as shown in Figure 8B-2. The results show that a relatively modest volume of construction vehicles are expected to pass through the various intersections being analyzed in the area, ranging from three to 15 vehicles, with no more than seven expected on any one approach, which is a very modest increase.

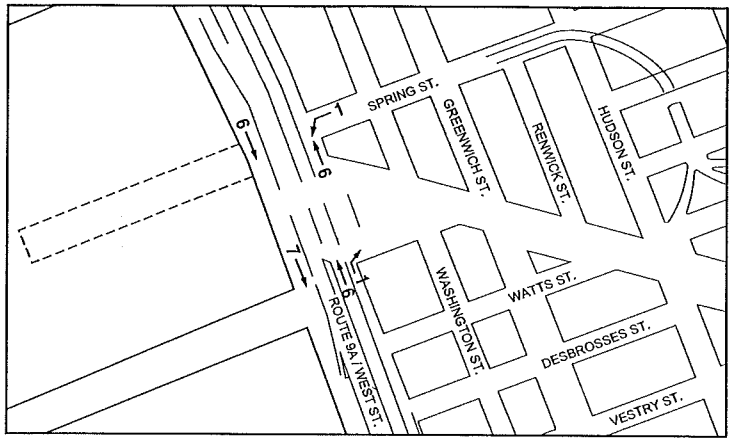
Traffic levels of service were analyzed with the addition of these construction vehicles, and the resulting overall intersection levels of service are shown in Tables 8B-4 through 8B-6 (detailed level of service findings for each traffic movement at each analysis location are provided in Appendix C). The overall intersection level of service is presented below for signalized intersections; for the unsignalized intersection of Route 9A and Barclay Street, the critical traffic movement's level of service is shown.

Table 8B-4
2006 No Action and Preferred Alternatives:
AM Peak Hour Intersection Levels of Service

Intersection	Ref. No.	2006 No Action	2006 Preferred Alternative	Required Mitigation
Route 9A and Canal Street	1A/1B	C	C	None
Route 9A and Chambers Street	2	C	C	None
Route 9A and Barclay Street (critical approach)	3	C	C	None
Route 9A and Vesey Street	4	F	F	None
Route 9A and Liberty Street	5	A	A	None
Route 9A and BBT Entrance/Exit	6	D	D	None
Washington Street and Vesey Street	7	NA	NA	None
Washington Street and Liberty Street	8	NA	NA	None
Greenwich Street/West Broadway and Vesey Street	9	NA	NA	None
Greenwich Street and Liberty Street	10	NA	NA	None
Church Street and Vesey Street	11	B	B	None
Church Street and Fulton Street	12	C	C	None
Church Street and Dey Street	13	B	B	None
Church Street and Cortlandt Street	14	C	C	None
Church Street and Liberty Street	15	B	B	None

Note: NA = Not applicable; closed for construction or security reasons.

There would be no impacts requiring mitigation in the AM or midday traffic analysis hours. In the PM peak hour, there would be an impact at one location—Route 9A and Liberty Street. This impact would occur due to increased delays to southbound traffic although the overall intersection is expected to operate at an acceptable level of service.



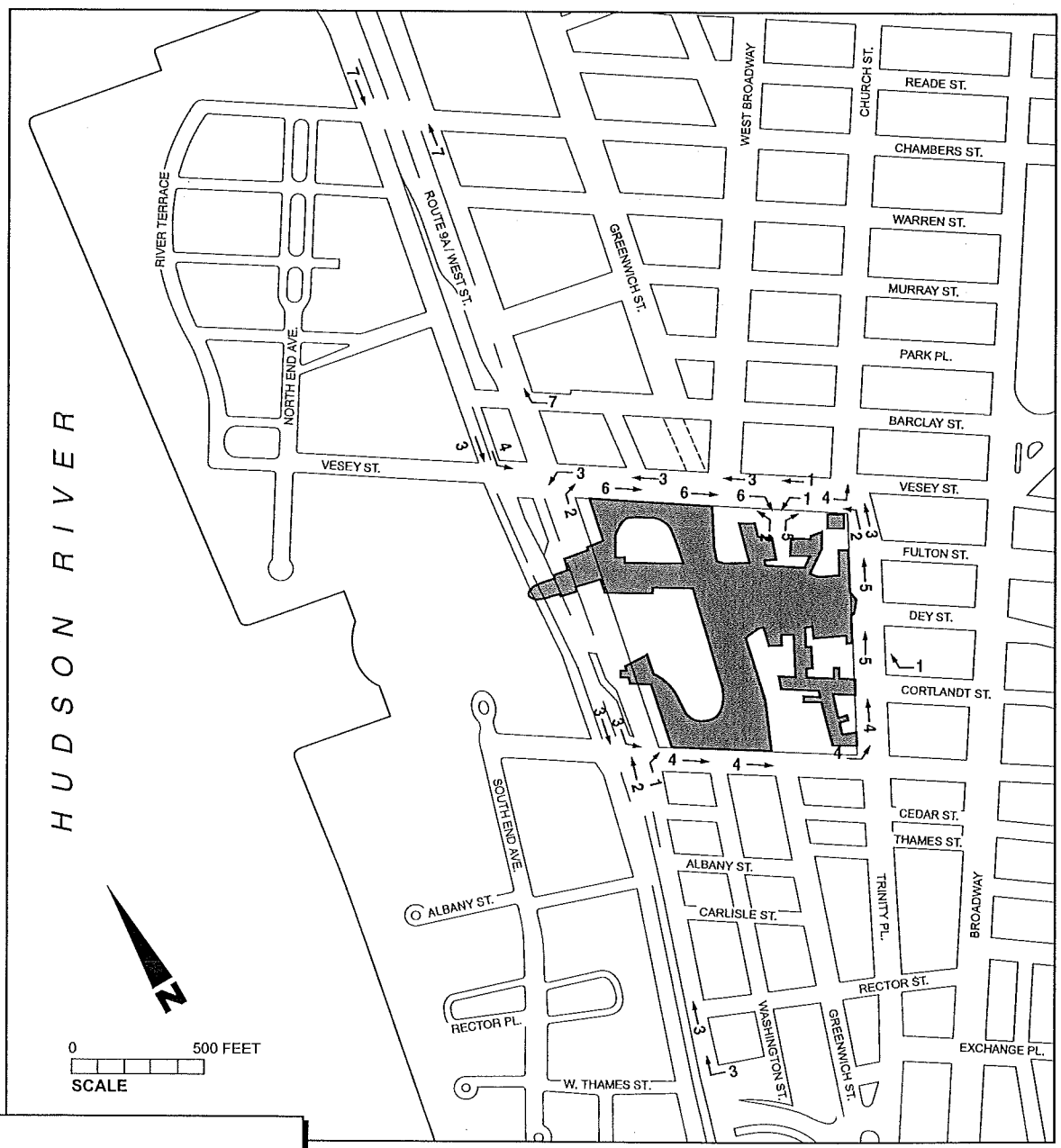


Figure 8B-2
Peak Hourly Construction Period Truck Trips

Table 8B-5
2006 No Action and Preferred Alternatives: Midday Peak Hour Intersection Levels of Service

Intersection	Ref. No.	2006 No Action	2006 Preferred Alternative	Required Mitigation
Route 9A and Canal Street	1A/1B	C	C	None
Route 9A and Chambers Street	2	B	B	None
Route 9A and Barclay Street (critical approach)	3	B	B	None
Route 9A and Vesey Street	4	E	E	None
Route 9A and Liberty Street	5	A	A	None
Route 9A and BBT Entrance/Exit	6	D	D	None
Washington Street and Vesey Street	7	NA	NA	None
Washington Street and Liberty Street	8	NA	NA	None
Greenwich Street/West Broadway and Vesey Street	9	NA	NA	None
Greenwich Street and Liberty Street	10	NA	NA	None
Church Street and Vesey Street	11	B	B	None
Church Street and Fulton Street	12	C	C	None
Church Street and Dey Street	13	B	B	None
Church Street and Cortlandt Street	14	D	D	None
Church Street and Liberty Street	15	A	A	None
Note: NA = Not applicable; closed for construction or security reasons.				

Table 8B-6
2006 No Action and Preferred Alternatives: PM Peak Hour Intersection Levels of Service

Intersection	Ref. No.	2006 No Action	2006 Preferred Alternative	Required Mitigation
Route 9A and Canal Street	1A/1B	C	C	None
Route 9A and Chambers Street	2	C	C	None
Route 9A and Barclay Street (critical approach)	3	B	B	None
Route 9A and Vesey Street	4	E	E	None
Route 9A and Liberty Street	5	B	C	Signal timing adjustment
Route 9A and BBT Entrance/Exit	6	E	E	None
Washington Street and Vesey Street	7	NA	NA	None
Washington Street and Liberty Street	8	NA	NA	None
Greenwich Street/West Broadway and Vesey Street	9	NA	NA	None
Greenwich Street and Liberty Street	10	NA	NA	None
Church Street and Vesey Street	11	A	A	None
Church Street and Fulton Street	12	B	B	None
Church Street and Dey Street	13	A	A	None
Church Street and Cortlandt Street	14	C	C	None
Church Street and Liberty Street	15	A	A	None
Note: NA = Not applicable; closed for construction or security reasons.				

OPENING YEAR (2009)

FUTURE COMMON TO ALL ALTERNATIVES

By the opening year for the Permanent WTC PATH Terminal, it is expected that background conditions in Lower Manhattan will change as compared to today. As new development occurs on and around the WTC site, vehicular traffic and parking demand in Lower Manhattan will increase. However, the ongoing reconstruction of streets in Lower Manhattan and the infrastructure improvements planned with the WTC Memorial and Redevelopment Plan and the Route 9A Project will improve circulation in the immediate vicinity of the Project Site.

At present, LMDC, PANYJ, NYSDOT, and the New York City Department of Transportation are coordinating a circulation plan for new and existing streets in Lower Manhattan. This plan is expected to be implemented by 2009.

NO ACTION ALTERNATIVE

Under the No Action Alternative, PANYNJ would maintain the temporary WTC PATH station, and the Preferred Alternative itself would not generate vehicle trips. Therefore, the No Action Alternative would not result in traffic impacts in the opening year.

PREFERRED ALTERNATIVE

The Preferred Alternative would generate a minimal number of new vehicle trips since only approximately 1 percent of riders would transfer between PATH and automobiles and only ½ percent transfer between PATH and taxis (based on surveys conducted by PANYNJ before September 11, 2001. As described in the DEIS, a sub-grade concourse between the Permanent WTC PATH Terminal and Liberty Plaza Park, as was proposed in the Terminal with a Liberty Plaza Connection Alternative, would have improved traffic circulation at the intersection of Church and Liberty Streets. Although this connection is no longer proposed, the Preferred Alternative would not result in adverse changes in traffic conditions as compared to the No Action Alternative. Therefore, the Preferred Alternative is not expected to result in significant adverse traffic impacts in its opening year.

DESIGN YEAR (2025)

FUTURE COMMON TO ALL ALTERNATIVES

By 2025, all elements of the WTC Memorial and Redevelopment Plan will be completed as will the other private development currently planned in Lower Manhattan. The combined completion and occupation of these projects will increase traffic flows in Lower Manhattan. However, the capacity improvements that are planned as part of the transportation recovery efforts, including mitigation measures being proposed as part of the *World Trade Center Memorial and Redevelopment Plan Generic Environmental Impact Statement* should help to alleviate congestion as compared to the conditions that existed before September 11, 2001.

NO ACTION ALTERNATIVE

Because the temporary station would need to be retired from service, the 2025 No Action Alternative would result in former PATH riders who would drive to Lower Manhattan or use

commuter vans or express buses. The percentage diversion to these alternative modes is assumed to be the same for 2025 as cited above for the opening year.

Weekday, AM peak hour projections for year 2025 indicate that approximately 26,045 PATH riders would enter Lower Manhattan at the WTC Terminal and that approximately 4,510 would board PATH trains at the WTC Terminal for trips to New Jersey. Table 8B-7 presents the estimated volume of vehicle trips that would be made into and out of Lower Manhattan should there be no WTC PATH service.

Table 8B-7
2025 No Action Alternative: Projected Increase in AM Peak Hour Vehicle Trips from Diverted PATH Customers

Trips	Autos	Buses	Vans	Total
Inbound	866	109	26	1,001
Outbound	153	32	8	193
Total	1,019	141	34	1,194

Note: Assumes average occupancies of 1.5 persons per auto, 50 persons per bus, and 10 persons per van for inbound trips, and 1.5 persons per auto, 30 persons per bus, and 6 persons per van for "reverse commute" outbound trips in the AM peak hour.

As shown in Table 8B-7, it is estimated that under the No Action Alternative there would be 866 new auto trips into Lower Manhattan in the AM peak hour, 109 new bus trips, and 26 new commuter van trips, for a total of 1,001 new inbound trips under a worst case scenario with no PATH WTC service. It is estimated that there would be 153 new auto trips out from Lower Manhattan in the AM peak hour ("reverse commute" trips), 32 new bus trips, and 8 new commuter van trips, for a total of 193 new outbound trips. (As described above, lower vehicle occupancies were applied for reverse commuters). Overall, 1,194 new vehicular trips can be expected within Lower Manhattan during the AM peak hour, and a generally comparable volume in the PM peak hour although in the opposite direction.

The addition of approximately 1,200 additional vehicle trips in each of the peak hours in the Lower Manhattan area would represent an increase in traffic and possible adverse impacts at key locations, especially near the portals to the area such as the Holland Tunnel and possibly along the Route 9A corridor, as was noted above for year 2009 conditions. A projected increase of approximately 1,001 new inbound vehicle trips would represent approximately 25 percent of the Holland Tunnel's inbound capacity and a considerable percentage of its toll plaza capacity in New Jersey. Furthermore, increased travel delays would be expected at key Lower Manhattan locations under the No Action Alternative.

PREFERRED ALTERNATIVE

Since a Permanent WTC PATH Terminal would be operational under this alternative, traffic volumes in the study area would be substantially lower than in the No Action Alternative described above. As described in the DEIS, the Terminal with a Liberty Plaza Connection Alternative would have resulted in improved traffic circulation as compared to the Preferred Alternative. However, since the Preferred Alternative would generate far fewer vehicle trips than the No Action Alternative in the design year, it would not result in significant adverse traffic impacts.

E. MITIGATION

As described in Chapter 2, "Project Alternatives" and Chapter 3, "Construction Methods and Materials," PANYNJ has committed to Environmental Performance Commitments (EPCs) as part of their planning, design, and construction of the Preferred Alternative. Four EPCs specifically address potential construction period impacts to access and circulation. Table 8B-8 shows these EPCs and current plans for their implementation.

Table 8B-8
Environmental Performance Commitments

Proposed Commitment	Implementation Plan
Establish a project-specific pedestrian and vehicular maintenance and protection plan.	PANYNJ will develop a Maintenance and Protection of Traffic Plan (MPT) as part of their contract documents for the Preferred Alternative. A construction Traffic Management Plan (TMP) will also be developed for the Lower Manhattan Recovery Projects to address these issues in a broader sense. The TMP will be coordinated by PANYNJ, LMDC, MTA, NYSDOT, NYCDOT, the Lower Manhattan Construction Command Center, and others, as appropriate, based on updated construction scheduling and staging as the designs of individual projects are advanced.
Promote public awareness through mechanisms such as: a) signage; b) telephone hotline; and c) Web site updates.	The TMP will have a public outreach component to communicate traffic information, lane closures, access changes, and travel advisories for the duration of project construction.
Ensure sufficient alternate street, building, and station access during construction period.	For the Preferred Alternative, the MPT Plan included in the contract documents will be used to implement this EPC. The TMP will address the access issues for the Lower Manhattan Recovery Projects by coordinating the individual MPTs required and times for specific land uses and infrastructure (i.e. bus stops, transit stations, etc.).
Regular communication with New York City Department of Transportation and participation in its construction efforts.	PANYNJ will consult with NYCDOT to develop the MPT Plan for the Preferred Alternative. NYCDOT will be active in the development, update, and implementation of the TMP for the Lower Manhattan Recovery Projects.

Although the EPCs would help to reduce potential congestion and vehicular access problems during the construction period, project-generated vehicle trips would result in one construction period impact during the PM peak hour at the intersection of Route 9A and Liberty Street. A modest transfer of 5 seconds of green signal time from the Liberty Street approach to Route 9A would mitigate this adverse impact. PANYNJ will incorporate this mitigation into the Project's MPT Plan.

As described in the *Route 9A Project Draft Supplemental Environmental Impact Statement*, NYSDOT will lead in preparing a Traffic Management Plan (TMP) for the Lower Manhattan Recovery Projects. PANYNJ will coordinate with NYSDOT to ensure that the construction period traffic mitigation required for the Preferred Alternative is incorporated into the coordinated TMP. ✶

A. INTRODUCTION

This section discusses and describes the various public transportation services that were provided both pre- and post-September 11, 2001, the travel characteristics and volumes of public transportation users in and through the study area, and an analysis of effects of the No Action and Preferred Alternatives on the public transit network in the World Trade Center (WTC) area. The public transportation services that are described and analyzed in this section include New York City Transit (NYCT) subways, New Jersey Transit (NJ Transit) commuter rail, trans-Hudson ferries, and local and express bus service. Since PATH service was already described in Section 8A, it is not developed further in this section.

Public transit is the primary means of transportation to Lower Manhattan. Before September 11, 2001, the WTC was both a major trip generator and transit hub served by 11 NYCT subway lines (1, 2, 3, 4, 5, 9, A, C, E, N and R) and over five dozen bus lines, and was the terminus for two PATH train lines. In addition, almost 17,000 round-trip passengers prior to September 11, 2001 used trans-Hudson ferries within a few blocks of the WTC site.

The terrorist attacks radically altered the transit network in the WTC area. Most substantially, the terrorist attacks destroyed the WTC PATH Terminal and the Cortlandt Street Station on the 1 and 9 line, and forced the closing of the E line's WTC Station and the Cortlandt Street Station on the N and R line. It also destroyed the 1 and 9 subway tunnel traversing the WTC site, which prevented 1 and 9 local subway service south of Chambers Street and impacted both local and express service along the entire Seventh Avenue Line.

Without WTC/Lower Manhattan PATH service, many former PATH riders diverted primarily to one of three routes or travel modes:

- NJ Transit commuter rail to Penn Station-New York with a transfer to Lower Manhattan-bound NYCT subway service.
- Uptown-bound PATH trains to Christopher Street Station with a transfer to Lower Manhattan-bound NYCT subway or bus service.
- Trans-Hudson ferries.

The Preferred Alternative is not expected to induce PATH ridership beyond levels that would have occurred had the terrorist attacks not happened. Therefore, the Preferred Alternative would not generate additional ridership on NYCT subways, local or express bus service, NJ Transit commuter rail, or trans-Hudson ferries from transferring PATH riders.

In November 2003, the opening of the temporary WTC PATH station allowed for resumed PATH service to Lower Manhattan. The Preferred Alternative would replace and enhance the passenger capacity of the former WTC PATH Terminal destroyed on September 11, 2001 and the temporary WTC PATH station that was recently opened. In time, the demand for

transportation services would grow as the WTC site is redeveloped and other previously planned or anticipated development occurs in Lower Manhattan. A fully functioning PATH system would be a necessary component in the public transportation system and the overall transportation network for the region in order to accommodate increasing transit demand. As stated in the "Probable Impacts" section below, if the Preferred Alternative is not implemented, the operation of the overall transit network would be impacted. West-of-Hudson travelers would be especially affected as their commute would likely be more expensive and time-consuming, and may involve additional transfers when compared to their former PATH commute. It is anticipated that the No Action condition would result in travel patterns similar to those of the period between September 11, 2001 and the opening of the temporary PATH station. This analysis draws upon that period as a basis for assessing the No Action condition.

B. METHODOLOGY

The analyses begin with a description of transit services that were available both pre- and post-September 11, 2001. Transit services, including local/express buses, commuter rail, NYCT subways, and trans-Hudson ferries, are reviewed in terms of frequency and service area. Historical ridership data are also compared and analyzed. The current and historical, or "existing conditions," service and ridership information are then compared to the expected system operations and ridership once the Preferred Alternative would open in 2009, and to the Terminal's 2025 design year.

A line-haul analysis is included for NYCT subway lines operating in the WTC area, comparing the average passenger load of each subway car to its corresponding guideline and maximum capacities. The arrival load represents the volume on board as a train enters a station while the leave load compares the volume to the capacity of a train as it departs.

The evaluation of potential subway line-haul impacts indicates the extent to which crowding may occur. Generally, any increase in load levels that remains within the guideline capacity is not considered substantial. Projected increases to a build condition that exceeds guideline capacity may be considered adverse if the project generates five or more passengers per car.

Based on a comparison of PATH ridership estimates to pre-September 11, 2001 conditions, it is not anticipated that the Preferred Alternative would generate substantial new riders at subway stations or on local buses or ferries. Furthermore, the Preferred Alternative would generate fewer riders on these services than the No Action Alternative. Therefore, this chapter provides a qualitative assessment of the project's effects on subway station operations, local bus service, and ferries.

C. DESCRIPTION OF THE AFFECTED ENVIRONMENT

PRE-SEPTEMBER 11, 2001 BASELINE CONDITIONS

NYCT SUBWAY SERVICE

The majority of commuters accessing the WTC area used the NYCT subway system. Figure 8C-1 provides a pre-September 11, 2001 map of the NYCT subway system in the WTC area.

Table 8C-1 presents subway station usage for May 2001 for the five subway stations nearest the WTC site. Turnstile registrations, which are recordings of the number of people entering the system through each turnstile, are the most comprehensive source of data on subway ridership at

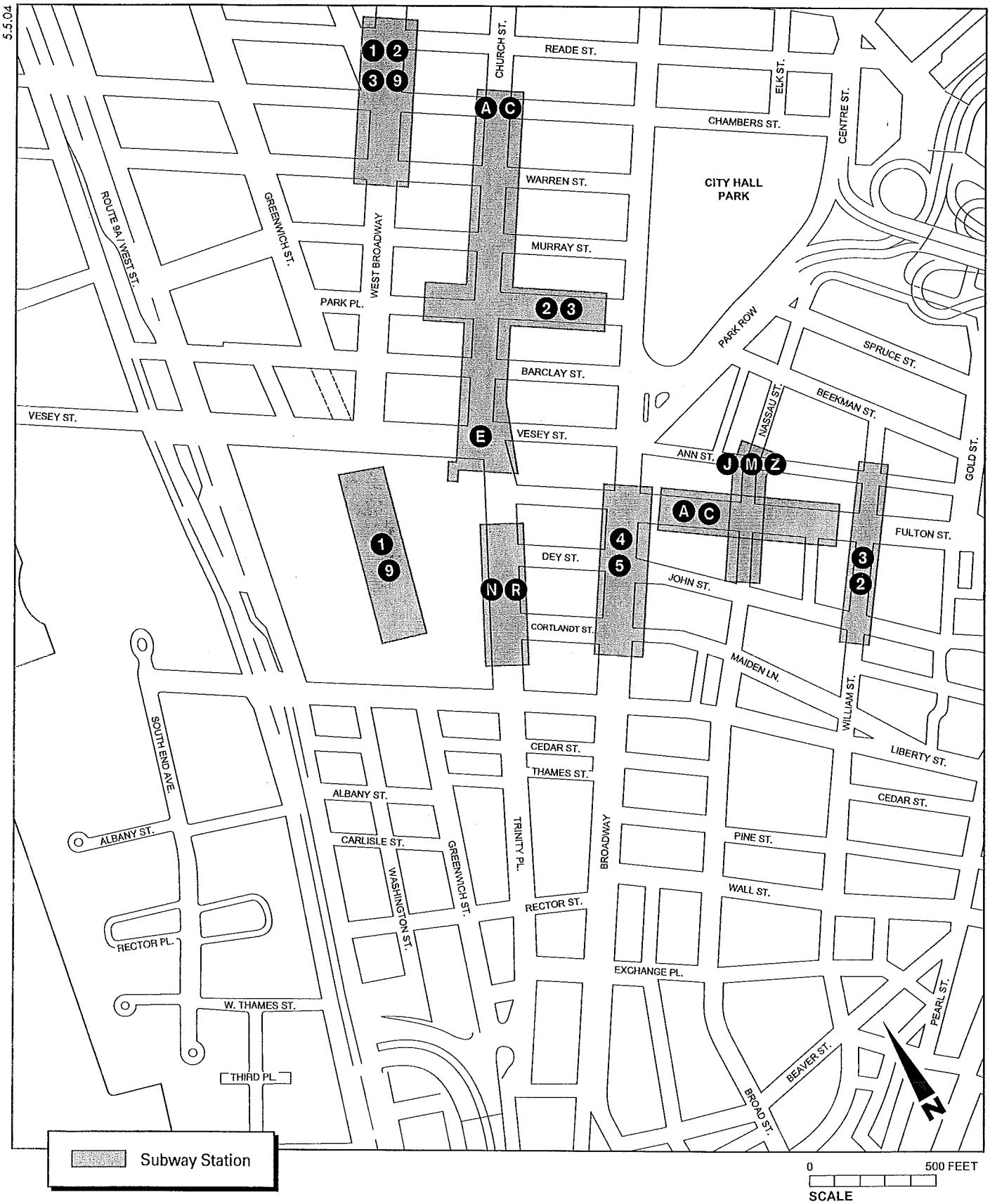


Figure 8C-1

Pre-September 11, 2001 Subway Station Locations

the station level. Although turnstile registrations provide a fair estimate of passenger boardings by station and time of day, comparable data is not available for passengers exiting each station. However, the patterns and magnitude of passenger flows can be assumed to be approximately the same during the morning peak period as during the evening peak given the high proportion of all trips that are related to commuting to work during the peaks. Thus, for example, according to Table 8C-1, 9,575 passengers entered the Cortlandt Street (1 and 9) Station between 4 PM and 7 PM, and approximately the same number of passengers would be expected to have exited the same station during the morning peak period.

Table 8C-1
Pre-September 11, 2001 (May 2001) Average Weekday Subway Turnstile Registration

Station	Routes	Time Period		
		6 AM – 9 AM	4 PM – 7 PM	24 Hour
Cortlandt Street	1, 9	1,569	9,575	19,446
Chambers Street	1, 2, 3, 9	1,219	5,880	17,432
Cortlandt Street	N, R	3,391	11,764	27,650
Fulton Street/Broadway-Nassau	A, C, J, M, Z, 2, 3, 4, 5	3,090	33,215	65,941
Chambers Street/ WTC/Park Place	A, C, E, 2, 3	3,949	28,742	62,713
Total		13,218	89,176	193,182

Source: New York City Transit

A subway line haul analysis was performed for the *WTC Memorial and Redevelopment Plan Generic Environmental Impact Statement (GEIS)*, using the *CEQR Technical Manual* guidelines for subway capacity, with ridership and subway data provided by NYCT. Volume to capacity (v/c) ratios were calculated for each subway line for the AM peak hour (8AM to 9AM). As shown in Table 8C-2, the southbound 5 train at Fulton Street operated above capacity with entering station v/c ratios of 1.36. The other subway lines that served the WTC area, including the 1 and 9 trains at Cortlandt Street, the N and R trains at Cortlandt Street, and the E train at WTC, operated well below capacity. The northbound 1 and 9 trains and the northbound 4 train had slightly higher leaving station v/c ratios compared with entering station v/c ratios, an indication that there was some reverse commuting from Lower Manhattan (i.e. passengers transferring from PATH and ferries).

LOCAL BUS SERVICE

The roles of local buses are to serve the immediate Lower Manhattan area and to connect it with various parts of Manhattan to the north and Downtown Brooklyn. Local bus routes are designed to collect and distribute passengers throughout the service area. All local bus routes operated during the weekdays and most provided weekend service. All public local bus routes were operated by NYCT and provided extensive service throughout Lower Manhattan. NYCT operated 12 local bus routes in Lower Manhattan including the M1, M1 Limited, M6, M9, M15 (South Ferry), M15 Limited (South Ferry), M15 (City Hall/Park Row), M15 Limited (City Hall/Park Row), M20, M22, M103, and B51.

Table 8C-2

Pre-September 11, 2001 (May 2001) Subway Line-Haul for WTC Area Stations

Station	Route	Direction	Peak Hour Capacity	Arrival Load		Leave Load	
				Volume	V/C	Volume	V/C
Cortlandt Street	1/9	Northbound	16,800	2,439	0.15	2,838	0.17
		Southbound	20,400	4,006	0.20	2,695	0.13
Park Place	2	Northbound	12,000	6,659	0.55	5,671	0.47
		Southbound	15,600	8,099	0.52	6,042	0.39
	3	Northbound	9,720	5,126	0.53	3,687	0.38
		Southbound	11,880	6,128	0.52	4,692	0.39
Fulton Street	4	Northbound	18,000	12,575	0.70	12,874	0.72
		Southbound	16,800	12,292	0.73	8,577	0.51
	5	Northbound	13,200	8,974	0.68	8,768	0.66
		Southbound	8,400	11,400	1.36	7,159	0.85
Broadway Nassau	A	Northbound	32,400	20,902	0.65	13,162	0.41
		Southbound	5,400	4,150	0.77	3,603	0.67
	C	Northbound	11,520	4,335	0.38	2,860	0.25
		Southbound	8,640	529	0.06	373	0.04
World Trade Center	E	Northbound	21,600	0	0.00	714	0.03
		Southbound	21,600	6,784	0.31	0	0.00
Cortlandt Street	N	Northbound	14,080	3,197	0.23	1,730	0.12
		Southbound	21,120	1,372	0.06	885	0.04
	R	Northbound	12,320	2,499	0.20	1,521	0.12
		Southbound	19,360	666	0.03	235	0.01

Source: *WTC Memorial and Redevelopment Plan Generic Environmental Impact Statement* (GEIS).

Since local buses operated with relatively short headways (less than 10 minutes) and made many stops, service was frequent throughout Lower Manhattan, particularly during weekday morning and afternoon peak periods. All local bus routes in the study area started/terminated in Lower Manhattan and connected with destinations in Midtown and Upper Manhattan with the exception of the B51, which operated between Lower Manhattan and Downtown Brooklyn via the Manhattan Bridge. The busiest local bus route in Lower Manhattan (and New York City) was the M15 (including limited-stop service), which typically served over 65,000 riders on an average weekday. The M15 was also the only bus route with two different terminal points in Lower Manhattan (South Ferry and Park Row/City Hall). The M15 and the M1 routes operated "limited stop" local service that skipped selected bus stops to provide faster service.

The closest local bus service to the WTC site was provided by the M1 from Harlem and M6 from Central Park South. These two bus routes traveled southbound along Broadway to South Ferry and northbound on Trinity Place/Church Street for their return trips uptown. Other nearby bus routes east of the WTC site included the M15 (Harlem), M103 (Harlem), and B51 (Downtown Brooklyn) routes, which all terminated at City Hall/Park Row (a 5-10 minute walk from the WTC site). West of the WTC, three local bus routes provided local service. The M22 traveled between Grand Street/FDR Drive on the Lower East Side via westbound Chambers Street to the World Financial Center at Vesey Street. On its eastbound trip, the M22 also passed along City Hall/Park Row. Terminating at Battery Park City were the M20 from Lincoln Center from the north and the M9 from Union Square, which approached from the south. Both bus

routes served the WTC site along Route 9A and South End Avenue. A map of each of the aforementioned local bus routes serving Lower Manhattan is provided in Figure 8C-2. Table 8C-3 presents the pre-September 11, 2001 data provided by NYCT on the average weekday bus ridership for the total length of these routes. This data was obtained from the Urban Planning and Transportation Study that was prepared in September 2002 by the Port Authority of New York and New Jersey (PANYNJ) and the Lower Manhattan Development Corporation (LMDC).

Table 8C-3
Pre-September 11, 2001 Average Weekday Local Bus Ridership

Route	Ridership
M1 & M1 Limited	19,080
M6	7,198
M9	5,015
M15 (all variations)	65,385
M20	5,150
M22	3,927
M103	15,402
B51	927
Total	122,084

Source: *Lower Manhattan and the World Trade Center Site: Urban Planning and Transportation Study* (PANYNJ and LMDC, September 2002)

EXPRESS BUS SERVICE

The role of express bus service in the study area is to serve commuters from communities generally outside of Manhattan, and to transport them to and from Lower Manhattan. A total of 36 express bus routes operated between Lower Manhattan and various parts of New York City (mostly the outer boroughs). These express bus routes operated on a limited schedule (usually during the morning and evening peak periods) and were designed to bring commuters from distant locations into Lower Manhattan in a quick and efficient manner. New York express bus routes utilized one of three travel corridors within Lower Manhattan—Broadway/Church Street, Route 9A, or Water Street.

NYCT operated the majority of New York City express bus routes to and from Lower Manhattan, including 20 routes from Staten Island and three routes each from Manhattan and Brooklyn. To many Staten Island commuters, these routes provided the only direct transit service to Manhattan other than the Staten Island Ferry. Staten Island express bus service was operated solely by NYCT and included the X3 and X4 buses, which terminated on Murray Street in Battery Park City; the X8, which terminated on Frankfort Street; the X11, X12A, X16, X17A and X19 buses, which terminated on Worth Street and Broadway; the X13, X15, X18 and X20 buses, which terminated on Water Street and Broad Street; and the X1, X6, X7, X9, X10, X12B, X14 and X17C buses, which stopped in Lower Manhattan but terminated elsewhere. NYCT also operated three express buses, X25, X90, and X92, to Lower Manhattan from Manhattan's East Side and three express routes from Brooklyn, the X27, X28 and X29.

There were ten other New York City express bus routes subsidized by the New York City Department of Transportation (NYCDOT) and operated by private bus companies. Command Bus Company operated five bus routes from Brooklyn (BM1, BM2, BM2S, BM3 and BM4). Queens Surface Corp. and Triborough Coach Lines each operated two bus routes from Queens

(QM1, QM1A, QM11 and QM24W). Liberty Lines Express operated one bus route from the Bronx (BxM18). A map of the express bus routes serving Lower Manhattan is provided in Figure 8C-3. Table 8C-4 presents the average weekday ridership for NYCT and NYCDOT subsidized express bus routes for pre-September 11, 2001.

Table 8C-4
Pre-September 11, 2001 Average Weekday Express Bus Ridership

Bus Route		Ridership
NYCT (Staten Island Routes)	X1	6,352
	X3	972
	X4	1,301
	X6	1,124
	X7	1,218
	X8	1,587
	X9	874
	X10	3,362
	X11	966
	X12	2,212
	X13 / X14	1,402
	X15	2,005
	X16	468
	X17A & X17C	3,807
	X18	605
	X19	1,356
	X20	201
	Total	29,812
NYCT (Manhattan Routes)	X25	147
	X26	No service
	X90	714
	X92	765
	Total	1,626
NYCT (Brooklyn Routes)	X27	3,963
	X28	4,141
	X29	657
	Total	8,761
Command Bus	BM1	2,459
	BM2	2,166
	BM3	1,872
	BM4	1,057
	Total	7,554
NYCDOT Franchise (Queens)	QM1/1A	1,888
	QM11	739
	QM24W	462
	Total	3,089
Liberty Lines Express	BxM18	335
Total Express Bus		51,177

Source: *Lower Manhattan and the World Trade Center Site: PANYNJ and LMDC Urban Planning and Transportation Study* (Beyer Blinder Belle, September 2002)

Although of lesser importance due to the volume of riders and frequency of operations, it should also be noted that NJ Transit operated two commuter bus routes (120 and 134), Westchester County Bee-Line operated one route (BXM4C), ten privately operated express bus routes served

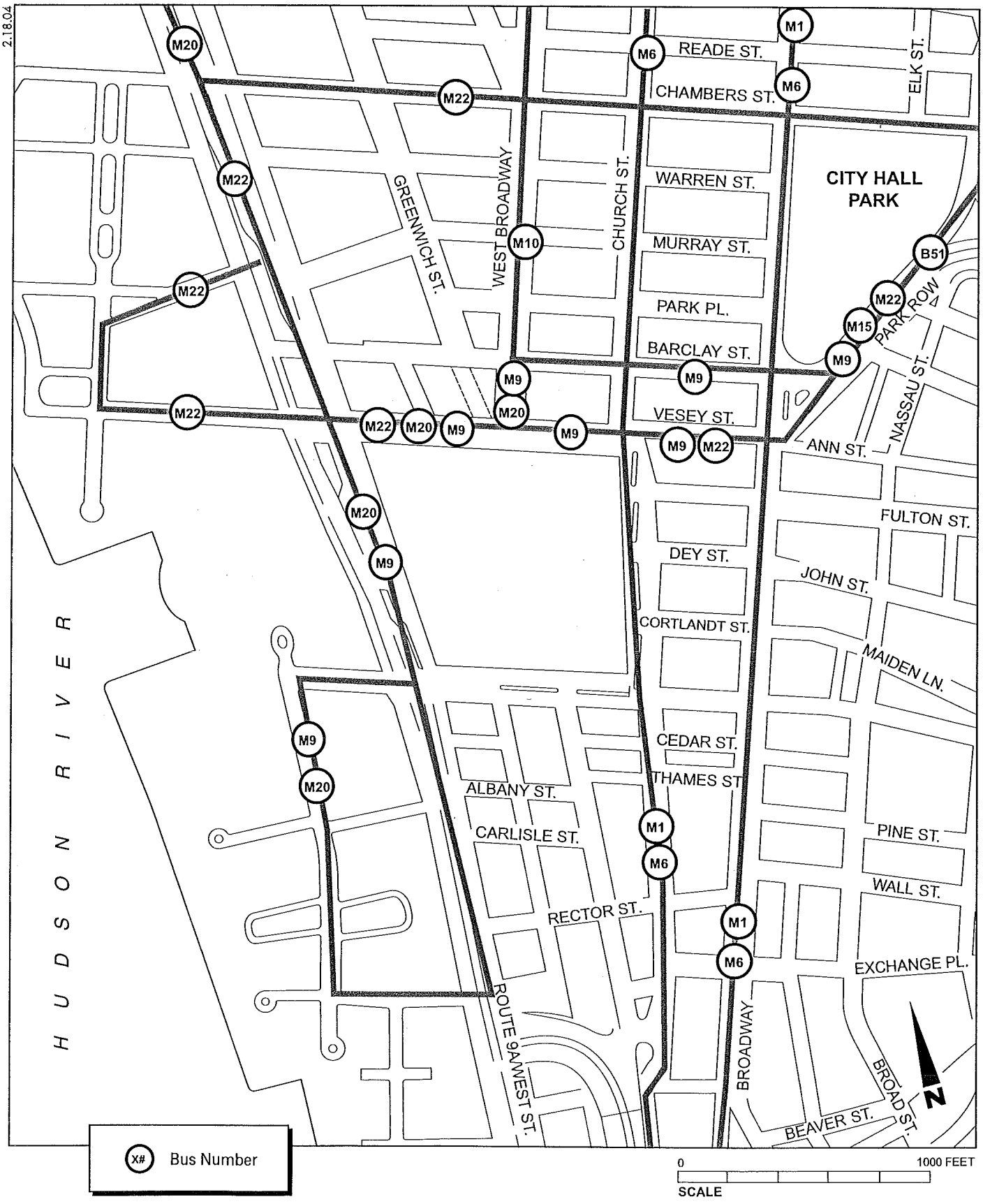


Figure 8C-2

Pre-September 11, 2001 Local Bus Routes

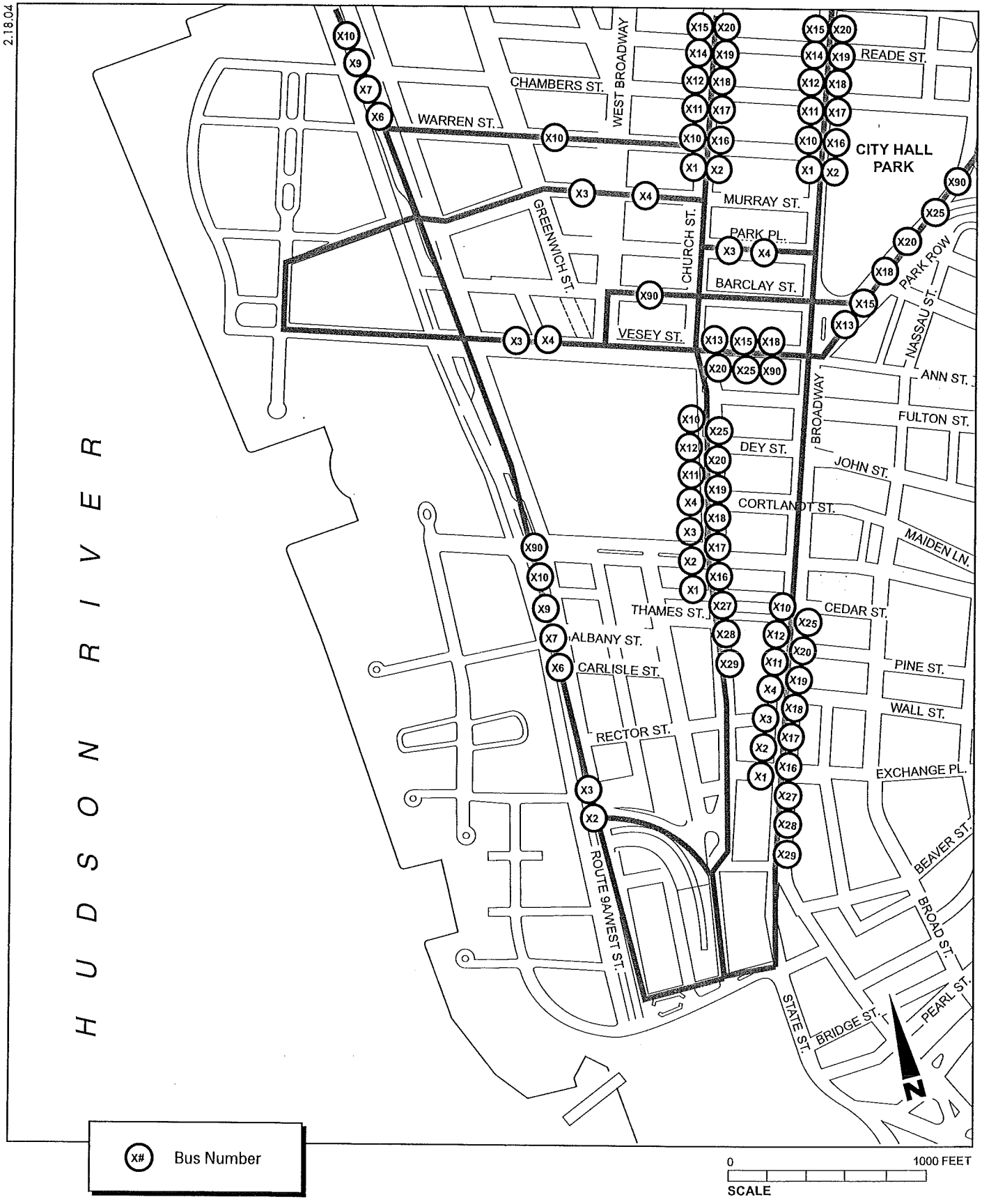


Figure 8C-3

Pre-September 11, 2001
Express Bus Routes

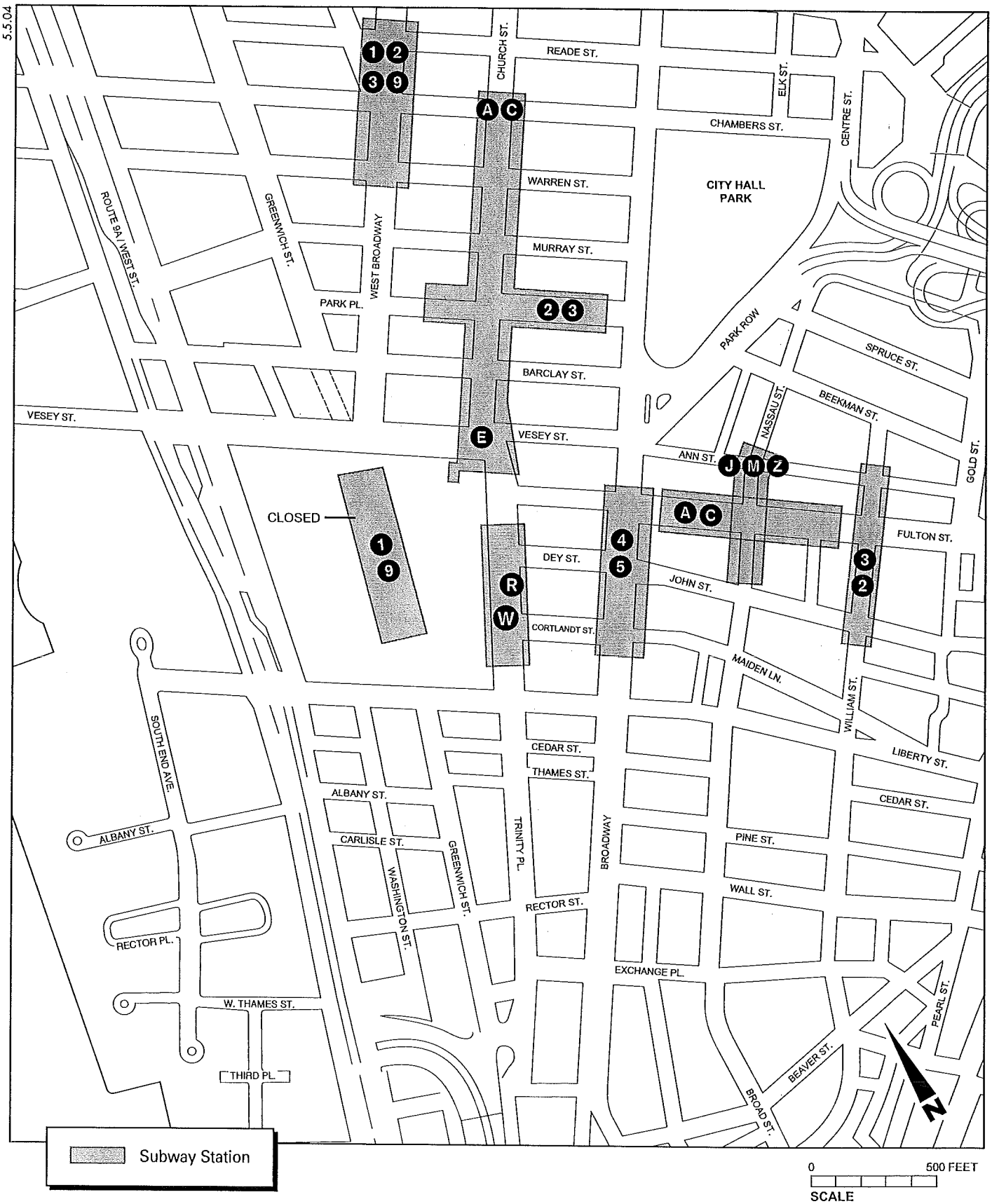


Figure 8C-4

Post-September 11, 2001 Subway Station Locations

suburban New Jersey communities, and two routes served Pennsylvania with Manhattan-bound morning peak period weekday service and outbound service during the evening peak period.

NEW JERSEY TRANSIT COMMUTER RAIL

Although NJ Transit commuter rail did not directly serve Lower Manhattan, many of its passengers used it in conjunction with PATH to do so. Prior to September 11, 2001, NJ Transit commuter rail passengers destined for Lower Manhattan would transfer to PATH service at either Newark or Hoboken depending on their particular line. Passengers on the Northeast Corridor, Raritan Valley, or North Jersey Coast Lines would transfer at Newark, while all other lines would transfer at Hoboken.

TRANS-HUDSON FERRIES

Prior to September 11, 2001, trans-Hudson ferry service was a small but growing part of the transportation network in Lower Manhattan consisting of almost 17,000 average weekday passengers. Table 8C-5 provides a listing of the various trans-Hudson ferry routes that served Lower Manhattan prior to the events of September 11, 2001. Table 8C-5 also indicates the average weekday ridership for each of these ferry routes.

Table 8C-5
Pre-September 11, 2001 Trans-Hudson Ferry Routes to Lower Manhattan

Manhattan Landing	New Jersey Landing	Operator	Average Weekday Ridership
World Financial Center	Colgate (Jersey City, NJ)	NY Waterway	1,572
	Harborside (Jersey City, NJ)		1,478
	Hoboken (NJ Transit Terminal)		8,970
	Liberty Harbor Marina		258
North Cove Marina	Liberty Landing Marina	Liberty Park Water Taxi	545
Pier 11	Atlantic Highlands, NJ	Seastreak	500
	Highlands, NJ	Seastreak	777
	Highlands, NJ	New York Fast Ferry	791
	Port Imperial (Weehawken, NJ)	NY Waterway	1,194
	Port Liberte, NJ	NY Waterway	835
Total Average Weekday Ridership			16,920

Source: *Lower Manhattan and the World Trade Center Site: PANYNJ and LMDC Urban Planning and Transportation Study* (Beyer Blinder Belle, September 2002)

CHANGES IN THE AFFECTED ENVIRONMENT SINCE SEPTEMBER 11, 2001

This section presents an overview of the various changes that were imposed on the WTC-area transit facilities and services due to the September 11, 2001 terrorist attacks. With the exception of the trans-Hudson ferries, the conditions described below do not reflect those after the temporary WTC PATH station was opened in November 2003. Following its opening, travel patterns to Lower Manhattan have begun to return to pre-September 11, 2001 conditions.

NYCT SUBWAY SERVICE

The NYCT subway system changed substantially as a result of September 11, 2001. Due to the destruction of the WTC concourse, which had been the principal point of access to the local Eighth Avenue (E) Subway Line WTC Station and the Broadway (N and R) Line's Cortlandt Street Station, these station facilities were immediately closed. Both of these subway stations were reopened, however, during the first half of 2002.

In addition, a portion of the Seventh Avenue Line (1 and 9) tunnel that traversed a portion of the WTC site was destroyed, severing the line and eliminating all service south of Chambers Street. Prior to the reconstruction and reopening of the damaged tunnel in September 2002, service along the entire Broadway Line was radically affected. Because of the need to continue to operate local service north of Chambers Street and the physical inability to turn back local trains at or south of Chambers Street, service was reconfigured to operate Seventh Avenue local trains through to Brooklyn. The 1 train operated as an all-stop local from the Bronx to New Lots Avenue, Brooklyn. The 9 train, which had previously provided rush-hour skip-stop service with the 1 train north of 137th Street, was discontinued. The 2 train retained its route, but operated as a local in Manhattan. The 3 train operated express between East 148th Street in Harlem to 14th Street. The resulting service provided considerably less express service in Manhattan and no connecting Manhattan express service from Brooklyn. Subway service at the southernmost stations in Manhattan on other subway lines, including the Eighth Avenue Express and Broadway Local lines, were increased to compensate in part for the loss of 1 and 9 service. Figure 8C-4 shows these NYCT subway system changes following September 11, 2001.

Since the reopening of the damaged 1 and 9 subway tunnel in September 2002, subway service along this Seventh Avenue Line has returned to pre-September 11, 2001 levels.

Table 8C-6 provides an overview of the average weekday subway ridership, measured in turnstile registrations, for May 2002. Subway ridership decreased substantially at the five stations that served the WTC site.

Table 8C-6
Post-September 11, 2001 (May 2002) Average Weekday Subway Turnstile Registration

Station	Time Period			Change (May 2001 to May 2002) 24-Hour Total	
	6-9 AM	4-7 PM	24 Hours	Ridership	Percent
Cortlandt Street (1/9)	0	0	0	-19,466	-100.0%
Chambers Street (1/2)	955	4,339	14,001	-3,431	-19.7%
Cortlandt Street (N/R)	0	0	0	-27,650	-100.0%
Fulton St./B'way-Nassau St. (1, 2, 4, 5, A, C, J, M, Z)	2,277	30,163	62,616	-3,325	-5.0%
Chambers St.-WTC/Park Pl. (1, 2, A, C, E)	1,380	14,202	33,705	-29,008	-46.3%
Total	4,612	48,704	110,322		
Ridership Change (May 2001 to May 2002)	-8,606	-40,472	-82,860		
Percent Change (May 2001 to May 2002)	-65.1%	-45.4%	-42.9%		

Source: New York City Transit

Table 8C-7 summarizes the post-September 11, 2001 subway line haul results for the six subway stations in the vicinity of the WTC site for 2003. Due to the loss of employment in and reduction of commuter trips to Lower Manhattan, subway ridership and passenger distribution to the area's subway stations have altered. For the most part, line-haul levels at affected stations were lower than pre-September 11, 2001.

Table 8C-7
Post-September 11, 2001 (May 2002) Subway Line-Haul for WTC Area Stations

Station	Route	Direction	Total Peak Hour Capacity	Trains Entering Station		Trains Leaving Station	
				Volume	V/C	Volume	V/C
Cortlandt Street	1/9	Northbound	Station closed following September 11, 2001				
		Southbound	Station closed following September 11, 2001				
Park Place	2	Northbound	10,800	6,149	0.57	5,614	0.52
		Southbound	13,200	8,077	0.61	7,188	0.54
	3	Northbound	9,720	3,897	0.40	3,121	0.32
		Southbound	10,800	4,883	0.45	3,856	0.36
Fulton Street	4	Northbound	15,600	9,574	0.61	10,603	0.68
		Southbound	15,600	9,092	0.58	6,939	0.44
	5	Northbound	13,200	7,165	0.54	7,681	0.58
		Southbound	14,400	8,963	0.62	6,320	0.44
Broadway Nassau	A	Northbound	32,400	16,979	0.52	11,338	0.35
		Southbound	16,200	4,844	0.30	4,279	0.26
	C	Northbound	11,520	3,446	0.30	2,325	0.20
		Southbound	8,640	457	0.05	319	0.04
World Trade Center	E	Northbound	21,600	0	0.00	83	0.00
		Southbound	21,600	4,774	0.22	0	0.00
Cortlandt Street	N	Northbound	12,320	2,442	0.20	1,726	0.14
		Southbound	10,560	72	0.01	29	0.00
	R	Northbound	12,320	1,794	0.15	1,421	0.12
		Southbound	15,840	835	0.05	445	0.03

Source: *WTC Memorial and Redevelopment Plan Generic Environmental Impact Statement* (GEIS).

UPTOWN PATH LINES

Following the destruction of the WTC PATH Terminal on September 11, 2001, many commuters diverted to PATH's Midtown Manhattan routes. Once in Manhattan, these passengers connected to NYCT subways to reach destinations in Lower Manhattan. As a result, ridership at PATH's Christopher Street Station doubled from approximately 4,000 to 8,000 daily riders.

As a direct result of the dramatic increase in passengers exiting the Christopher Street PATH station in the morning, which has only one entry/exit location and narrow platforms, PANYNJ barred passengers from entering this station on weekdays from 7:00 to 9:45 AM. In addition, trains operating from Journal Square and Hoboken to 33rd Street did not stop at Christopher Street on weekdays from 4:30 to 7:00 PM.

LOCAL BUS SERVICE

Following September 11, 2001, NYCT's 12 local bus routes, which included the M1, M1 Limited, M6, M9, M15 (South Ferry), M15 Limited (South Ferry), M15 (City Hall/Park Row), M15 Limited (City Hall/Park Row), M20, M22, M103 and B51, continued to operate, albeit with some modifications to route and stop locations due to WTC-related street closings. Figure 8C-5 provides a map of these local bus routes following September 11, 2001.

The collective total ridership along the total length of these routes did not change substantially following September 11, 2001. Specific ridership data for the Lower Manhattan portion of these routes are not available, however. Table 8C-8 presents a comparison of pre- and post-September 11, 2001 average weekday bus ridership for the total length of these local routes.

Table 8C-8
Pre- and Post-September 11, 2001 Average Weekday Local Bus Ridership

Route	Pre-September 11, 2001	Post-September 11, 2001	Percent Change
M1 & M1 Limited	19,080	18,920	-0.8%
M6	7,198	7,089	-1.5%
M9	5,015	4,114	-18.0%
M15 (all variations)	65,385	65,422	0.1%
M20	5,150	6,172	19.8%
M22	3,927	3,679	-6.3%
M103	15,402	15,733	2.2%
B51	927	898	-3.1%
Total	122,084	122,027	-0.1%

Source: *Lower Manhattan and the World Trade Center Site: PANYNJ and LMDC Urban Planning and Transportation Study*

EXPRESS BUS SERVICE

Express bus service continues to operate much as it did prior to September 11, 2001. In addition to routing changes and bus stop relocations in Lower Manhattan due to street closings, the only other changes to NYCT express bus service involved the elimination of the X14 route from Staten Island and the implementation of a new route (X26) between Penn Station-New York and Battery Park City. Figure 8C-6 provides a map of the NYCT and NYCDOT-subsidized express bus routes following September 11, 2001.

Table 8C-9 presents a comparison of pre- and post-September 11, 2001 average weekday ridership for NYCT and NYCDOT-subsidized express bus routes. As shown, ridership fell on the majority of these routes. Overall, express bus ridership decreased by about 2 percent.

Express bus ridership to Lower Manhattan decreased about 3 percent in total on the express bus services provided by NJ Transit (120 and 134), Westchester County Bee-Line (BXM4C), and the privately operated express bus routes serving suburban New Jersey (11 routes) and Pennsylvania (two routes), despite the addition of one new route provided by Academy Bus between Hoboken and Lower Manhattan.

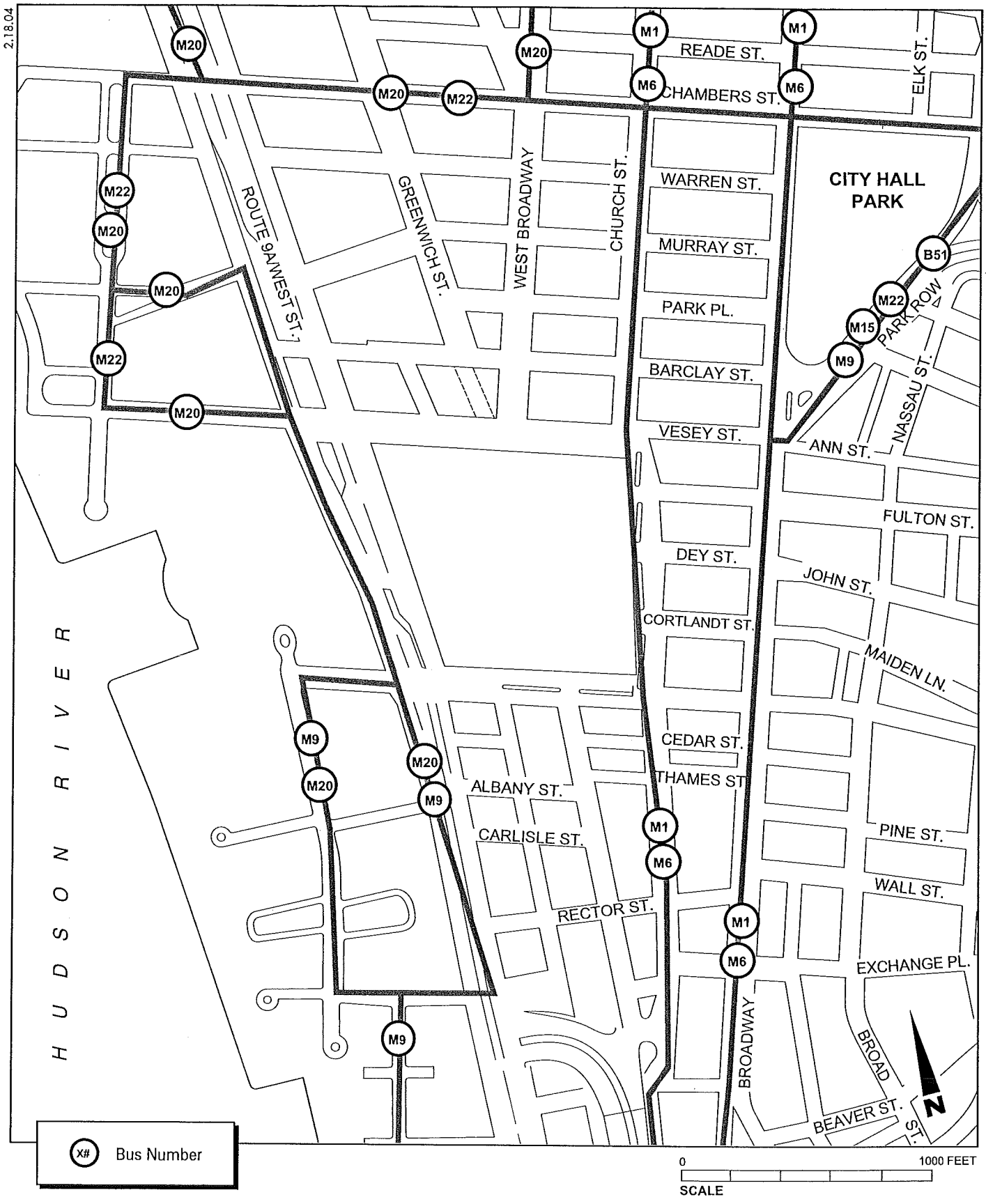


Figure 8C-5

Post-September 11, 2001 Local Bus Routes

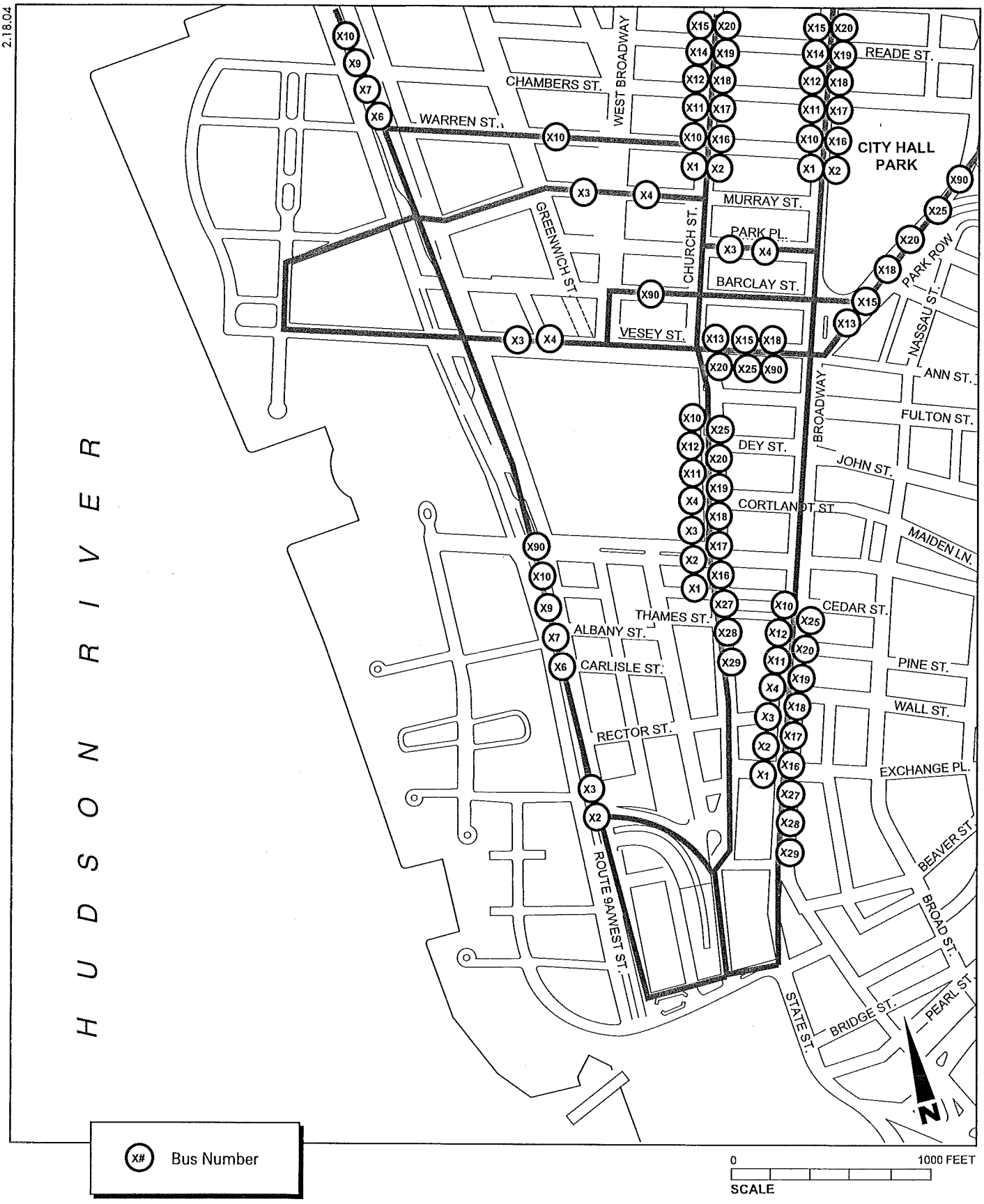


Figure 8C-6

Post-September 11, 2001 NYCT and NYCDOT Subsidized Express Bus Routes

Table 8C-9

Pre- and Post-September 11, 2001 Average Weekday Express Bus Ridership

Bus Route		Pre-September 11, 2001	Post-September 11, 2001	Percent Change
NYCT (Staten Island Routes)	X1	6,352	6,003	-5.5%
	X3	972	769	-20.9%
	X4	1,301	1,263	-2.9%
	X6	1,124	1,023	-9.0%
	X7	1,218	990	-18.7%
	X8	1,587	1,577	-0.6%
	X9	874	842	-3.7%
	X10	3,362	3,289	-2.2%
	X11	966	944	-2.3%
	X12	2,212	2,159	-2.4%
	X13 / X14	1,402	1,458	4.0%
	X15	2,005	1,653	-17.6%
	X16	468	510	9.0%
	X17A & X17C	3,807	4,752	24.8%
	X18	605	574	-5.1%
	X19	1,356	1,215	-10.4%
	X20	201	111	-44.8%
	Total	29,812	29,132	-2.3%
NYCT (Manhattan Routes)	X25	147	25	-83.0%
	X26	No service	189	100.0%
	X90	714	594	-16.8%
	X92	765	483	-36.9%
	Total	1,626	1,291	-20.6%
NYCT (Brooklyn Routes)	X27	3,963	4,242	7.0%
	X28	4,141	4,426	6.9%
	X29	657	717	9.1%
	Total	8,761	9,385	7.1%
Command Bus	BM1	2,459	2,448	-0.5%
	BM2	2,166	1,981	-8.5%
	BM3	1,872	1,852	-1.1%
	BM4	1,057	1,013	-4.2%
	Total	7,554	7,294	-3.4%
NYCDOT Franchise (Queens)	QM1/1A	1,888	1,811	-4.1%
	QM11	739	605	-18.1%
	QM24W	462	294	-36.4%
	Total	3,089	2,710	-12.3%
Liberty Lines Express	BxM18	335	333	-0.6%
Total Express Bus		51,177	50,145	-2.0%

Source: *Lower Manhattan and the World Trade Center Site: PANYNJ and LMDC Urban Planning and Transportation Study*

NJ TRANSIT COMMUTER RAIL

Following the events of September 11, NJ Transit commuter rail services to New York City increased by approximately 30 percent, requiring additional trains on its routes serving New York's Penn Station. Although this additional capacity could accommodate the demand generated by the absence of PATH service to Lower Manhattan, it precluded certain service enhancements planned for the NJ Transit system.

For example, NJ Transit completed construction of the Secaucus Transfer, which provides a link between the Northeast Corridor line serving Penn Station and the Main and Bergen County lines that serve Hoboken. Prior to its opening, passengers on several NJ Transit commuter rail lines would travel to Hoboken and then connect to PATH trains or ferries to access Midtown Manhattan. With the Secaucus Transfer, these passengers can now connect to Penn Station-bound commuter trains, resulting in a shorter commute time. Although the project was completed in summer of 2003, its full opening was delayed until the opening of the temporary WTC PATH station because NJ Transit could not support the increased ridership associated both with diverted PATH passengers and the Secaucus Transfer.

TRANS-HUDSON FERRIES

Following the events of September 11, 2001, demand for ferry service between New Jersey and the WTC area increased by about 164 percent to almost 45,000 average weekday riders, using June 2002 ridership totals. Ferry operators rushed to respond to this demand by implementing increased peak hour service and new routes. To provide for these new services, ferry operators placed orders for over 20 new vessels, and chartered numerous fishing, whale watching, and sightseeing boats to augment capacity in the interim.

Table 8C-10 provides a list of the post-September 11, 2001, trans-Hudson ferry routes serving Lower Manhattan. In addition, Table 8C-10 indicates the average weekday ridership for each of these ferry routes and the percent change for each route from pre-September 11, 2001 levels.

Immediately following September 11, 2001, the World Financial Center ferry terminal was closed to the general public, and the Colgate, Harborside, Hoboken, and Liberty Harbor Marina services using this facility were rerouted to Pier 11 on the East River. The World Financial Center ferry terminal continued to play a key role by accommodating special charter ferries that provided the only access to the New York Mercantile Exchange in the weeks after it reopened on September 17th. This role expanded throughout the fall as other firms located at the World Financial Center contracted similar charter services for their employees.

With most ferry services between New Jersey and Lower Manhattan consolidated at Pier 11, the capacity of this terminal was soon proved inadequate for the high level of demand. Between September 11 and September 17, 2001, two additional barges were installed bringing the total number of slips at this facility to ten, but severe crowding continued.

In response, PANYNJ developed a new ferry terminal adjacent to Pier A on the west side of Battery Park. This facility consisted of a barge with a covered passenger waiting area and six slips. On November 5, 2001, all NY Waterway ferries from Hoboken and Harborside were diverted from Pier 11 to Pier A, as were the ferries serving the Liberty Landing Marina. This shortened the length of these routes, thereby reducing travel times and allowing an increase in service frequency. Limited service to the World Financial Center terminal from Hoboken South and Colgate was also restored at this time.

Table 8C-10
Comparison of Pre- and Post-September 11, 2001 (June 2002) Trans-Hudson Ferry Ridership to Lower Manhattan

Manhattan Landing	New Jersey Landing	Operator	Net Change	
			Riders	Percent
World Financial Center	Colgate (Jersey City, NJ)	NY Waterway	4,626	194%
	Harborside (Jersey City, NJ)		0	-100%
	Hoboken (NJ Transit Terminal)		6,924	-23%
	Liberty Harbor Marina		0	-100%
	Pier 11 Shuttle Service		86	N/A
	Port Imperial (Weehawken, NJ)		0	N/A
North Cove Marina	Liberty Landing Marina	Liberty Park Water Taxi	0	-100%
Pier A	Colgate (Jersey City, NJ)	NY Waterway	2,423	N/A
	Hoboken (NJ Transit Terminal)	NY Waterway	9,774	N/A
	Liberty Landing Marina	Liberty Park Water Taxi	472	N/A
	Pavonia/Newport (Jersey City, NJ)	NY Waterway	2,846	N/A
Pier 11	Atlantic Highlands, NJ	Seastreak	796	59%
	Colgate (Jersey City, NJ)	NY Waterway	3,502	N/A
	East River Shuttle Service	NY Waterway	57	N/A
	Highlands, NJ	New York Fast Ferry	764	-3%
	Highlands, NJ	Seastreak	1,384	78%
	Hoboken (NJ Transit Terminal)	NY Waterway	6,378	N/A
	Keyport, NJ	New York Fast Ferry	152	N/A
	Liberty Harbor Marina	NY Waterway	1,320	N/A
	Port Imperial (Weehawken, NJ)	NY Waterway	1,748	46%
	Port Liberte, NJ	NY Waterway	660	-21%
	South Amboy, NJ	Seastreak	634	N/A
	World Financial Center Shuttle	NY Waterway	86	N/A
Total Average Weekday Ridership			44,632	164%

Notes: Pier A opened on November 5, 2001.
Source: *Lower Manhattan and the World Trade Center Site: PANYNJ and LMDC Urban Planning and Transportation Study* (Beyer Blinder Belle, September 2002)

Prior to the opening of the temporary WTC PATH station, trans-Hudson ferry services were distributed among three Lower Manhattan facilities: World Financial Center, Pier A, and Pier 11. Ferry service from the Jersey City communities of Colgate and Harborside were accommodated at Pier 11 on the east side of Manhattan. Colgate ferries also called at the World Financial Center with Harborside ferries calling at Pier A. Hoboken South ferries provided service to all three Lower Manhattan landings. The Newport service operated to Pier A exclusively, while ferries from the Liberty Landing Marina in Jersey City served Pier A and the North Cove Marina at Battery Park City. The Liberty Harbor Marina ferry served Pier 11. The ferries from Port Liberte and Port Imperial (Weehawken) continued to call at Pier 11. Direct service was also provided between Weehawken and the World Financial Center.

Of the ferry landings in Manhattan, Pier 11 on the East River saw the greatest increase in demand since September 11, 2001. Using June 2002 ridership data, passengers using this facility averaged more than 17,600 on a typical weekday, a nearly 300 percent increase over pre-September 11, 2001 levels. Much of this increase is attributable to the introduction to this facility of routes serving landings in Jersey City, Hoboken, and South Amboy, New Jersey. The ferry service to and from NJ Transit's Hoboken Terminal (Hoboken South) was the most heavily patronized of the services calling at Pier 11 with an average weekday ridership of almost 6,400 passengers, followed by the Colgate, Jersey City, route with 3,500. Both of these routes were implemented post-September 11, 2001. The ferry service at Port Imperial in Weehawken, previously the most heavily patronized Pier 11 service, experienced a 46 percent increase in ridership to about 1,750 passengers. Ridership on Seastreak's Highlands and Atlantic Highlands, New Jersey, runs also showed marked increases of 78 percent and 59 percent, respectively. Contrary to this trend has been the Port Liberte service, which experienced a 21 percent decrease in ridership from pre-September 11, 2001 levels.

When the temporary WTC PATH station reopened in November 2003, trans-Hudson ferry ridership decreased substantially. In response to this drop in demand, the Pier A ferry landing in Lower Manhattan was decommissioned and several ferry routes were discontinued. Figure 8C-7 provides a map of current trans-Hudson ferry service routes.

As shown in Table 8C-11, ridership on an average weekday during this period was 27,197 passengers. This was approximately a 61 percent decrease from ridership levels experienced in June 2002, prior to the opening of the temporary WTC PATH station. However, when compared to pre-September 11, 2001 ridership levels of 16,920 average weekday passengers, this was an increase of almost 61 percent despite the fact that lower ridership levels are typical of ferries during the winter months when the most recent data was obtained.

Table 8C-11

Trans-Hudson Ferry Ridership with Temporary PATH Service (January 2004)

Manhattan Landing	New Jersey Landing	Average Weekday Ridership
World Financial Center	Colgate (Jersey City, NJ)	2,520
	Hoboken (NJ Transit Terminal)	4,759
	Port Imperial (Weehawken, NJ)	363
North Cove Marina	Liberty Landing Marina	646
Pier 11	Atlantic Highlands, NJ	872
	Colgate (Jersey City, NJ)	1,609
	Highlands, NJ	1,184
	Belford, NJ	2,021
	Hoboken (NJ Transit Terminal)	7,191
	Newport, NJ	826
	Liberty Harbor Marina	1,605
	Port Imperial (Weehawken, NJ)	1,547
	Port Liberte, NJ	753
	South Amboy, NJ	660
	Harborside (Jersey City, NJ)	641
Total Average Weekday Ridership		27,197

Note: Data represents average weekday ridership from January 5, 2004 through January 9, 2004.
Source: New York City Department of Transportation, Office of Private Ferries (January 2004)

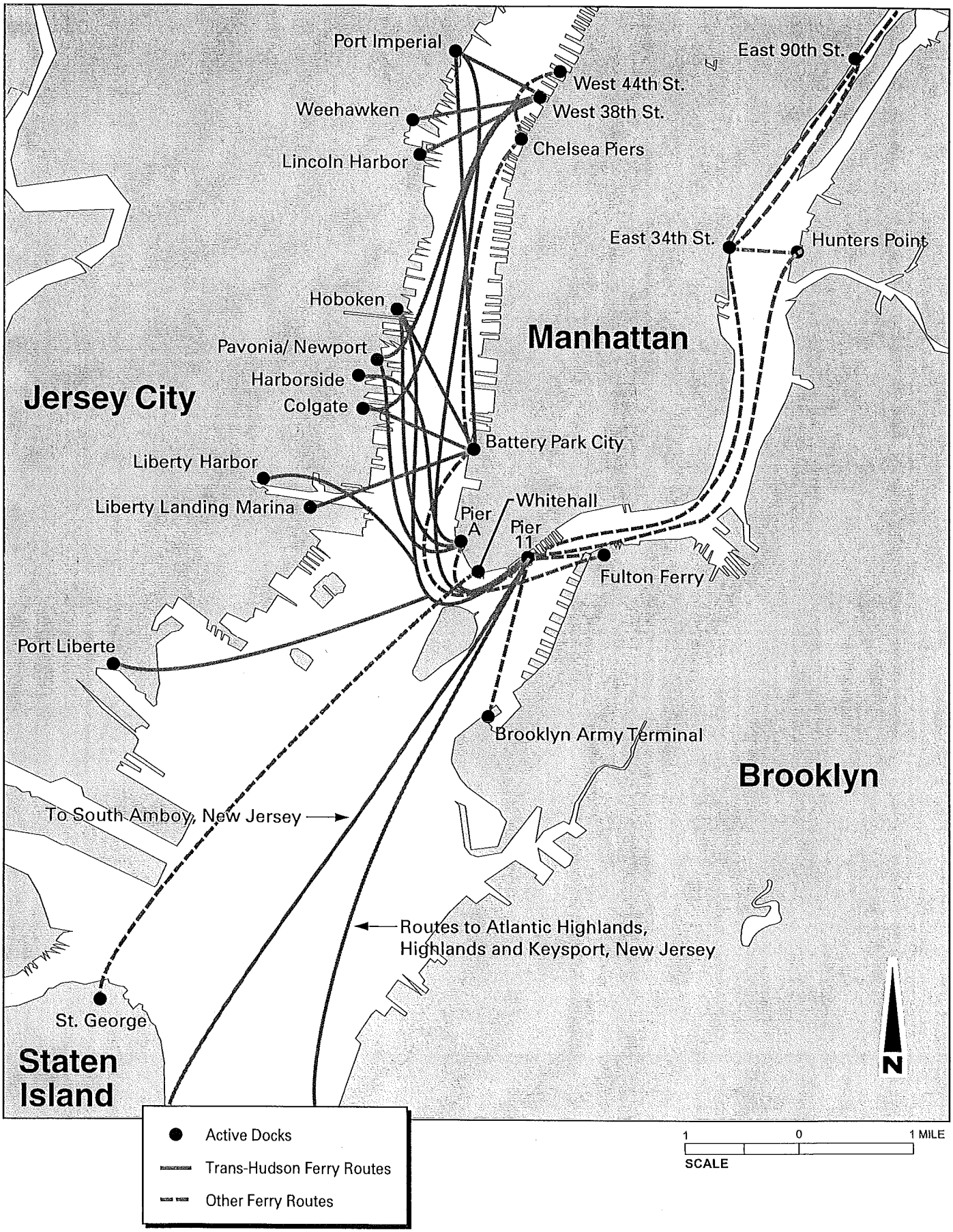


Figure 8C-7

Post-September 11, 2001 (June 2003)
Trans-Hudson Ferry Routes

D. PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

CONSTRUCTION PERIOD (2006)

FUTURE COMMON TO ALL ALTERNATIVES

During the construction period of the Preferred Alternative, other transit projects would be under development in the study area, including the Fulton Street Transit Center, South Ferry Terminal, and Cortlandt Street Station. It is expected that these projects would open prior to or concurrent with the Permanent WTC PATH Terminal such that all of these facilities would be operational in 2009. However, a new World Financial Center Ferry Terminal, which is independent of the Preferred Alternative, is expected to be fully operational in 2005.

PANYNJ is constructing a new ferry terminal at the World Financial Center. Located on the Hudson River at the foot of Vesey Street, the new terminal will replace the existing, temporary facility adjacent to the Winter Garden. The new terminal has the capacity to berth a maximum of five vessels (four end loading and on side loading vessels). The terminal public space is designed to handle two full boat loads of 400 arriving passengers (800 total) and half a boat load of departing passengers (200 total) at any given time. The floating terminal will have a fabric roof, glass walls, restrooms, ticket booth and a concession area. Construction is expected to be completed by the end of 2005.

NO ACTION ALTERNATIVE

The temporary WTC PATH station was designed to accommodate anticipated passenger volumes through the construction period, years 2005 to 2008. If the Preferred Alternative is not undertaken, the temporary WTC PATH station would continue to provide access to Lower Manhattan for PATH passengers during these years. Therefore, the No Action Alternative would not impact transit passengers, which include users of local and express buses, commuter rail, commuter vans, NYCT subways, and ferries, during the construction period.

PREFERRED ALTERNATIVE

The construction of the Preferred Alternative is expected to induce a modest amount of construction-related roadway traffic to the area above the volume of construction vehicles associated with the rebuilding of the WTC itself and other projects in the area. This construction activity may lead to temporary closing, re-alignment, or narrowing of sidewalks and pedestrian passageways used to access subway station entrances/exits in the immediate area, specifically to the R and W line's Cortlandt Street Station and the E line's WTC Station. At no time, however, would any area subway station be completely closed due to construction activities. A Maintenance and Protection of Traffic (MPT) plan, which would include pedestrian traffic, would be in place during the construction period. Otherwise, no construction-related impacts are anticipated for NYCT subway riders or operations.

Construction-related activity may also require the temporary relocation or closing of bus stops and/or layover locations in the vicinity of the WTC site as well as the closing, re-alignment or narrowing of sidewalks used to access some bus stops. Construction-related traffic may thus modestly impact bus operations in the immediate area.

Construction activity associated with the Preferred Alternative is not anticipated to impact ferry riders or operations.

OPENING YEAR (2009)

FUTURE COMMON TO ALL ALTERNATIVES

In addition to their planning for a Permanent WTC PATH Terminal, PANYNJ is planning to implement improvements elsewhere on the PATH system as described in Chapter 8, Section A, "PATH". In addition, other transit agencies are planning projects that will collectively improve access to, from, and within Lower Manhattan by the 2009 opening year. These current proposals are described below.

Fulton Street Transit Center

The Fulton Street Transit Center will rehabilitate, reconfigure, and enhance the multilevel complex of subway stations in the area of Fulton Street, Nassau Street, and Broadway, and will provide new connections to stations on Church Street. The project will improve platforms, mezzanines, and connecting corridors, and will provide a new central concourse with an above-grade presence. The facility has a below-grade concourse connection to NYCT's R and W station at Cortlandt Street and the Preferred Alternative's lower concourse. The Fulton Street Transit Center is projected for completion by 2009.

Cortlandt Street Station Reconstruction

MTA will reconstruct the Cortlandt Street Station on the 1 and 9 line, which has been closed since the terrorist attacks. It is expected that the Cortlandt Street Station will reopen in 2009.

South Ferry Terminal

The MTA will reconstruct the existing South Ferry Subway Station into a new terminal that will eliminate the physical and operational deficiencies of the existing station, improve reliability of 1/9 service along either line, and improve intermodal connectivity with other transit services in its vicinity. South Ferry is the southern terminus of the NYCT 1 and 9 subway lines, which serve the full length of the west side between South Ferry and 242nd Street in the Bronx. The South Ferry Terminal will consist of two levels: the lower level will contain two transit tracks serving a single-island platform, and the upper level will house the fare-control mezzanine and a connection to the Whitehall Street Station of the R and W subway lines. Construction on the project is anticipated to commence in 2005, with a completion in late 2007.

Hudson-Bergen Light Rail

In 2005, NJ Transit plans to open Minimum Operating Segment (MOS) 2 of the Hudson-Bergen Light Rail system. This segment will extend service from Hoboken Terminal to the Tonnelle Avenue Park-and-Ride in North Bergen, New Jersey. NJ Transit and FTA are also preparing an Environmental Impact Statement for MOS3 of the HBLR, which would extend service south in Bayonne from 22nd Street to 8th Street and north from Tonnelle Avenue to a terminus in Tenafly. It is anticipated that the MOS3 will be completed before 2025.

The HBLR has transfers to the PATH system at Hoboken and Exchange Place. As the expansions are completed, it is anticipated that some commuters would use HBLR and PATH for their travel to Lower Manhattan. It is expected that these commuters would primarily divert from private automobiles or from NJ Transit commuter rail and buses. As noted in Chapter 8, Section A, "PATH," the PATH ridership projections include these potential diversions.

NO ACTION ALTERNATIVE

If the Preferred Alternative is not constructed, it is expected that the temporary WTC PATH station presently operating would continue service in the opening year. Although its current transit connections would be retained, it is not expected that the temporary station would be directly linked to the reconstructed Cortlandt Street Station (1 and 9 line) or the completed Fulton Street Transit Center.

PREFERRED ALTERNATIVE

No impacts to transit riders or operations (subway, bus, or ferry) are expected once the Preferred Alternative is fully operational in 2009. The Preferred Alternative is not expected to induce PATH ridership beyond levels that would have occurred had the terrorist attacks not happened. Therefore, this alternative would not generate additional unforeseen ridership on NYCT subways, local or express bus service, NJ Transit commuter rail, or trans-Hudson ferries from transferring PATH riders.

The Preferred Alternative would provide greater passenger capacity than the temporary WTC PATH station currently in service, comparable to the former WTC PATH Terminal. This additional PATH capacity would serve to alleviate crowding on complementary transit services such as trans-Hudson ferry and bus service and downtown-bound subway service from Penn Station-New York.

The Preferred Alternative would provide weather-protected and ADA-compliant pedestrian connections between the PATH rail system, the NYCT subway system, and to area buildings, and would provide more convenient access to trans-Hudson ferries.

DESIGN YEAR (2025)

FUTURE COMMON TO ALL ALTERNATIVES

Transportation and transit infrastructure, in particular, are a key component of the redevelopment plans for Lower Manhattan. Several projects are currently being studied or planned that would improve existing facilities and would provide for new routes to serve the area. In addition to the projects described above for the construction period and the opening year as well as PATH system improvements shown in Chapter 8, Section A, "PATH" and above, two new facilities would be completed by 2025.

Second Avenue Subway

The Metropolitan Transportation Authority (MTA) plans to construct a new subway line along Manhattan's east side from 125th Street to Hanover Square. In the vicinity of the Project Site, the Second Avenue Subway would follow Water Street with a station located at Fulton Street. FTA issued a Record of Decision for the Second Avenue Subway in 2004.

JFK Airport Access

LMDC, MTA, PANYNJ, and the New York City Economic Development Corporation undertook a transportation study to identify a feasible rail link that will 1) serve Long Island commuters by creating a direct connection between Lower Manhattan and the Long Island Rail Road's Jamaica station, and 2) serve JFK airport passengers by improving the connection between Lower Manhattan and JFK International Airport. The study identified two leading

options: Constructing a New Tunnel across the East River, and utilizing the existing MTA-NYCT's Montague Tunnel which currently serves the M and R subway services. The proposed Lower Manhattan terminal for this rail service would be connected to the Fulton Street Transit Center and the Permanent WTC PATH Terminal. The rail access to JFK will be undertaken as a separate action from this project and will undergo an independent environmental review.

NO ACTION ALTERNATIVE

By 2025 under the No Action Alternative, the temporary WTC PATH station would close and service between New Jersey and Lower Manhattan would be suspended. Thus, WTC-bound PATH passengers would be diverted to other modes of travel. Given this worst case scenario, 153,632 projected weekday WTC PATH Terminal users in design year 2025 would divert to other modes of public transportation to access Lower Manhattan, and 27,551 passengers would divert during the AM peak hour. The majority of these commuters would require a more expensive and time-consuming commute, potentially involving additional transfers, than if the Preferred Alternative were operational. Table 8C-12 provides projected weekday and AM peak hour diversions for each available mode of public transportation for the year 2025.

Although current trans-Hudson buses and commuter vans are operating at or near capacity during peak hours, added capacity may be obtained through the purchase and operation of additional vehicles, as was noted above for the opening year condition. The impact of these additional buses and vans to the roadway network are described further in Chapter 8, Section B.

The passenger capacity of ferries may also be increased through the operation of additional boats or larger boats. Port infrastructure would likely need to be expanded to accommodate the demand for ferry services.

During the AM peak hour, the NYCT subway system would be required to serve over 11,000 added passengers. As discussed earlier in this section, the subway system contains available line-haul capacity to accommodate passengers transferring from NJ Transit commuter rail, PABT-bound buses, and Midtown Manhattan PATH passengers.

Table 8C-12
2025 No Action Alternative: Diversions to Public Transportation without the Permanent WTC PATH Terminal

Mode	Diverted Weekday Passenger Trips	Diverted AM Peak Hour Passenger Trips
Bus to Lower Manhattan	33,961	6,090
Bus to PABT / NYCT Subway	8,086	1,450
Commuter Railroad / NYCT Subway	29,109	5,220
Commuter Van	1,617	290
Ferry	56,601	10,150
Uptown PATH / NYCT Subway	24,258	4,350
Total	153,632	27,551

Notes: The "Diverted Weekday Passenger Trips" are considered conservative estimates since they are derived using the projected number of trips anticipated for the Permanent WTC PATH Terminal. Without this investment in public transportation infrastructure, the number of trips to Lower Manhattan from west-of-Hudson locations would be somewhat less.

The No Action Alternative, on the other hand, would severely impact NJ Transit commuter rail services. During the AM peak hour, the system would be required to accommodate an additional 5,220 passengers, in addition to the ridership growth that NJ Transit would have already experienced. Severe crowding during the AM and PM peak periods would be commonplace. Train throughput would also be impacted as trains would require longer dwell times for passengers to board and alight.

In addition, although upgrades are planned for the Ninth Street PATH station, it will not have adequate capacity to support general system growth if the Preferred Alternative is not constructed.

PREFERRED ALTERNATIVE

No impacts to transit riders or operations (subway, bus, or ferry) are expected in the design year. The Preferred Alternative is not expected to induce PATH ridership beyond levels that would have occurred had the terrorist attacks not happened. Therefore, this alternative would not generate additional unforeseen ridership on NYCT subways, local or express bus service, NJ Transit commuter rail, or trans-Hudson ferries from transferring PATH riders.

The Preferred Alternative would provide greater passenger capacity than the temporary WTC PATH station currently in service, comparable to the former WTC PATH Terminal. This additional PATH capacity would serve to alleviate crowding on complementary transit services such as trans-Hudson ferry and bus service and downtown-bound subway service from Penn Station-New York.

The Preferred Alternative would provide weather-protected and ADA-compliant pedestrian connections between the PATH rail system, the NYCT subway system, and to area buildings, and would provide more convenient access to trans-Hudson ferries.

E. MITIGATION

The Preferred Alternative would not adversely impact the operation of other transit service to, from, and within Lower Manhattan. Since the Preferred Alternative would provide for enhanced PATH service and improved connectivity to other modes, any impacts to transit service would be beneficial. Thus, mitigation is not required. ✷

A. INTRODUCTION

This section describes on-street pedestrian conditions in the vicinity of the World Trade Center (WTC) site to identify whether the Permanent WTC PATH Terminal would adversely impact conditions in the area. The analyses that follow provide an overview of existing conditions, both before and after September 11, 2001, in order to establish a baseline from which future conditions are developed and can be compared. Pre-September 11, 2001 volumes were used to evaluate opening year (2009) and design year (2025) impacts. Conditions during the construction period (2006) are estimated based on current (post-September 11, 2001) activities.

The analyses focus on a pedestrian study area and representative intersections at which increases in congestion could occur as a result of the Terminal's construction or relocated on-street access points differing from the pre-September 11, 2001 WTC PATH Terminal. The Preferred Alternative includes improved pedestrian access for Lower Manhattan with connections to the World Financial Center and the Dey Street concourse, which would be constructed by the Metropolitan Transportation Authority (MTA) as part of the Fulton Street Transit Center.

The No Action and Preferred Alternatives, as evaluated in this Environmental Impact Statement (EIS), account for the numerous development projects planned for Lower Manhattan, including the World Trade Center Memorial and Redevelopment Plan, Washington Street Urban Renewal Area, Battery Park City, and other residential and commercial projects. With the exception of the World Trade Center Memorial and Redevelopment Plan, these projects were planned prior to September 11, 2001, and they were expected to generate new demand for PATH service. Projections of PATH ridership in the opening year (2009) and design year (2025) account for these planned developments, which would occur with or without the Preferred Alternative. Thus, the Preferred Alternative would not directly induce new PATH riders, exceeding levels that would have been experienced had the terrorist attacks not occurred. However, the analyses contained in this section indicate that some crosswalks are adversely impacted in the study area. These impacts are partially the result of increased activity from projects independent of the Preferred Alternative, such as the Memorial, a Performing Arts Center, and cultural facilities on the WTC site, as well as from repositioned access points to the Preferred Alternative. The impacts can be mitigated by widening crosswalks.

Per the analysis framework prepared for the Lower Manhattan recovery projects, the Preferred Alternative's potential impacts on pedestrian conditions is based on two baseline conditions. The first is a pre-September 11, 2001 baseline, which is used to evaluate project-generated impacts in the opening and design years. The pre-September 11, 2001 baseline is applied under the assumption that much of the activity in Lower Manhattan lost to the terrorist attacks would be restored by 2009. For the short-term construction-period analysis, the project's effects are compared to a baseline network that reflects 2003 conditions. This chapter describes potential impacts resulting only from the construction of the Preferred Alternative. The cumulative construction-period effects of PATH and the other Lower Manhattan recovery projects are

presented in Chapter 15, "Cumulative Effects." Given that the opening and design years analyses presented in this chapter assume a baseline condition that included the pre-September 11, 2001 WTC and PATH terminal, the build condition includes the other Lower Manhattan recovery projects. As such, the 2009 and 2025 analyses are essentially a cumulative impacts assessment for the recovery projects. However, in order to discern the relative effect of the new PATH Terminal, this chapter identifies the percentage of the impact attributed to changes in the on-street circulation of PATH riders. For those locations at which 50 percent or more of the new pedestrian volumes would be PATH riders, project-generated impacts are identified and mitigation measures are proposed.

B. METHODOLOGY

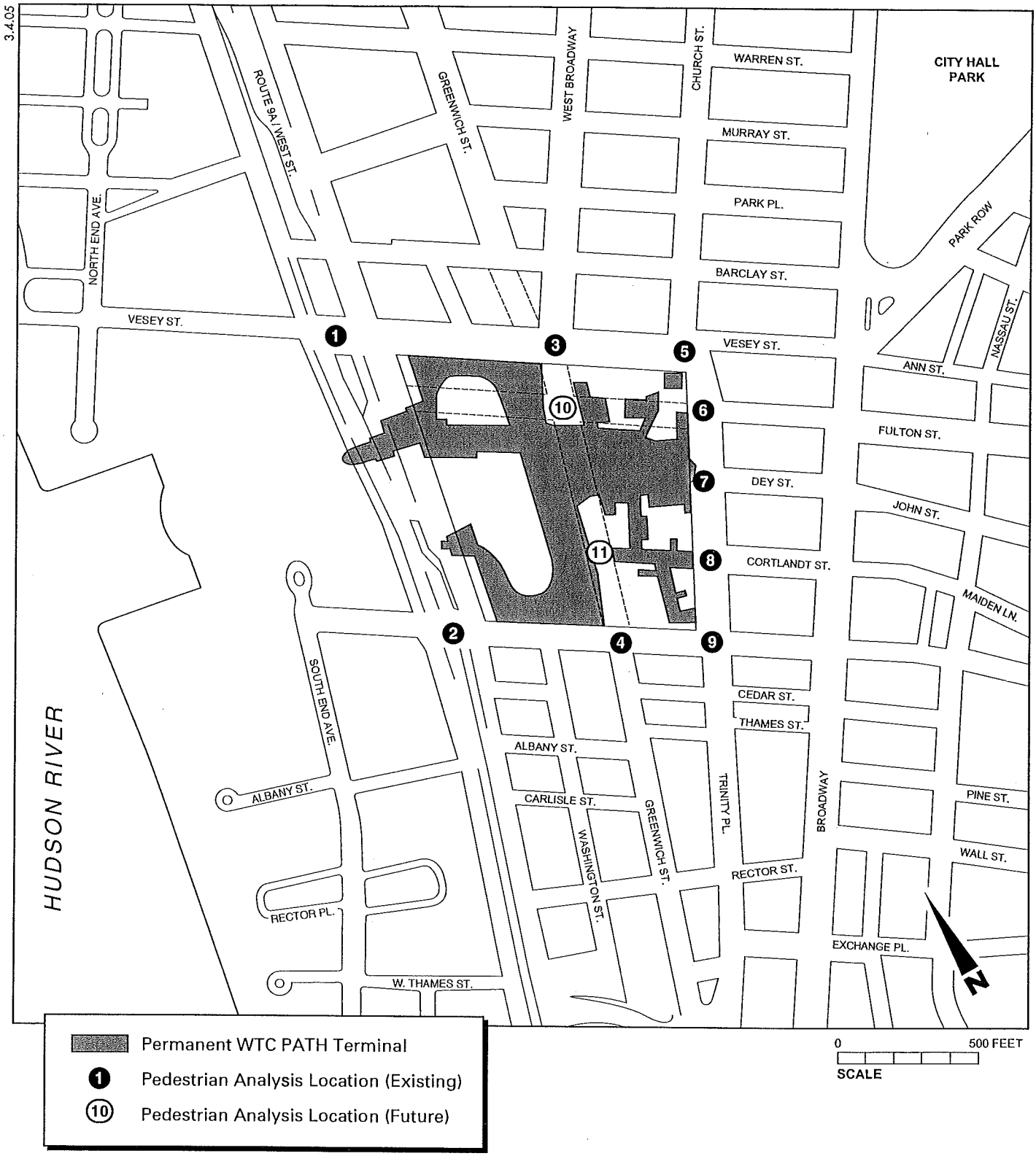
The pedestrian study area, illustrated in Figure 8D-1, includes the intersections that would most likely be used by future PATH patrons. These intersections include:

- Route 9A (West Street) at Vesey Street (north, south and east crosswalks);
- Route 9A (West Street) at Liberty Street (north, south and east crosswalks);
- West Broadway at Vesey Street (all crosswalks);
- Greenwich Street at Fulton Street (all crosswalks at new intersection);
- Greenwich Street at Cortlandt Street (new midblock crosswalk);
- Greenwich Street at Liberty Street (all crosswalks);
- Church Street at Vesey Street (all crosswalks);
- Church Street at Fulton Street (all crosswalks);
- Church Street at Dey Street (all crosswalks);
- Church Street at Cortlandt Street (all crosswalks); and
- Church Street at Liberty Street (all crosswalks and northwest corner reservoir).

To evaluate potential impacts during the construction period, the analyses compare pedestrian conditions with and without the Preferred Alternative in 2006. On-street pedestrian volumes in the construction period include pedestrian counts following September 11, 2001, projected temporary WTC PATH station riders, and growth in the period following September 11, 2001. Pedestrian network geometries were collected after September 11, 2001 and the latest Lower Manhattan construction staging plans were reviewed to model the analyses.

To evaluate potential impacts of the Preferred Alternative during the design year, projected future conditions are compared to on-street pedestrian conditions before September 11, 2001, the equivalent condition had the terrorist attacks not occurred. As described above, no new PATH ridership would be induced by the Preferred Alternative, but possible changes in pedestrian access patterns for new entry points may create differences in crosswalk flows.

Pedestrian volumes for pre-September 11, 2001 conditions were increased by 0.5 percent per year for comparison purposes. This rate is commonly applied to estimate background growth for development projects in Manhattan per methodologies specified in the *New York City Environmental Quality Review (CEQR) Technical Manual* (December 2001). Current volumes of on-street pedestrians are based on counts collected following September 11, 2001. Based on these survey data, three peak hours were selected for analysis: AM (8:15 AM to 9:15 AM), midday (12 PM to 1 PM) and PM (5 PM to 6 PM). Pedestrian volume networks were calculated as a joint effort between the Port Authority of New York and New Jersey (PANYNJ) for this EIS, and the Metropolitan Transportation Authority (MTA), New York State Department of



PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 8D-1
Pedestrian Analysis Locations

Transportation (NYSDOT), and Lower Manhattan Development Corporation (LMDC) for their respective EISs to ensure consistency between these closely related projects.

The pedestrian level of service analyses were based on *2000 Highway Capacity Manual (HCM)* procedures, conducted for crosswalk and corner reservoir levels of service at key intersections that could be affected by the Preferred Alternative.

Crosswalks and street corner conditions are influenced by the effects of traffic signals. Street corners must be able to provide sufficient space for a mix of standing pedestrians (queued to cross a street) and circulating pedestrians (crossing the other street or moving around the corner). The *HCM* applies a measure of time and space availability based on the area of the corner, signal timings, and the space used by circulating pedestrians. The total "time-space" available for these activities is the net area of the corner (in square feet) multiplied by the signal cycle length and expressed as square feet-minutes. The analysis then determines the total circulation time for all pedestrian movements at the corner (expressed as pedestrian-minutes). The ratio of net circulation time-space divided by total pedestrian circulation time provides the level of service measurement of square feet per pedestrian.

Crosswalk level of service is also a function of time and space. Similar to corner analyses, crosswalk conditions are expressed as a measurement of the area available (the crosswalk width multiplied by the width of the street) and the signal timing, which is expressed as square feet-minutes. The average time required for a pedestrian to cross the street is calculated based on the width of the street and an assumed walking speed. As per guidance in the *CEQR Technical Manual*, a walking speed of 4 feet per second is commonly used for projects in New York City. The ratio of average crossing time to the time-space available in the crosswalk is the level of service measurement of available square feet per pedestrian. Additionally, in the first seconds of the "walk" cycle, the pedestrians queued to cross the street create a surge effect as they begin to cross. Therefore, the crosswalk level of service analysis incorporates a factor for this "surge" to estimate worst-case conditions. The level of service analysis also accounts for vehicular turning movements that pass through the crosswalk. Table 8D-1 summarizes level of service definitions for crosswalks and corner reservoirs.

For Manhattan, levels of service (LOS) A through D reflect acceptable conditions, while LOS E and F reflect congested conditions (*CEQR Technical Manual*, December 2001).

Off-street pedestrian flows were calculated by the PANYNJ Traffic Engineering Department to design the underground concourses of the Preferred Alternative. It is assumed that these concourses would be designed to process pedestrians at acceptable levels of service, and are therefore not analyzed in this EIS. Absent the Preferred Alternative, the WTC Memorial and Redevelopment would design a pedestrian network with sufficient capacity for pedestrians using the WTC site.

C. DESCRIPTION OF THE AFFECTED ENVIRONMENT

PRE-SEPTEMBER 11, 2001 BASELINE CONDITIONS

Prior to September 11, 2001, the pedestrian crossing network functioned at acceptable levels of service, with the exception of the Church Street intersections at Vesey, Fulton, Dey, Cortlandt, and Liberty Streets. These locations contained one or more crosswalks that operated at LOS E or

Table 8D-1
Pedestrian Level of Service Definitions

LOS	Circulation Area (Square Feet per Pedestrian)	Description
A	130+	Pedestrians move in desired paths without altering their movements in response to other pedestrians. Walking speeds are freely selected and conflicts between pedestrians are unlikely.
B	40-129	Sufficient area is provided to allow pedestrians to freely select walking speeds, to bypass other pedestrians and to avoid crossing conflicts with others. At this level, pedestrians begin to be aware of other pedestrians and to respond to their presence in the selection of their walking path.
C	24-39	Sufficient space is available to select normal walking speeds and to bypass other pedestrians in primarily unidirectional streams. Where reverse-direction or crossing movements exist, minor conflicts will occur and speeds and volume will be somewhat lower.
D	15-23	Freedom to select individual walking speed and to bypass other pedestrians is restricted. Where crossing reverse-flow movements exist, the probability of conflict is high and its avoidance requires frequent changes in speed and position. The level of service provides reasonably fluid flow; however, considerable friction and interaction between pedestrians is likely to occur.
E	6-14	Virtually all pedestrians would have their normal walking speed restricted, requiring frequent adjustment of gait. At the lower range of this level of service, forward movement is possible only by shuffling. Insufficient space is provided for passing of slower pedestrians. Cross- or reverse-flow movements are possible only with extreme difficulties. Design volumes approach the limit of walkway capacity, with resulting stoppages and interruptions in flow.
F	0-5	All walking speeds are severely restricted and forward progress is made only by shuffling. There is frequent, unavoidable contact with other pedestrians. Cross- and reverse-flow movements are virtually impossible. Flow is sporadic and unstable. Space is more characteristic of queued pedestrians than of moving pedestrians.

Source: Transportation Research Board, *2000 Highway Capacity Manual.*

F, according to analyses performed for the Fulton Street Transit Center and World Trade Center Memorial and Redevelopment Plan EISs. Table 8D-2 summarizes the results of the pre-September 11, 2001 conditions.

The east crosswalk at the intersection of Church at Vesey Streets operated at LOS E in the midday peak hour and the west crosswalk operated at LOS E in the AM, midday, and PM peak hours. The east crosswalk at the intersection of Church at Fulton Streets operated at LOS E in the AM, midday and PM peak hours, and the south crosswalk operated at LOS E in the AM and PM peak hours. The east crosswalk at the intersection of Church and Dey Streets operated at LOS E in the AM, midday and PM peak hours, and the north and south crosswalks operated at LOS E in the PM peak hour. The east crosswalk at the intersection of Church and Cortlandt Streets operated at LOS E in the midday and PM peak hours. The north crosswalk at Church and Liberty Streets operated at LOS E in the AM and PM peak hours, the south crosswalk operated at LOS F in the AM peak hour, and the west intersection operated at LOS F in the AM peak hour and LOS E in the PM peak hour. Heavy commuter, tourist, and

Table 8D-2
Pre-September 11, 2001 Pedestrian Level of Service

Location	AM Peak Hour	Midday Peak Hour	PM Peak Hour
Route 9A (West Street) at Vesey Street (1)			
North Crosswalk	A	A	A
East Crosswalk	N/A	N/A	N/A
South Crosswalk	A	A	A
Route 9A (West Street) at Liberty Street (2)			
North Crosswalk	B	B	B
East Crosswalk	N/A	N/A	N/A
South Crosswalk	A	A	A
West Broadway at Vesey Street (3)			
North Crosswalk	N/A	N/A	N/A
East Crosswalk	C	C	C
West Crosswalk	B	B	B
Greenwich Street at Liberty Street (4)			
East Crosswalk	D	D	C
South Crosswalk	N/A	N/A	N/A
West Crosswalk	B	B	B
Church Street at Vesey Street (5)			
North Crosswalk	B	C	B
East Crosswalk	D	E	D
South Crosswalk	C	C	C
West Crosswalk	E	E	E
Church Street at Fulton Street (6)			
North Crosswalk	C	C	B
East Crosswalk	E	E	E
South Crosswalk	E	D	E
Church Street at Dey Street (7)			
North Crosswalk	D	C	E
East Crosswalk	E	E	E
South Crosswalk	D	C	E
Church Street at Cortlandt Street (8)			
North Crosswalk	B	C	B
East Crosswalk	C	E	E
South Crosswalk	C	D	C
Church Street at Liberty Street (9)			
North Crosswalk	E	D	E
East Crosswalk	B	B	C
South Crosswalk	F	C	D
West Crosswalk	F	D	E
Northwest Corner	N/A	N/A	N/A

Note: Refer to Figure 8D-1 for location numbers.

shopping traffic between the WTC site and points east of Church Street contributed to these conditions. Other crosswalks along Vesey and Liberty Streets operated with acceptable levels of service.

CHANGES IN THE AFFECTED ENVIRONMENT SINCE SEPTEMBER 11, 2001

Following September 11, 2001, the pedestrian network functioned at acceptable levels of service due to the substantially reduced pedestrian activity due to the absence of the WTC and the pre-September 11, 2001 WTC PATH Terminal, with the exception of the Church Street intersections at Vesey and Fulton Streets. These locations contained one or more crosswalks that operated at LOS E. The events of September 11, 2001, which destroyed the WTC PATH facility, resulted in a major shift in transit mode from New Jersey to Lower Manhattan. This demand was temporarily filled between September 12, 2001 and November 22, 2003 by increased ferry ridership to Lower Manhattan, increased PATH ridership to 33rd Street, Christopher Street, and 9th Street Stations with transfers to subways, and increased NJ Transit ridership with transfers to subways. Table 8D-3 summarizes the LOS analysis for conditions since September 11, 2001.

The west crosswalk at the intersection of Church and Vesey Streets experienced LOS E in the PM peak hour, and the east crosswalk at the intersection of Church and Fulton Streets experienced LOS E in the PM peak hour. Other crosswalks along Church, Vesey, and Liberty Streets operated at acceptable levels of service. Tourist, shopper, and business interaction between the temporary WTC site viewing area on Church Street and primary office and subway destinations to the east of Church Street contributed to these conditions.

The temporary WTC PATH station restored service to Lower Manhattan on November 23, 2003. Because pedestrian surveys for the post-September 11, 2001 conditions were conducted prior to the opening of the temporary WTC PATH station, trips directly associated with the facility are not reflected in the analysis results shown in Table 8D-3. However, future conditions in the 2006 construction period have been adjusted to account for trips to and from the temporary station.

The Route 9A pedestrian overpass at Liberty Street (formerly known as South Bridge) was destroyed on September 11, 2001 and reconstructed in approximately the same location. The Liberty Street overpass was reconstructed prior to pedestrian counts and observations conducted in 2003. The former North Bridge spanning Route 9A, which was located south of 3 World Financial Center at the Winter Garden, was also destroyed on September 11, 2001. However, the replacement pedestrian bridge was reconstructed north of 3 World Financial Center and south of Vesey Street in November 2003, after pedestrian counts and observations were conducted. Pedestrian conditions crossing Route 9A in the period following September 11, 2001 were analyzed under November 2003 conditions, which included pedestrian overpasses at Liberty and Vesey Streets, but did not include temporary WTC PATH station trips. According to observations, pedestrian levels of service at the overpasses were acceptable in the post-September 11, 2001 conditions, and included lower volumes than pre-September 11, 2001 conditions. Pedestrian volumes are shown in Appendix C.

Table 8D-3
Post-September 11, 2001 Pedestrian Level of Service

Location	AM Peak Hour	Midday Peak Hour	PM Peak Hour
Route 9A (West Street) at Vesey Street (1)			
North Crosswalk	C	B	C
East Crosswalk	N/A	N/A	N/A
South Crosswalk	A	A	A
Route 9A (West Street) at Liberty Street (2)			
North Crosswalk	Out of service for other construction; pedestrians diverted to overpass		
East Crosswalk			
South Crosswalk			
West Broadway at Vesey Street (3)			
North Crosswalk	Out of service for other construction; pedestrians diverted to walkway		
East Crosswalk			
West Crosswalk			
Greenwich Street at Liberty Street (4)			
East Crosswalk	Out of service for other construction; pedestrians diverted to walkway		
South Crosswalk			
West Crosswalk			
Church Street at Vesey Street (5)			
North Crosswalk	B	B	B
East Crosswalk	C	D	C
South Crosswalk	B	B	B
West Crosswalk	D	D	E
Church Street at Fulton Street (6)			
North Crosswalk	A	A	A
East Crosswalk	D	D	E
South Crosswalk	A	A	A
Church Street at Dey Street (7)			
North Crosswalk	A	A	B
East Crosswalk	C	D	D
South Crosswalk	B	B	B
Church Street at Cortlandt Street (8)			
North Crosswalk	A	B	B
East Crosswalk	B	D	D
South Crosswalk	B	B	B
Church Street at Liberty Street (9)			
North Crosswalk	B	B	C
East Crosswalk	A	B	B
South Crosswalk	B	B	B
West Crosswalk	B	C	B
Northwest Corner	N/A	N/A	N/A

Note: Refer to Figure 8D-1 for location numbers.

D. PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

CONSTRUCTION PERIOD (2006)

FUTURE COMMON TO ALL ALTERNATIVES

Pedestrian trips in the study area are expected to increase as commercial and residential projects are opened and as currently vacated buildings are reoccupied in the vicinity of the WTC site. Table 8D-4 summarizes pedestrian levels of service for the 2006 baseline conditions. (It should be noted that the baseline conditions include the trips to and from the temporary WTC PATH station, since it would be maintained in 2006.)

The east crosswalk at Church and Fulton Streets would operate at LOS E in the PM peak hour; this pedestrian movement experienced LOS E conditions following September 11, 2001, as discussed above. The west crosswalk at Church and Vesey Streets would operate at LOS F in the AM and PM peak hours, primarily due to the large volume of temporary WTC PATH station pedestrians accessing the Vesey Street bridge over Route 9A. The intersection of Church Street at Liberty Street would experience LOS E in the north crosswalk in the AM and PM peak hours, and LOS F and E in the west crosswalk in the AM and PM peak hours, respectively. These poor levels of service would result from temporary WTC PATH station pedestrians, who would originate from and be destined for points south and east of the WTC. They would primarily use the north crosswalk to go to or come from the east, and would use the west crosswalk to go to or come from the south. All other crosswalks would operate at acceptable levels of service.

The Route 9A pedestrian overpasses at Vesey and Liberty Streets, reconstructed after September 11, 2001, would be maintained throughout the construction period. The pedestrian overpasses would process additional pedestrian volumes due to temporary WTC PATH station trips and growth since the 2003 pedestrian counts.

NO ACTION ALTERNATIVE

The No Action Alternative would not result in construction of a Permanent WTC PATH Terminal. Thus, pedestrian operations in the study area would be unchanged from the baseline conditions presented in Table 8D-4.

PREFERRED ALTERNATIVE

During the construction period, pedestrian conditions would be nearly identical to those previously described for the No Action Alternative. Because construction of the Preferred Alternative would maintain pedestrian patterns from conditions following September 11, 2001, major shifts in pedestrian patterns would not be expected. Also, the construction activities would maintain access to NYCT subways and the temporary WTC PATH station.

The east side of the Route 9A (West Street) sidewalk would stay closed between Liberty and Vesey Streets during Route 9A reconstruction. Meanwhile, free-flow pedestrian walkways would be maintained on Liberty and Vesey Streets between the Route 9A pedestrian overpasses and Church Street during PATH/WTC construction. The width of the sidewalk on the west side of Church Street would be maintained to at least ten feet, while the area between Liberty and Vesey Streets would be for equipment storage and staging.

Table 8D-4
2006 Construction Period Baseline Pedestrian Level of Service

Location	AM Peak Hour	Midday Peak Hour	PM Peak Hour
Route 9A (West Street) at Vesey Street (1)			
North Crosswalk	Out of service for other construction; pedestrians diverted to overpass		
East Crosswalk			
South Crosswalk			
Route 9A (West Street) at Liberty Street (2)			
North Crosswalk	Out of service for other construction; pedestrians diverted to overpass		
East Crosswalk			
South Crosswalk			
West Broadway at Vesey Street (3)			
North Crosswalk	Out of service for other construction; pedestrians diverted to walkway		
East Crosswalk			
West Crosswalk			
Greenwich Street at Liberty Street (4)			
East Crosswalk	Out of service for other construction; pedestrians diverted to walkway		
South Crosswalk			
West Crosswalk			
Church Street at Vesey Street (5)			
North Crosswalk	B	B	B
East Crosswalk	C	C	C
South Crosswalk	C	B	D
West Crosswalk	F	D	F
Church Street at Fulton Street (6)			
North Crosswalk	B	B	B
East Crosswalk	D	D	E
South Crosswalk	D	D	C
Church Street at Dey Street (7)			
North Crosswalk	B	A	B
East Crosswalk	C	D	D
South Crosswalk	D	C	D
Church Street at Cortlandt Street (8)			
North Crosswalk	B	B	B
East Crosswalk	B	C	C
South Crosswalk	B	C	B
Church Street at Liberty Street (9)			
North Crosswalk	E	C	E
East Crosswalk	C	B	D
South Crosswalk	C	B	B
West Crosswalk	F	C	E
Northwest Corner	N/A	N/A	N/A

Note: Refer to Figure 8D-1 for location numbers.

Currently, because of construction-related street closures at the WTC site, the West Broadway/Vesey Street and Greenwich Street/Liberty Street intersections do not have any conflict points with pedestrians. These pedestrians, similar to current conditions, would be diverted onto walkways to or from the Vesey and Liberty Street overpasses at Route 9A, separating them from construction activities and, therefore, conflicting vehicles or pedestrian traffic signals.

It has been assumed that during construction there would be limited at-grade pedestrian crossings of Route 9A at Vesey or Liberty Street (most likely construction workers), and the majority of pedestrian crossings would be made using the two pedestrian overpasses crossing Route 9A. These overpasses at Vesey and Liberty Streets, reconstructed after September 11, 2001, would be maintained throughout the construction period. They would process nearly identical pedestrian volumes when compared to conditions without the Preferred Alternative, and would operate at improved levels of service when compared to pre-September 11, 2001 conditions.

As described in Chapter 17, "Safety and Security," PANYNJ would implement measures to protect pedestrians, including temporary WTC PATH riders, during the construction period.

OPENING YEAR (2009)

FUTURE COMMON TO ALL ALTERNATIVES

As private development occurs on and near the WTC site, pedestrian activity in the study area will increase. Furthermore, the opening of a memorial and cultural facilities at the WTC site will attract visitors to the area during all periods of the day. These pedestrians will increase the demand for on-street facilities on and near the proposed Project Site.

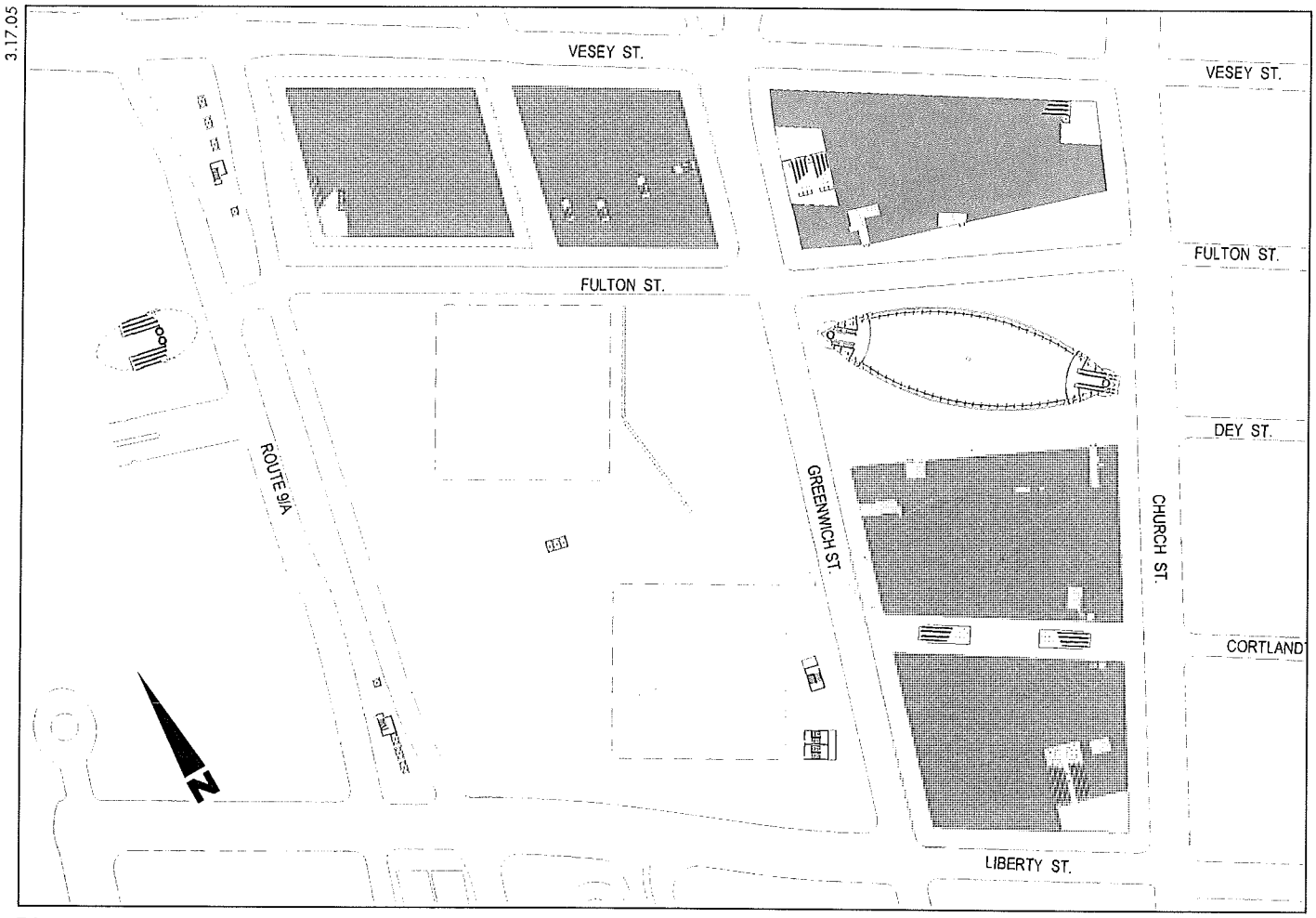
NO ACTION ALTERNATIVE

Absent the Preferred Alternative, it is expected that the temporary WTC PATH station would continue to maintain service to the extent possible. However, as stated in Chapter 8, "PATH", Section A, increasing passenger volumes anticipated over time would place severe operating constraints on the temporary WTC PATH and projected WTC-bound PATH, passengers would be diverted to other modes of travel. Furthermore, on-street pedestrian circulation in the area would increase in the opening year with the completion of elements of LMDC's World Trade Center Memorial and Redevelopment Plan (Freedom Tower, retail and restaurants, Performing Arts Center, Memorial, and cultural land uses), and would likely exceed levels measured before September 11, 2001

PREFERRED ALTERNATIVE

The Preferred Alternative would have nine access points to the street and WTC concourse. Eight access points would be available within the WTC site and there would be an access point through a concourse connecting the WTC site with the World Financial Center via a pedestrian tunnel below Route 9A (see Figure 8D-2).

Hourly pedestrian volumes under the Preferred Alternative are illustrated in Appendix C. Complete pedestrian volume maps are included in the Technical Appendix. Table 8D-5 summarizes the projected future conditions in the opening year if the events of September 11, 2001 had not taken place and compares them to conditions under the Preferred Alternative.



Plan

Figure 8D-2
Street-Level Access

Table 8D-5
2009 Opening Year Preferred Alternative:
Pedestrian Level of Service

Location	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
	Pre-9/11 Baseline	Preferred Alternative	Pre-9/11 Baseline	Preferred Alternative	Pre-9/11 Baseline	Preferred Alternative
Route 9A at Vesey Street (1)						
North Crosswalk	A	C	A	C	A	C
East Crosswalk	N/A	B	N/A	E	N/A	B
South Crosswalk	A	A	A	B	A	A
Route 9A at Liberty Street (2)						
North Crosswalk	C	A	B	A	C	A
East Crosswalk	N/A	A	N/A	B	N/A	A
South Crosswalk	B	C	A	C	B	D
West Broadway at Vesey Street (3)						
North Crosswalk	N/A	E	N/A	E	N/A	E
East Crosswalk	C	D	C	D	C	D
South Crosswalk	N/A	D	N/A	E	N/A	D
West Crosswalk	B	D	B	E	B	E
Greenwich Street at Fulton Street (10)						
North Crosswalk	N/A	C	N/A	E	N/A	D
East Crosswalk	N/A	D	N/A	D	N/A	C
South Crosswalk	N/A	C	N/A	C	N/A	D
West Crosswalk	N/A	E	N/A	E	N/A	E
Greenwich Street Midblock (11)						
North Crosswalk	N/A	B	N/A	B	N/A	B
Greenwich Street at Liberty Street (4)						
North Crosswalk	N/A	A	N/A	B	N/A	A
East Crosswalk	B	B	A	C	A	B
South Crosswalk	N/A	D	N/A	D	N/A	D
West Crosswalk	A	D	A	E	A	C
Church Street at Vesey Street (5)						
North Crosswalk	B	D	C	C	B	D
East Crosswalk	D	E	E	E	D	E
South Crosswalk	C	D	C	D	D	D
West Crosswalk	E	D	E	D	E	E
Church Street at Fulton Street (6)						
North Crosswalk	C	B	C	C	C	B
East Crosswalk	E	D	E	D	E	E
South Crosswalk	E	B	E	C	E	C
West Crosswalk	N/A	C	N/A	D	N/A	B

Table 8D-5 (cont'd)
2009 Opening Year Preferred Alternative:
Pedestrian Level of Service

Location	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
	Pre-9/11 Baseline	Preferred Alternative	Pre-9/11 Baseline	Preferred Alternative	Pre-9/11 Baseline	Preferred Alternative
Church Street at Dey Street (7)						
North Crosswalk	E	B	D	B	E	B
East Crosswalk	D	C	E	C	E	C
South Crosswalk	E	B	E	C	E	C
Church Street at Cortlandt Street (8)						
North Crosswalk	B	C	C	D	B	D
East Crosswalk	B	B	E	D	D	D
South Crosswalk	C	B	E	B	C	B
Church Street at Liberty Street (9)						
North Crosswalk	E	E	E	C	F	E
East Crosswalk	B	C	B	B	C	C
South Crosswalk	E	D	B	B	D	C
West Crosswalk	F	E	D	C	E	E
Northwest Corner	F	E	E	B	F	C

Note: Refer to Figure 8D-1 for location numbers.

The proposed site plan for the WTC complex would extend Fulton Street westward from Church Street to Route 9A and extend Greenwich Street between Vesey and Liberty Streets, which would create additional pedestrian crossing areas at the Fulton Street intersections at Route 9A, Greenwich Street, and Church Street; the Greenwich Street intersections at Vesey Street/West Broadway; and at Cortlandt Street's extension from Church Street. These new crossings have been analyzed, with the exception of the Fulton Street at Route 9A intersection because of the proximity of the World Financial Center pedestrian concourse crossing under Route 9A, which is estimated to carry nearly all of Route 9A-crossing PATH riders.

The redevelopment of the WTC and the future memorial are expected to generate increased pedestrian circulation within the WTC and in crosswalks on Vesey, Church, and Liberty Streets. The redevelopment adds land uses such as a memorial, cultural facilities, retail, and a performing arts center, that were not included in the pre-September 11, 2001 program, which results in higher trip generation and pedestrian volumes.

The Preferred Alternative includes the WTC Memorial and Redevelopment Program in its background pedestrian volumes. The Preferred Alternative conditions were compared to the pre-September 11, 2001 projected future conditions, which included the WTC complex. Because the pre-September 11, 2001 WTC complex included fewer pedestrian volumes and less on-street circulation between land uses than the proposed WTC Memorial and Redevelopment Plan, the cumulative pedestrian volumes calculated for the build condition would be higher in many places than pre-September 11, 2001 projected future conditions. However, the on-street pedestrian trips to and from the Preferred Alternative would be lower than the pre-September 11, 2001 projected future conditions crossing Route 9A because of an improved connection to the World Financial Center. Pedestrian trips would also be higher at Vesey Street and West Broadway because of the destruction of the 7 WTC pedestrian overpass. Because of the unequal number of background trips generated by the pre-September 11, 2001 WTC complex and the proposed WTC Memorial and Redevelopment, it

was difficult to determine the impacts of the Preferred Alternative. Therefore, a different methodology for determining adverse impacts was employed.

The analyses below summarize pedestrian conditions by intersection, and identify crosswalks operating at unacceptable LOS E or F. The summaries identify whether these levels of service result from WTC Memorial and Redevelopment Plan background volumes or from the Preferred Alternative by assigning a percentage share of trips to the latter. Calculating this share of trips is achieved by dividing the number of trips to and from the Terminal by the total number of pedestrians crossing. In the summaries below, an adverse impact is defined as a location operating at LOS E or F, at which 50 percent or more of the total volume is associated with the Preferred Alternative.

Route 9A and Vesey Street

The Route 9A/Vesey Street east crosswalk would operate at LOS E during the midday peak hour. AM and PM peak hour levels of service would be acceptable. During the midday peak hour, PATH ridership is low while WTC shopping, tourism, and employee trip generation and circulation is high, so midday LOS E conditions are most likely not a result of PATH trips.

Route 9A and Liberty Street

The Route 9A/Liberty Street intersection would experience improved levels of service, most likely a benefit of the World Financial Center connection, which would improve access to Battery Park City for residents and the World Financial Center for commuters and shoppers.

West Broadway and Vesey Street

Before September 11, 2001, this intersection operated at acceptable levels of service because of the pedestrian overpass spanning Vesey Street west of West Broadway, which connected 6 and 7 WTC. In the opening year, the West Broadway/Vesey Street intersection would operate at LOS D and E during all peak hours because street crossings must be made at grade. Approximately 10 to 15 percent of these AM peak hour trips are project-generated. Thus, based on the impact criteria described above, this project would not require mitigation at this location.

Greenwich Street and Fulton Street

Several of the new Greenwich Street/Fulton Street crosswalks would operate at LOS E during specific peak hours, as described in Table 8D-5. Entrances to the WTC Memorial and cultural land uses, Performing Arts Center, Tower 2, and Wedge of Light Plaza are located adjacent to this intersection. There would be heavy on-street pedestrian flows between these uses and public transportation access on the south side of Fulton Street, such as subways and the Preferred Alternative. It is estimated that the share of the Preferred Alternative trips to 7 WTC and points north of Vesey Street would be approximately 20 to 30 percent. Thus, based on the impact criteria described above, this project would not require mitigation at this location.

Greenwich Street Midblock and Cortlandt Street

The new Greenwich Street midblock pedestrian crossing at Cortlandt Street would operate at acceptable levels of service during all peak hours. Project-generated trips using this crosswalk destined for the WTC Memorial, Tower 5, and points south of Liberty Street would be able to cross Greenwich Street using the pedestrian-only phase.

Greenwich Street and Liberty Street

The Greenwich Street/Liberty Street west crosswalk would operate at LOS E during the midday peak hour. During the midday peak hour, PATH ridership is low while WTC shopping, tourism, and employee trip generation and circulation is high, so midday LOS E conditions are most likely not a result of PATH trips.

Church Street and Vesey Street

The Church Street/Vesey Street east crosswalk would operate at LOS E during all peak hours, and the west crosswalk would operate at LOS E during the PM peak hour. These levels of service are generally similar to pre-September 11, 2001 projected future conditions, or worsened from LOS D to E. It is estimated that the share of project-generated trips to points north of Vesey and east of Church Streets would be approximately 15 to 25 percent. Thus, based on the impact criteria described above, this project would not require mitigation at this location.

Church Street and Fulton Street

The Dey Street connection between the WTC site and the Fulton Street Transit Center would be operational in the 2009 Opening Year. As a result, pedestrians would be diverted from the east-west crossings at the intersection of Fulton and Church Streets, and the intersection would experience an improved level-of-service as compared to pre-September 11, 2001 conditions.

Church Street and Dey Street

As noted above, the Dey Street connection between the WTC site and the Fulton Street Transit Center would be operational in the 2009 Opening Year. The new concourse would divert pedestrians from the east-west crossings at the intersection of Dey and Church Streets, and the intersection would experience an improved level-of-service as compared to pre-September 11, 2001 conditions.

Church Street and Cortlandt Street

The Dey Street connection would also divert pedestrians from the east-west crossings at the intersection of Cortlandt and Church Streets, and the intersection would experience an improved level-of-service as compared to pre-September 11, 2001 conditions.

Church Street and Liberty Street

For access to the Financial District, pedestrians would use Permanent WTC PATH Terminal exits in the vicinity of WTC Towers 3 and 4, and cross Church and Liberty Streets at street level. Based on surveys conducted before September 11, 2001, it is anticipated that 40 percent of alighting AM peak hour PATH trips are destined for the Financial District.

In the AM, midday and PM peak hours, approximately 4,070, 70, and 1,890 new trips would be added to the totals of 5,840, 3,170 and 5,110 trips, respectively, resulting in increases of up to 70 percent.

The loss in area per person would range from 1 to 17 SFP in the crosswalks, and from 2.8 to 17.7 in the northwest corner reservoir. The northwest corner reservoir LOS F in the AM peak hour would congest pedestrian flows when pedestrians are queued to cross away from the WTC/PATH site in the west and north crosswalks, and block pedestrians crossing inbound from the northeast and southwest corners of the intersection. Pedestrians normally crossing at Church and Liberty Street may divert to the Cortlandt or Cedar Street intersections, or illegally cross

Church Street between Liberty and Cortlandt Streets. Pedestrians circulating through the northwest corner reservoir during surge conditions require more physical space than could be afforded in that area, which could force pedestrians to wait on the street in Liberty or Church Street vehicular travel lanes.

Mitigation to restore LOS E conditions would include widening the north and west crosswalks by 10 feet each, making them 25 feet wide. To restore the northwest corner reservoir LOS F conditions to LOS E conditions would include widening the north and west sidewalks by five feet each.

Given that the Preferred Alternative would generate more than 50 percent of the volume at this location, mitigation measures would be necessary as part of this project.

DESIGN YEAR (2025)

FUTURE COMMON TO ALL ALTERNATIVES

Independent of the Preferred Alternative, the on-street pedestrian circulation in the design year would increase beyond opening year levels with the completion of the WTC office and hotel land uses and the development of Battery Park City Site 26. These levels would also exceed conditions measured before September 11, 2001.

NO ACTION ALTERNATIVE

For analysis purposes, it was assumed that absent the Preferred Alternative, projected WTC-bound PATH passengers would be diverted to other modes of travel. Because on-street connections to mass transit located away from the WTC site would have to be made, on-street pedestrian conditions under the No Action Alternative would likely be worse than prior to September 11, 2001. The Permanent WTC PATH Terminal's purpose of serving as a central transit hub for Lower Manhattan would be negated, since PATH passengers would be diverted to overloaded NJ Transit commuter trains and NYCT subways; additional NY Waterway ferries would be needed; and additional passenger vehicle, taxi, express bus, and van trips would increase traffic on NYCDOT and NYSDOT roadways. These cumulative diversions would all increase on-street pedestrian circulation in Lower Manhattan.

Conditions described for the No Action Alternative in the opening year would worsen substantially by the design year. AM peak hour WTC Memorial and Redevelopment trips would increase over 100 percent from approximately 15,000 to 35,000 people per hour. The increased volumes in the design year may result in deteriorated levels of service at many analysis locations.

Without the sub-grade Route 9A connection, which is proposed as part of the Preferred Alternative, at-grade pedestrian activity will increase along Route 9A and its cross streets. Because ferry connections are made west of Route 9A, deteriorated levels of service on Route 9A could occur. Levels of service could deteriorate on Church Street between Liberty and Vesey Streets due to the locations of express bus routes and subway stations east of the WTC site. Auto and commuter van activity will increase and will worsen pedestrian levels of service because passenger drop-offs will occur adjacent to Liberty, Vesey, and Church Streets. As compared to the Preferred Alternative, the No Action Alternative would increase on-street pedestrian flows and worsen crosswalk congestion, necessitating additional mitigation to ensure proper circulation.

PREFERRED ALTERNATIVE

The hourly volumes representing pedestrians using the Permanent WTC PATH Terminal and the on-street pedestrian network in the design year are illustrated in Appendix C. Table 8D-6 summarizes projected future conditions in the design year if the events of September 11, 2001 had not taken place and compares them to conditions under the Preferred Alternative. Similar to the opening year conditions, at the Church and Liberty Street intersection, the northwest corner reservoir and all crosswalk levels of service in all peak hours deteriorate substantially.

Route 9A and Vesey Street

The Route 9A/Vesey Street east crosswalk would operate at LOS E during the midday peak hour. AM and PM peak hour levels of service would be acceptable. During the midday peak hour, PATH ridership is low while WTC shopping, tourism, and employee trip generation and circulation is high, so midday LOS E conditions are most likely not a result of PATH trips.

Route 9A and Liberty Street

The Route 9A/Liberty Street intersection would operate at acceptable levels of service during the AM, midday, and PM peak hours.

West Broadway and Vesey Street

Before September 11, 2001, this intersection operated at acceptable levels of service because of the pedestrian overpass spanning Vesey Street west of West Broadway, which connected 6 WTC to 7 WTC. In the opening year, the West Broadway/Vesey Street intersection would operate at LOS D, E, and F during all peak hours because street crossings must be made at grade. Approximately 10 to 15 percent of the AM peak hour trips using these crosswalks are project-generated trips destined to points north of Vesey Street including 7 WTC. Thus, based on the impact criteria described above, this project would not require mitigation at this location.

Greenwich Street and Fulton Street

All crosswalks at the new Greenwich and Fulton Street intersection would operate at LOS D, E, or F during all peak hours. Entrances to the WTC Memorial and cultural land uses, Performing Arts Center, Tower 2, and Wedge of Light Plaza are located adjacent to this intersection. There would be heavy on-street pedestrian flows between these uses and public transportation access on the south side of Fulton Street, such as subways and PATH. It is estimated that the share of project-generated trips to 7 WTC and points north of Vesey Street would be approximately 20 to 30 percent. Thus, based on the impact criteria described above, this project would not require mitigation at this location.

Table 8D-6
2025 Design Year Preferred Alternative:
Pedestrian Level of Service

Location	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
	Pre-9/11 Baseline	Preferred Alternative	Pre-9/11 Baseline	Preferred Alternative	Pre-9/11 Baseline	Preferred Alternative
Route 9A at Vesey Street (1)						
North Crosswalk	A	C	A	C	A	C
East Crosswalk	N/A	C	N/A	E	N/A	C
South Crosswalk	A	A	A	C	A	A
Route 9A at Liberty Street (2)						
North Crosswalk	C	A	B	B	C	A
East Crosswalk	N/A	A	N/A	A	N/A	A
South Crosswalk	B	D	A	D	B	D
West Broadway at Vesey Street (3)						
North Crosswalk	N/A	F	N/A	F	N/A	E
East Crosswalk	C	D	C	E	C	D
South Crosswalk	N/A	D	N/A	E	N/A	D
West Crosswalk	B	E	D	E	C	E
Greenwich Street at Fulton Street (10)						
North Crosswalk	N/A	D	N/A	E	N/A	D
East Crosswalk	N/A	E	N/A	F	N/A	E
South Crosswalk	N/A	D	N/A	E	N/A	E
West Crosswalk	N/A	E	N/A	F	N/A	E
Greenwich Street Midblock (11)						
North Crosswalk	N/A	B	N/A	B	N/A	B
Greenwich Street at Liberty Street (4)						
North Crosswalk	N/A	D	N/A	E	N/A	D
East Crosswalk	B	D	A	E	A	D
South Crosswalk	N/A	E	N/A	E	N/A	E
West Crosswalk	A	E	A	F	A	E
Church Street at Vesey Street (5)						
North Crosswalk	C	D	C	D	B	D
East Crosswalk	D	E	E	E	D	E
South Crosswalk	C	D	C	D	D	E
West Crosswalk	E	E	E	E	E	E
Church Street at Fulton Street (6)						
North Crosswalk	C	C	C	E	C	C
East Crosswalk	E	E	E	D	E	E
South Crosswalk	E	B	D	C	E	C
West Crosswalk	N/A	D	N/A	E	N/A	D

Table 8D-6 (cont'd)
2025 Design Year Preferred Alternative:
Pedestrian Level of Service

Location	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
	Pre-9/11 Baseline	Preferred Alternative	Pre-9/11 Baseline	Preferred Alternative	Pre-9/11 Baseline	Project Alternative
Church Street at Dey Street (7)						
North Crosswalk	E	C	D	C	E	C
East Crosswalk	D	C	E	C	E	D
South Crosswalk	E	B	E	C	E	C
Church Street at Cortlandt Street (8)						
North Crosswalk	B	C	C	D	C	D
East Crosswalk	C	B	E	D	E	D
South Crosswalk	C	B	E	C	C	B
Church Street at Liberty Street (9)						
North Crosswalk	E	E	C	E	C	E
East Crosswalk	B	C	E	B	D	D
South Crosswalk	E	D	B	C	D	C
West Crosswalk	F	E	D	C	E	E
Northwest Corner	F	E	F	C	F	D

Note: Refer to Figure 8D-1 for location numbers.

Greenwich Street Midblock and Cortlandt Street

The new Greenwich Street midblock pedestrian crossing at Cortlandt Street would operate at acceptable levels of service during all peak hours. Project-generated trips using this crosswalk destined for the WTC Memorial, Tower 5, and points south of Liberty Street would be able to cross Greenwich Street using the pedestrian-only phase.

Greenwich Street and Liberty Street

All crosswalks at the Greenwich Street/Liberty Street intersection would operate at LOS D, E, or F during all peak hours. Approximately 5 to 10 percent of peak hour trips using these crosswalks are project-generated trips destined to points south of Liberty Street including Tower 5. Thus, based on the impact criteria described above, this project would not require mitigation at this location.

Church Street and Vesey Street

The Church Street/Vesey Street east and west crosswalks would operate at LOS E during all peak hours, and the south crosswalk would operate at LOS E during the PM peak hour. These levels of service are generally similar to pre-September 11, 2001 projected future conditions, or worsened from LOS D to E. The Preferred Alternative would generate 20 to 25 percent of trips to points north of Vesey and east of Church Streets. Thus, based on the impact criteria described above, this project would not require mitigation at this location.

Church Street and Fulton Street

The Church Street/Fulton Street north and west crosswalks would operate at LOS E during the midday peak hour, the east crosswalk at LOS E during the AM and PM peak hours, and the

south crosswalk at acceptable levels of service during all peak hours. It is estimated that the share of project-generated trips to points east of Church Street would be less than 5 percent. Thus, based on the impact criteria described above, this project would not require mitigation at this location.

Church Street and Dey Street

The Dey Street concourse between the WTC site and the Fulton Street Transit Center would divert pedestrians from the east-west crossings at the intersection of Dey and Church Streets, and the intersection would experience an improved level-of-service as compared to pre-September 11, 2001 conditions.

Church Street and Cortlandt Street

The Dey Street connection would also divert pedestrians from the east-west crossings at the intersection of Cortlandt and Church Streets, and the intersection would experience an improved level-of-service as compared to pre-September 11, 2001 conditions.

Church Street and Liberty Street

Pedestrians would use Terminal exits in the vicinity of WTC Towers 3 and 4, and cross Church Street and Liberty Streets at street level, as noted under opening year conditions. Based on surveys conducted before September 11, 2001, it is anticipated that 40 percent of alighting AM peak hour PATH trips are destined for the Financial District.

In the AM, midday, and PM peak hours, approximately 4,490, 90 and 2,010 new trips would be added to the totals of 8,420, 4,980 and 7,050 trips, respectively, resulting in increases of up to 50 percent.

At crosswalk conditions in all peak hours at this location, LOS F conditions at the north and west crosswalks could cause pedestrians to spill into the opposing traffic travel lanes during the pedestrian signal. The loss in area per person would range from 1 to 10 SFP in the crosswalks, and from 1.3 to 12.4 in the northwest corner reservoir. The northwest corner reservoir LOS F in the AM peak hour would congest pedestrian flows when pedestrians are queued to cross away from the WTC/PATH site in the west and north crosswalks, and block pedestrians crossing inbound from the northeast and southwest corners of the intersection. Pedestrians normally crossing at Church and Liberty Street may divert to the Cortlandt or Cedar Street intersections, or illegally cross Church Street between Liberty and Cortlandt Streets. Pedestrians circulating through the northwest corner reservoir during surge conditions require more physical space than could be afforded in that area, which could force pedestrians to wait on the street in Liberty or Church Street vehicular travel lanes.

Mitigation to restore LOS E conditions would include widening the north and west crosswalks by 11 feet each, making them 26 feet wide. To restore the northwest corner reservoir LOS F conditions would include widening the north and west sidewalks by six feet each.

Given that the Preferred Alternative would generate more than 50 percent of the volume at this location, mitigation measures would be necessary as part of this project.

E. MITIGATION

The overall effect of the Preferred Alternative on the on-street pedestrian network would be an improvement over conditions that existed with the pre-September 11, 2001 WTC PATH

Terminal. The off-street connections to the Fulton Street Transit Center and many of the redeveloped WTC land uses would reduce pedestrian trips made by PATH riders that would be made on the street.

CONSTRUCTION PERIOD (2006)

During the construction period, pedestrian conditions would be nearly identical to the No Action conditions, and no specific mitigation is necessary. Because the construction of the Preferred Alternative would maintain pedestrian patterns from conditions following September 11, 2001, major shifts in pedestrian patterns are not expected. When considering the cumulative construction impacts on the pedestrian network discussed in Chapter 15, "Cumulative Effects," coordination between lead agencies would help ensure that pedestrian crossing patterns are maintained and pedestrian safety needs are accommodated.

However, to ensure the safe and convenient movement of pedestrians during the construction period, PANYNJ would implement Environmental Performance Commitments (EPCs) as part of the Preferred Alternative. As described in Chapter 8, Section B, "Vehicular Traffic and Parking," these EPCs would include a Maintenance and Protection of Traffic (MPT) Plan as well as communication tools to inform and protect the public.

OPENING YEAR (2009)

The opening year levels of service were compared to projected future conditions based on pre-September 11, 2001 volumes. Based on the criteria described above, the Preferred Alternative would result in an adverse impact at the intersection of Church and Liberty Streets.

The location of the Terminal's access points combined with the large volumes generated by the World Trade Center Memorial and Redevelopment Plan would adversely impact some crosswalks. To assess the proportion of impacts from this project, a percent share of trips attributed to the Preferred Alternative was calculated for crosswalks operating at unacceptable LOS E or F. This calculation divides the number of trips destined to and from the Permanent WTC PATH Terminal by the total number of pedestrians. Table 8D-7 summarizes adversely impacted crosswalks and lists mitigation measures, followed by the percentage share of trips attributed to the Preferred Alternative in relation to total pedestrian volumes.

Mitigation is necessary to restore some crosswalks in the Preferred Alternative's conditions to the levels of service calculated in projected future conditions based on pre-September 11, 2001 volumes. The measures suggested to mitigate adverse impacts include increases in crosswalk widths to improve levels of service at selected crosswalks on West Broadway, and on Greenwich, Church, Vesey, Fulton, and Liberty Streets, which would primarily be the result of background volumes generated by the WTC Memorial and Redevelopment Plan. The measures suggested to mitigate adverse impacts primarily due to the Preferred Alternative at the intersection of Church and Liberty Streets would consist of widening crosswalks by ten feet and sidewalks by five feet. To avoid subsequent impacts to vehicular traffic operations, it is recommended that sidewalks be widened within the limits of the WTC site. Table 8D-7 provides summaries of impacted intersections and mitigation.

It should be noted that additional or more aggressive measures may be required to mitigate the project's effects in the design year, as described below. FTA and PANYNJ would ensure that all of the required mitigation for both the opening and design year impacts is implemented in a single phase in or about the opening year.

Table 8D-7
Pedestrian Impacts and Mitigation Measures

Location	Mitigation Measure	Percent share of volumes attributed to the Preferred Alternative
Route 9A at Vesey Street		
North Crosswalk	No impact; no action needed	
East Crosswalk	No impact; no action needed	
South Crosswalk	No impact; no action needed	
Route 9A at Liberty Street		
North Crosswalk	No impact; no action needed	
East Crosswalk	No impact; no action needed	
South Crosswalk	No impact; no action needed	
West Broadway at Vesey Street		
North Crosswalk	Widen crosswalk	10-15 percent PATH effects
East Crosswalk	Widen crosswalk	10-15 percent PATH effects
South Crosswalk	Widen crosswalk	10-15 percent PATH effects
West Crosswalk	Widen crosswalk	10-15 percent PATH effects
Greenwich Street at Fulton Street		
North Crosswalk	Widen crosswalk	20-30 percent PATH effects
East Crosswalk	Widen crosswalk	20-30 percent PATH effects
South Crosswalk	Widen crosswalk	20-30 percent PATH effects
West Crosswalk	Widen crosswalk	20-30 percent PATH effects
Greenwich Street Midblock		
North Crosswalk	No impact; no action needed	
Greenwich Street at Liberty Street		
North Crosswalk	Widen crosswalk	5-10 percent PATH effects
East Crosswalk	Widen crosswalk	5-10 percent PATH effects
South Crosswalk	Widen crosswalk	5-10 percent PATH effects
West Crosswalk	Widen crosswalk	5-10 percent PATH effects
Church Street at Vesey Street		
North Crosswalk	No impact; no action needed	
East Crosswalk	Widen crosswalk	5-10 percent PATH effects
South Crosswalk	No impact; no action needed	
West Crosswalk	Widen crosswalk	25-35 percent PATH effects
Church Street at Fulton Street		
North Crosswalk	Widen crosswalk	0-5 percent PATH effects
East Crosswalk	Widen crosswalk	0-5 percent PATH effects
South Crosswalk	Widen crosswalk	0-5 percent PATH effects
West Crosswalk	Widen crosswalk	0-5 percent PATH effects
Church Street at Dey Street		
North Crosswalk	No impact; no action needed	
East Crosswalk	No impact; no action needed	
South Crosswalk	No impact; no action needed	

Table 8D-7 (cont'd)
Pedestrian Impacts and Mitigation Measures

Location	Mitigation Measure	Percent share of volumes attributed to the Preferred Alternative
Church Street at Cortlandt Street		
North Crosswalk	No impact; no action needed	
East Crosswalk	No impact; no action needed	
South Crosswalk	No impact; no action needed	
Church Street at Liberty Street		
North Crosswalk	Widen crosswalk by 10 feet	55 percent PATH effects
East Crosswalk	No impact; no action needed	
South Crosswalk	No impact; no action needed	
West Crosswalk	Widen crosswalk by 10 feet	75 percent PATH effects
Northwest Corner	Widen sidewalks by 5 feet each	75 percent PATH effects

DESIGN YEAR (2025)

The design year levels of service were compared to projected future conditions based on pre-September 11, 2001 volumes. Mitigation would be necessary at adversely impacted crosswalks at the West Broadway and Vesey Street intersection, Greenwich Street intersections at Fulton and Liberty Streets, and Church Street intersections at Vesey and Fulton Streets. The mitigation measures include widening crosswalks. At the intersection of Liberty and Church Streets, LOS F conditions would result on the northwest corner reservoir, and in the north and west crosswalks in the AM peak hour. More aggressive mitigation would be required at this location, consisting of widening crosswalks by 11 feet and sidewalks by six feet. Thus, crosswalks and sidewalks would need to be one foot wider than was presented for the opening year. The mitigation measures presented for other impacts in the opening year section would also mitigate all design year impacts. PANYNJ will coordinate with LMDC and NYCDOT to implement the recommended pedestrian improvements in the vicinity of the WTC site. ✶

A. INTRODUCTION

By fostering the use of mass transit to Lower Manhattan, the Preferred Alternative would have a beneficial effect on regional air quality in the New York Metropolitan Area (NYMA). Without the Terminal, it is expected that vehicles–miles–traveled in the metropolitan area would increase as some portion of the transit riders shift to automobiles for their daily commute (see Chapter 8B, "Vehicular Traffic and Parking"); this, in turn, would result in an increase in vehicle–related emissions such as carbon monoxide, nitrogen oxides, particulate matter, and volatile organic compounds, as discussed later in this chapter.

While the Preferred Alternative would result in a net air quality benefit to the NYMA, the pre–September 11, 2001 conditions also included that same benefit. Furthermore, since the Preferred Alternative would not, in itself, result in an increased ridership when compared to the forecasts prepared before September 11, 2001 condition, there would be no change in local air quality in the vicinity of the Project Site or stations in New Jersey. The Preferred Alternative would essentially provide better service to demand that was forecasted to have occurred under any condition. Moreover, as discussed in Chapter 8B, Chapter 8, Section B, "Vehicular Traffic and Parking," a very small percentage of PATH riders generated vehicle trips at the WTC site. Therefore, the Preferred Alternative would result in a very small number of vehicle trips in the vicinity of the WTC, which is consistent with pre–September 11, 2001 conditions. The Preferred Alternative would also use electricity, steam, and/or river water cooling to provide for energy needs and would not require any on–site combustion of pollution–generating fossil fuels.

The greatest potential for adverse impacts on ambient air quality from the Preferred Alternative is during the construction phase. A detailed assessment of the potential construction–related impacts to air quality is included in this chapter. The cumulative effects of the Preferred Alternative's construction along with other projects planned in Lower Manhattan are discussed in Chapter 15, "Cumulative Effects." Furthermore, as described in Chapter 2, "Project Alternatives," the Port Authority of New York and New Jersey (PANYNJ) has committed to a series of environmentally friendly ("green") design measures, including energy conservation measures, which would result in an overall reduction in pollutant emissions.

B. METHODOLOGY

POLLUTANTS FOR ANALYSIS

In the NYMA, ambient concentrations of carbon monoxide are predominantly influenced by mobile source emissions. Emissions of particulate matter and nitrogen oxides come from both mobile and stationary sources; emissions of sulfur dioxide are associated mainly with stationary sources. Ozone, one of the region's most problematic air pollutants, is not emitted directly in any substantial quantity, but is formed in the atmosphere by a series of complex chemical reactions involving mainly volatile organic compounds and nitrogen oxides.

CARBON MONOXIDE

Carbon monoxide (CO), a colorless and odorless gas, is produced in the urban environment primarily by the incomplete combustion of gasoline and other fossil fuels. In an urban area, approximately 80 to 90 percent of CO emissions are from motor vehicles. CO concentrations can vary greatly over relatively short distances. Elevated concentrations are usually limited to crowded intersections, heavily traveled and congested roadways, or parking lots or garages. Consequently, CO concentrations must be predicted on a local scale (microscale).

While operation of the Preferred Alternative would not result in any long–term increase in vehicular traffic at local intersections, a microscale analysis of the impact of construction on CO concentrations at affected intersections has been performed.

NITROGEN OXIDES AND OZONE

Nitrogen oxides (nitrogen oxide, NO, and nitrogen dioxide, NO_2—together NO_x) are of principal concern because of their role, together with volatile organic compounds (VOCs), as precursors in the formation of ozone. While there is a standard for average annual NO_2 concentrations, it is normally examined only for large fossil fuel energy sources. Ozone is formed through a series of reactions that take place in the atmosphere in the presence of sunlight. Because the reactions are slow and occur as the pollutants are diffusing downwind, elevated ozone levels are often found many miles from sources of the precursor pollutants. The effects of NO_x and VOC emissions from mobile sources are therefore generally examined on a regional basis, together with the emission of these pollutants from stationary sources. The change in regional mobile source emissions of these pollutants is related to the total number of vehicle trips and vehicle miles of travel throughout the NYMA, which is designated as a severe non–attainment area for ozone by the United States Environmental Protection Agency (EPA) (i.e., counties in Northern New Jersey, New York City, Long Island, Southern Hudson Valley, and western Connecticut).

Operation of the Preferred Alternative would result in a long–term reduction in vehicular traffic at local intersections; however, its construction would result in temporary emission of ozone precursors from on–road and on–site engines. A regional (mesoscale) analysis has been performed for both sources.

LEAD

Lead emissions in air are principally associated with industrial sources and motor vehicles that use gasoline containing lead additives. Most U.S. vehicles produced since 1975, and all produced after 1980, are designed to use unleaded fuel. As these newer vehicles have replaced the older ones, motor–vehicle–related lead emissions have decreased. As a result, ambient concentrations of lead have declined substantially. Nationally, the average measured atmospheric lead level in 1985 was only about one–quarter the level of 1975.

In 1985, EPA announced new rules drastically reducing the amount of lead permitted in leaded gasoline. Monitoring results indicate that this action has been effective in substantially reducing atmospheric lead levels. Even at locations in the New York City area where traffic volumes are very high, atmospheric lead concentrations are far below the national standard of 1.5 micrograms per cubic meter (3–month average).

No substantial sources of lead are associated with the Preferred Alternative, and, therefore, analysis was not warranted.

RESPIRABLE PARTICULATE MATTER—PM_{10} AND $PM_{2.5}$

Particulate matter (PM) is a broad class of air pollutants that includes discrete particles of a wide range of sizes and chemical compositions, as either liquid droplets (aerosols) or solids suspended in the atmosphere. The constituents of PM are both numerous and varied, and they are emitted by a wide variety of sources (both natural and anthropogenic). Natural sources include the condensed and reacted forms of natural organic vapors; salt particles resulting from the evaporation of sea spray; wind–borne pollen, fungi, molds, algae, yeasts, rusts, bacteria, and debris from live and decaying plant and animal life; particles eroded from beaches, soil and rock; particles emitted from volcanic and geothermal eruptions and from forest fires. Major anthropogenic sources include the combustion of fossil fuels (e.g., vehicular exhaust, power generation, home heating), chemical and manufacturing processes, all types of construction, agricultural activities, as well as wood–burning stoves and fireplaces. Particulate matter also acts as a substrate for the adsorption of other pollutants, often toxic and some likely carcinogenic compounds.

Fine particulate matter, or $PM_{2.5}$, are fine particles with an aerodynamic diameter of less than or equal to 2.5 micrometers. This smaller fraction of the particle size range has the ability to reach the lower regions of the respiratory tract, delivering with it other compounds that adsorbed to the surfaces of the particles, and is also extremely persistent in the atmosphere. $PM_{2.5}$ is mainly derived from combustion material that has volatilized and then condensed to form primary particulate matter (often soon after the release from an exhaust pipe or stack) or from precursor gases reacting in the atmosphere to form secondary particulate matter. Diesel–powered vehicles, especially heavy trucks and buses, are a substantial source of respirable PM; PM concentrations may, consequently, be locally elevated near roadways with high volumes of heavy diesel–powered vehicles.

A microscale analysis of $PM_{2.5}$ and PM_{10} (particles with an aerodynamic diameter of less than or equal to 10 micrometers) has been conducted for the construction phase of the Preferred Alternative, which would include potential sources such as diesel engine and fugitive dust emissions.

SULFUR DIOXIDE

Sulfur dioxide (SO_2) emissions are primarily associated with the combustion of sulfur–containing fuels: oil and coal.

Due to the federal restrictions on the sulfur content in diesel fuel for on–road vehicles, no substantial quantities are emitted from vehicular sources. Additionally, during the construction phase, all on–site nonroad engines would be employing ultra low sulfur diesel (ULSD), which would emit very small amounts of SO_2. Therefore, analysis of SO_2 was not warranted.

AIR QUALITY STANDARDS

NATIONAL AND STATE AIR QUALITY STANDARDS

As required by the Clean Air Act, primary and secondary NAAQS have been established for six major air pollutants: CO, NO_2, ozone, respirable PM, SO_2, and lead. The primary standards protect public health and represent levels at which there are no known substantial effects on human health. The secondary standards are intended to protect the nation's welfare, and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the

environment. For NO_2, ozone, lead and PM, the primary and secondary standards are the same; there is no secondary standard for CO. EPA recently promulgated additional NAAQS which became effective September 16, 1997: a new 8–hour standard for ozone, which will replace the existing 1–hour standard, and in addition to retaining the PM_{10} standards, EPA adopted 24–hour and annual standards for $PM_{2.5}$. The standards for these pollutants are presented in Table 9–1. These standards have also been adopted as the ambient air quality standards for New York State.

INTERIM GUIDANCE CRITERIA REGARDING $PM_{2.5}$ IMPACTS

New York State Department of Environmental Conservation (NYSDEC) has published a policy to provide interim direction for evaluating $PM_{2.5}$ impacts. This draft policy would apply only to facilities applying for permits or major permit modification under the State Environmental Quality Review Act (SEQRA) that emit 15 tons of PM_{10} or more annually. The interim draft policy states that such a project will be deemed to have a potential adverse impact if the project's maximum predicted impacts are predicted to increase $PM_{2.5}$ concentrations by more than 0.3 $\mu g/m^3$ averaged annually or more than 5 $\mu g/m^3$ on a 24–hour basis. Projects that exceed either the annual or 24–hour threshold will be required to prepare a written assessment of the severity of the impacts, to evaluate alternatives, and to employ reasonable and necessary mitigation measures to minimize the $PM_{2.5}$ impacts to the maximum extent practicable. The Preferred Alternative as a whole was not predicted to have emissions of more than 15 tons per year at any stage, and is not a "source" requiring a permit from NYSDEC.

New York City Department of Environmental Protection (NYCDEP) is currently recommending interim guidance criteria for evaluating the potential $PM_{2.5}$ impacts from projects in New York City. The interim guidance criteria currently employed by NYCDEP[1] for determination of adverse impacts from $PM_{2.5}$ are as follows:

- Predicted 24–hour (daily) average increase in $PM_{2.5}$ concentrations greater than 5 $\mu g/m^3$ at a discrete location of public access, either at ground or elevated levels (microscale analysis); and
- Predicted annual average increase in ground–level $PM_{2.5}$ concentrations greater than 0.1 $\mu g/m^3$ on a neighborhood scale (i.e., the annual increase in concentration representing the average over an area of approximately 1 square kilometer, centered on the location where the maximum impact is predicted for stationary sources; or at a distance from a roadway corridor similar to the minimum distance defined for locating background monitoring stations).

In order to put these levels in context, the average bias (difference) between 24–hour average $PM_{2.5}$ concentrations measured at collocated monitors (two identical monitors at the same location) in four monitoring stations in New York City from January to December 2000 ranged from 0.41 to 0.83 $\mu g/m^3$. Monitored changes in concentration that would be lower than these levels could not conclusively indicate any change in concentration.

The above NYCDEP draft interim guidance criteria have been used for the purpose of evaluating the impacts of the Preferred Alternative on $PM_{2.5}$ concentrations from mobile sources, and determine the need to mitigate particulate matter emissions from the Preferred Alternative.

[1] NYCDEP, Croton Water Filtration Plant EIS, January 2004.

Table 9–1
Ambient Air Quality Standards

Pollutant	Primary		Secondary	
	ppm	µg/m^3	ppm	µg/m^3
Carbon Monoxide (CO)				
Maximum 8–Hour Concentration[1]	9	10,000	None	
Maximum 1–Hour Concentration[1]	35	40,000		
Lead				
Maximum Arithmetic Mean Averaged Over 3 Consecutive Months	NA	1.5	NA	1.5
Nitrogen Dioxide (NO_2)				
Annual Arithmetic Average	0.053	100	0.053	100
Ozone (O_3)				
1–Hour Average[2]	0.12	235	0.12	235
8–Hour Average[3]	0.08	157	0.08	157
Total Suspended Particles (TSP)				
Annual Mean Rural Open Space Rural Residential Urban Residential Urban Industrial	NA	 45 55 65 75	None	
Maximum 24–Hour Concentration	NA	250		
Respirable Particulate Matter (PM_{10})				
Average of 3 Annual Arithmetic Means	NA	50	NA	50
24–Hour Concentration[1]	NA	150	NA	150
Fine Respirable Particulate Matter ($PM_{2.5}$)				
Average of 3 Annual Arithmetic Means	NA	15	NA	15
24–Hour Concentration[4]	NA	65	NA	65
Sulfur Dioxide (SO_2)				
Annual Arithmetic Mean	0.03	80	NA	NA
Maximum 24–Hour Concentration[1]	0.14	365	NA	NA
Maximum 3–Hour Concentration[1]	NA	NA	0.50	1,300

Notes:

ppm – parts per million
µg/m^3 – micrograms per cubic meter
NA – not applicable

Particulate matter concentrations are in µg/m^3. Concentrations of all gaseous pollutants are defined in ppm — approximately equivalent concentrations in µg/m^3 are presented.

TSP levels are regulated by a New York State Standard only. All other standards are National Ambient Air Quality Standards (NAAQS).

[1] Not to be exceeded more than once a year.
[2] Applies only to previously designated non attainment areas—until formal revocation by EPA.
[3] Three–year average of the annual fourth highest daily maximum 8–hr average concentration.
[4] Not to be exceeded by the 98th percentile averaged over 3 years.

Sources: 40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards; 6 NYCRR Part 257: Air Quality Standards.

STATE IMPLEMENTATION PLAN (SIP)

The Clean Air Act, as amended in 1990 (CAA) defines non–attainment areas (NAA) as geographic regions that have been designated as not meeting one or more of the NAAQS. When an area is designated as non–attainment by EPA, the state is required to develop and implement a State Implementation Plan (SIP) for each applicable NAAQS, which is a state's plan on how it will meet the NAAQS under the deadlines established by the CAA.

EPA has re–designated New York City as in attainment for CO. The CAA requires that a maintenance plan ensure continued compliance with the CO NAAQS for former non–attainment areas. New York City is also committed to implementing site–specific control measures throughout the city to reduce CO levels, should unanticipated localized growth result in elevated CO levels during the maintenance period.

Manhattan has been designated as a moderate NAA for PM_{10}. On December 17, 2004, EPA took final action designating the five boroughs of New York City as well as Nassau, Suffolk, Rockland, Westchester and Orange counties as $PM_{2.5}$ non-attainment areas under the CAA. State and local governments are required to develop implementation plans (by early 2008) that include measures designed to attain the standards in or after 2010.

Nassau, Rockland, Suffolk, Westchester and the five counties of New York City have been designated as severe non–attainment for ozone 1–hour standard. In November 1998, New York State submitted its *Phase II Alternative Attainment Demonstration for Ozone*, which was finalized and approved by EPA effective March 6, 2002, addressing attainment of the one–hour ozone NAAQS by 2007. New York State has recently submitted revisions to the SIP; these SIP revisions included additional emission reductions that EPA requested to demonstrate attainment of the standard, and an update of the SIP estimates using two new EPA models—the mobile source emissions model MOBILE6, and the non–road emissions model NONROAD—which have been updated to reflect current knowledge of engine emissions, and the latest mobile and non–road engine emissions regulations. On April 15, 2004, EPA designated these same counties as moderate non–attainment for the new 8–hour ozone standard which became effective as of June 15, 2004 (the entire Orange county was moved to the Poughkeepsie moderate non–attainment area for 8–hour ozone). EPA will revoke the 1–hour standard in June, 2005; however, the specific control measures for the 1–hour standard included in the SIP will be required to stay in place until the 8–hour standard is attained. The discretionary emissions reductions in the SIP would also remain but could be revised or dropped based on modeling. A new SIP for ozone will be adopted by the state no later than June 15, 2007, with a target attainment deadline of June 15, 2010.

TRANSPORTATION CONFORMITY

The conformity requirements of the Clean Air Act and regulations promulgated thereunder (conformity requirements) limit the ability of Federal agencies to assist, fund, permit, and approve transportation projects that do not conform to the applicable SIP. An area's metropolitan planning organization, which is the entity responsible for transportation planning, together with the State, are responsible for demonstrating conformity of metropolitan long–range transportation plans and transportation improvement programs. The U.S. Department of Transportation (USDOT) has final approval authority over the conformity of plans and transportation improvement programs. Conformity determinations for FTA projects must be made according to the requirements of 40 CFR Part 93.

At this time, as a result of the terrorist attacks of September 11, 2001, and the loss of New York Metropolitan Transportation Council (NYMTC's) files containing regional transportation and air quality data, combined with the damage incurred to the downtown mass transit system, the conformity requirements for the NYMA have been temporarily waived until September 30, 2005, pursuant to Public Law 107–230; Stat. 1469, enacted October 1, 2002. As part of the waiver process, project sponsors are to consult with the Interagency Consultation Group (ICG) to determine if the Preferred Alternative would be considered regionally significant and if additional air quality analysis is required during the waiver period. PANYNJ consulted with the ICG in February 2004, and the ICG has determined that in the absence of the waiver, this project would be exempt from conformity analysis requirements in accordance with 40 CFR 93.127. The ICG also agreed that a mesoscale analysis is not required.

MICROSCALE AIR QUALITY ANALYSIS METHODOLOGY

OVERVIEW

The air quality analysis in this EIS focuses on the potential adverse impacts during construction of the proposed WTC Permanent PATH Terminal. The cumulative air quality analysis in Chapter 15, "Cumulative Effects," applies the same procedures discussed below to a number of major projects assumed to be under construction simultaneously. In addition, regional (mesoscale) emissions inventories were prepared to determine the predicted direct and indirect emissions during construction, and predicted direct and indirect emissions savings attributable to the operation of the Terminal.

During construction, the potential effects on ambient air quality in the study area are the sum of three distinct sources of air pollutant emissions. The three sources are:

- On Road mobile sources (CO and PM)
- Construction equipment (CO, NO_2 and PM)
- Fugitive dust (PM only)

Mobile sources are the on–road construction vehicles (transporting materials or removing debris) traveling to and from the site, as well as their effects (i.e., increased congestion) on the base vehicular traffic traveling on the same roads. The construction equipment includes all of the fossil–fueled machinery that would be necessary to complete each element of the Preferred Alternative in the 2006 analysis year. Fugitive dust emissions are a result of activities that disturb material likely to result in the release of particulate matter. Examples of this type of emission include excavation, demolition, and vehicular traffic on paved or unpaved surfaces.

It is important to include each of these sources since they may act in concert to yield elevated levels of air pollutants. For example, while the particulate matter in diesel exhaust mostly consists of $PM_{2.5}$ and the fugitive dust from earth–moving activities are generally greater in size that PM_{10}, there is some contribution of $PM_{2.5}$ from the latter.

The following sections describe the methodologies used for each of the analyses described above.

ANALYSIS OF ON-ROAD MOBILE SOURCES

To compare estimated CO concentrations from the Preferred Alternative with the national ambient air quality standards for CO (which are based on 1– and 8–hour averages of CO

concentrations), estimates of maximum construction-related concentrations for these same periods must be prepared. Since experience in the study area has been that violations of the 1–hour CO standard are extremely rare, the CO analysis for this study focuses on determining the maximum predicted 8–hour CO concentrations.

Similarly, analyses of PM_{10} and $PM_{2.5}$ were conducted for the 24–hour and annual average conditions.

The on–road analyses for the Preferred Alternative are based on a modeling approach approved by EPA that has been widely employed for evaluating air quality impacts of projects in New York City, New York State, and throughout the country. Some additional, newer procedures for modeling $PM_{2.5}$ that have been developed in coordination with NYCDEP are also used. A series of worst–case assumptions relating to meteorology, traffic, and background concentration levels, were used as inputs. This approach results in a conservative estimate of expected air quality impacts caused by the Preferred Alternative and the resulting total pollutant concentrations.

Dispersion Models for Microscale Analyses

At all sites selected for CO analysis, maximum predicted 8–hour average CO concentrations were determined using EPA's CAL3QHC model[1], Version 2.0. The CAL3QHC model is a Gaussian dispersion model, which assumes that the dispersion of pollutants downwind of a pollution source follows a Gaussian (or normal) distribution, and is designed specifically for predicting CO concentrations along roadway segments.

Ambient concentrations of PM were computed at the selected receptor sites using the more refined version, CAL3QHCR. This version of the model can utilize hourly traffic and meteorology data, and is therefore more appropriate for calculating 24–hour and annual average concentrations. Tier II analysis, which includes the modeling of hour–by–hour concentrations based on hourly traffic data and 5–years of monitored hourly meteorological data, was performed to predict maximum 24–hour and annual average PM levels.

Worst–Case Meteorological Conditions

In general, the transport and concentration of pollutants from vehicular sources are influenced by three principal meteorological factors: wind direction, wind speed, and atmospheric stability, which accounts for the effects of dispersion or mixing in the atmosphere.

The CAL3QHC CO computations were performed using a wind speed of one meter per second, and stability class D, representative of neutral conditions in New York City. At each receptor location, the wind angle that maximized the pollutant concentrations was used in the analysis regardless of frequency of occurrence.

The CAL3QHCR Tier II PM analyses utilized monitored hourly meteorological data from LaGuardia Airport station in the years 1998–2002. All hours are modeled, and the highest resulting concentration for any averaging time is presented.

---

[1] EPA, *A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections,* User's Guide to CAL3QHC. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, September 1995.

Vehicle Emissions Data

Vehicular exhaust emission factors were computed using the EPA Mobile Source Emissions Model, MOBILE6.2[1]. This is the latest, recently released emissions model, capable of calculating engine emission factors for various vehicle types, based on the fuel type (gas, diesel, or alternative technologies), meteorological conditions, vehicle speeds, roadway types, number of starts per day and engine soak time, and various other factors that influence emissions, such as inspection maintenance programs.

Vehicle classification data were based on field studies and data obtained from other traffic studies as discussed in Chapter 8, "Transportation." Emission estimates were based on guidance from NYCDEP and NYSDEC on the appropriate credits to be used in the MOBILE6.2 model to accurately reflect the inspection and maintenance program. The inspection and maintenance programs require inspections of automobiles and light trucks to determine if pollutant emissions from the vehicles' exhaust systems are below acceptable emission standards. Vehicles failing the emissions test must undergo maintenance and pass a repeat test to be registered.

Based on the latest guidance from NYSDEC and NYCDEP, taxis are assumed to all be in hot stabilized mode which excludes any start-up emissions. The general categories of vehicle types for specific roadways were further categorized into subcategories based on their relative fleet–wide breakdown[2].

An ambient temperature of 52.5° Fahrenheit was used for the sites in New York City. This temperature, calculated based on the latest guidance from EPA, NYSDEC, and NYCDEP, represents the average temperature measured at the Central Park meteorological station during the 10 highest 8–hour CO events measured at the East 34th Street NYSDEC air quality monitoring station during the years 2000 through 2002.

Re–entrained road dust is not expected to have a substantial impact on $PM_{2.5}$ concentrations since these particles are typically larger than 2.5 micrometers. However, the contribution of re–entrained road dust to PM_{10} concentrations, as presented in the PM_{10} SIP, is considered to be substantial, so the PM_{10} estimates include both exhaust and road dust. Road dust emission factors were calculated according to the latest procedure delineated by EPA[3].

Site Selection

The selection of air quality receptor sites followed the guidance suggested by EPA in the Revisions to the Guideline on Air Quality Models (40 CFR Part 51) and in Guideline on Air Quality Models, the EPA's Guideline for Modeling Carbon Monoxide from Roadway Intersections (EPA–454/R–92–005, 1992).

Based on the results of this screening analysis, the sites that were analyzed were the intersections of Route 9A and Vesey Street, and Route 9A and Liberty Street. These intersections include the

---

[1] EPA, *User's Guide to MOBILE6.1 and MOBILE6.2: Mobile Source Emission Factor Model*, EPA420-R-02-028, October 2002.

[2] The MOBILE6 emissions model utilizes 29 vehicle categories by size and fuel. Traffic counts and predictions are based on broader size categories, and then broken down according to the fleet–wide distribution of subcategories and fuel types (diesel, gasoline, or alternative).

[3] EPA, *Compilation of Air Pollutant Emission Factors AP–42, Fifth Edition, Volume I: Stationary Point and Area Sources*, Ch. 13.2.1, NC, http://www.epa.gov/ttn/chief/ap42/, December 2003.

locations that would experience a combination of the highest background traffic volumes and levels of service, and the highest volumes of project-induced traffic from all access routes converging near the Project Site and leaving the Project Site.

In addition, for PM modeling only, the roadways surrounding the entire site, Vesey, Church, Liberty and West Streets were modeled, adding both project contributions and additional background contributions from local roadways that would not be included in the measured background levels.

ANALYSIS OF ON-SITE CONSTRUCTION ACTIVITY

Scenarios

The analyses were performed for two scenarios, based on the alternatives being considered for the Route 9A Project. Since air pollutant emissions for the construction of the pedestrian concourse which would run under Route 9A would vary significantly depending on the choice of an at-grade or short bypass tunnel scenario for Route 9A, both scenarios were analyzed.

Emission Factors

Stationary source analysis was conducted for all construction engines predicted to be on-site, including trucks entering, exiting and idling when necessary. Diesel construction engines—excluding trucks—would be using ultra low-sulfur diesel (ULSD) fuel; where practicable, engines larger that 60 horsepower (HP) would include emissions reduction measures to reduce emissions of PM and volatile organic compounds (VOCs). These emission reductions are premised on the application of the Environmental Performance Commitments (EPCs) discussed in Chapter 3, "Construction Methods and Materials," which the PANYNJ has committed to as part of the Lower Manhattan Recovery Project's Environmental Analysis framework. These commitments have been made to lessen the severity of the potential adverse effects of construction on ambient air in lower Manhattan. For the purpose of this study, it was assumed that PM emissions from all such engines would be reduced by 40 percent—the average reduction achieved by using diesel oxidation catalysts (DOC)[1,2]. PM emissions may be further reduced in cases where diesel particle filters (DPF) would be used—85 percent reductions or higher can be achieved with this technology, and in cases where diesel engines can be replaced with electric engines connected to grid power thus eliminating those local emissions altogether. Since it is uncertain at this time what emission reduction technologies would be most efficient with each equipment type, and since DOCs reduce more VOCs, which are ozone precursors and are of regional concern, the EPCs provide the flexibility to utilize either DOC or DPF control technologies. Therefore, the minimum PM emissions reduction of DOCs was assumed for the local impact analyses.

Emission factors for all analyzed pollutants emitted from the combustion of fuel by on-site construction equipment (excluding delivery trucks/heavy vehicles) were developed using the Draft EPA NONROAD2004 Emissions Model (NONROAD)[3,1]. The model is based on source

---

[1] NESCAUM, Memorandum - Diesel Emissions Resulting from Ground Zero Activity, April 8, 2002.

[2] Environment Canada, NESCAUM, Manufacturer of Emission Controls Association, The Impact Of Retrofit Exhaust Control Technologies on Emissions From Heavy-Duty Diesel Construction Equipment, SAE 199-01-0110.

[3] EPA, *EPA's Newest Draft Nonroad Emission Inventory Model*; www.epa.gov/otaq/nonrdmdl.htm, May 2004

inventory data accumulated for specific categories of nonroad equipment. Data provided in the output files from NONROAD were used to derive (i.e., back-calculate from regional emission estimates) the emission factors for each type of equipment that is expected to be present on-site during construction activities. Rates of emission from on-site trucks delivering or removing material were developed using the EPA MOBILE6.2 emissions model as described above. Emission rates associated with fugitive dust emissions from mobile equipment were developed using the procedures defined in EPA's AP-42[2]. Engine emissions are generally predicted to diminish over the years, as newer technologies are introduced. However, for the multi-year regional emissions inventory, VOC and PM emissions were conservatively assumed throughout construction. NO_x emissions were predicted to gradually decrease over the years as newer technologies become available.

In order to predict average concentrations for the time periods corresponding to the appropriate standards and regulations, emissions were modeled for two time periods: 24-hour and annual. These emissions were based on the construction activity predicted for each of those time scales. As described previously in Chapter 3, "Construction Methods and Materials," typical daily activity emissions were calculated on a monthly basis and averaged over the year to produce annual emission rates for each work zone; peak-day activity emissions were calculated on a monthly basis, and the values calculated for the month with the highest total emissions from all work zones were used for the 24-hour emission rates. For predictions of annual average concentrations annual average emissions were used throughout the year.

The analysis has been updated since the DEIS. The Liberty Plaza Connection is no longer assessed, and more refined information and data regarding the construction of the pedestrian concourse under Route 9A have been incorporated into the analysis based on updated construction plans from NYSDOT. This includes the elimination of the bus-way to site 26 in Battery Park City, now included as part of the WTC subgrade parking facilities (within the cumulative model). In addition to the construction under the Route 9A Short Bypass Alternative, the effect of the Route 9A At Grade Alternative on the construction of the pedestrian concourse was examined. This impacts not only the cumulative analysis, but the project-specific analysis as well since it would change the construction of the pedestrian concourse which is associated with the Preferred Alternative.

NO_x emissions include both NO and NO_2. For the microscale analyses, NO_2 is the pollutant of interest, to be compared to the NAAQS of 100 $\mu g/m^3$. Approximately 10 percent of NO_x emissions from diesel engines, such as construction equipment or trucks, are in the form of NO_2. However, NO transforms into NO_2 after it is emitted as part of the photochemical process that occurs as the pollutants travel downwind. Since the focus in the microscale analyses is on receptors immediately adjacent to the site, it is assumed that a full conversion of NO to NO_2 would not occur. The time scale for maximal conversion under urban conditions is on the order of 30 to 45 minutes (Seinfeld and Pandis, 1997).[3] After that time, maximal conversion would

---

[1] EPA, *User's Guide for the EPA Nonroad Emissions Model Draft NONROAD 2002*, EPA420-P-02-013, December 2002

[2] USEPA, *Compilation of Air Pollutant Emission Factors AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources*, various sections, www.epa.gov/ttn/chief/ap42, NC, January 1995—updates and draft sections through 2003.

[3] Seinfeld, John H., Pandis, Spyros N. 1998, Atmospheric Chemistry and Physics – From Air Pollution to Climate Change, John Wiley & Sons, New York, NY, 1997.

reach peak at approximately 58 percent, which is the regional NO_2/NO_x ratio monitored at NYSDEC stations. Since mean wind speed is 5.4 meters per second, the average detention time for the chemical reactions would be on the order of a few seconds for the nearest location, and a few minutes at most for the furthest locations downwind. At five minutes the expected conversion level is 36 percent (this would be the level at a minimum of approximately 100 meters from the source). Although much less conversion would occur by the time the pollutants reach the nearest receptors (where the highest concentrations are expected), a more conservative estimate was used for this study, assuming the average conversion rate to be 40 percent for all modeled locations.

Dispersion Modeling

Air quality impacts from construction emissions were evaluated using the Industrial Source Complex Short Term (ISC3) dispersion model developed by EPA[1]. The ISC3 model calculates pollutant concentrations from one or more sources based on hourly meteorological data, and has the capability to take into account the effect of downwash (exhaust plume affected by wakes and eddies from nearby structures). The meteorological data set consisted of the five latest years of concurrent meteorological data appropriate for the study site at LaGuardia Airport (1998–2002).

Background Concentrations

The modeling analysis directly accounts for only those pollutants emitted by local sources included in the model. Background concentrations, representing all other source contributions, must be added to the model predictions to obtain total or ambient levels at a prediction site. The highest recent monitoring data from NYCDEP monitoring stations (discussed in the next section) was used to represent background contributions from distant sources. Only the CO concentrations have been adjusted for future years to account for reduced vehicular emissions in the analysis years. Background traffic contributions from local roadways (that is traffic which is not related to the Preferred Alternative) were modeled explicitly in the same model for mobile source models, or separately for the construction site model.

RECEPTOR LOCATIONS

The emission estimates and dispersion modeling are used to determine the increase in pollutant concentration from construction activities at discrete locations in the analysis which are called receptors. Receptors were placed at locations that would have continuous public access such as residences, offices, open spaces, and in some cases sidewalks—representative locations in the vicinity of the construction activities, as well as elevated locations on all residential buildings and hotels. As shown in Figure 9–1, receptors were concentrated at locations surrounding the Project Site and in close proximity to the construction activities. As the distance increases from the construction site, the effects of construction of the Preferred Alternative on ambient air quality decreases and therefore, the greatest potential for project–related impacts would occur in the nearest group of receptors.

[1] USEPA, *User's Guide for the Industrial Source Complex (Isc3) Dispersion Models*, EPA-454/B-95-003a, NC, 1995 and update 2002.

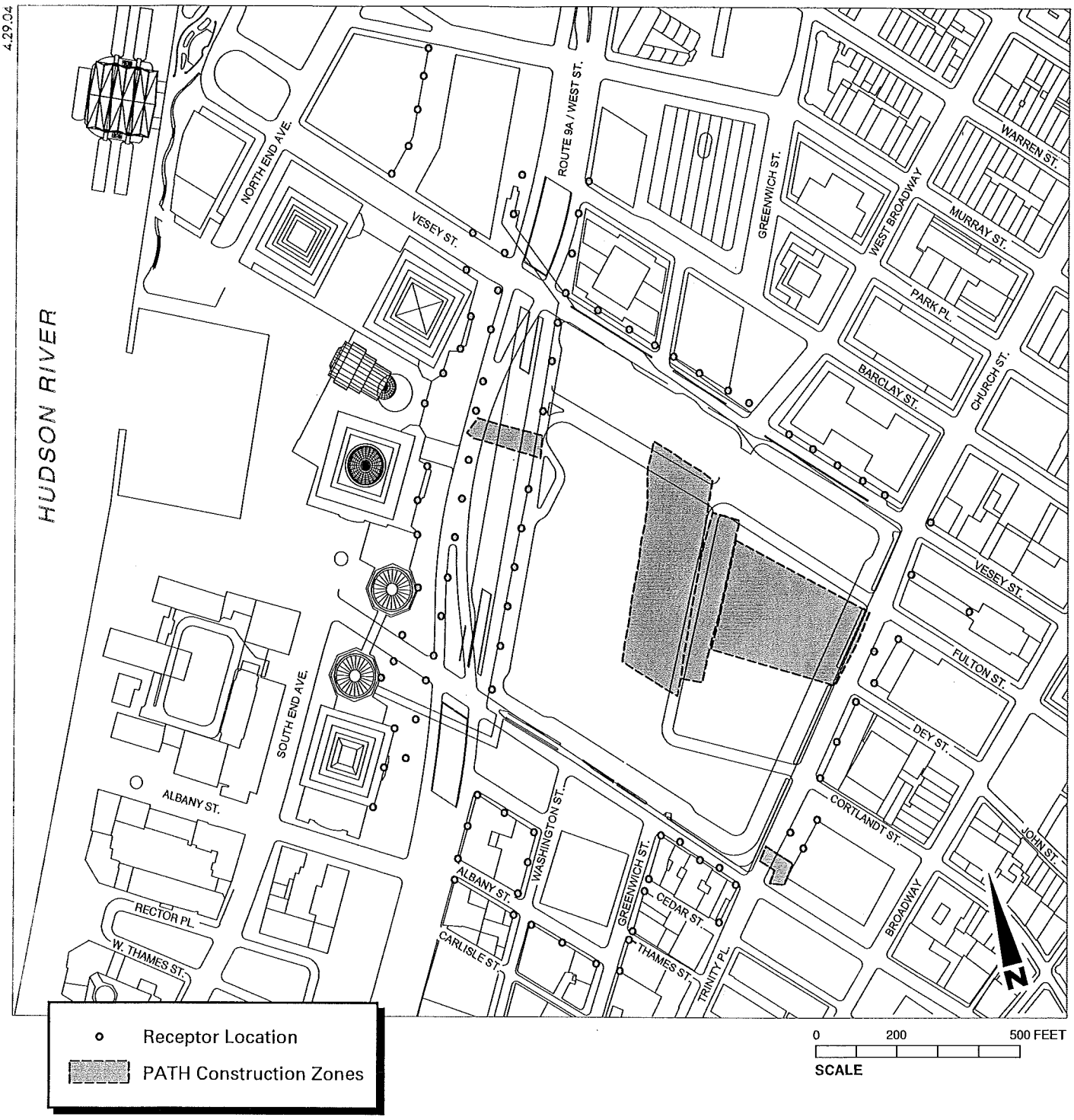


Figure 9-1

On-Site Model Source and Receptor Locations

MESOSCALE ANALYSIS OF EMISSIONS FROM CONSTRUCTION AND OPERATION OF THE PROJECT

A mesoscale (i.e., regional) analysis of air pollutants is typically performed by computing total pollutant levels ("burdens") within a project's overall study area. Pollutant burdens represent total expected quantities of pollutant emissions for a region throughout a defined time period.

CONSTRUCTION PERIOD EMISSIONS

An inventory of emissions from construction engines which would be operating on-site and from vehicles serving the construction operations of the Project Site, on an annual basis, was prepared based on the same assumptions presented above for the microscale analyses.

The inventory includes all emissions related to the construction of the Preferred Alternative. Emission factors were modeled using EPA's MOBILE6.2, AP-42 and NONROAD emissions models, as described above for the microscale analysis.

All worker, supervisor, service, utilities and fuel trips were assumed to be a round-trip distance of 18.4 miles, which is the average distance traveled for work related trips as reported by the New York Metropolitan Transportation Council (NYMTC). Concrete trucks were assumed to travel a distance of 26.2 miles—the average distances to four major concrete plants that were identified as potential suppliers. All other materials and excavated material removed from the site were assumed to travel across the George Washington Bridge, a round trip distance of 20.6 miles within the New York Metropolitan area.

A detailed description of the construction process, the engines predicted to be operating on-site and emission factors for all engines and vehicles throughout the construction years can be found in Appendix D.

Total annual emissions from construction engines were obtained by multiplying the emission factor by the hours of operation per day and the duration in days for each engine. On-road emissions were calculated by multiplying the average region-wide emission factors for each vehicle type by the distance traveled for each trip.

OPERATIONAL PERIOD EMISSIONS REDUCTION

The increment in pollutant emissions was computed for annual quantities of CO, VOCs, NO_x, and PM_{10} emitted by project-related changes in vehicular activity within the study area. Traffic reduction and the associated vehicle miles were estimated for conditions both with and without the Terminal, with the difference representing the reduction in VMT attributable to the Preferred Alternative.

Vehicular pollutant burdens were computed based on the EPA emission estimating procedures, using MOBILE6.2 (for CO, PM_{10}, VOCs, and NO_x) and the procedures described in AP-42 (for resuspended road dust). The choice and use of MOBILE6.2 is described in more detail above.

The estimate of reduced emissions due to the operation of the Terminal as compared to the No Action scenario, in which temporary service would be entirely disrupted, was computed based on annual trip reduction estimates. The annual number of vehicle trips was estimated based on travel demand factors presented in Chapter 8, "Transportation," and translated into vehicle miles based on an average travel distance of 9.2 miles for work related trips as reported by NYMTC. Assignment of the destinations and origins of the trips associated with the Preferred Alternative

was based on origin–destination information reported in the U.S. Census for the New York region.

NYSDEC has submitted detailed draft MOBILE6 regional emissions modeling results to EPA for 2007 as an update to the ozone SIP, including a breakdown of miles traveled on all roadway types and speeds by all vehicle classes. This model was used to generate NO_x and VOC emissions for all model years. The same model was revised in order to produce worst case winter CO emissions, as described in above. Meteorological conditions for the VOCs and NO_x were taken from the SIP determination, reflecting the summer ozone season.

C. DESCRIPTION OF THE AFFECTED ENVIRONMENT

PRE–SEPTEMBER 11, 2001 BASELINE CONDITIONS

The modeling analyses directly account for pollutants emitted by sources that are included in the models. However, background concentrations must be added to the concentrations predicted from these sources to obtain the total predicted ambient concentrations at any given location.

Worst–case background concentrations are represented by the highest concentrations monitored during past years at the nearest NYSDEC background monitoring stations. Stations used for background would generally be stations that are designed to monitor general population exposure and are located so as not to monitor specific local sources (i.e., stations that are not source–oriented, such as mobile source stations) but rather the impact of distant background sources. The concentrations monitored at such stations do nonetheless include a component of impacts from local sources, such as traffic, and therefore this approach results in a conservatively high estimate of total predicted concentrations.

The case of Lower Manhattan is somewhat unique in this respect. Prior to September 11, 2001, there were few, if any, monitoring stations in the immediate vicinity of the WTC site; however. in response to the terrorist attacks and the ensuing impact on air quality, New York State and Federal agencies initiated numerous air monitoring activities to better understand the ongoing impact of the disaster on air quality.

Table 9–2 provides monitoring data for both before and after the terrorist attacks. Because the post–September 11, 2001 data were collected long after the attacks, they are not influenced by the attacks themselves. These data represent existing conditions with reduced activity in Lower Manhattan, but possibly include components of ongoing reconstruction activity. Concentrations measured during both of these periods can be used as background for current conditions and future conditions in the absence of the major Lower Manhattan Recovery Projects. Modeled impacts of future activity can be added to these background concentrations as described above, to obtain the total predicted outdoor air quality. This procedure results in conservatively high concentrations because background concentrations of pollutants are decreasing over the years. The maximum concentrations presented for each pollutant and averaging period are the levels that were used as background in this study.

CHANGES IN THE AFFECTED ENVIRONMENT SINCE SEPTEMBER 11, 2001

The impact of September 11, 2001 on air quality in Lower Manhattan is related in this section. This is not intended as a comprehensive analysis, but is restricted to an overview of issues

Table 9–2
Measured Concentrations from the Nearest Air Quality Monitoring Stations

Pollutant	Station	Period	Units	2000	2001	2002	Max
CO	PS 59, 288 E. 57th Street, Manhattan	1–hour	ppm	4.1	3.7	3.2	4.1
		8–hour	ppm	2.8	2.3	2.2	2.8
NO_2	Mabel Dean, 240 2nd Ave.	Annual	ppm	0.036	0.038	NA	0.038
	PS 59, 288 E. 57th Street, Manhattan	Annual	ppm	0.038	0.038	0.038	
SO_2	Mabel Dean, 240 2nd Ave.	3–hour	ppm	0.081	0.064	NA	0.081
	PS 59, 288 E. 57th Street, Manhattan	3–hour	ppm	0.073	0.065	0.057	
	Mabel Dean, 240 2nd Ave.	24–hour	ppm	0.045	0.045	NA	0.046
	PS 59, 288 E. 57th Street, Manhattan	24–hour	ppm	0.046	0.038	0.036	
	Mabel Dean, 240 2nd Ave.	Annual	ppm	0.013	0.014	NA	0.014
	PS 59, 288 E. 57th Street, Manhattan	Annual	ppm	0.013	0.012	0.012	
PM_{10}	Mabel Dean, 240 2nd Ave.	24–hour	$\mu g/m^3$	49	30	NA	50
	JHS 126 424 Leonard St, Brooklyn	24–hour	$\mu g/m^3$	NA	50	42	
	Mabel Dean, 240 2nd Ave.	Annual	$\mu g/m^3$	22	19	NA	22
	JHS 126 424 Leonard St, Brooklyn	Annual	$\mu g/m^3$	NA	20	21	
$PM_{2.5}$	Mabel Dean, 240 2nd Ave.	24–hour	$\mu g/m^3$	43	44	NA	44
	JHS 126 424 Leonard St, Brooklyn	24–hour	$\mu g/m^3$	NA	35	34	
	Mabel Dean, 240 2nd Ave.	Annual	$\mu g/m^3$	16.8	17.1	NA	17.1
	JHS 126 424 Leonard St, Brooklyn	Annual	$\mu g/m^3$	NA	15.3	14.0	

Notes: NA = Full data not available.
All averages other than annual are second–highest of the year, except $PM_{2.5}$ 24–hour averages, which are the 98th percentile value.
Sources: NYSDEC, EPA.

pertinent to understanding what occurred, what may be relevant to future conditions, and to an evaluation of air quality impacts of the Preferred Alternative on the Lower Manhattan population. Data and information presented here are based on analysis of NYSDEC monitored data; the EPA study of WTC exposure[1] and oral comments on the EPA report made by the external technical peer review committee and by the public on July 14–15, 2003 and the summary report of that meeting[2], the Evaluation Report by the Office of Inspector General of the EPA on the EPA response[3]; the Natural Resources Defense Council's (NRDC) assessment[4]; and

[1] EPA, *External Review Draft*—Exposure and Human Health Evaluation of Airborne Pollution from the World Trade Center Disaster, NCEA, October 2002.

[2] EPA, *Summary Report of the U.S.EPA Technical Peer Review Meeting on the Draft Document Entitled: Exposure and Human Health Evaluation of Airborne Pollution from the World Trade Center Disaster*, NCEA, Washington, DC; EPA/600/R-03/142; NTIS, Springfield, VA, and www.epa.gov/ncea December, 2003 (publicly available as of March, 2004)];

[3] EPA, *EPA's Response to the World Trade Center Collapse: Challenges, Successes, and Areas for Improvement*, Report No. 2003-P-00012, Office of Inspector General, August 21 2003.

[4] NRDC, The Environmental Impacts of World Trade Center Attacks—A Preliminary Assessment, February 2002.

the results of a health survey in Lower Manhattan from December 2001, performed by New York City Department of Health (NYCDOH) in collaboration with the Centers for Disease Control and Prevention (CDC)[1], as well as anecdotal information, and questions and concerns raised by members of the general public in various forums and media and can be summarized as follows:

- The massive plume of pulverized material consisted mainly of cement, glass fibers, and cellulose, but also included high concentrations of silica, calcium, sulfate, metals such as lead and zinc, and numerous other compounds. Roughly 1.5 percent of the material was respirable, i.e., smaller than 10 micrometers (μm), including approximately 0.5 percent in the $PM_{2.5}$ size range.
- During the weeks that followed September 11, 2001, concentrations of monitored air pollutants exceeded screening benchmarks, and elevated levels of contaminants were recorded within and near the WTC Site. Population exposure to these exceedances was reduced by the fact that after the event, most of the affected areas were within restricted access zones.
- By mid– to late–October, particulate matter, chromium, PCBs, and lead concentrations across Lower Manhattan had largely returned to levels typical of New York City and other U.S. urban areas.
- The large majority of outdoor air measurements of asbestos were below established benchmarks and within the range of typical background levels. A few exceedances occurred near September 11, 2001 in time and in close proximity to the WTC site. A few very high levels of asbestos were found in settled dust indoors and, of course, in the debris on the WTC site itself.
- Of the 11 VOCs evaluated, short–term exceedances of screening benchmarks were seen for acetone, benzene, 1,3–butadiene, chloromethane, ethylbenzene, and toluene. Except for benzene, exceedances for these chemicals occurred in restricted zones.

With the above in mind, and in order to minimize impacts from the simultaneous reconstruction efforts in Lower Manhattan, PANYNJ, in coordination with the other agencies involved in the reconstruction efforts, have committed to a higher standard for environmental performance in an effort to minimize or eliminate environmental impacts during the construction and the operational phases, with special attention given to air quality. The policy for substantially reducing diesel emissions during construction, for instance, will result in a large fleet of clean–technology construction equipment in service long after the Preferred Alternative is constructed; the associated long-term benefit to air pollution will be on both local and regional scales.

Regarding pollutants that are discussed in this study, particulate matter monitoring around the WTC site began on September 26, 2001. Nearly all particulate matter associated with the September 11, 2001 dust cloud was debris larger than 30 micrometers in diameter. As shown in Table 9–3, $PM_{2.5}$ measurements from newly established ground–based sampling sites around the WTC perimeter varied widely, depending on wind direction. During some days in late September and early October, 24–hr average $PM_{2.5}$ concentrations exceeded 200 $\mu g/m^3$ at locations along the WTC site perimeter. However, $PM_{2.5}$ concentrations decreased rapidly with distance from the WTC, with few $PM_{2.5}$

[5] NYCDOH, A Community Needs Assessment of Lower Manhattan Following the World Trade Center Attack, Community HealthWorks, December 2001.

Table 9–3
Particulate Matter Concentrations for WTC Specific Monitors, 2001–2003

	Albany Street	Battery Park	Chambers Street	Pace Plaza	Wall Street	Max
PM_{10}						
Sept. 24 to Dec. 31, 2001, 24–hour average (range)	11.9 – 79.5	NA	NA	NA	11.0 – 49.1	79.5
2002 annual average	26.8	NA	NA	20.5	27.4	27.4
July 2002 to July 2003 annual average	19.1	NA	NA	20.4	NA	20.4
2002 2nd high 24-hour average	65.4	NA	NA	45.0	54.0	65.4
July 2002 to July 2003 2nd high 24-hour average	52.9	NA	NA	73.1	NA	73.1
$PM_{2.5}$						
Sept. 24 to Dec. 31, 2001, 24–hour average (range)	5.9 – 37.6	4.8 – 32.9	4.8 – 39.3	5.2 – 42.4	5.6 – 25.1	42.4
2002 annual average	15.1	NA	14.7	14.8	15.0	15.1
July 2002–July 2003 annual average	16.9	NA	NA	13.2	NA	16.6
2002 98th percentile 24-hour average	41.7	NA	32.0	42.3	31.9	42.3
July 2002–July 2003 98th percentile 24-hour average	30.4	NA	NA	33.9	NA	33.3

Note: Data that was impacted by the Quebec forest fire in July 2002 were eliminated from this summary.
Source: AKRF analysis of hourly data provided by NYSDEC.

values exceeding EPA's Air Quality Index (AQI) level of concern at monitoring locations ranging from three to ten blocks away from the WTC. During the entire period following September 11, 2001, $PM_{2.5}$ values recorded at Lower Manhattan monitoring sites away from the WTC perimeter were not markedly different than during periods before or since the attacks.

The particulate matter concentrations monitored at the source–oriented stations, starting in 2002 (see Table 9–3), are comparable to normal concentrations in Manhattan (see Table 9–2). The PM_{10} concentrations are somewhat higher in 2002, possibly due to recovery and cleanup operations. The highest $PM_{2.5}$ concentrations in Lower Manhattan at these monitors in 2002 were actually slightly lower than the highest concentrations monitored elsewhere in Manhattan.

D. PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

CONSTRUCTION PERIOD (2006)

FUTURE COMMON TO ALL ALTERNATIVES

In 2006, absent this project, it is likely that construction will be occurring on several major projects that could substantially affect air quality in the study area. A detailed analysis of the potential effects of these projects on ambient air quality is included in Chapter 15 "Cumulative Effects." Without the federal transportation recovery projects and the redevelopment of the WTC Memorial and Redevelopment Plan, the level of construction activity would be much less, similar to the current condition. Therefore, in the absence of the major projects, air quality in the vicinity of the Project Site would not be substantially different than current conditions.

NO ACTION ALTERNATIVE

Under the No Action Alternative, a Permanent WTC PATH Terminal would not be constructed. Therefore, air quality emissions would be the same as those described for the Future Common to All Alternatives. Predicted conditions with other major Lower Manhattan Recovery projects can be found in Chapter 15, "Cumulative Effects."

PREFERRED ALTERNATIVE

As discussed in Chapter 3, "Construction Methods and Materials," 2006 was selected as the analysis year for the microscale (local) construction impact assessment. Maximum predicted pollutant concentrations with construction of the Preferred Alternative would be lower in 2005, 2007 and 2008 than predicted for 2006 since the activity level would be much less in those years. Therefore, the predicted pollutant concentrations for 2006 have been used for impact assessment and the determination whether any additional mitigation is necessary beyond the EPCs discussed in Chapter 3. The regional (mesoscale) emissions inventory was prepared for all construction years.

Microscale (Local) On-Road Carbon Monoxide Analysis

An analysis was conducted to determine the effects of project–generated construction vehicles on ambient CO concentrations at critical intersections. The sites selected for analysis include the intersections of West Street (Route 9A) with Liberty and Vesey Streets.

Table 9–4 shows the maximum predicted 8–hour average CO concentrations with and without construction of the Preferred Alternative. As shown in the table, construction vehicles would have a negligible effect on ambient CO concentrations even at the most heavily traveled intersections in the study area. The cumulative effect from other planned construction projects along with the Preferred Alternative on CO concentrations is discussed in Chapter 15, "Cumulative Effects."

Microscale (Local) Particulate Matter and Nitrogen Dioxide Analysis

The highest predicted increase in pollutant concentrations at various locations due to construction activity of the Preferred Alternative are presented in Table 9–5. The concentrations at locations adjacent to the construction sites include contributions from both on–road sources and on–site construction activity emissions.

Table 9–4
2006 Construction Period:
Maximum Predicted 8–Hour Average CO Concentrations

Site	No Action	Preferred Alternative
Route 9A and Liberty Street	5.1	5.1
Route 9A and Vesey Street	5.5	5.5
Note: NAAQS is 9 ppm.		

Table 9–5
2006 Highest Predicted Increase in Pollutant Concentrations from Construction of the Preferred Alternative

Pollutant	Average Period	Receptor Type	Maximum Increase [$\mu g/m^3$] With Route 9A Short Bypass	Maximum Increase [$\mu g/m^3$] With Route 9A At Grade
NO_2	Annual	Highest of All Receptors	6.0	7.8
		Residential Buildings / Hotel	5.3	5.3
$PM_{2.5}$	24–hour	Highest of All Receptors	47.8*	21.7*
		Residential Buildings / Hotel	6.0*	6.8*
		Other Locations on Access Routes	0.1	0.1
	Annual	Local Highest of All Receptors	0.7*	1.0*
		Local Highest Residential / Hotel	0.5*	0.5*
		Local on Access Routes	0.01	0.01
		Neighborhood Scale	0.08	0.08
PM_{10}	24–hour	Highest of All Receptors	53.4	30.7
		Residential Buildings / Hotel	7.8	14.0
		Other Locations on Access Routes	1.0	1.0
	Annual	Highest of All Receptors	1.0	1.4
		Residential Buildings / Hotel	0.9	0.9
		Other Locations on Access Routes	0.3	0.3

Notes: Interim guidance threshold levels for $PM_{2.5}$ are 5 $\mu g/m^3$ and 0.3 $\mu g/m^3$ for 24–hour and annual increases respectively, and 0.1 $\mu g/m^3$ for neighborhood scale annual average. For determination of adverse impacts, these values are applied in the absence of specific criteria.
The NAAQS are as follows: NO_2—Annual = 100 $\mu g/m^3$; $PM_{2.5}$—24–hour = 65 $\mu g/m^3$ and Annual = 15 $\mu g/m^3$; PM_{10}—24–hour = 150 $\mu g/m^3$ and Annual = 50 $\mu g/m^3$.
* Indicates substantial adverse impact–exceeding the interim guidance thresholds.

Annual average NO_2 concentrations were predicted to increase by a maximum of 7.8 $\mu g/m^3$. This maximum was predicted near the pedestrian concourse construction zone.

In the immediate vicinity of the Project Site, the increase in PM_{10} concentrations is predicted to range up to a maximum of 53.4 $\mu g/m^3$ on a 24–hour basis, and 1.4 $\mu g/m^3$ on an annual basis due to construction of the Preferred Alternative. The predicted increase in maximum $PM_{2.5}$ concentrations in the immediate vicinity of the site would be up to a maximum of 47.8 $\mu g/m^3$ and 1.0 $\mu g/m^3$ on 24–hour average and annual average basis, respectively, and an annual average of 0.08 $\mu g/m^3$ on a neighborhood scale. The local predicted increases in $PM_{2.5}$ concentration would exceed the interim guidance threshold values. The highest annual average particulate matter concentrations, in both cases, would be near West Street by the pedestrian concourse

construction. All maximum concentrations are predicted at locations immediately adjacent to the construction site boundary. Increments would be 10 to 90 percent lower at residential locations, depending upon the pollutants and the averaging period.

To illustrate the effects of the emissions from construction on ambient air quality in the vicinity of the WTC site, isopleths (i.e. lines of equal concentration) were developed based on the predicted concentration increments. Figures 9–2 through 9–11 show the increase in annual average PM_{10}, 24–hour average PM_{10}, annual average $PM_{2.5}$, 24–hour average $PM_{2.5}$ and annual average NO_2 concentrations due to construction of the Preferred Alternative for the year 2006, under both Route 9A alternatives. These figures also indicate the location of the highest predicted increase in emissions that are detailed in Tables 9-5 and 9-6. As shown in the figures, increases in these pollutant concentrations are centered on specific construction activities, and do not vary significantly by the Route 9A alternative. Most notable are the increases centered on the West Street area (related to the construction of the pedestrian concourse). Construction activities within the bathtub or the WTC itself would have a much smaller effect on off–site concentrations due to the distance from the sources to affected areas. As shown in Figures 9–8 and 9–9, at the north–eastern edge of the site, the intersection of Church Street and Vesey Street, the 5–$\mu g/m^3$ isopleth does not extend past the northern edge of the site. This is the extent of the impacts from the elements of the Preferred Alternative's construction within the bathtub in the northern–eastern direction. The impact is somewhat more pronounced when combined with the contribution from the pedestrian concourse construction, in the north–western direction to approximately one to two blocks north of the site. The annual impact on $PM_{2.5}$, which is of higher importance due to the exceedance of the NAAQS in the existing condition, is much smaller, barely extending past the site boundary in the north and at one spot near the pedestrian concourse construction.

The above concentrations were predicted assuming only a 40 percent reduction in particulate matter based on the use of ULSD fuel in conjunction with diesel oxidation catalysts. Without these EPCs, predicted concentrations would be much higher. Additional pollution reduction estimates are discussed in Section F, "Mitigation."

The maximum total annual average NO_2 concentrations presented in Table 9–6, including background levels, predicted near the pedestrian concourse construction zone, would not exceed the NAAQS. As presented in Figures 9–10 and 9–11, slight increases in NO_2 levels may be detected in the immediate vicinity of the pedestrian concourse construction.

The total predicted PM_{10} concentrations are not predicted to exceed the NAAQS at any location during construction; therefore, construction of the Preferred Alternative alone would not result in a significant adverse impact on PM_{10} concentrations. This is largely due to strict control of both engine emissions and fugitive dust emissions.

The $PM_{2.5}$ concentrations presented are based on the highest measured 24-hour background concentration of 44 $\mu g/m^2$. It is possible that without further mitigation measures, the predicted 24-hour average $PM_{2.5}$ concentrations could exceed the NAAQS level—65 $\mu g/m^3$ at locations immediately adjacent to the site, but not at residential locations. Current annual measured background levels of $PM_{2.5}$ in New York City exceed the NAAQS of 15 $\mu g/m^3$; predicted increments are therefore compared with the threshold levels to determine the significance of impacts, as presented above.

2.1.05

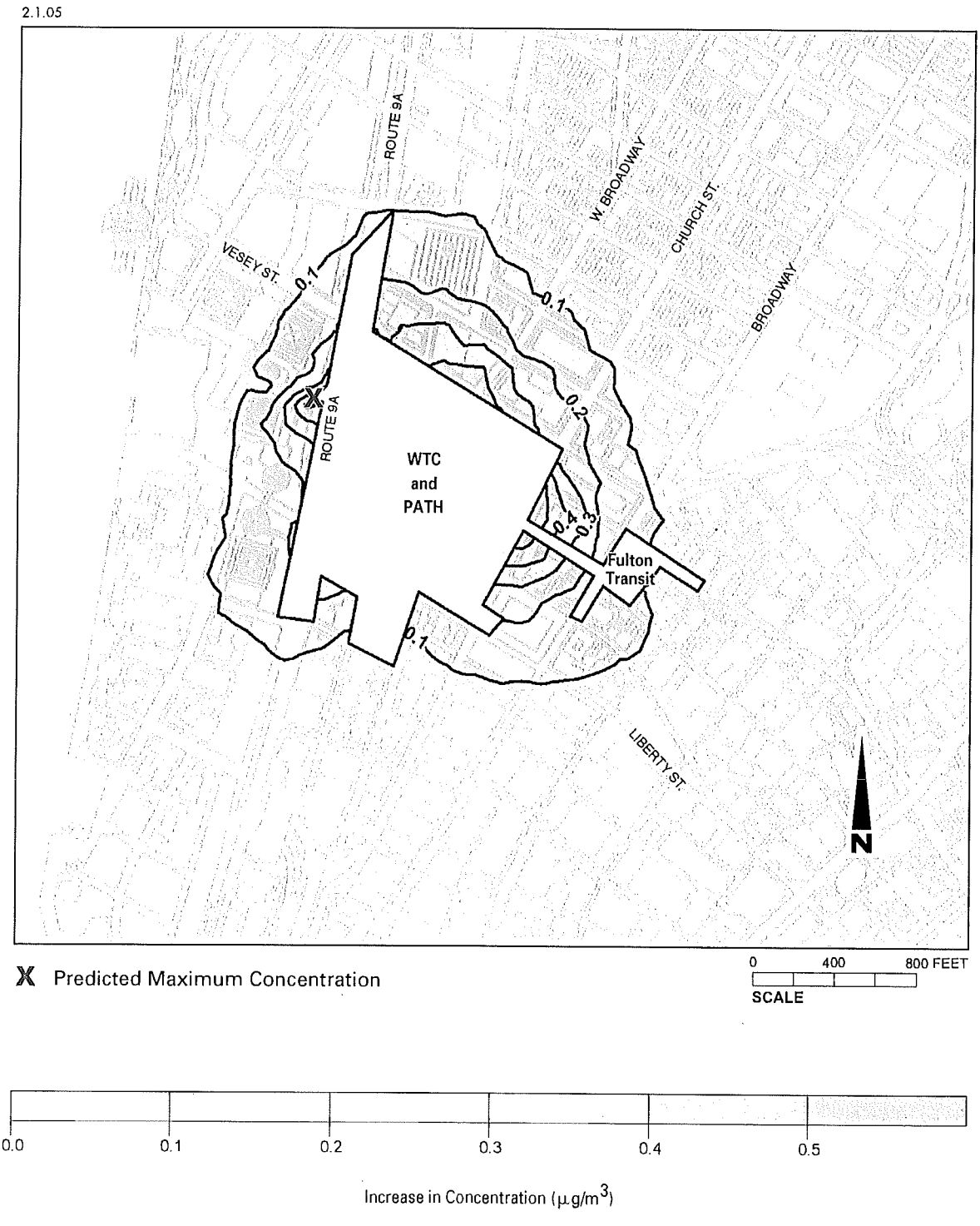


Figure 9-2

Maximum Predicted Annual Average PM_{10} PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative

2.1.05

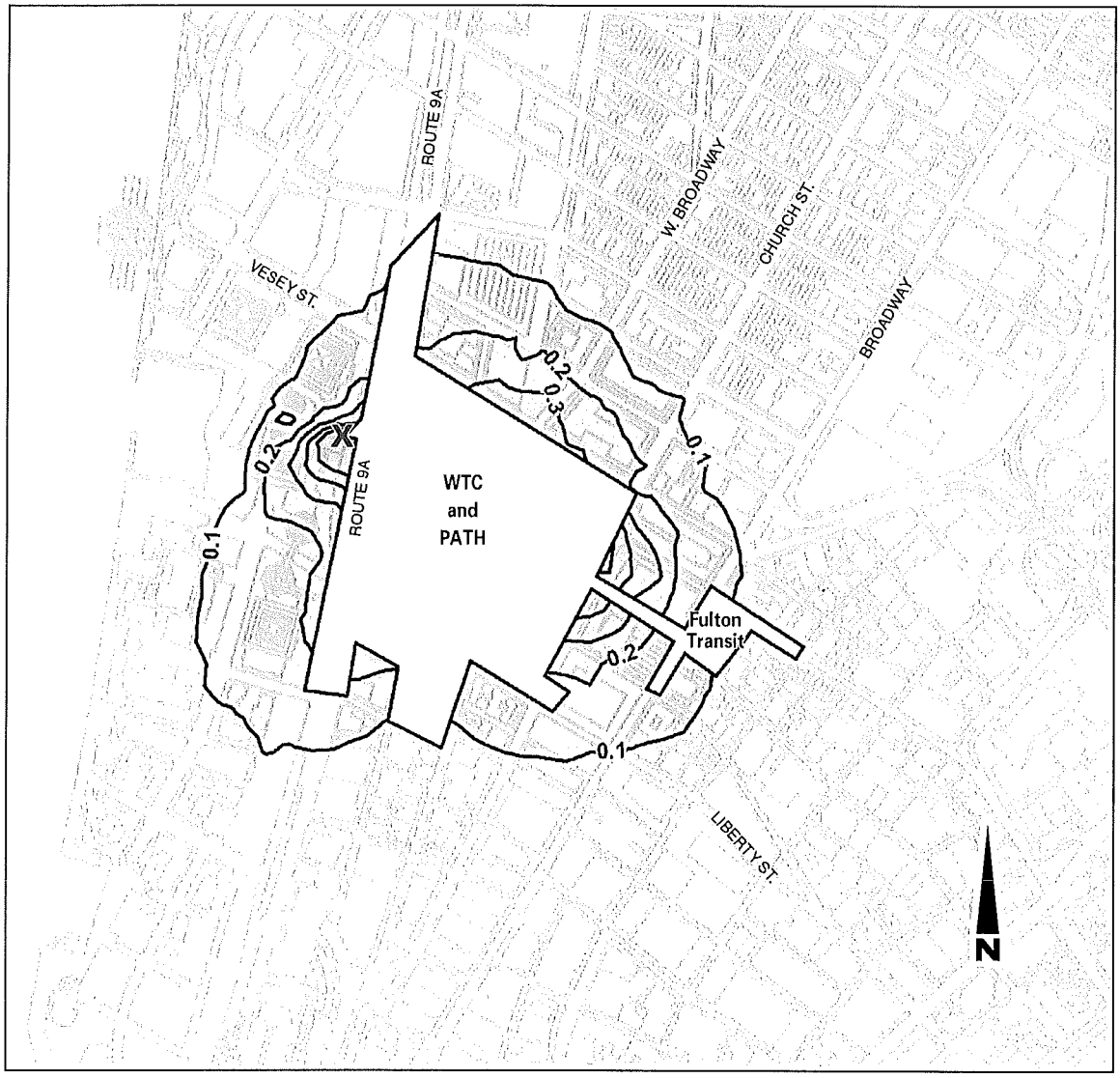


Figure 9-3

Maximum Predicted Annual Average PM_{10} PATH Construction Increment with Route 9A At-Grade Alternative

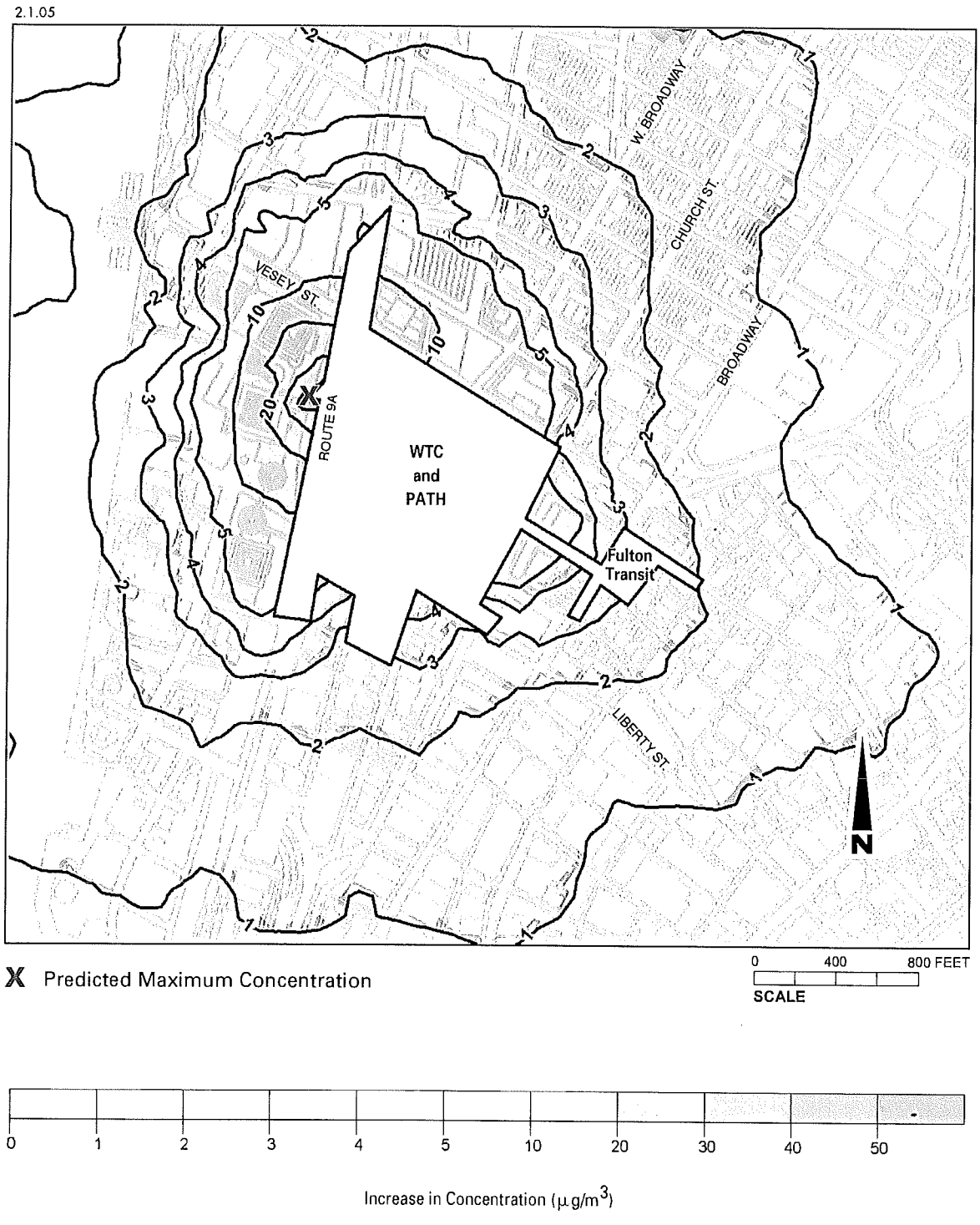


Figure 9-4

Maximum Predicted 24-Hour Average PM_{10} PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative

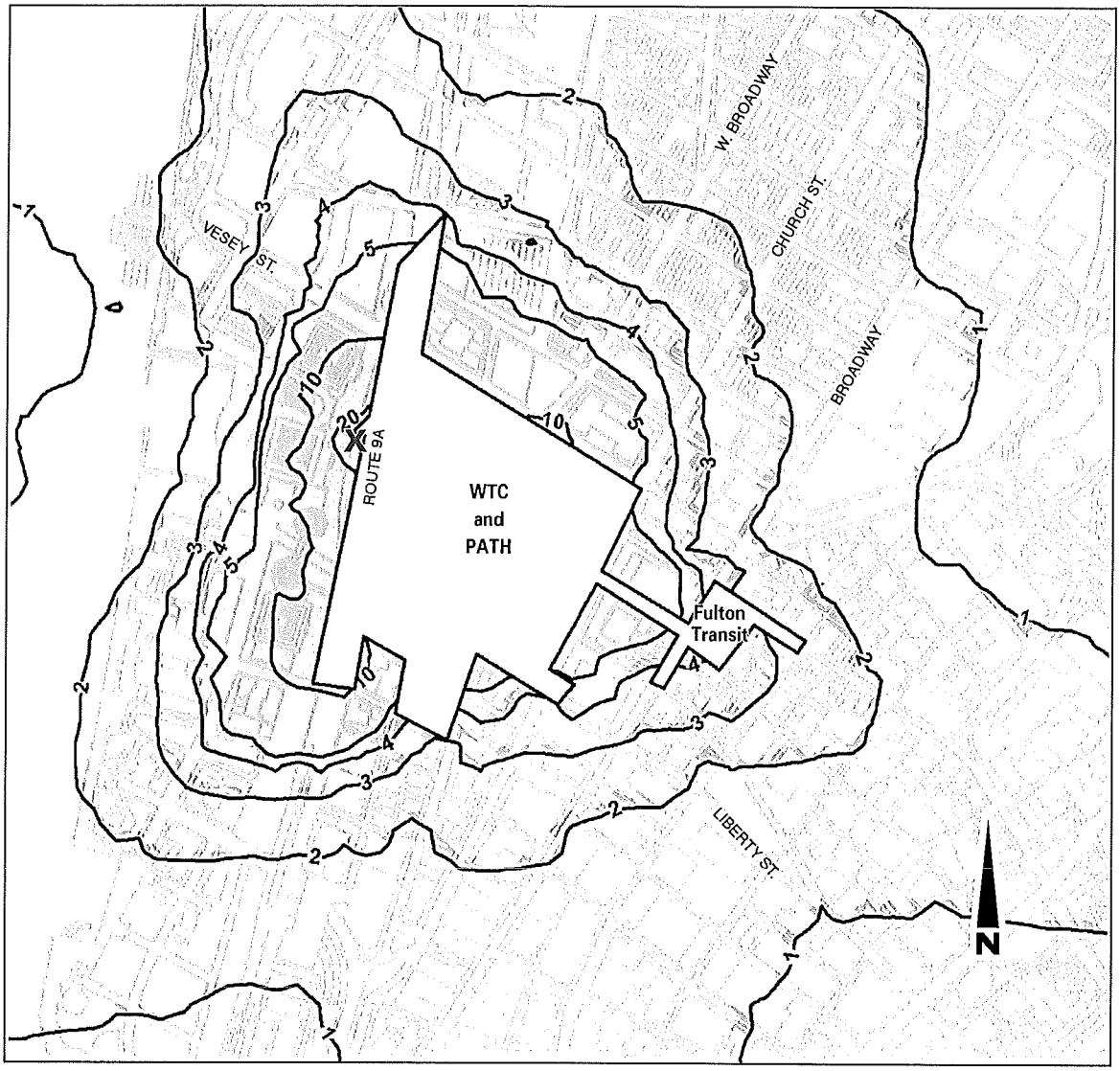


Figure 9-5

Maximum Predicted 24-Hour Average PM_{10} PATH Construction Increment with Route 9A At-Grade Alternative

2.1.05

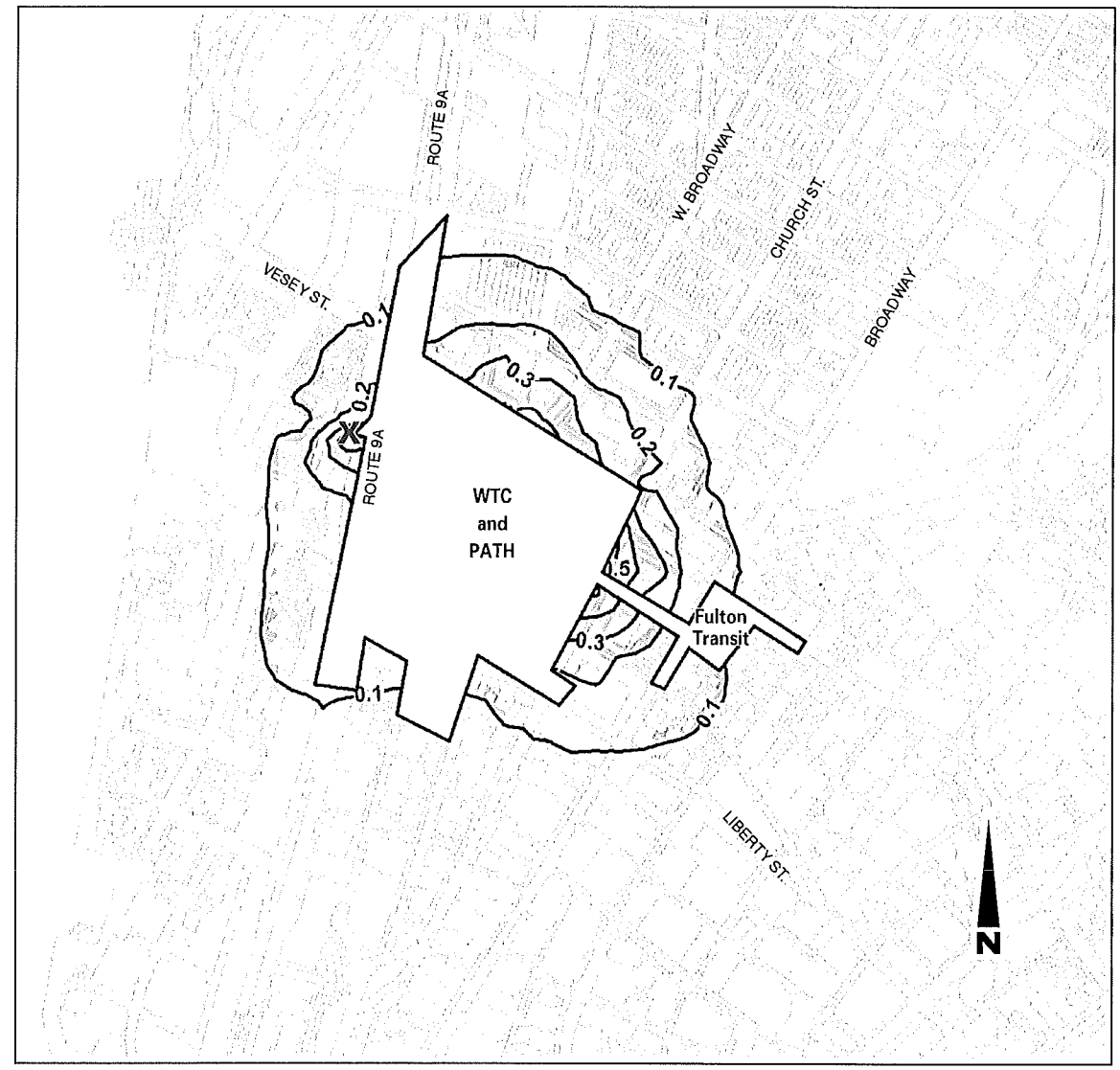


Figure 9-6

Maximum Predicted Annual Average $PM_{2.5}$ PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative

2.1.05

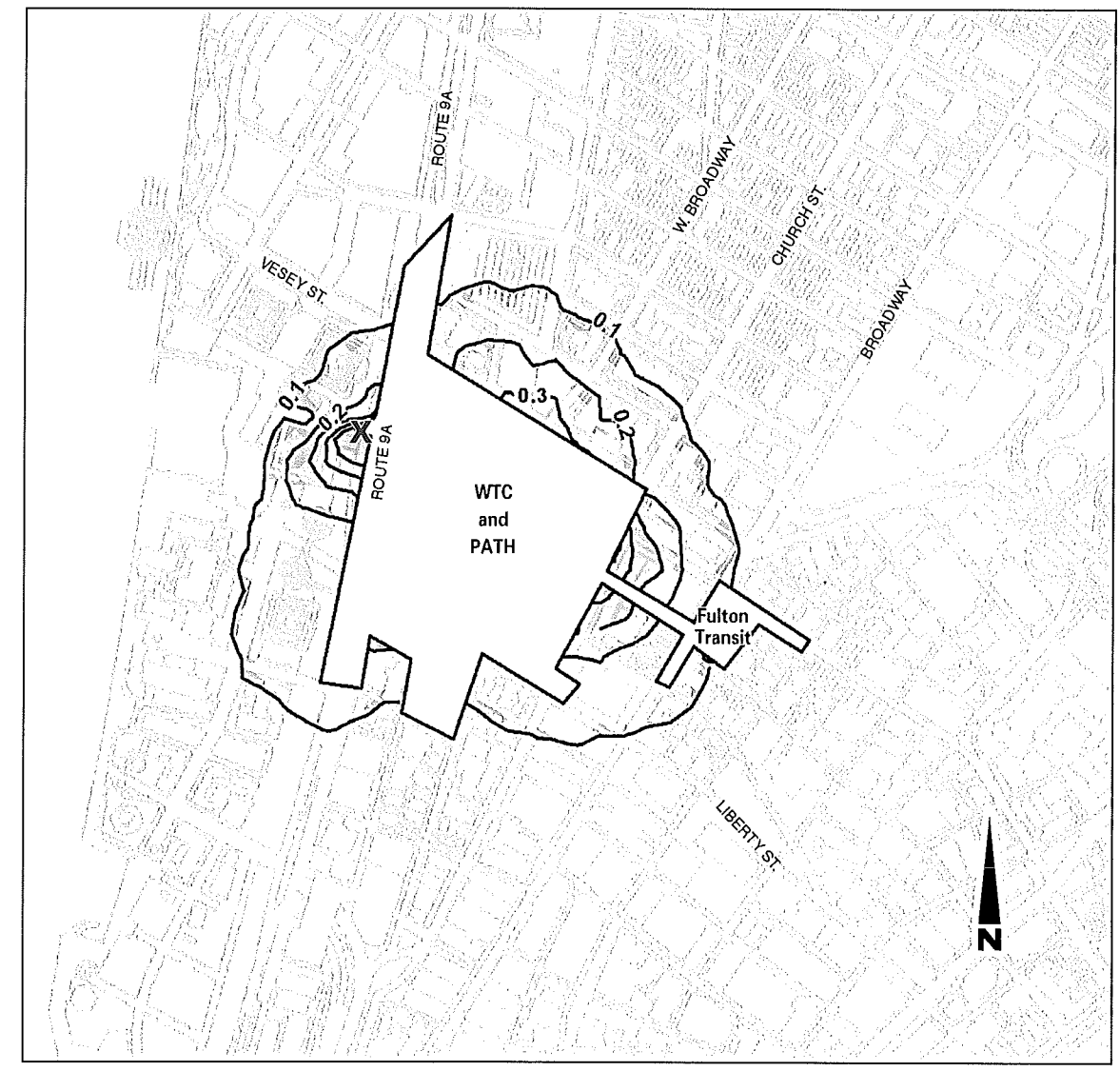


Figure 9-7

Maximum Predicted Annual Average $PM_{2.5}$ PATH Construction Increment with Route 9A At-Grade Alternative

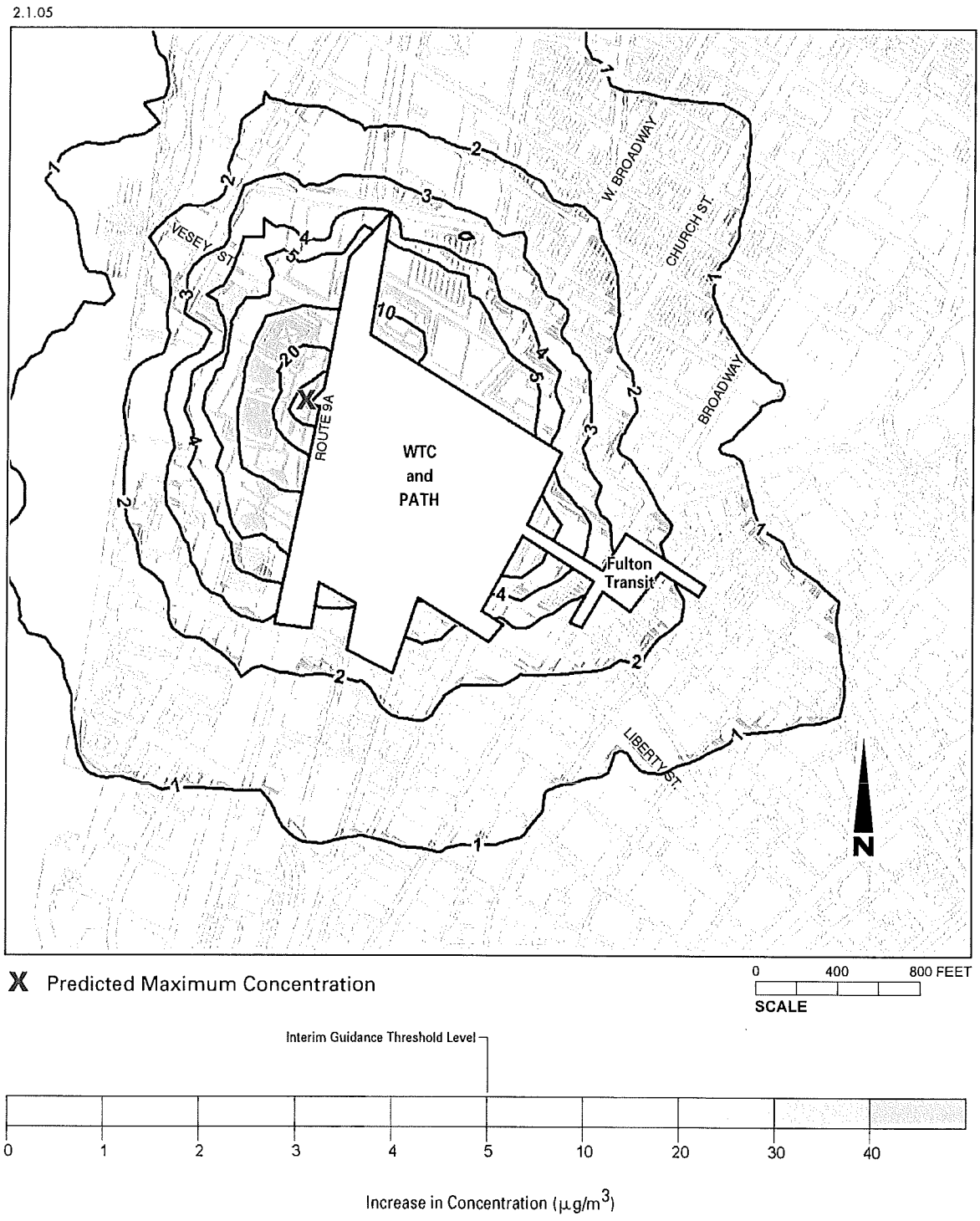
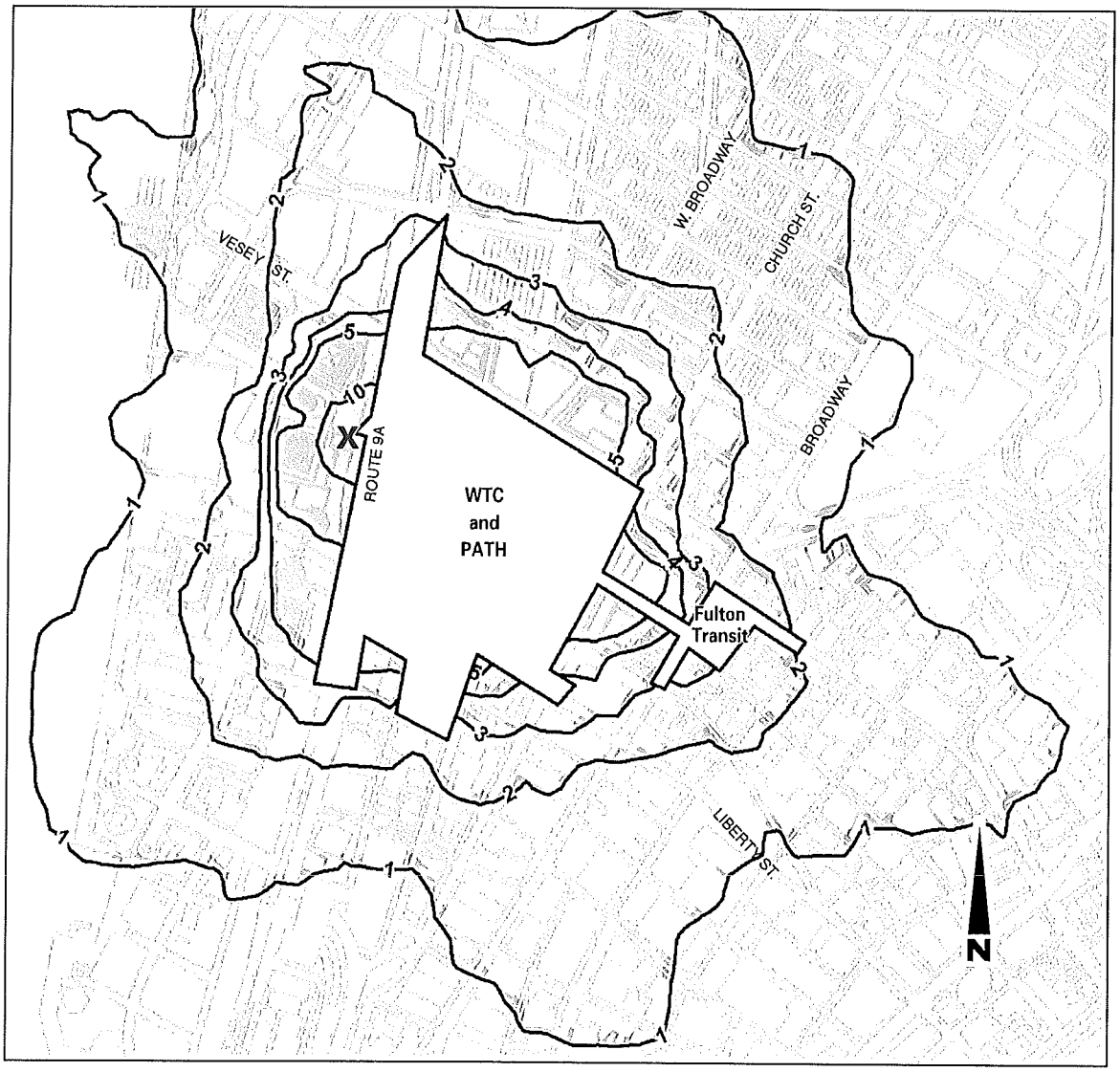


Figure 9-8

Maximum Predicted 24-Hour Average $PM_{2.5}$ PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative

2.1.05



X Predicted Maximum Concentration

0 400 800 FEET
SCALE

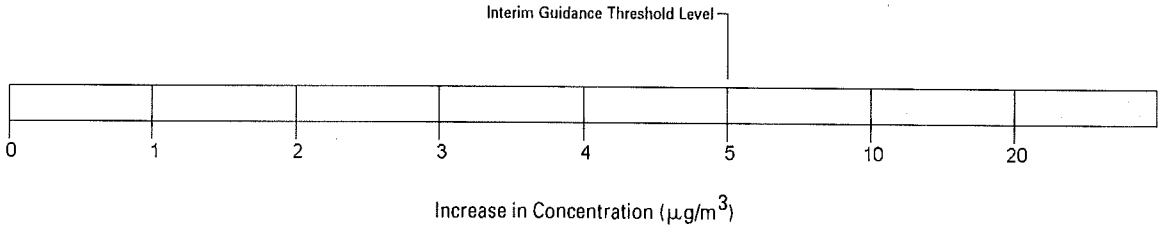


Figure 9-9

Maximum Predicted 24-Hour Average $PM_{2.5}$ PATH Construction Increment with Route 9A At-Grade Alternative

2.1.05

Figure 9-10

Maximum Predicted Annual Average NO_2 PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative

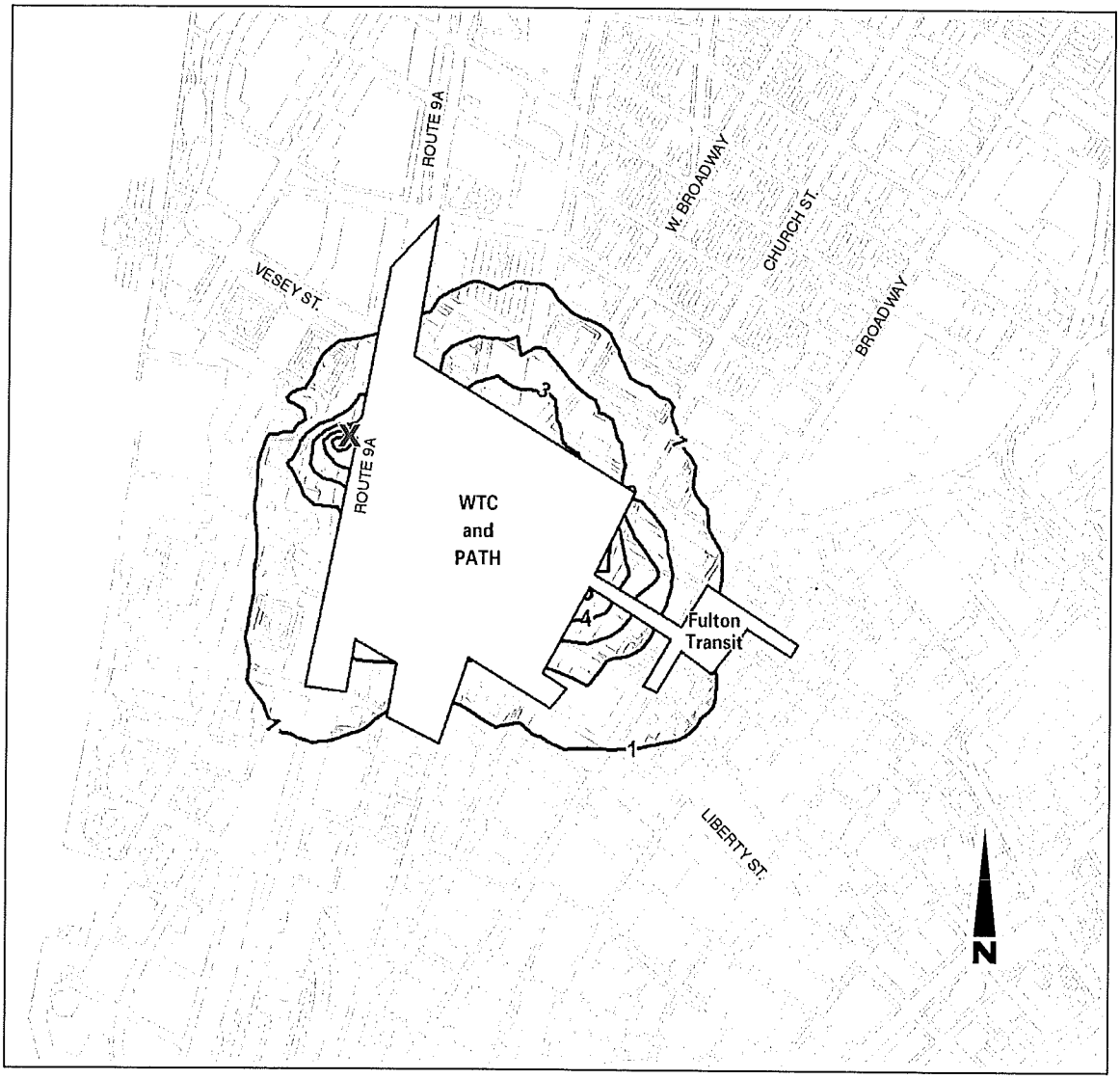


Figure 9-11

Maximum Predicted Annual Average NO_2 PATH Construction Increment with Route 9A At-Grade Alternative

Table 9–6
2006 Highest Predicted Total Pollutant Concentrations During Construction of the Preferred Alternative

Pollutant	Average Period	Receptor Type	Maximum Increase [µg/m³]	
			With Route 9A Short Bypass	With Route 9A At Grade
NO_2	Annual	Highest of All Receptors	78.0	79.8
		Residential Buildings / Hotel	77.3	77.3
$PM_{2.5}$	24–hour	Highest of All Receptors	94.9*	68.9*
		Residential Buildings / Hotel	52.0	52.8
		Other Locations on Access Routes	48.2	48.2
	Annual	Highest of All Receptors	19.1**	19.2**
		Highest Residential / Hotel	18.4**	18.4**
PM_{10}	24–hour	Highest of All Receptors	115.4	92.6
		Residential Buildings / Hotel	62.8	63.7
		Other Locations on Access Routes	63.0	63.0
	Annual	Highest of All Receptors	29.6	29.9
		Residential Buildings / Hotel	26.9	26.9
		Other Locations on Access Routes	28.9	28.9

Notes: All total concentrations include calculated background contributions from local mobile sources, as well as measured regional background values as follows: NO_2—Annual average 72 µg/m³; $PM_{2.5}$—Annual average 17.1 µg/m³ (highest of 2000-2002 annual values); 24-hour average 44.0 µg/m³ (highest of the three 2nd highest 24-hour averages in 2000-2002); PM_{10}—Annual average 24 µg/m³; 24-hour average 50 µg/m³.

The NAAQS are as follows: NO_2—Annual = 100 µg/m³; $PM_{2.5}$—24–hour = 65 µg/m³ and Annual = 15 µg/m³; PM_{10}—24–hour = 150 µg/m³ and Annual = 50 µg/m³.

Cumulative and project–generated maximum concentrations may occur at a different time and/or location.

* Indicates predicted exceedance of new NAAQS without mitigation.

** $PM_{2.5}$ annual average concentrations exceed the NAAQS in the existing background condition. See Table 9-10 for comparison with incremental thresholds.

As described above, conformity requirements limit the ability of Federal agencies to assist, fund, permit, and approve transportation projects that do not conform with the applicable SIP. The New York metropolitan area has been designated by USEPA as non-attainment for $PM_{2.5}$ in December 2004, and the State of New York has until April 2008 to complete a SIP delineating how the standard will be met by 2010 (with a possible extension as late as 2015.) The SIP would include emission inventories of existing and predicted sources, including construction emission, and the planned reductions for each source. Substantial increases in $PM_{2.5}$ concentrations were predicted during construction of the Preferred Alternative, which would constitute an adverse $PM_{2.5}$ impact. However, PANYNJ's current mitigation plan (see Section E, "Mitigation") incorporates measures aimed at reducing $PM_{2.5}$ emissions to the extent practicable. In the absence of any specific guidance regarding construction emissions as it relates to transportation conformity, project-level criteria have been used to assess these potential impacts and to develop appropriate mitigation measures.

Mesoscale Emissions Analysis

The total predicted emission of PM_{10}, NO_x and VOCs by year due to the proposed construction activity, including both on-site activity and related on-road emissions, are presented in Table 9-7. Of the total predicted project-generated emissions, 50 to 61 percent of VOC, 77 to 91 percent of NOx, 40 to 61 percent of PM_{10} and 78 to 88 percent of $PM_{2.5}$ would be from on–site sources.

Table 9–7
Total Regional (Mesoscale) Direct and Indirect Emissions from Construction of the Preferred Alternative (tons per year)

Pollutant	2005	2006	2007	2008
PM_{10}	1.8	2.4	0.6	0.7
$PM_{2.5}$	1.5	1.8	0.4	0.5
NO_x	39.1	44.4	10.1	11.1
VOC	2.1	2.9	0.7	0.8
Note: PM_{10} emissions include both engine emissions and resuspended road dust.				

As compared to the projected regional emissions inventory in the New York ozone SIP for the same years—the on–road portion of the emissions would be less than 0.007 percent and 0.002 percent of the SIP mobile source NO_x and VOC emissions, respectively; the on-site portion of the emissions would be 0.06 percent and 0.004 percent of the non-road SIP NO_x and VOC emissions or less (depending on the year), respectively.

The proposed mitigation for construction emissions, aimed at reducing impacts in the immediate vicinity of the construction sites (see above) would also reduce the total region-wide emissions related to the Preferred Alternative. See Section E, "Mitigation" for details.

Air Toxins

As discussed previously, the terrorist attacks resulted in the emission of a number of hazardous air pollutants (i.e. air toxics) that raised concern regarding the public health of residents and workers in Lower Manhattan. In response to the release of these potentially hazardous materials, numerous federal, state, and local agencies initiated air quality monitoring programs in Lower Manhattan to assess the potential short- and long-term effects of these air pollutant emissions.

It should be noted that the Preferred Alternative would not introduce sources of most of the non-criteria pollutants that affected Lower Manhattan following September 11, 2001, nor would the Preferred Alternative introduce new sources of high–alkalinity PM or glass fibers. Any excavation and tunneling would not include WTC debris, which has already been removed from the site during recovery and cleanup operations. The most substantive new emission of pollutants other than criteria pollutants would be from diesel emissions from construction equipment and later from buses and trucks. Diesel exhaust includes gaseous components, such as aldehydes, benzene, 1,3–butadiene, and formaldehyde, as well as some toxics adsorbed to the surfaces of particles, such as PAHs and their derivatives—comprising less than 1 percent of the particulate diesel exhaust mass. The EPCs (see Section E, "Mitigation") of the Preferred Alternative would require strict control of diesel emissions, including emissions reduction technologies such as diesel oxidation catalysts and diesel particulate filters as well as other

measures aimed at minimizing diesel exhaust emissions during construction to the extent practicable.

OPENING YEAR (2009)

FUTURE COMMON TO ALL ALTERNATIVES

Without this project, air quality in the opening year would be similar to the no action condition in 2006. It would be a function of whether the other federal transportation recovery projects and redevelopment of the WTC are under construction. At the present time, based on current schedules, it is expected that pollutant concentrations from construction activities would peak in 2006. Therefore, contributions of air pollutant emissions from construction activities would be less in 2009 than 2006.

NO ACTION ALTERNATIVE

Under the No Action Alternative, temporary WTC PATH service would continue to operate in the opening year. Therefore, any changes in local or regional air quality emission would be attributed to other independent projects or actions.

PREFERRED ALTERNATIVE

In the opening year, major construction activity would have been completed for the Preferred Alternative. Therefore, the only potential air quality impacts from this alternative in the opening year would be beneficial, since the Preferred Alternative would generate few, if any, vehicle trips as compared to the No Action condition.

The ventilation structures would emit tunnel air during normal operations, and smoke exhaust in case of fire in the tunnels. Under normal circumstances, ventilation air would be emitted at the new locations, similar to that which was emitted in the pre-September 11, 2001 condition at ground level from the Route 9A median. The new locations would be 40 feet above grade, 28 feet higher than the previous elevation. There would be no combustion of fossil fuels, since the trains are electrically operated.

DESIGN YEAR (2025)

FUTURE COMMON TO ALL ALTERNATIVES

By the design year for the Permanent WTC PATH Terminal, construction associated with the Route 9A Project, WTC Memorial and Redevelopment Plan, Fulton Street Transit Center, and South Ferry Terminal will have been concluded for several years. Thus, certain air quality emissions anticipated during the construction period and in the opening year will be much lower in the design year. There may be some increases in vehicular traffic from residential and commercial development in Lower Manhattan. However, federal regulation will have reduced vehicle emissions, resulting in improved air quality, as compared to the pre–September 11, 2001 conditions.

NO ACTION ALTERNATIVE

Because temporary WTC PATH service would be fully disrupted by 2025 an increase in motor vehicle–related air pollutant emissions is predicted with this alternative. While motor vehicle emissions are predicted to be much lower in the design year than the opening year due to engine improvements,

the number of projected PATH riders to Lower Manhattan would be much greater. Reflecting each of these issues, Table 9–8 shows the additional air pollutants emitted in the absence of the Permanent WTC PATH Terminal.

Table 9–8
2025 Design Year No Action Alternative: Incremental Increase in Regional Pollutant Emissions without the Permanent WTC PATH Terminal (Tons/Year)

Pollutant	New Jersey	New York	Total
VOC	45.8	8.1	53.9
NO_x	39.9	7.0	46.9
PM_{10}	33.1	5.8	38.9
CO	527	93	620

Notes: Estimate for CO is high because model produces winter emissions. NO_x and VOC emissions are summer emissions, as per the ozone SIP standard procedure.

By 2025, approximately 15.7 tons of VOCs, 18.0 tons of NO_x, 1.5 tons of PM_{10}, and 236.0 tons of CO would be emitted by motor vehicles destined from New Jersey to Lower Manhattan if a Permanent Terminal is not built and if temporary PATH service is not available.

PREFERRED ALTERNATIVE

The Preferred Alternative would reduce motor vehicular traffic congestion and emissions as compared to the No Action Alternative. Therefore, the Preferred Alternative for a Permanent WTC PATH Terminal would have a far greater beneficial impact on air quality in the NYMA than the No Action Alternative.

E. MITIGATION

As described in Chapter 2, "Project Alternatives," and Chapter 3, "Construction Methods and Materials," PANYNJ has committed to EPCs to reduce the potential construction period impacts of the Preferred Alternative (see Table 9-9).

The EPCs shown in Table 9-9, were assumed as part of the construction period analysis presented above. However, the DEIS for the Permanent WTC PATH Terminal determined that addition mitigation would be needed to reduce potential construction period impacts. Following the publication of the DEIS, PANYNJ developed an enhanced mitigation plan that would substantially reduce the project's construction-period emissions.

PROJECT-SPECIFIC COMMITMENTS

In addition to measures identified in the original EPCs, PANYNJ would implement the following mitigation to further reduce project-generated emissions during the construction period.

ULTRA LOW SULFUR DIESEL FUEL (ULSD)

As described in the EPCs, PANYNJ would require that contractors use ULSD for all non-road vehicles that operate with diesel engines.

Table 9–9
Environmental Performance Commitments

Commitment	Implementation Plan
Use ultra low sulfur diesel fuel in non–road construction equipment with engine horsepower (HP) rating of 60 HP and above.	PANYNJ's construction specifications would require ULSD for all non-road, diesel-powered engines. The Authority would collect monthly samples of the ULSD fuel to verify compliance for all diesel powered engines.
Where practicable, use diesel engine retrofit technology in non–road equipment to further reduce emissions. Such technology may include Diesel Oxidation Catalyst / Diesel Particulate Filters, engine upgrades, engine replacements, or combinations of these strategies.	As part of the contract specifications, the contractor would be required to retrofit all diesel-powered equipment greater than 50 HP.
Limit unnecessary idling times on diesel powered engines to 3 minutes	As part of the contract specifications, the contractor would provide a Diesel Emission Mitigation (DEM) Plan for review and prior approval by the Resident Engineer (RE). The DEM Plan shall address the control of emissions from all engines and vehicles including those that are not equipped with emission control devices.
Locate diesel powered exhausts away from fresh air intakes.	As part of the DEM, the contractor, as determined by the RE will be required to ensure diesel powered engines vehicles are located away from fresh air intakes.
Control dust related to construction site through a Soil Erosion Sediment Control Plan that includes, among other things: a) spraying of a suppressing agent on dust pile (non–hazardous, biodegradable); b) containment of fugitive dust; c) adjustment for meteorological conditions as appropriate.	PANYNJ has developed specifications for dust suspension, materials handing, and wheel washing. The specifications require the contractor to submit a Dust Control Plan which would be implemented 24 hours per day 7 days per week.

ELECTRIFICATION

Certain construction engines which operate in a fixed position or temporarily fixed position, such as welding machines and compressors, could operate on electric power source, thus eliminating the on–site diesel exhaust source. However, there may be instances where some local generation would be needed when access to connection points is not feasible.

PANYNJ or its contractor would develop a plan, in consultation with Con Ed, as appropriate, to disperse grid power throughout the contraction zone for the Preferred Alternative. In its contract documents, PANYNJ would require all contractors and subcontractors to use electrically powered equipment for air compressors, pumps, mixing, desanding and grout plants, welding machines, and any other diesel powered equipment that can be replaced with an electrically powered version. However, this does not apply to the east-west pedestrian concourse beneath Route 9A if the concourse is built by NYSDOT, since NYSDOT has not yet finalized what level of electrification would be possible for its projects.

Given current conditions, it is expected that at lest 50 percent of the air compressors, pumps, mixing, desanding and grout plants, welding machines, and other diesel powered equipment that can be replaced with an electrically powered version would operate on electric power sources.

ADVANCED REDUCTION TECHNOLOGIES

In addition to the DOCs, which were considered as part of the original EPCs, other tailpipe emission technologies are available which can achieve reductions in PM emissions of 85 percent and as high as 98 percent, such as diesel particle filters (DPF). However, DPFs are not effective for every type of engine operation, and there may be technical difficulties in applying DPFs to some engines. The existing DPFs which have been verified by EPA or by the California Air Resources Board (CARB) as effective at substantially reducing PM emissions are mostly dependent on a high operational exhaust temperature for part of the operational cycle in order to

regenerate the filter and enable the continued operation of the engine. In some cases of construction engines that requirement is not met. DPFs with other means of regeneration exist, but would need to be tested for the specific desired applications. Also, it is possible that first application costs of cutting edge diesel reduction technology may prove to be prohibitive.

In its contract documents, PANYNJ would require the use of DPFs or other measures with equivalent PM removal efficiency for all nonroad diesel engines of 50 horsepower or greater wherever the implementation of such a device is feasible. However, there may be cases where DPFs would not be feasible for safety considerations, mechanical reasons, or where the technology would not function properly. In such cases, the constructor would submit a request for an exception for review and approval by PANYNJ prior to implementation, and in these cases, DOCs may be used. Only in cases where, for technical reasons, neither DPFs or DOCs can be used effectively, and where the operation cannot be performed by another engine or other means, would the use of diesel engines greater than 50 horsepower be allowed without tailpipe reduction measures, subject to the above described approval process.

NEWER ENGINES

The use of new construction engines would ensure that older, higher emitters are not operating on–site, and would make the operation of added control technologies easier and more efficient. For example, DPFs do not generally function with engines manufactured prior to 1994/5, since those engines did not include fuel injection. Since newer engines tend to have lower emissions to begin with, tailpipe reduction technologies would function more efficiently.

In its contract documents, PANYNJ would require the use of post-1995 fuel injection engines, which meet the Tier II engine emissions standards, as defined in Title 40, Part 89.112. Exceptions will be made only for specific engines that are not yet commercially available as Tier II, and where the task cannot be reasonably accomplished using alternative engines or means which do comply with these demands. In such cases, the contractor would submit a request for an exception for review and approval by PANYNJ prior to implementation.

DIESEL EMISSION MITIGATION (DEM) PLAN

PANYNJ would require contractors to prepare a DEM Plan that shall address the control of emissions from all engines and vehicles including those that are not equipped with emission control devices. As described in the EPCs, the DEM Plan would limit idling times on diesel powered engines to 3 minutes and would require that contractors locate diesel powered engines away from fresh air intakes.

DUST CONTROL PLAN

As described in the EPCs, PANYNJ would require contractors to submit a Dust Control Plan. Among other things, the plan would contain protocols and procedures for the spraying of dust piles, containment of fugitive dust, and appropriate adjustment measures to accommodate changes in meteorological conditions.

VERIFICATION

The effectiveness of measures to reduce construction period emissions depends on compliance. To that end, verification procedures would be implemented through construction specifications and contract documents. PANYNJ would verify mitigation and would identify opportunities to

expand its implementation as part of its ongoing oversight and auditing of the Project's construction. Furthermore, verification procedures would be implemented in accordance with decisions of the Lower Manhattan Construction Command Center, including procedures for reporting updates to the public.

OTHER EMISSIONS REDUCTION TECHNOLOGIES

PANYNJ is and will continue to investigate additional means (e.g., fuel emulsions) to reduce NO_x (NO and NO_2) emissions, but it is not yet known whether these measures would reduce the effectiveness of the above described mitigation. Therefore, specific means to further reduce NO_x have not been identified in the mitigation plan for the Preferred Alternative at this time. If this investigation results in additional means to reduce NO_x without jeopardizing the PM reduction measures and if other constraints such as technological availability are resolved, then PANYNJ would implement these additional mitigation techniques, as appropriate.

MITIGATION ANALYSIS

The above described mitigation measures would substantially reduce project-generated, construction period emissions. To quantify the effect of these measures on local pollutant concentrations, a mitigation scenario was developed and modeled using the general methodology described in Section B above.

The precise emissions reduction for each engine type is not yet known. Therefore, a conservative scenario was developed to demonstrate the effectiveness of the mitigation measures. The following assumptions were used for this analysis:

- ULSD was assumed for all non-road equipment. The use of ULSD alone was assumed to reduce PM emissions by 14 percent as compared to normal non-road diesel fuel.
- Research indicated that most diesel equipment over 150 HP can successfully employ DPFs; however, fewer pieces of equipment in the 50-150 HP range are able to do so. Because the majority of the Preferred Alternative's construction emissions would be from equipment having engines of 150 HP or greater, it was assumed that 75 percent of all engines of 50 HP or greater would employ DPFs or equivalent technology and that the remaining 25 percent would employ DOCs. On average, engines using DPFs were assumed to achieve a 90 percent reduction in PM. Those employing DOCs were assumed to achieve a 40 percent reduction in PM.
- It was assumed that all engines would be Tier II compliant; and
- It was assumed that half of all air compressors, pumps, mixing, desanding and grout plants, and welding machines used on site would operate with electric power.

Tables 9-10 and 9-11 present the results of the mitigation analysis. Table 9-10 shows the highest predicted microscale (local) increase in pollutant concentrations at various types of locations, which are depicted graphically in Figures 9-12 through 9-17. The concentrations presented in the Tables include contributions from both on–road sources and on–site construction activity emissions. The concentrations marked "Other Locations along Access Routes" represent the highest predicted impacts from on–road sources at more distant locations that would not be impacted by the construction activity on–site. The total concentrations, including background levels, are presented in Table 9-11.

Table 9–10
2006 Highest Predicted Increase in Pollutant Concentrations from Construction of the Preferred Alternative with Mitigation

Pollutant	Average Period	Receptor Type	Maximum Increase [µg/m3]	
			Route 9A Short Bypass	Route 9A At Grade
NO_2	Annual	Highest of All Receptors	5.7	7.7
		Residential Buildings / Hotel	4.4	4.4
$PM_{2.5}$	24–hour	Highest of All Receptors	16.4*	7.9*
		Residential Buildings / Hotel	2.2	2.4
		Other Locations on Access Routes	0.1	0.1
	Annual	Local Highest of All Receptors	0.2	0.3
		Local Highest Residential / Hotel	0.2	0.2
		Local on Access Routes	0.01	0.01
		Neighborhood Scale	0.04	0.04
PM_{10}	24–hour	Highest of All Receptors	21.1	16.4
		Residential Buildings / Hotel	4.1	13.3
		Other Locations on Access Routes	1.0	1.0
	Annual	Highest of All Receptors	0.6	0.7
		Residential Buildings / Hotel	0.5	0.5
		Other Locations on Access Routes	0.3	0.3

Notes:
Interim guidance threshold levels for $PM_{2.5}$ are 5 µg/m^3 and 0.3 µg/m^3 for 24–hour and annual increases, respectively, and 0.1 µg/m^3 for neighborhood scale annual average. For determination of adverse impacts, these values are applied in the absence of specific criteria.
The NAAQS are as follows: NO_2—Annual = 100 µg/m^3; $PM_{2.5}$—24–hour = 65 µg/m^3 and Annual = 15 µg/m^3; PM_{10}—24–hour = 150 µg/m^3 and Annual = 50 µg/m^3.
* Indicates substantial adverse impact–exceeding the interim guidance thresholds.

With mitigation, the maximum predicted increments are substantially lower than were shown in the construction period assessment (see Figures 9-12 through 9-21 and Table 9-10). With mitigation, maximum $PM_{2.5}$ increments would be reduced by approximately 66 percent. More importantly, neighborhood scale increments would be reduced by half to below the threshold level of 0.1 µg/m^3. As can be seen in Figures 9-16 through 9–19 (compare to base case Figures 9–6 through 9–9), the extent of increments above the interim threshold guidance levels would be reduced to a small area immediately adjacent to the site boundary, along the West Street bikeway, for 24–hour averages only. The occurrence of such high levels would depend on the coincidence of peak background levels above the 98th percentile together with peak construction activity and the extreme metrological conditions that led to the concentration predicted in the model. At a very conservative maximum, this could occur on up to six days of the peak construction year. Such an occurrence, although possible, is not likely and in any event would be rare. This would be a temporary situation, limited to a small area immediately adjacent to the Route 9A construction site and would not be expected to occur in subsequent years during which construction activity would be reduced. Construction activity will be managed by PANYNJ in this area to ensure that emissions from construction equipment and extreme meteorological conditions are prevented from occurring concurrently.

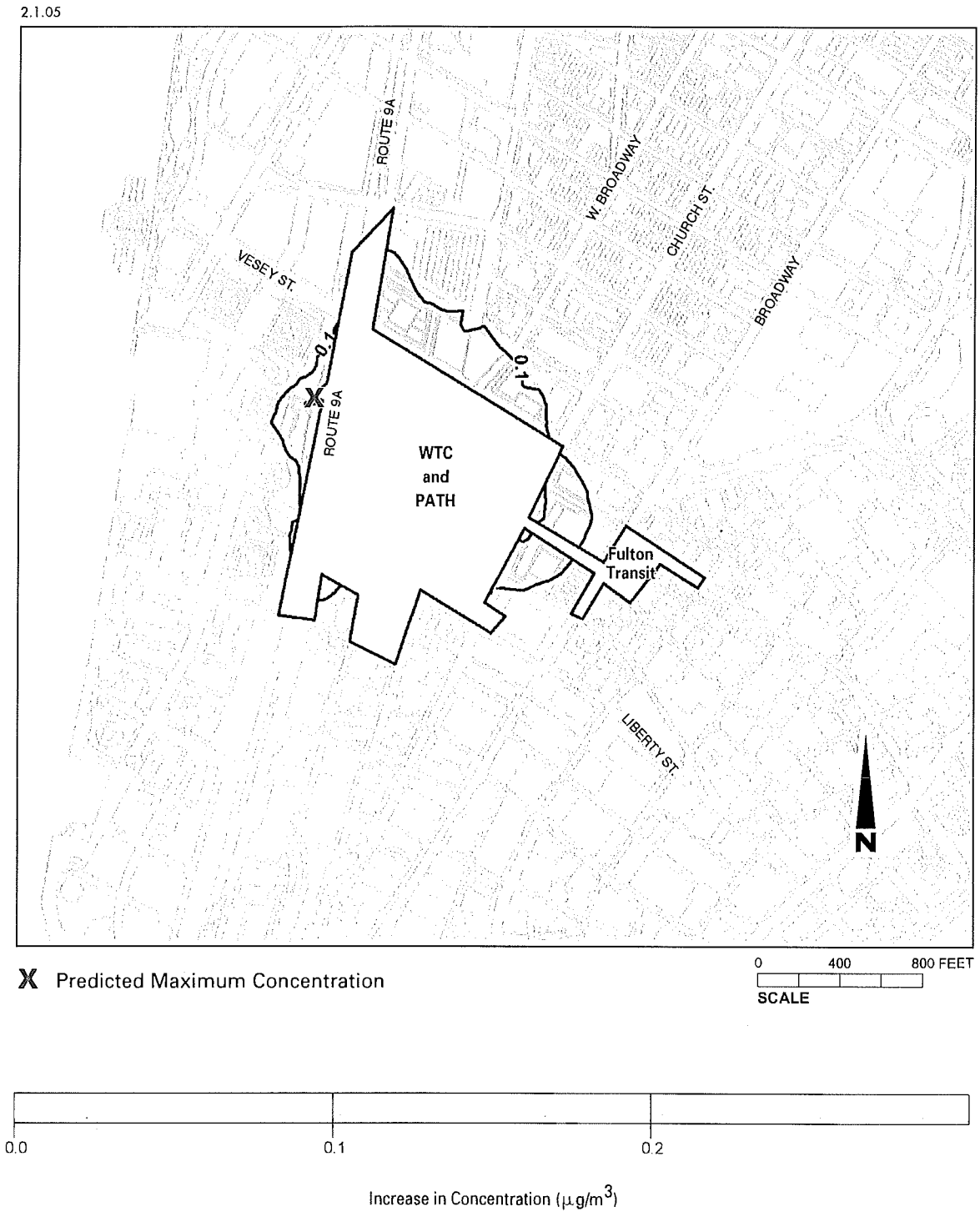


Figure 9-12

Maximum Predicted Annual Average PM_{10}
PATH Construction Increment with
Route 9A Short Bypass Tunnel Alternative and Mitigation

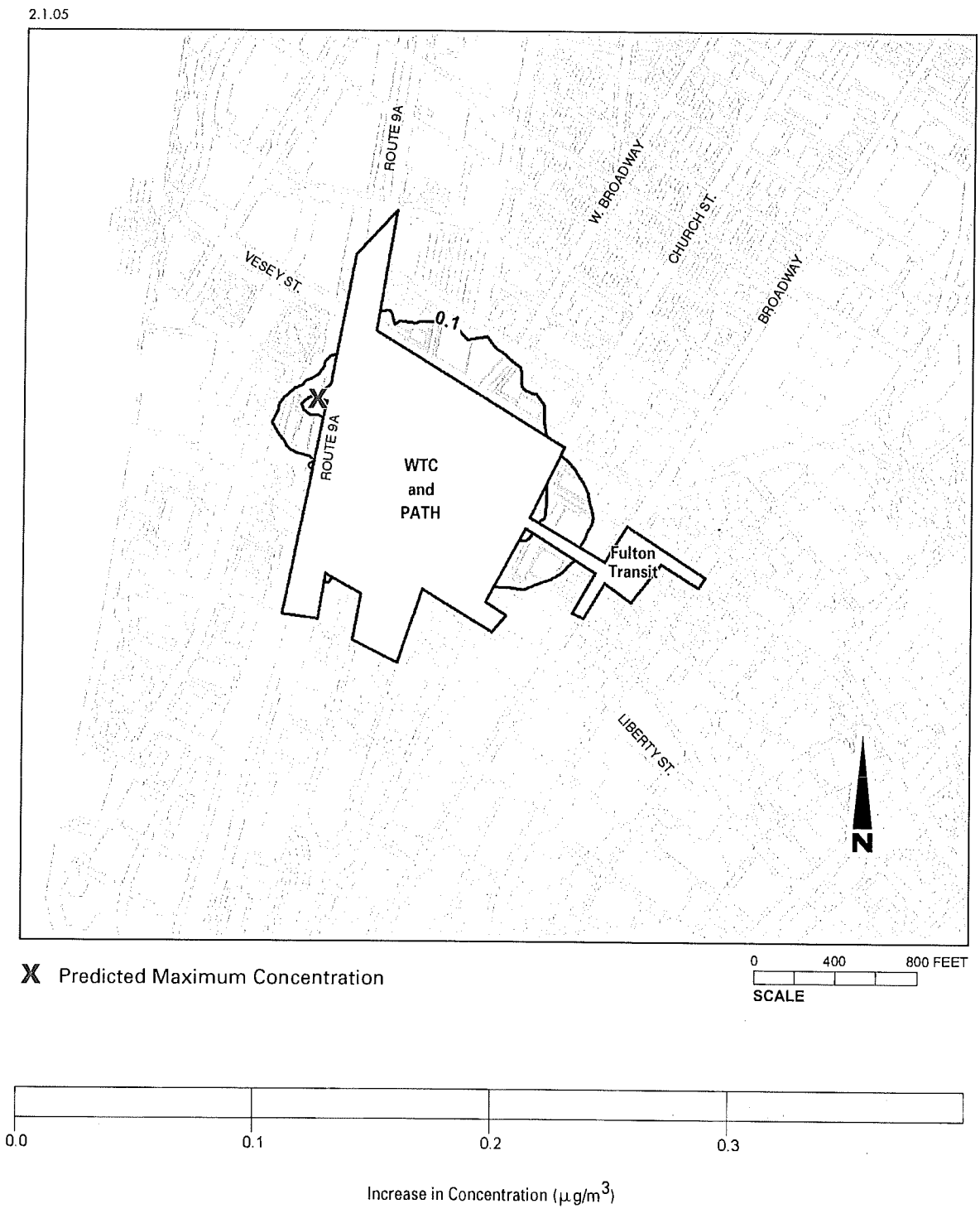


Figure 9-13

Maximum Predicted Annual Average PM_{10} PATH Construction Increment with Route 9A At-Grade Alternative and Mitigation

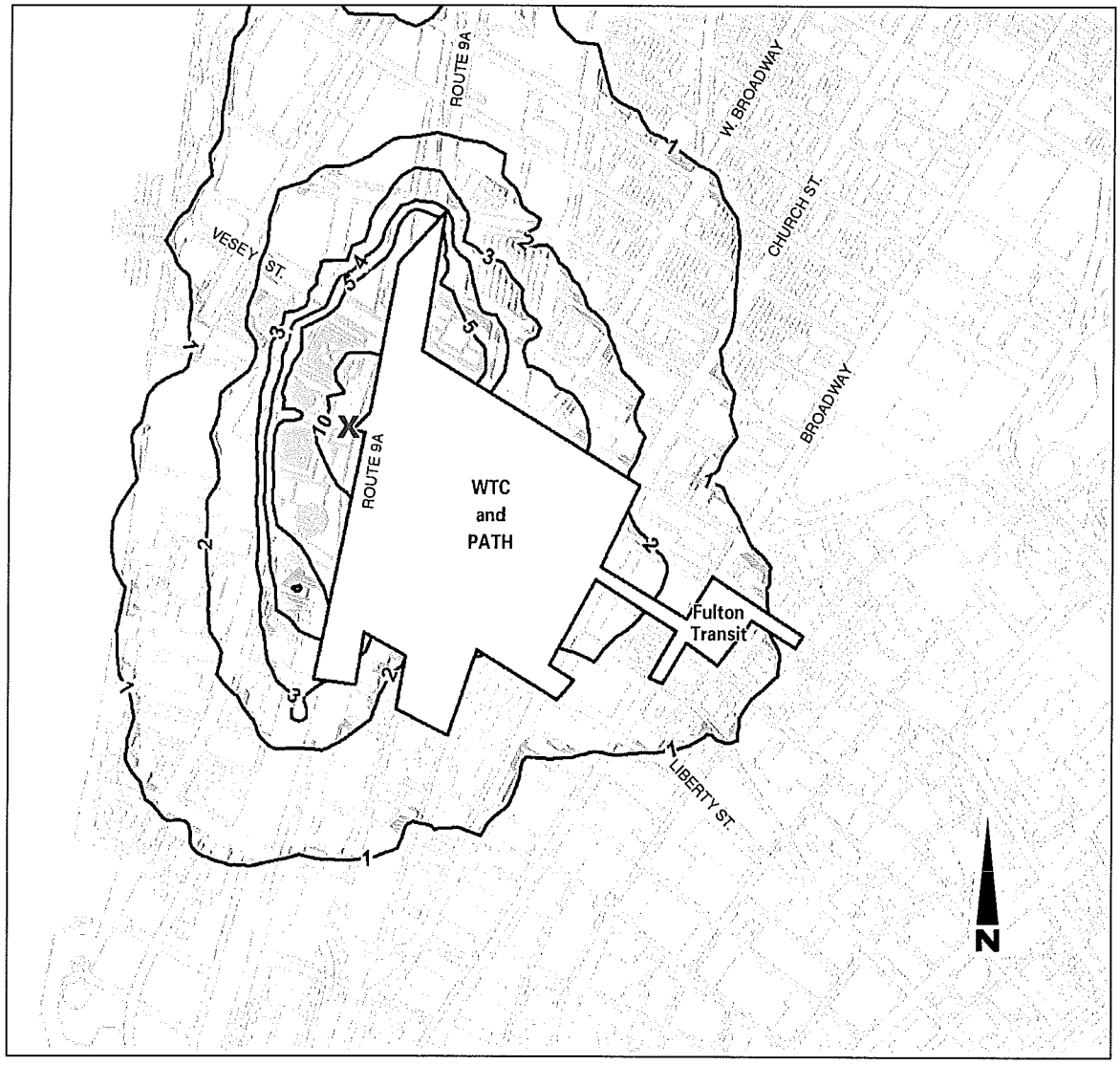


Figure 9-14

Maximum Predicted 24-Hour Average PM_{10} PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative and Mitigation

2.1.05

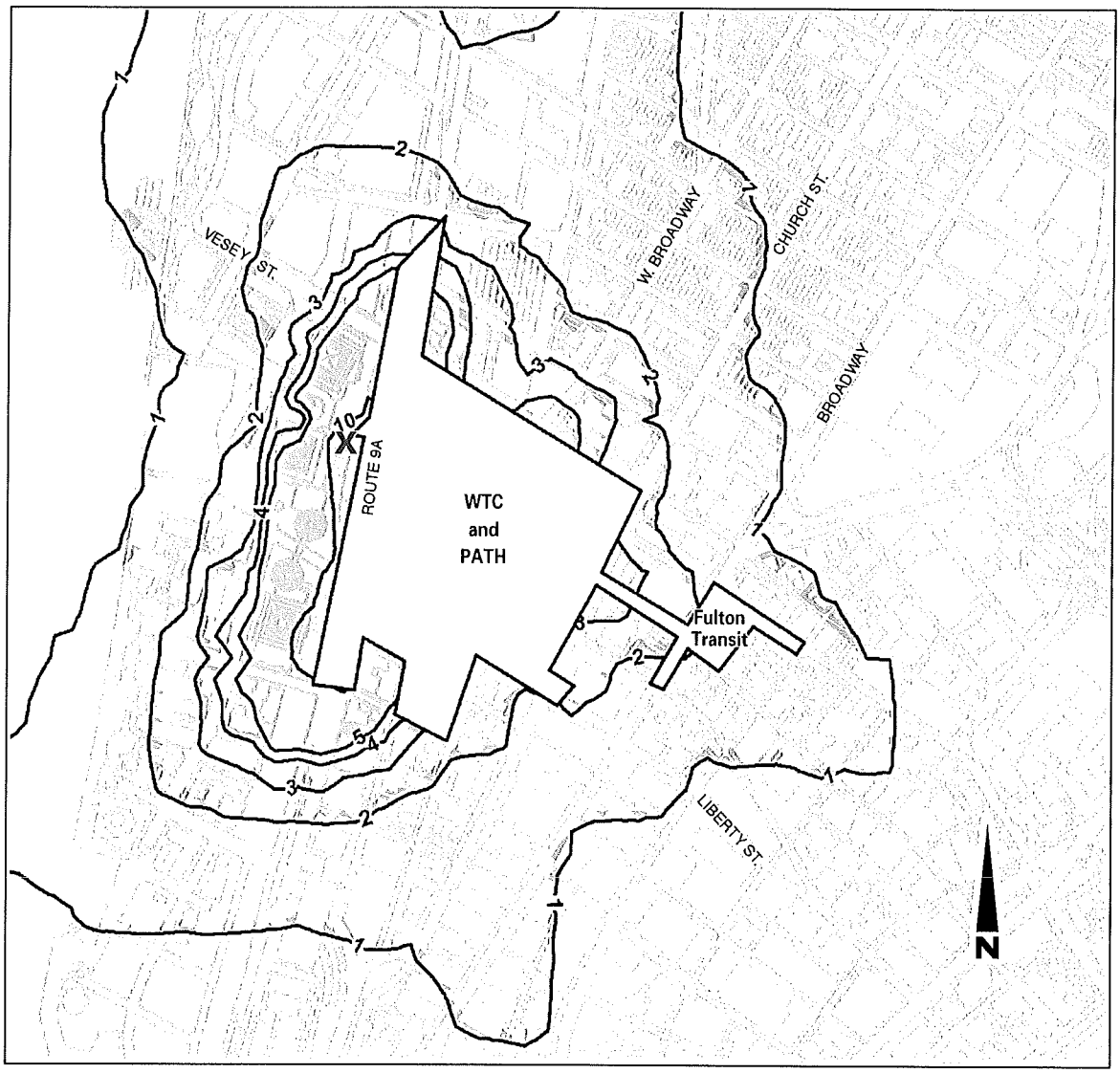


Figure 9-15

Maximum Predicted 24-Hour Average PM_{10} PATH Construction Increment with Route 9A At-Grade Alternative and Mitigation

2.1.05

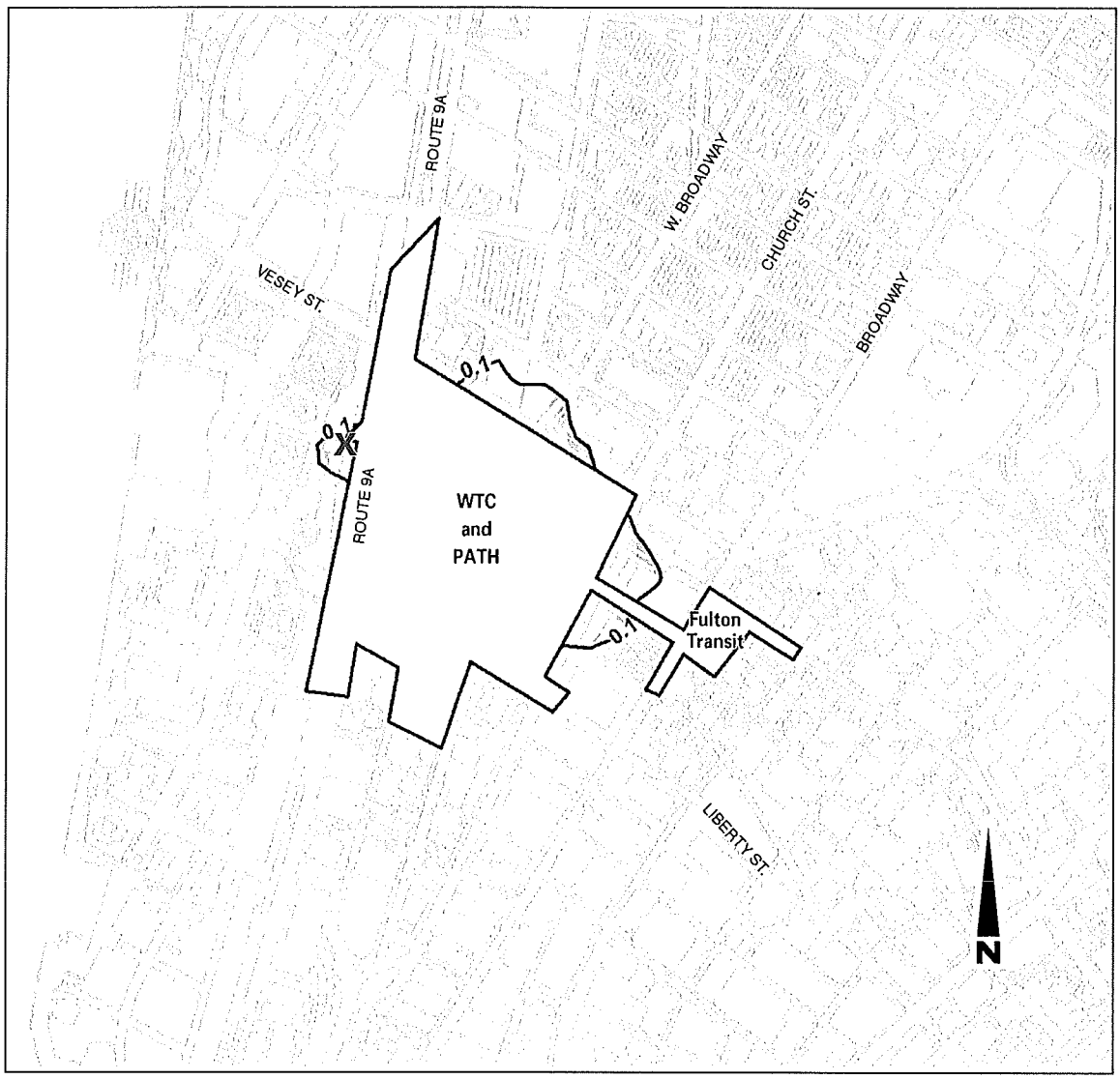


Figure 9-16

Maximum Predicted Annual Average $PM_{2.5}$ PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative and Mitigation

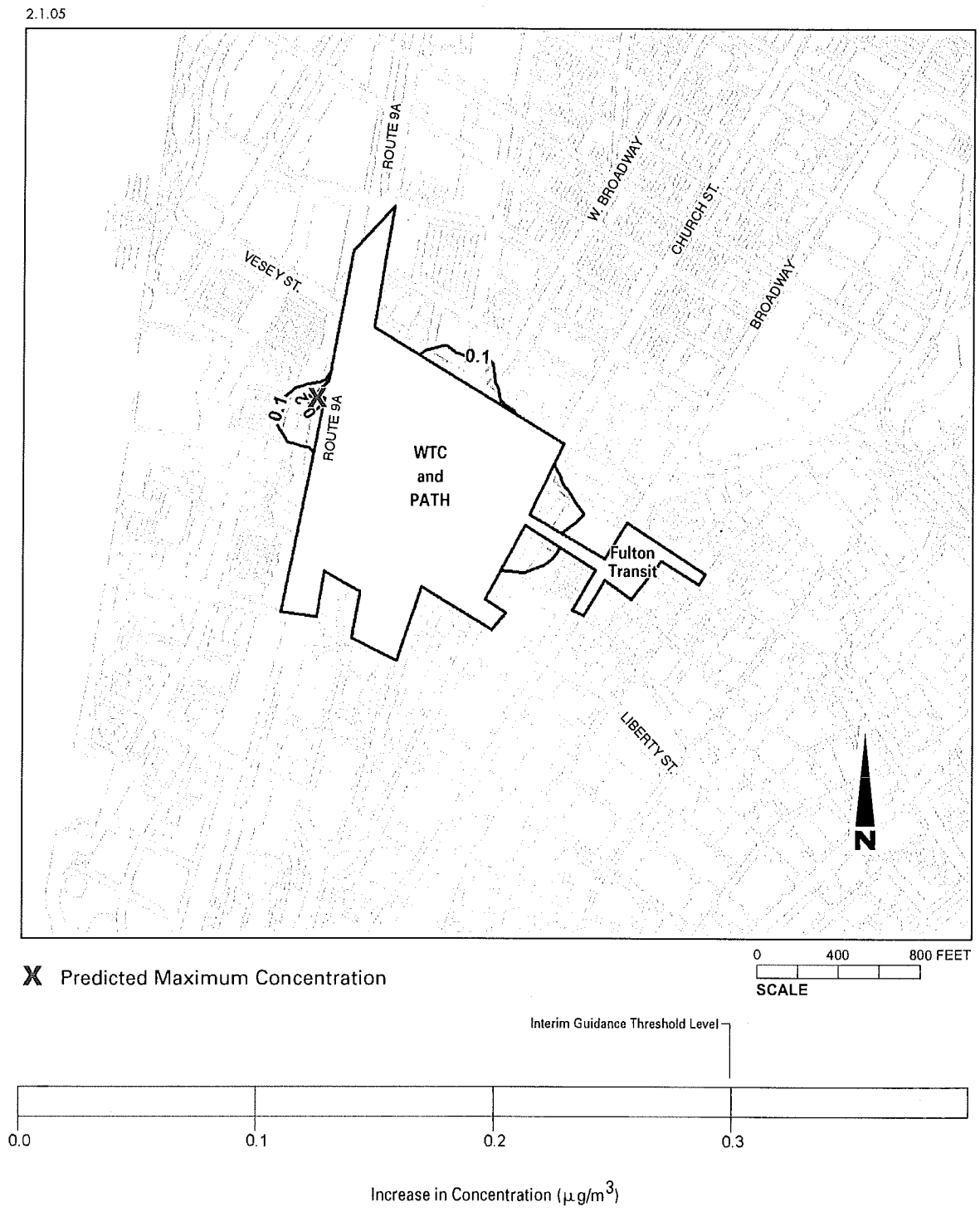


Figure 9-17

Maximum Predicted Annual Average $PM_{2.5}$ PATH Construction Increment with Route 9A At-Grade Alternative and Mitigation

2.1.05

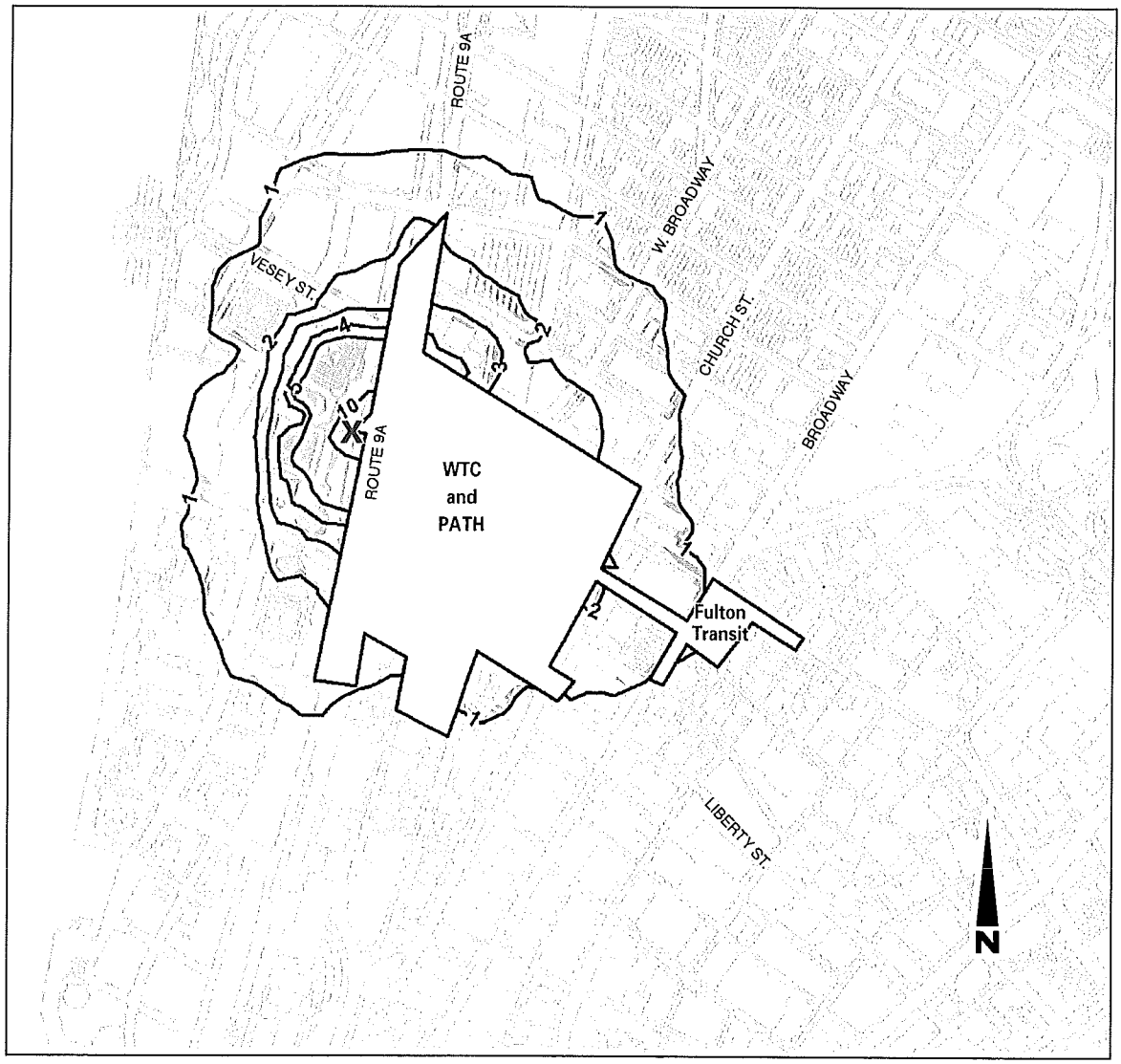
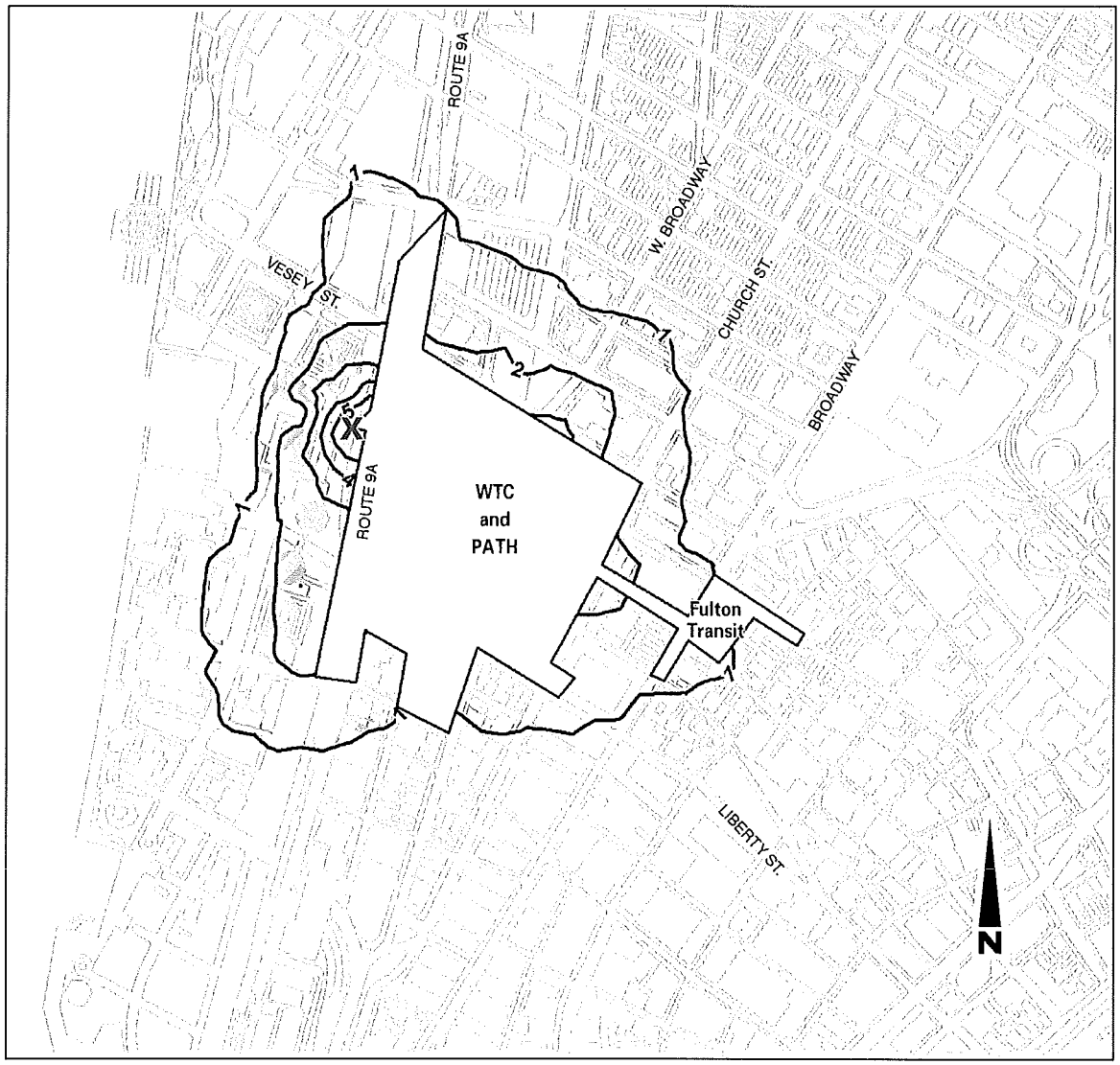


Figure 9-18

Maximum Predicted 24-Hour Average $PM_{2.5}$ PATH Construction Increment with Route 9A Short Bypass Tunnel Alternative and Mitigation

2.1.05



X Predicted Maximum Concentration

0 400 800 FEET
SCALE

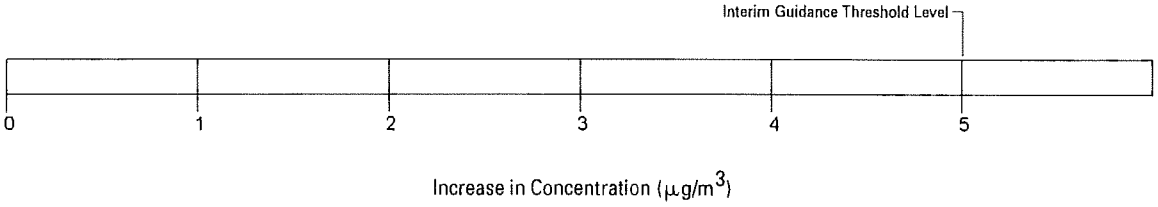


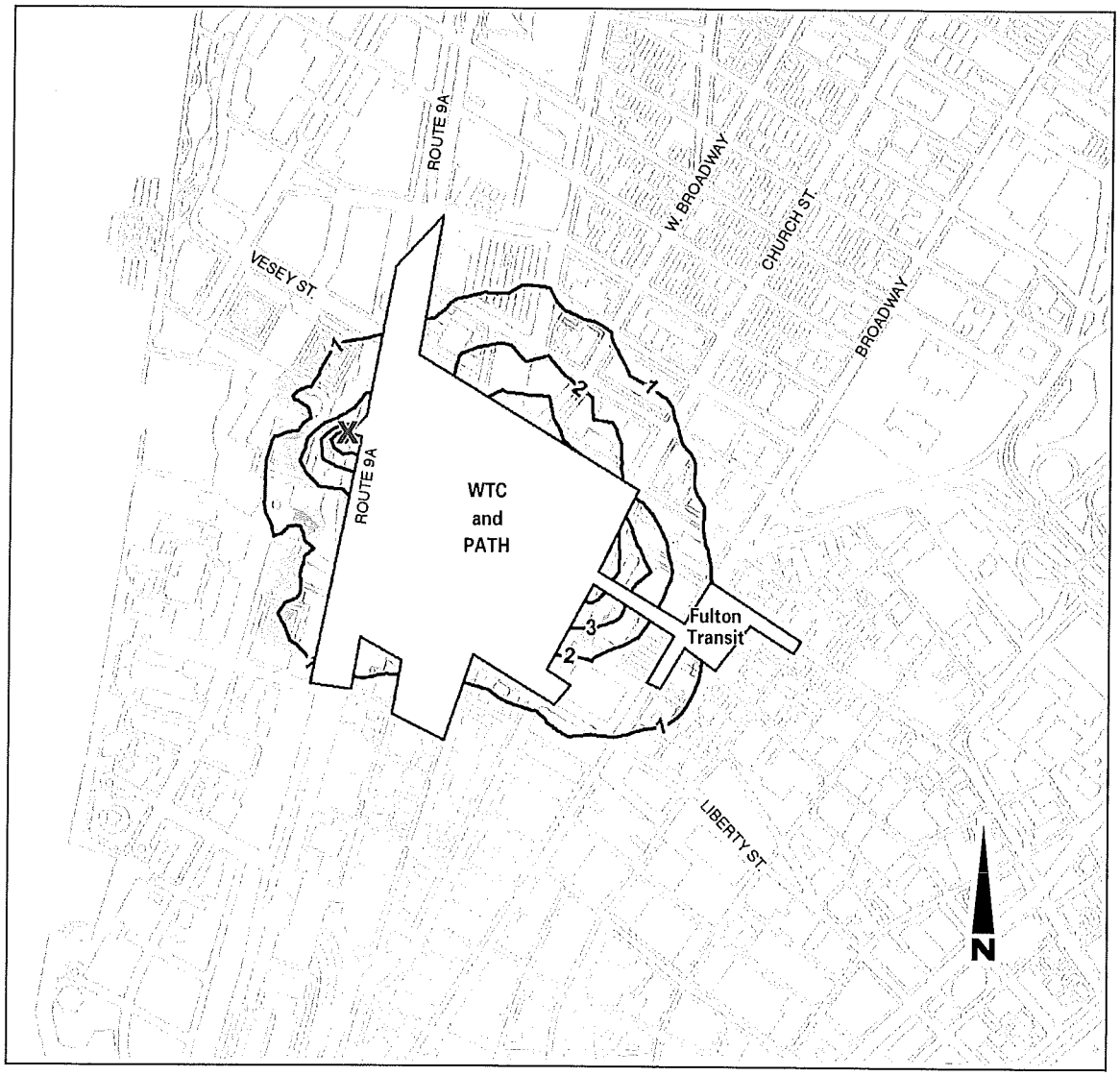
Figure 9-19

Maximum Predicted 24-Hour Average $PM_{2.5}$ PATH Construction Increment with Route 9A At-Grade Alternative and Mitigation

Figure 9-20

Maximum Predicted Annual Average NO_2
PATH Construction Increment with
Route 9A Short Bypass Tunnel Alternative and Mitigation

2.1.05



X Predicted Maximum Concentration

0 400 800 FEET
SCALE

0 1 2 3 4 5

Increase in Concentration ($\mu g/m^3$)

Figure 9-21

Maximum Predicted Annual Average NO_2 PATH Construction Increment with Route 9A At-Grade Alternative and Mitigation

Table 9–11
2006 Highest Predicted Total Pollutant Concentrations During Construction of the Preferred Alternative with Mitigation

Pollutant	Average Period	Receptor Type	Maximum Increase [µg/m^3]	
			Route 9A Short Bypass	Route 9A At Grade
NO_2	Annual	Highest of All Receptors	77.7	79.7
		Residential Buildings / Hotel	76.4	76.4
$PM_{2.5}$	24–hour	Highest of All Receptors	63.6	55.1
		Residential Buildings / Hotel	48.2	48.5
		Other Locations on Access Routes	48.2	48.2
	Annual	Highest of All Receptors	18.4**	18.7**
		Highest Residential / Hotel	18.1**	18.1**
PM_{10}	24–hour	Highest of All Receptors	83.0	78.4
		Residential Buildings / Hotel	60.1	69.3
		Other Locations on Access Routes	63.0	63.0
	Annual	Highest of All Receptors	29.2	29.2
		Residential Buildings / Hotel	26.8	26.8
		Other Locations on Access Routes	28.9	28.9

Notes:

All total concentrations include calculated background contributions from local mobile sources, as well as measured regional background values as follows: NO_2—Annual average 72 µg/m^3; $PM_{2.5}$—Annual average 17.1 µg/m^3 (highest of 2000-2002 annual values); 24-hour average 44.0 µg/m^3 (highest of the three 2nd highest 24-hour averages in 2000-2002); PM_{10}—Annual average 24 µg/m^3; 24-hour average 50 µg/m^3.

The NAAQS are as follows: NO_2—Annual = 100 µg/m^3; $PM_{2.5}$—24–hour = 65 µg/m^3 and Annual = 15 µg/m^3; PM_{10}—24-hour = 150 µg/m^3 and Annual = 50 µg/m^3.

Cumulative and project–generated maximum concentrations may occur at a different time and/or location.

** $PM_{2.5}$ annual average concentrations exceed the new NAAQS in the existing background condition; however the conformity process is not yet in effect. See Table 10– for comparison with incremental thresholds.

The total concentrations from cumulative construction of the Lower Manhattan Recovery Projects, including mitigation, are presented in Chapter 15, "Cumulative Effects."

Mesoscale Emissions Analysis

Table 9-12 shows the total project-generated emission of PM_{10}, $PM_{2.5}$, NO_x and VOCs by year with mitigation. This includes both on-site activity and related on-road emissions.

As compared to the projected regional emissions inventory in the New York ozone SIP for the same years—the on-road portion of the emissions would be less than 0.007 percent and 0.002 percent of the SIP mobile source NO_x and VOC emissions, respectively; the on-site portion of the emissions would be 0.05 percent and 0.003 percent of the non-road SIP NO_x and VOC emissions or less (depending on the year), respectively.

Table 9–12
Total Emissions from Construction of the Preferred Alternative with Mitigation (tons per year)

Pollutant	2005	2006	2007	2008
PM_{10}	0.8	1.2	0.3	0.3
$PM_{2.5}$	0.5	0.7	0.2	0.2
NO_x	34.0	36.8	8.4	8.4
VOC	1.9	2.5	0.6	0.7
Note: PM_{10} emissions include both engine emissions and resuspended road dust.				

A. INTRODUCTION

This chapter assesses the potential for noise and vibration impacts from construction and operation of the proposed Permanent World Trade Center (WTC) PATH Terminal.

This chapter includes a description of impact standards and criteria, a description of existing conditions, an assessment of construction impacts, an assessment of permanent impacts once the Permanent WTC PATH Terminal is operational, and a description of potential mitigation measures. Although the analyses and corresponding mitigation measures for these two assessments contain similar language, the analyses actually assess two different types of potential impacts.

Airborne noise is what most people think of when they hear the word "noise." It is noise that travels through the air—such as the sound of traffic on a nearby roadway, or children playing in a playground. *Ground-borne noise* is the rumbling sound caused by *vibration* (or oscillatory motion). With ground-borne noise, buildings and other structures act like speakers for low-amplitude noise. As an example, ground-borne noise is the low rumbling sound that occurs within a building as a train passes beneath.

Appendix E of this Environmental Impact Statement (EIS) provides supporting information for the various analyses, including descriptive information on how noise and vibrations are perceived, and details on the assessment methodologies and conclusions.

B. METHODOLOGY

AIRBORNE NOISE

The analysis of airborne noise for the Preferred Alternative was performed using the procedures set forth in the U.S. Department of Transportation, Federal Transit Administration (FTA) guidance manual, *Transit Noise and Vibration Impact Assessment* (April 1995). This FTA document sets forth methodologies for analyzing airborne noise during construction and operation. It also provides the criteria for assessing impacts as well as suggested mitigation measures.

Airborne noise levels from construction and operation of the Permanent WTC PATH Terminal are subject to the criteria defined by the FTA. In addition, noise levels from some construction equipment are regulated by the Noise Control Act of 1972 (49 USC §§4901 et. seq.)

The FTA guidance does not present standardized impact criteria for assessing airborne, construction-period noise impacts. However, it does contain levels that if exceeded may result in adverse community reactions, which were applied in this EIS for the assessment of potential adverse impacts. Sensitivity to noise is a function of land use, time of day, and duration. Thus, the FTA criteria provides for levels by type of use, time of day, and duration. The L_{eq} noise level

represents the constant equivalent sound level of a fluctuating source, usually for a 1-hour period. The L_{dn} is a descriptor for the cumulative 24-hour, day-night noise level and accounts for greater sensitivity to noise during nighttime hours. (See Appendix E for a more detailed description of the FTA criteria.)

Table 10-1 shows the FTA impact criteria for the detailed construction noise assessment conducted in accordance with FTA methodologies. For purposes of impact assessment, an airborne noise impact would occur if noise levels during construction exceed the FTA recommended values in Table 10-1. The residential and commercial use categories are most relevant to this EIS.

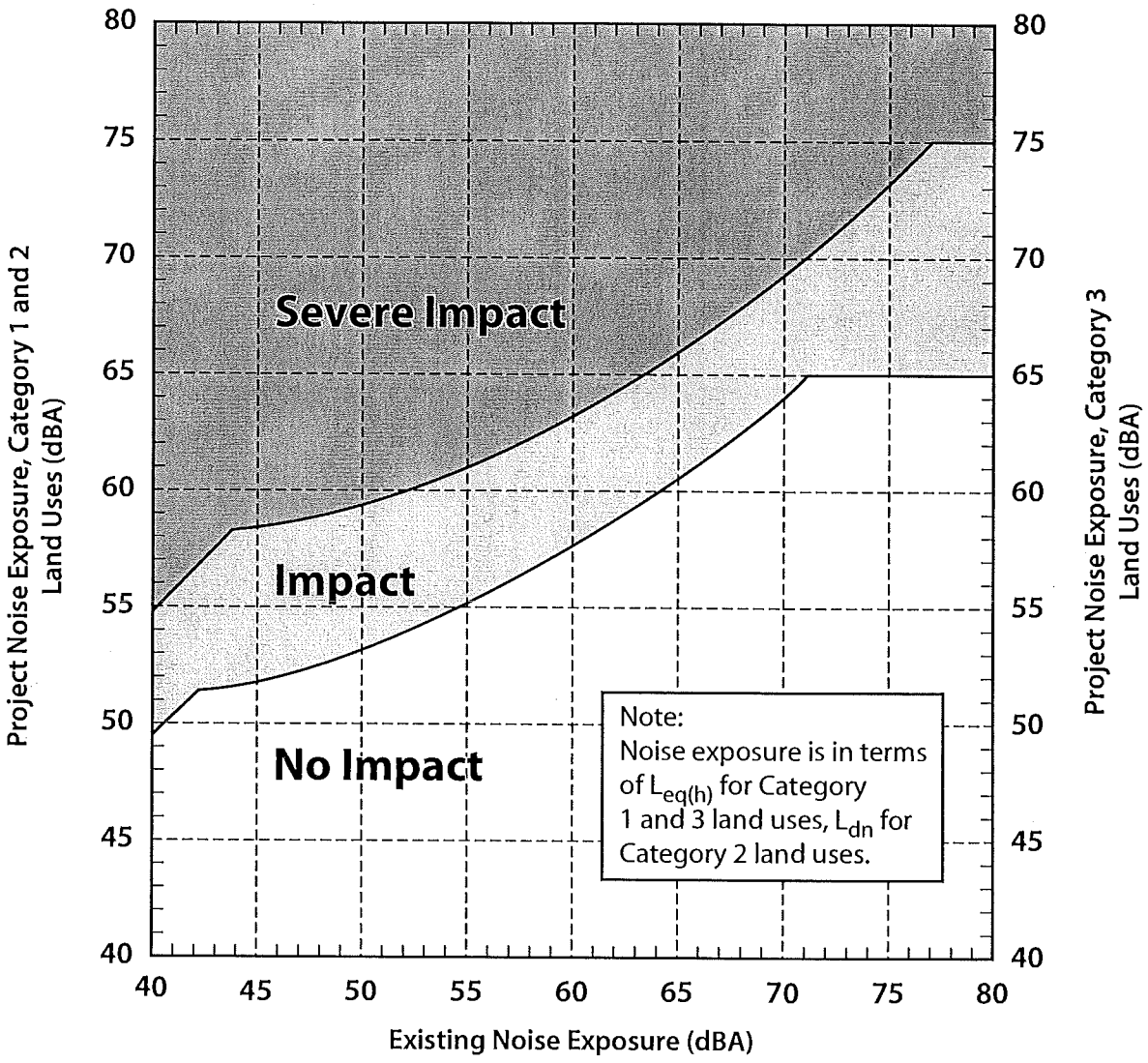
Table 10-1
FTA Impact Criteria for Detailed Assessment of Airborne Construction Noise (in dBA)

Land Use	Descriptor	Day	Night
Residential	8-hour L_{eq}	80	70
	30-day average L_{dn}	75[1]	
Commercial	8-hour L_{eq}	85	85
	30-day average $L_{eq(24)}$	80	
Industrial	8-hour L_{eq}	90	90
	30-day average $L_{eq(24)}$	85	

Note: [1] In urban areas with existing ambient L_{dn} greater than 65 dB, the impact criterion is existing ambient L_{dn} + 10 dB.

For airborne operational noise, the FTA guidance manual defines noise criteria based on the specific type of land use that would be affected, with explicit operational noise impact criteria for three land use categories. These impact criteria are based on either peak 1-hour L_{eq} or 24-hour L_{dn} values. Table 10-2 describes the land use categories defined in the FTA guidance manual, and provides noise metrics used for determining operational noise impacts. As described in Table 10-2, Categories 1 and 3—which include land uses that are noise-sensitive, but where people do not sleep—require examination using the 1-hour L_{eq} descriptor for the noisiest peak hour. Category 2, which includes residences, hospitals, and other locations where nighttime sensitivity to noise is very important, requires examination using the 24-hour L_{dn} descriptor.

As shown in Figure 10-1, the FTA impact criteria for airborne operational noise are keyed to the noise level generated by the Preferred Alternative (called "project noise exposure"). Two types of impacts—"severe impact" and "impact"—are defined for each land use category, depending on existing ambient noise levels. The difference between "severe impact" and "impact" is that a severe impact occurs with a change in noise that a substantial percentage of people find annoying, while an impact occurs when a change in noise is noticeable to most people but not necessarily sufficient to result in strong adverse reactions from the community. Equations defining the relationship between existing ambient noise levels and the "impact" and "severe impact" thresholds are presented in Appendix E, "Noise Analysis."



Source: Transit Noise and Vibration Impact Assessment, DOT-T-95-16, April 1995

Figure 10-1
FTA's Noise Impact Criteria for Transit Projects

Table 10-2
FTA's Land Use Categories and Metrics for Operational Transit Noise Impact Criteria

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor $L_{eq(h)}$[1]	Tracts of land where quiet is an essential element in the intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with substantial outdoor use.
2	Outdoor L_{dn}[2]	Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels, where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor $L_{eq(h)}$[1]	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, and churches, where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Buildings with interior spaces where quiet is important—such as medical offices, conference rooms, recording studios, and concert halls—fall into this category. Places for meditation or study associated with cemeteries, monuments, museums. Certain historical sites, parks, and recreational facilities are also included.

Notes: [1] L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity.
[2] L_{dn} for the 24-hour cumulative noise level.
Source: *Transit Noise and Vibration Impact Assessment*, FTA, April 1995.

For purposes of impact assessment, an airborne noise impact during operations would occur if noise levels fall in the "impact" or "severe impact" areas. For example, for Land Use Category 2 and an existing noise exposure of 60 dBA, a project-generated noise exposure of 65 dBA would result in "severe impact" while a project-generated noise exposure of 60 dBA would constitute an "impact." Similarly, for the same land use category and existing noise exposure, a project-generated noise exposure of 55 dBA would not constitute an impact.

NOISE PREDICTION METHODOLOGY

Following the procedures set forth in FTA's guidance manual, existing noise levels were first determined by field measurement. The project-generated noise levels from construction activities and the proposed PATH train operations were then calculated. Those levels were evaluated using the impact criteria discussed above to determine the Preferred Alternative's potential for adverse impacts. This methodology is discussed in more detail below.

DETERMINATION OF EXISTING NOISE LEVELS

Noise measurements were performed at receptor locations to establish existing conditions. Traffic on adjacent roadways and streets was the dominant noise source at each location.

Selection of Noise Receptors

Existing noise levels vary depending on local site conditions and the time of day. To determine the existing ambient noise levels in the area that could be affected by the construction or operation of the Preferred Alternative, specific analysis locations (referred to as "receptors") were chosen throughout the study area. A total of five receptor sites adjacent to the Project Site were chosen. These sites were selected to represent the range of land uses (e.g., residences, church, institution, offices) which would be particularly sensitive to noise increases, and would be likely to experience the greatest increases in noise from the Preferred Alternative's

construction and operation. The locations chosen as noise receptors are summarized in Table 10-3 (which also indicates each site's FTA land use category) and are shown in Figure 10-2. Potential noise and vibration impacts were also assessed at the site of the proposed WTC Memorial. However, the analysis is not based on existing noise levels since current construction activities in the WTC "bathtub" would result in an inaccurate assessment.

Table 10-3
Noise Receptor Sites and Locations

Site	Location	Land Use	FTA Land Use Category	Type of Measurement	Year of Measurement
1	Hilton Millennium Hotel (Church and Dey Streets)	Hotel	2	24-Hour	2003
2	114 Liberty Street (between Church and Greenwich Streets)	Residences and Offices	2	24-Hour	2003
3	World Financial Center (Route 9A between Vesey and Liberty Streets)	Offices	3	20-Minutes	2003
4	Barclay Street and Washington Street Intersection	Institution and offices	3	20-Minutes	2003
5	180 Broadway (between Dey and Cortland Streets)	Residences and Offices	2	24-Hour	2003

Note: For definition of land use categories, see Table 10-2.

Noise Monitoring

Noise monitoring was conducted at all five noise receptor sites. As shown in Table 10-3, at each site noise levels were measured for either one continuous 24-hour period or four 20-minute periods—AM, midday, PM, and nighttime. At receptor sites 1, 2, and 5, continuous 24-hour noise measurements were conducted; at receptor sites 3 and 4, 20-minute measurements were conducted. L_{dn} values for sites 3 and 4 were estimated from the 20-minute measurements as discussed below.

All measurements were performed using Type I instrumentation. Precision Sound Level Meters (SLM) were used in field measurements. The SLMs meet or exceed the requirements set forth in the ANSI S1.4-1983 Standards for Type I quality and accuracy. Acoustical calibrators were used to calibrate the SLMs before and after each measurement period. The SLMs were operated on the A-weighting network and slow-meter response as recommended by the manufacturer. Measurements were not collected if roadway pavement was wet, or if wind speed exceeded 12 miles per hour. A porous windscreen was used on each SLM during all measurement periods.

All field measurements were taken by mounting the SLMs approximately five feet above the sidewalk or ground surface at each receptor. This height is generally considered representative of the ear level of an average person. Where possible, measurement sites were located in open areas away from buildings or other potentially reflective surfaces, representative of the outdoor use area of a given receptor.

If possible, the SLMs were placed on public sidewalks in front of private properties. During measurement periods, important events and site conditions were noted, and a sketch was drawn for each receptor location showing important and permanent features of the area to aid in

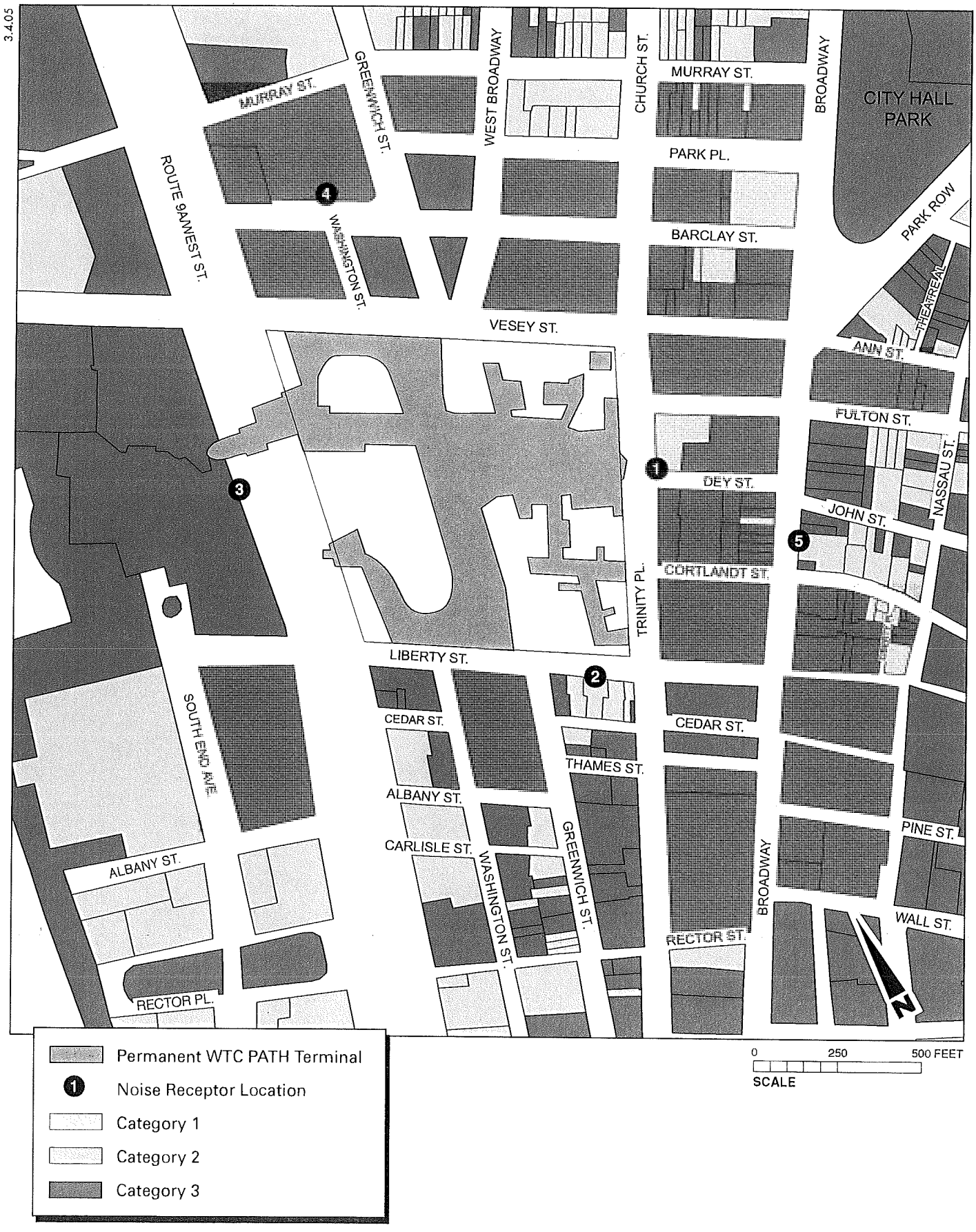


Figure 10-2

Noise Receptor Locations and FTA Land Use Categories

locating microphone positions at a later date. If an unusual noise source interrupted the measurement session, the measurement was temporarily paused until the noise source was out of range. Typical noise sources of this type include car alarms or car horns, occasional airplanes flying overhead, the roaring of motorcycles, and barking dogs.

Calculation of L_{dn} Noise Levels

L_{dn} noise levels can be calculated directly from 24-hour noise levels, but must be approximated if noise levels are not measured over a 24-hour period. The FTA guidance manual provides equations to approximate the L_{dn} noise level using either a peak, midday, and nighttime hourly L_{eq} noise level, or daytime, early nighttime, and late nighttime L_{eq} value. At receptor sites where continuous 24-hour measurement data were not available, those equations were used to calculate L_{dn} noise levels.

MODELING TO PREDICT FUTURE CONDITIONS FOR THE PROJECT ALTERNATIVES

A proportional modeling technique was used to approximate changes in noise levels from predicted changes in traffic volumes that would be independent of the Preferred Alternative. Traffic noise levels were then calculated using existing noise levels, existing traffic data, and estimated future traffic data. In general, with this technique, vehicular traffic volumes were converted into passenger car equivalent (PCE) values, for which one medium-duty truck (having a gross weight between 9,900 and 26,400 pounds) was assumed to generate the noise equivalent of 13 cars, one heavy-duty truck (having a gross weight of more than 26,400 pounds) was assumed to generate the noise equivalent of 47 cars, and each bus was assumed to generate the noise equivalent of 18 cars.

Because sound levels use a logarithmic scale, this model proportions logarithmically with traffic changes. For example, if the existing traffic volume on a street is 100 PCE with a noise level of 70 dBA, and if the future traffic volumes for No Build and Build conditions were 120 PCE and 150 PCE, respectively, then the No Build noise level would be 70.8 dBA, the Build noise level would be 71.8 dBA, and the project-generated noise level would be 64.8 dBA. This example assumes that traffic is the dominant noise source at a particular location. This assumption is true at all of the receptor locations in the vicinity of the Project Site under the baseline condition (i.e., no construction activities).

MODELING TO PREDICT IMPACTS FROM CONSTRUCTION ACTIVITIES

Noise from construction activities was estimated following the methodologies set forth in the April 1995 FTA guidance manual. The detailed noise assessment procedures were followed. The procedure is based on equations calculating noise levels from operation of each piece of construction equipment.

The combination of noise from all pieces of equipment operating during the same time period is obtained from adding the L_{eq} values for each piece of equipment. For the detailed assessment, 8-hour L_{eq} values and 30-day average L_{dn} values were calculated assuming all appropriate usage factors for the specified time periods for each element of construction as discussed in Chapter 3, "Construction Methods and Materials."

MODELING TO PREDICT IMPACTS FROM TRAIN OPERATIONS

Noise from the PATH train operations was also analyzed using the methodologies set forth in the FTA guidance manual. The analysis considered two major noise sources from PATH train

operations: noise from fixed-rail operations (i.e., noise from the PATH train operations emanating from stations, air ventilation openings, and train/subway gratings), and noise from mechanical equipment operations (i.e., substations, HVAC equipment, etc.).

The Preferred Alternative would not directly affect the operation of PATH trains (throughput or number of cars) as compared to future conditions, which were anticipated before September 11, 2001. Thus, the Preferred Alternative would not result in adverse noise impacts to existing land uses along the PATH's right-of-way. However, with the development of a memorial at the WTC site, there would be a change in land use from Category 3 to Category 1 adjacent to the proposed location of the Permanent WTC PATH Terminal. Thus a general noise assessment was performed per FTA guidance to determine operational-period noise levels and to examine potential impacts to the WTC Memorial.

Noise from rail vehicle operations would reverberate in the enclosed space of the underground tunnels and station. Reverberation effects of the tunnel and terminal would cause substantially higher noise levels resulting from source noise and reflected noise. To account for this phenomenon, noise levels were adjusted by calculating a noise level caused by the reflected portion of the fixed railway noise (which was assumed to bounce off acoustically reflective surfaces in the tunnels and terminal), and adding the noise level calculated for free-field conditions through logarithmic summation. For a conservative analysis, it was assumed that the tunnel or terminal are hard reflective surfaces with little or no sound absorption.

Based on the methods of sound propagation in enclosed spaces, i.e., the reflected effect, approximately 6dB was added to the free-field predicted noise levels and adjusted for noise receptor locations based on distance and acoustical attenuation through the terminal entrance or ventilation shaft. The analysis accounts for the fact that the Preferred Alternative's design will incorporate acoustical treatments on interior wall surfaces such as perforated metal acoustical panels containing glass fibers and spray-on mineral-based coatings. These measures would provide for 25 dBA attenuation.

VIBRATION AND GROUND-BORNE NOISE

To examine potential vibration and ground-borne impacts during construction, the FTA guidance document provides a screening procedure to project the magnitude of vibration levels to determine the potential for impacts and whether mitigation measures may be necessary. To examine potential vibration and ground-borne noise impacts during operation, the FTA guidance lays out a three-step approach: a screening procedure, a general assessment methodology, and a detailed analysis methodology. The analysis below includes a screening and general assessment. Detailed analysis is usually performed as part of the design process, when the general assessment prepared for the EIS indicates that a facility could cause potential impacts.

IMPACT CRITERIA

The vibration levels for typical human and structural responses and sources are shown in Table 10-4. Although the perceptibility threshold for ground-borne vibration is about 65 VdB, human response occurs when vibration exceeds 70 VdB.

Background vibration is usually well below the threshold of human perception, and is of concern only when the vibration affects very sensitive manufacturing or research equipment. Electron microscopes, high-resolution lithography equipment, and laser and optical equipment are typical of equipment that is highly sensitive to vibration.

Table 10-4
Typical Levels of Ground-Borne Vibration

Human/Structural Response	Velocity Level (VdB)	Typical Sources (at 50 feet)
Threshold, minor cosmetic damage fragile buildings	100	Blasting from construction projects
		Bulldozers and other heavy tracked construction equipment
Difficulty with vibration-sensitive tasks, such as reading a video screen	90	Commuter rail, upper range
Residential annoyance, infrequent events	80	Rapid transit rail, upper range
		Commuter rail, typical range
Residential annoyance, frequent events	70	Bus or truck over bump
		Rapid transit rail, typical range
Limit for vibration-sensitive equipment. Approximate threshold for human perception of vibration	60	Bus or truck, typical
	50	Typical background vibration

Source: *Transit Noise and Vibration Impact Assessment* (FTA, April 1995).

The FTA criteria for ground-borne vibration and noise from transit operations are based on the maximum levels for a single event. The criteria are shown in Table 10-5 and are used to determine if the Preferred Alternative would result in vibration and ground-borne noise impacts.

Table 10-5
Ground-Borne Vibration and Noise Impact Criteria

Land Use Vibration Category	Ground-borne Vibration Impact Criteria (VdB re 1 micro inch/second)		Ground-borne Noise Impact Criteria (dBA re 20 micro Pascals)	
	Frequent Events[1]	Infrequent Events[2]	Frequent Events[1]	Infrequent Events[2]
1	65 VdB[3]	65 VdB[3]	35 dBA[4]	43 dBA[4]
2	72 VdB	80 VdB	35 dBA	43 dBA
3	75 VdB	83 VdB	40 dBA	48 dBA

Notes:
1 "Frequent events" are defined as those with more than 70 vibration events per day. Most rapid transit projects fall into this category.
2 "Infrequent events" are defined as those with fewer than 70 vibration events per day. This category includes most commuter rail systems.
3 This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
4 Because the vibration-sensitive equipment in typical Category 1 buildings is not sensitive to ground-borne noise, FTA does not provide a ground-borne noise impact criterion for this category. However, Category 1 buildings for this EIS include historic structures, which may include residences. Therefore Category 2 ground-borne noise criteria are used for Category 1 as well.

Source: *Transit Noise and Vibration Impact Assessment*, FTA, April 1995, pages 8-2 through 8-3.

The limits are specified for the three land use categories defined below:

- *Vibration Land Use Category 1: High Sensitivity*—Buildings where low ambient vibration is essential for the operations within the building (e.g. vibration-sensitive research, hospitals with vibration-sensitive equipment, etc.), which may be well below levels associated with human annoyance. Although the FTA methodology does not classify historic structures in this category, this analysis does. Historic buildings are potentially sensitive to architectural damage from frequent vibration levels higher than 65 VdB. Architectural damage (e.g., cracked plaster) can adversely affect a building's historic features and character.
- *Vibration Land Use Category 2: Residential*—This category covers all residential land uses and any buildings where people sleep, such as hotels and hospitals.
- *Vibration Land Use Category 3: Institutional*—This category includes schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference.

In terms of construction activities, the focus of vibration criteria is the levels that should not be exceeded to prevent architectural and structural damage to nearby buildings. The generally accepted criteria for avoidance of construction-related damage, which the FTA has adopted in its guidance manual, is 0.20 inches per second (approximately 100 VdB) for fragile buildings or 0.12 inches per second (approximately 95 VdB) for extremely fragile buildings.

CONSTRUCTION VIBRATION PREDICTION METHODOLOGY

The FTA guidance manual provides screening methodologies for determining where there is a potential for impact to sensitive structures from construction activities, such pile driving, demolition, drilling, excavation, or blasting. The procedure includes: 1) selecting the equipment and determining the vibratory levels at a reference distance of 25 feet; 2) determining peak particle velocity at a receptor location by adjusting for the actual distance; 3) applying the vibration damage threshold criterion discussed above; and 4) if consideration of annoyance or interference with vibration-sensitive activities is of concern, estimate the vibration level.

C. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The terrorist attacks resulted in disrupted traffic flows and a general decrease in traffic volumes in the Lower Manhattan area compared with pre-September 11, 2001 conditions. This likely resulted in reduced traffic noise levels, although in some areas traffic noise levels may have remained unchanged or increased, due to the increase in traffic speeds that sometimes accompanies a decrease in volume. Construction-related cleanup and recovery activities post-September 11, 2001 added to noise levels in the area.

At receptor Sites 1, 2, and 5, a continuous 24-hour noise measurement was obtained, and at receptor Sites 3 and 4, measurements were made for four 20-minute periods during the AM peak, midday, PM peak, and at night. Measured $L_{eq(1)}$ and L_{dn} noise levels for the 24-hour continuous measurement receptor sites are shown in Table 10-6, and measured $L_{eq(1)}$ for the peak periods and calculated L_{dn} noise levels for the shorter time period measurement receptor sites are shown in Table 10-7. As shown in the tables, all of the measured noise levels are relatively high and reflect the high level of vehicular activity that takes place in the study area.

Table 10-6
Post-September 11, 2001 Measured 24-Hour Noise Levels (in dBA)

Hour Starting	Site 1 (Hilton Millennium Hotel) Measured $L_{eq(1)}$ Noise Level	Site 2 (114 Liberty Street) Measured $L_{eq(1)}$ Noise Level	Site 5 (180 Broadway) Measured $L_{eq(1)}$ Noise Level
01:00 AM	65	58	72
02:00 AM	66	59	67
03:00 AM	65	57	72
04:00 AM	64	60	73
05:00 AM	68	60	73
06:00 AM	71	63	76
07:00 AM	73	71	76
08:00 AM	72	70	76
09:00 AM	70	68	74
10:00 AM	70	66	73
11:00 AM	70	67	73
Noon	72	66	76
01:00 PM	71	64	74
02:00 PM	71	64	74
03:00 PM	69	64	74
04:00 PM	71	66	75
05:00 PM	68	65	74
06:00 PM	67	64	72
07:00 PM	66	64	72
08:00 PM	66	62	74
09:00 PM	64	62	71
10:00 PM	67	62	71
11:00 PM	64	70	72
Midnight	64	68	73
L_{dn}	74	71	79

Note: Field measurements were conducted in November and December, 2003.

Table 10-7
Post-September 11, 2001 Measured 20-Minute Noise Levels (in dBA)

Receptor Site	Location	Time Period	Measure $L_{eq(1)}$ Noise Level	FTA Calculated L_{dn} Noise Level
3	World Financial Center	Peak	67	72
		Midday	67	
		Late Night	65	
4	Barclay and Washington Street Intersection	AM Peak	66	70
		Midday	73	
		Late Night	58	

Source: Measurements were conducted in November and December 2003.

Data gathered at parks in Lower Manhattan were used to approximate an existing noise level at the future memorial site. Because traffic flows in the area have changed since September 11, 2001, current noise levels are likely lower than values obtained before September 11, 2001 and would not be representative of the area's usual noise levels.

Measured Leq(1) noise levels at parks in Lower Manhattan are shown in Table 10-8. The lowest measured Leq(1) noise level of 65.3 dBA was selected to represent the existing noise level at the memorial site for noise analysis.

Table 10-8
Measured 20-Minute Noise Levels For Parks in Lower Manhattan (in dBA)

Location	$L_{eq(1)}$	Date
Vietnam Veteran Plaza	66.9	2000
A park on Water St. between Fulton and Beekman Streets	68.8	1997
Seward Park	68.0	1997
Battery Park	71.0	1995
Hudson River Park	66.1	1996
Battery Park City	65.3	1996

D. PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

CONSTRUCTION PERIOD (2006)

FUTURE COMMON TO ALL ALTERNATIVES

Noise levels in the area will be highly influenced by the construction activity that is independent of the Preferred Alternative, such as the WTC Memorial and Redevelopment Plan, Route 9A Project, and the Fulton Street Transit Center. With these projects under construction, year 2006 noise levels would be substantially higher than the measured 2003 levels shown in Table 10-6 and 10-7. (Predicted construction noise levels generated by these projects are discussed in Chapter 15, "Cumulative Effects.")

NO ACTION ALTERNATIVE

Since the No Action Alternative would not result in construction of a Permanent WTC PATH Terminal, noise levels in the study area would be unchanged as compared to the Future Common to All Alternatives.

PREFERRED ALTERNATIVE

Noise

Construction activities for the Preferred Alternative would be expected to result in increased noise above current levels. These levels would vary depending on the location of construction, the equipment and construction methods employed, and the distance between the noise source and the receptor. Construction activities would occur within close proximity to sensitive land uses (e.g., residential uses); therefore the Preferred Alternative's construction has the potential to result in perceptible changes in noise levels that may result in annoyance to nearby residents. Since construction activities, in general, could take place 10 hours a day, 6 days per week, potential impacts may occur not only during the day, but also during weekend periods. Typical noise levels for construction equipment that may be used during construction of the Preferred Alternative are presented in Table 10-9.

Table 10-9
Construction Equipment Noise Emission Levels (in dBA)

Equipment	Typical Noise Level (dBA) 50 feet from source
Air compressor	81
Backhoe	80
Ballast Equalizer	82
Ballast Tamper	83
Bulldozer	85
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer (Pavement Breaker)	88
Loader	85
Paver	89
Pile Driver (Impact)	101
Pile Driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rail Saw	90
Rock Drill	98
Roller	74
Saw	76
Scarifier	83
Scraper	89
Shovel	82
Spike Driver	77
Tie Cutter	84
Tie Handler	80
Tie Inserter	85
Truck	88

Note: Values do not incorporate potential noise reduction measures that may be included in the Construction Noise Management Plan.
Source: *Transit Noise and Vibration Impact Assessment*, FTA, April 1995.

Noise from construction equipment is regulated by EPA noise emission standards. These federal requirements mandate that: (1) certain classifications of construction equipment and motor vehicles meet specified noise emission standards; and (2) construction materials be handled and transported in such a manner as not to create unnecessary noise. These regulations would be carefully followed. In addition, appropriate low-noise emission level equipment would be used and operational procedures implemented where feasible and practicable. Specific construction noise mitigation measures are listed on Table 10-14.

In general, the surrounding area has relatively high noise levels from existing traffic volumes, and increases in noise levels caused by delivery trucks and workers traveling to and from the construction sites would not be perceptible. However, small increases in noise levels would be expected near a few defined delivery truck routes and streets in the immediate vicinity of localized construction area. Except for the area immediately adjacent to the sites, all truck trips would be restricted to truck routes.

For receptor locations immediately adjacent to the construction area, a detailed assessment was performed to examine the potential for noise impacts during construction, rather than a general assessment. The assessment was performed using the methodology previously discussed.

Table 10-10 shows maximum predicted L_{eq} and L_{dn} noise levels in the year 2006 with construction of the Preferred Alternative, but without the implementation of noise mitigation measures. The predicted levels would exceed the recommended residential land use $L_{eq(8)}$ thresholds of 80 dBA at receptor sites 1 and 2. The predicted levels would also exceed the recommended commercial land use $L_{eq(8)}$ threshold of 85 dBA, and the 30-day L_{eq} threshold of 80 dBA at Site 3. However, the predicted levels would not exceed either the $L_{eq(8)}$ or 30-day L_{eq}/L_{dn} thresholds at Sites 4 or 5. Farther than approximately one to two blocks away, noise increases from construction of the Terminal are not expected to be substantial, due to the shielding effect of intervening buildings located between the terminal construction zone and these more distant receptors, as well as the masking effect of traffic and other ambient noise in the immediate vicinity of these receptors.

Table 10-10
2006 Construction Period Noise Levels Without Mitigation for the Preferred Alternative (in dBA)

Receptor Site	Location	Land Use Category	FTA Impact Criteria		Project-Generated Noise Levels		Impact	
			8-hour L_{eq}	30-Day *L_{dn}/ L_{eq}	8-hour L_{eq}	30-Day *L_{dn}/ L_{eq}	8-hour L_{eq}	30-Day *L_{dn}/ L_{eq}
1	Hilton Millennium Hotel	Residential	80	84	80	74	Yes	No
2	114 Liberty Street	Residential	80	81	80	74	Yes	No
3	World Financial Center/Dow Jones, on Route 9A	Commercial	85	80	88	81	Yes	Yes
4	Barclay Street and Washington Street Intersection	Commercial	85	80	69	62	No	No
5	180 Broadway	Residential	80	89	66	60	No	No

Notes: The 30-day L_{eq} is for commercial uses and the 30-day L_{dn} is for residential uses. At sites 1, 2, and 5 with high ambient noise levels (L_{dn} > 65 dB), the recommended residential use 30-day L_{dn} thresholds would be existing ambient + 10 dB (e.g. 74 dBA + 10 dBA = 84 dBA at Site 1).

Without the implementation of noise mitigation measures, construction operations would have an adverse noise impact at sensitive receptors immediately adjacent to receptor sites 1, 2, and 3.

Vibration

Construction activities associated with the Preferred Alternative would result in varying degrees of ground vibration, depending on the stage of construction, the equipment and construction methods employed, and the distance from the construction to buildings and vibration sensitive structures. Since much of the work would be within the WTC "bathtub" or near the 1 and 9 subway line, vibration levels would be perceptible off-site only for a portion of the construction period.

Table 10-11 shows typical construction equipment and vibration levels at distances varying from 5 feet to 50 feet. Depending on the distance, several of the values are above the 0.20 inches per second vibration damage threshold criterion for fragile buildings, and well above the 0.12 inches per second vibration damage threshold for extremely fragile buildings.

Table 10-11
2006 Construction Period Vibration Levels vs. Distance from Source for the Preferred Alternative (in dBA)

Equipment	Peak Particle Velocity (inches per second)					
	5 feet	10 feet	20 feet	30 feet	40 feet	50 feet
Pile driver (typical impact)	7.20	2.55	0.90	0.49	0.32	0.23
Clam shovel drop (slurry wall)	2.26	0.80	0.28	0.15	0.10	0.07
Hydromill slurry wall in soil	0.09	0.03	0.01	0.01	0.00	0.00
Hydromill slurry wall in rock	0.19	0.07	0.02	0.01	0.01	0.01
Large bulldozer	1.00	0.35	0.12	0.07	0.04	0.03
Caisson drilling	1.00	0.35	0.12	0.07	0.04	0.03
Loaded trucks	0.85	0.30	0.11	0.06	0.04	0.03
Jackhammer	0.39	0.14	0.05	0.03	0.02	0.01
Small bulldozer	0.03	0.01	0.00	0.00	0.00	0.00

To account for potential vibration impacts that may result from construction of the Preferred Alternative, all historic buildings located within 90 feet of the construction zone for the Project Site were identified (see Chapter 6, "Cultural Resources"). These buildings are: the Former East River Savings Bank; the Barclay-Vesey Building, the Beard Building, 114-118 Liberty Street, and St. Paul's Chapel and Graveyard. To avoid damage to these structures, a construction protection plan would be developed and mitigation measures would be implemented as described in Section E, "Mitigation."

FTA vibration-induced architectural damage thresholds are 0.20 inches per second peak particle velocity (PPV) for fragile buildings and 0.12 PPV for extremely fragile buildings. These thresholds would be adhered to during construction of the proposed project, for all applicable buildings.

OPENING YEAR (2009)

FUTURE COMMON TO ALL ALTERNATIVES

In the opening year, ambient noise in the vicinity of the Project Site would increase as compared to today. These increases would be attributed to vehicular traffic generated by residential and commercial development projects in Lower Manhattan as well as the independent construction of elements of the WTC Memorial and Redevelopment Plan. However, measures, such as the

Route 9A short bypass, could remove traffic from street level, which would lessen the projected increase in ambient noise.

NO ACTION ALTERNATIVE

Under the No Action Alternative, noise and vibration levels would primarily be a function of ongoing construction activities for elements of the World Trade Center Memorial and Redevelopment Plan. All other construction activities related to the Lower Manhattan Recovery Projects will have been completed, with the exception of the Permanent WTC PATH Terminal. Accordingly, construction noise and vibration levels would be substantially lower than the cumulative levels predicted for the 2006 peak construction year.

PREFERRED ALTERNATIVE

A general noise assessment as per FTA guidance was performed for the WTC Memorial site, assuming a Category 1 land use. The analysis assumes that all mechanical equipment would either be specified to have low noise levels, placed in acoustically shielded enclosures, or placed at locations where noise from equipment would not exceed 50 dBA at receptor locations. Examples of acoustical treatments for mechanical equipment include absorptive acoustical panels and enclosures, acoustical louvers, dampers, silencers, absorptive duct linings and plenums, and mufflers. As shown in Table 10-12, the predicted noise levels would be well below the impact criteria, and project-generated noise would not be expected to perceptibly increase ambient noise levels since the change in Build $L_{eq(1)}$ levels would be less than 0.5 dBA.

Table 10-12
Train Noise Impact Evaluation of the Preferred Alternative at the WTC Memorial Site

Noise Receptor Site	Land Use Category	Noise Receptor	Existing Noise Level	Allowable Project-Generated Noise Level	Actual Project-Generated Noise Level	Impact	Total (Build) Noise Level With the Proposed Project
WTC Memorial	1	L_{eq}	65.3	61.0	50.5	No	65.4
Note: For definition of land use categories, see Table 10-2.							

The ventilation structures for the Preferred Alternative would be located within the median of Route 9A. Exhaust/intake elevations would be approximately 40 feet. The fans within these ventilation structures would only be used during emergency situations and would not generate noise during normal operating conditions.

Table 10-13 shows project-generated vibration and ground-borne noise levels. Based upon the general vibration assessment results, PATH train operations would not produce vibration levels that would exceed the FTA impact criteria. PATH train operations would produce ground-borne noise levels exceeding FTA criteria for special buildings such as concert halls, TV studios, recording studios, auditoriums and theaters, which were used to represent the WTC Memorial site. However, the use of these criteria results in a conservative assessment of potential impact because, based on the information that is currently available, most of the WTC Memorial site would be open and subject to relatively high ambient noise levels (see Table 10-12). Furthermore, the WTC Memorial and the Preferred Alternative will be designed cooperatively to ensure that ground-borne noise from PATH operations would not adversely impact the WTC Memorial (see Section E, "Mitigation").

Table 10-13
Vibration and Ground-Borne Noise Impact Evaluation of the Preferred Alternative at the WTC Memorial Site

Land Use	FTA Criteria[1] Level		Predicted Project Exposure Level		Threshold Exceeded
	Vibration	Ground-borne Noise	Vibration	Ground-borne Noise	
Concert Halls, TV Studios, Recording Studios	65	25	60	40	Ground-borne noise
Auditoriums	65	30	60	40	Ground-borne noise
Theaters	72	35	60	40	Ground-borne noise

Note: [1] Vibration impact criteria for special buildings (i.e., concert halls, TV studios, recording studios, auditoriums, and theaters) are shown in Table 8-2 in the FTA Manual.

DESIGN YEAR (2025)

FUTURE COMMON TO ALL ALTERNATIVES

The WTC Memorial and Redevelopment Plan and other commercial and residential projects planned for Lower Manhattan will be completed before the design year, 2025. With these developments in place, ambient noise levels in the vicinity of the Project Site are expected to be similar to those that existed prior to September 11, 2001.

NO ACTION ALTERNATIVE

Under the No Action Alternative, noise levels in the study area would be slightly higher than with the Preferred Alternative, due to the increase in vehicular traffic (autos and buses) expected to result from a reduction in, or the elimination of, PATH service. However, this expected increase in vehicular traffic would not likely increase noise levels substantially above current conditions.

PREFERRED ALTERNATIVE

Similar to the opening year analysis, this alternative is not expected to result in impacts to the WTC Memorial, since the Preferred Alternative would incorporate design elements to reduce noise and ground-borne vibration, as necessary (see Section E, "Mitigation').

E. MITIGATION

PROJECT-SPECIFIC COMMITMENTS

CONSTRUCTION PERIOD

Noise

The implementation of the mitigation measures listed in Table 10-14 would eliminate all project-generated construction noise impacts. Table 10-15 shows maximum predicted L_{eq} and L_{dn} noise levels, with these mitigation measures in place. The mitigated levels would not exceed the $L_{eq(8)}$ or 30-day L_{eq}/L_{dn} thresholds at any of the five receptor sites.

Table 10-14
Summary of Noise Mitigation Measures

Construction Element [1]	Equipment Causing Impact	Mitigation Measures	Potential Noise Reduction (dBA)
1	Impact wrenches with noise emission level of 85 dBA at 50 ft	Use impact wrenches with noise emission level of 82 dBA at 50 ft [2]	3
	Pavement breakers	Install muffler on pavement breaker cylinder	13 [4]
3	Air-operated grout drills	Place drill inside acoustical enclosure	18 [4]

Notes: 1 See Chapter 3, "Construction," for descriptions of the construction elements.
Sources: 2 Goodson Tools and Supplies for Engine Builders, P.O. Box 847, Winona, MN 55987-0847
4 *Engineering Section Report* , Workers Compensation Board of British Columbia, Stuart Eaton, February 2000.

Table 10-15
2006 Construction Period Noise Levels with Mitigation (in dBA)

Receptor Site	Location	Land Use Category	FTA Impact Criteria		Project-Generated Noise Levels		Impact	
			8-hour L_{eq}	30-Day $*L_{dn}/L_{eq}$	8-hour L_{eq}	30-Day $*L_{dn}/L_{eq}$	8-hour L_{eq}	30-Day $*L_{dn}/L_{eq}$
1	Hilton Millennium Hotel	Residential	80	84	78	72	No	No
2	114 Liberty Street	Residential	80	81	79	73	No	No
3	World Financial Center/Dow Jones, on Route 9A	Commercial	85	80	84	79	No	No
4	Barclay Street and Washington Street Intersection	Commercial	85	80	67	61	No	No
5	180 Broadway	Residential	80	89	64	58	No	No

Notes: The 30-day L_{eq} is for commercial uses and the 30-day L_{dn} is for residential uses. At sites 1, 2, and 5 with high ambient noise levels (L_{dn} > 65 dB), the recommended residential use 30-day L_{dn} thresholds would be existing ambient + 10 dB (e.g. 74 dBA + 10 dBA = 84 dBA at Site 1).

PANYNJ would verify mitigation and would identify opportunities to expand its implementation as part of its ongoing oversight and auditing of the Project's construction. This would include on-site noise monitoring during construction. Furthermore, verification procedures would be implemented in accordance with decisions of the Lower Manhattan Construction Command Center, including procedures for reporting updates to the public.

At the World Financial Center (Site 3) noise levels during the peak construction year 2006 would be above 80 dBA for the 8-hour L_{eq} at the commercial receptors affected by the Preferred Alternative. The existing windows at these receptors provide a minimum 35 dBA attenuation. Therefore, construction noise levels may increase the interior noise levels above 45 dBA, the level generally considered acceptable for indoor uses. It is expected that a combination of the measures described above, as well as additional mitigation measures to be developed as

construction methods are further refined, could reduce the Preferred Alternative's construction period impacts at these locations.

Vibration

PANYNJ and FTA have executed a Memorandum of Agreement (MOA) pursuant to Section 106 of the National Historic Preservation Act (see Appendix B-2). The MOA includes protocols for developing and implementing Construction Protection Plans (CPPs) to avoid, minimize, or mitigate the project's potential construction-period vibration impacts on the Barcley-Vesey Building, Former East River Savings Bank, the Beard Building, 114-118 Liberty Street, and St. Paul's Chapel and Graveyard.

PANYNJ and FTA, in consultation with SHPO and Section 106 consulting parties, and in coordination with LMDC, NYSDOT, and MTA/NYCT, where appropriate, shall develop a Construction Protection Plan (CPP) for the Preferred Alternative. The CPP would set forth measures for the protection and avoidance of structural and architectural damage for these historic properties. The CPP would be based on requirements in the "New York City Department of Buildings Technical Policy and Procedure Notice (PPN) #10/88" regarding procedures for the avoidance of damage to historic structures resulting from adjacent construction. The PPN defines adjacent historic structures as being contiguous or within a lateral disturbance of 90 feet from a lot under development or alteration.

The CPP would describe in detail the construction procedures of the Preferred Alternative, as well as the construction procedures associated with other projects under construction in the vicinity of each of these historic properties. It would also provide for the inspecting and reporting of existing conditions at these properties, establish protection procedures, establish a monitoring program to measure vertical and lateral movement and vibration, establish and monitor construction methods to limit vibration; and establish methods and materials to be used for any repairs. The plan shall also specify the implementation of special vibration protection measures to protect these historic properties from increased vibration levels associated with construction activities. The CPP would provide for a historical architect meeting the Secretary of Interior's Standards to supervise implementation of the CPP.

The CPP would empower the historical architect, in consultation with the Chief Engineer of PANYNJ to issue "stop work" orders to prevent any damage to historic properties, and any recommencement of work shall only be permitted at such time that the Chief Engineer and historical architect have assurance that the appropriate modifications have been made to the construction technique to assure that no damage would occur to historic properties.

OPENING AND DESIGN YEARS

As described previously, the Preferred Alternative would incorporate design measures to reduce noise from PATH trains within the WTC Memorial. Examples of these measures include acoustical treatments for mechanical equipment such as absorptive acoustical panels and enclosures, acoustical louvers, dampers, silencers, absorptive duct linings and plenums, and mufflers. The Project's architects and engineers will determine the specific measures to incorporate as the Preferred Alternative's design advances. Using these measures, PANYNJ will achieve at least 25 dBA of attenuation within the Memorial, and operational noise generated by the Preferred Alternative would be far lower than FTA's impact criteria for train noise.

As described above, the Preferred Alternative would exceed FTA's impact criteria for ground-borne noise within the Memorial. However, the impact criteria may be also exceeded by high

ambient noise levels such that ground-borne noise generated by the Terminal would not be perceptible. If it is determined that ambient noise levels within the Memorial would exceed 40 dBA, then additional mitigation measures to reduce ground-borne noise would not bee needed within the Terminal itself.

If its design guidelines specify an ambient noise level within the Memorial that is below 40 dBA, PANYNJ will explore ground-borne noise mitigation measures that would meet or exceed the desired attenuation for the Memorial. Examples of mitigation that would be explored include absorptive treatment for interior wall surfaces within the Terminal as well as the use of resilient fasteners, ballast mats, resiliently supported ties, and/or floating slabs for the PATH tracks.

ENVIRONMENTAL PERFORMANCE COMMITMENTS

As described in Chapter 2, "Project Alternatives," PANYNJ, LMDC, MTA/NYCT, and NYSDOT have developed Environmental Performance Commitments (EPCs) that would be implemented as part of their respective Lower Manhattan Recovery Projects. Table 10-16 shows these commitments as well as PANYNJ's plans for their implementation.

Table 10-16
Environmental Performance Commitments

Commitment	Implementation Plan
Where practicable, schedule individual project construction activities to avoid or minimize adverse impacts.	In accordance with Governor Pataki's November 22, 2004 Executive Order, PANYNJ will coordinate the scheduling and staging of construction activities through the Lower Manhattan Construction Command Center. The Command Center will review PANYNJ's plans in conjunction with other planned activities and will recommend schedule adjustments, as appropriate.
Coordinate construction activities with projects under construction in adjacent and nearby locations to avoid or minimize impacts.	Through the ongoing coordination efforts of the LMCCG and the Command Center, adverse noise and vibration effects on sensitive receptors will be minimized through scheduling and routing of deliveries, as well as coordination of street closures and placement of truck/equipment staging areas.
Consider condition of surrounding buildings, structures, infrastructures, and utilities where appropriate.	In accordance with the Project's executed Memorandum of Agreement, PANYNJ will perform pre-construction building conditions surveys of the potentially affected historic buildings within 90 feet of the Preferred Alternative's construction zone. These efforts would be coordinated with the other appropriate Lower Manhattan project sponsors for sites that may be affected by cumulative vibration.
Prepare contingency measures in the event established limits are exceeded.	The Permanent WTC PATH Terminal construction contractor will procure the services of a qualified acoustical firm (INCE certified or licensed Professional Engineer) to assist in the implementation of a Noise Control and Abatement Plan, which will include on-site noise monitoring during construction, and implementation of mitigation measures to ensure compliance with applicable noise exposure thresholds. Vibration monitoring specifications, and corrective actions in the event threshold levels are exceeded, will be included in the Construction Protection Plan pursuant to the Stipulations of the Project's executed MOA.

Although not required for the Preferred Alternative, additional construction noise mitigation measures may be implemented. As described in Chapter 15, "Cumulative Effects," these measures may be needed to mitigate the cumulative effects of the Lower Manhattan recovery projects at receptors affected by construction of the Preferred Alternative. To adequately address these impacts, PANYNJ, in coordination with other project sponsors, and as part of the Lower Manhattan Construction Coordination Group (LMCCG), is developing and refining a range of

construction noise and vibration mitigation measures. Specific construction noise reduction measures being explored include:

- The use of acoustic barriers and walled enclosures around certain construction activities. Noise tents/enclosures could be used around workers using jackhammers. A temporary noise barrier of 20 feet in height could be installed along the fence line/property line of the Project Site to reduce noise levels. In addition, temporary barriers, such as wood panels on top of Jersey barriers could be positioned adjacent to and moved along slurry wall and other construction operations, etc.
- The placement of construction equipment in shielded locations, such as below grade in the Project Site.
- The installation of silencers on jackhammers, air compressors, generators, light plants and cranes to reduce noise levels at specific locations (e.g., adjacent to existing residential uses).
- The use of electrically operated equipment, rather than combustion equipment, wherever possible.
- The use of soil beds, timber planking and/or exterior rubber lining on truck body and aluminum carrying case to reduce rock impact noise during truck load/unloading operations.
- The use of drive-through street-level truck enclosures for truck loading and unloading.
- The use of sheds/enclosures at concrete pump sites during concrete truck unloading, and the placement of most loading/unloading inside the bathtub and away from street level noise receptors.
- The placement of most loading/unloading inside the bathtub and away from noise receptors located at street level.
- The designation of central areas for noisy activities, such as cutting steel or wood or use of noisy equipment such as impact wrenches. When feasible, use of pre-cut, pre-fabricated, or modular construction materials that minimize need for on-site fabrication or cutting methods. ✳

A. INTRODUCTION

This chapter assesses the infrastructure and energy requirements of the Preferred Alternative. It is expected that the Preferred Alternative would require all of the utilities previously used by PATH before September 11, 2001. However, new technologies and sustainable design principals proposed with the construction and operation of the new facility would result in equal or less demand for infrastructure and energy as compared to pre-September 11, 2001 conditions.

In addition to the Terminal and its pedestrian concourses, PANYNJ would construct ancillary facilities that support PATH operations and enhance the safety and security of the WTC site. As described in Chapter 2, "Project Alternatives," the ancillary facilities include two ventilation structures within the median of Route 9A, emergency egress within the WTC site, and mechanical and communications rooms. PANYNJ would also enhance security within the Terminal with the proposed structural hardening and reinforcement of the roof of the east-west concourse. The roof of the east-west concourse would eventually become the road bed for an extended Fulton Street, as proposed in the Generic Environmental Impact Statement for the World Trade Center Memorial and Redevelopment Plan.

As described in Chapter 2, "Project Alternatives," the sponsors of the Lower Manhattan recovery projects, including PANYNJ, Lower Manhattan Development Corporation (LMDC), New York State Department of Transportation (NYSDOT), and Metropolitan Transportation Authority (MTA), have coordinated to develop environmentally friendly ("green") design and sustainability principals to reduce the demand for and use of infrastructure and resources during construction and incorporated into project design and operations.

PANYNJ has been and continues to investigate sustainable strategies for the Preferred Alternative to guide the preliminary design process. These strategies would be consistent with criteria contained in the New York City Transit Environmental Guidelines and the United States Green Building Council (USGBC) Leadership in Energy Efficiency (LEED) Guidelines 2.1 and requirements of New York State Executive Order 111.

B. METHODOLOGY

The potential impacts to infrastructure from the construction and operation of the Preferred Alternative are assessed and evaluated in this section. These construction activities and future operations are then considered with regard to existing infrastructure to determine if the Preferred Alternative would impact current utilities. The evaluation of infrastructure and energy included the following review tasks:

- The physical setting of the proposed project;
- The mapping of utilities for the World Trade Center (WTC) site and surrounding areas;
- PANYNJ reports and files;

- Regulatory agency correspondence and reports pertaining to the subject site; and
- Pertinent federal and state regulatory databases and records.

The primary goal of the PANYNJ is to achieve improved environmental and sustainable attributes in the design, construction and operation of the Preferred Alternative. To achieve this, the PANYNJ has been and continues to investigate strategies that would primarily improve energy efficiency in the Preferred Alternative. The strategies would take into consideration not just the Preferred Alternative, but also its effect on the surrounding area (i.e., regional and neighborhood issues).

The analysis involves identifying infrastructure needs for the Preferred Alternative in comparison to the pre-September 11, 2001 Terminal as well as the site existing with today's temporary PATH station. The strategies include conservation and efficiency goals for water usage, energy usage and sewage and solid waste generation. The strategies to improve the environmental and sustainable attributes in the design, construction, and operation of the Preferred Alternative would include:

- A water management plan to reduce water usage and the load on the city's water supply would be considered for the Proposed PATH Terminal utilizing the 1992 Energy Policy Act. The water management plan would set baseline requirements for the buildings' water fixtures. The goal of the water management plan would be a 30 percent reduction in the use of potable water. This reduction would be applicable towards water supply and sewage generation.
- A materials management plan would pertain to solid waste collection, recycling and disposal. While there is no quantifiable measure at this time for solid waste in conjunction with pre, post and the future PATH Terminal, it is anticipated that a reduction in solid waste would occur as a result of the implementation of the materials management plan.
- An energy management plan aimed to reduce energy consumption by twenty percent below the American Society of Heating, Refrigeration, and Air Conditioning Engineers 90.1/1999 Standard (ASHRAE). The energy management plan would incorporate the use of ENERGY STAR compliant appliances as well as a central chilling plant to achieve the reduction set.

C. DESCRIPTION OF THE AFFECTED ENVIRONMENT

PRE-SEPTEMBER 11, 2001 BASELINE CONDITIONS

The Project Site is located in an area that has substantial infrastructure needs. The description of the affected environment includes the following components: water supply, sanitary sewage and stormwater disposal, solid waste, and energy under pre-September 11, 2001 conditions.

WATER SUPPLY

Three watersheds comprise New York City's water supply system: Croton, Delaware, and Catskill. The water supply system extends as far north as the Catskill Mountains and delivers approximately 1.4 billion gallons per day (gpd) of water to its customers located in the five boroughs of New York City and Westchester County. Water from these watersheds is carried to the city by means of a complex system including, reservoirs, aqueducts, and tunnels, and is distributed throughout the city by a large network of piping.

The Croton watershed collects water from Westchester and Putnam counties and delivers it to the Jerome Park Reservoir in the Bronx. From this point the New Croton Aqueduct distributes the water to the Bronx and Manhattan via underground piping.

Water consumption in the five boroughs of New York City averages approximately 1.2 billion gpd. Average consumption in Manhattan is estimated at 420 million gallons per day (mgd); peak consumption is approximately 500 mgd. The Croton system has a lower pressure than the Delaware and Catskill systems and supplies an average of 110 mgd, primarily to domestic users in the areas of lower elevation. The Delaware and Catskill systems serve the fire hydrants and domestic uses in areas where both systems exist, and average about 310 mgd.

In 1989, the City implemented a program that sought to reduce water use by utilizing a metering program, and requiring that fixtures in existing and new buildings be of low-flow design (Local Law No. 20, 1989). Further, the City approved a water-free program where, if 70 percent of fixtures located in a facility were the type that automatically conserve water, a flat fee for water use would be initiated. These programs as well as other measures were aimed at reducing water consumption in the City.

Minimal water was used for the operation of the WTC PATH Terminal prior to September 11, 2001. Specifically, city water was used for maintenance purposes and to supply the bathroom facilities located within the PATH Terminal. Additional water was drawn from the Hudson River and used for the cooling system, which provided the WTC facility and PATH Terminal with thermal comfort.

SANITARY SEWAGE AND STORMWATER DISPOSAL

The Newton Creek Water Pollution Control Plant (NCWPCP) in Brooklyn services the Project Site and surrounding area. The NCWPCP discharges its effluent into the East River. The effluent discharged by the plant is regulated by a State Pollutant Discharge Elimination System permit, which is issued by the New York State Department of Environmental Conservation (NYSDEC). The NCWPCP has been designed to treat a monthly dry-weather flow of effluent of 310 mgd. The current 12-month average flow is 221 mgd, which is well below the design capacity. The average flow in the months prior to the events of September 11, 2001, was 218 mgd, also well below the design capacity.

The NCWPCP was built in 1967 and, at that time, no specific requirements for the levels of wastewater treatment were implemented. The NCWPCP was constructed with an aeration system that removed 60 percent of biological oxygen demand and 70 percent of total suspended solids. In 1974, the Federal Clean Water Act required a secondary wastewater treatment defined to remove 85 percent of both biological oxygen demand and total suspended solids. As of December 31, 2007, the City agreed to provide this full secondary wastewater treatment. In the interim, modifications to the wastewater treatment system at the NCWPCP are ongoing until the plant is upgraded to meet the secondary wastewater treatment facility requirements.

The Project Site and surrounding area is serviced by a combination of piping that collects stormwater runoff and sewage together (i.e., combined sewers). This system collects flows along Vesey, Church, Liberty, and Greenwich Streets and delivers them to the 78-inch diameter, South Branch Interceptor that runs along Route 9A. The interceptor carries flows to a pump station located at 14th Street and the Franklin Delano Roosevelt (FDR) Drive along the East River, and is then delivered to the NCWPCP, which is located in Brooklyn. During periods of precipitation, sewers carry both stormwater runoff and sewage to the NCWPCP. However, during times of dry

periods, only sewage is transferred to the NCWPCP. When the combined sanitary sewage and the stormwater runoff exceed the interceptor's capacities, the resultant excess is discharged to the East River without benefit of treatment.

The former PATH Terminal included both public and private bathrooms and several utility closets containing sinks. The wastewater produced in these areas was transferred to the sanitary system servicing the WTC site. Further, the former PATH Terminal did not generate any stormwater independent of the overall WTC complex or the PATH system.

SOLID WASTE

Solid waste generated in New York City is transferred to landfills located in surrounding states. Solid waste is collected from commercial and manufacturing companies through the transportation and collection services of private carters. Additionally, in 1989, the City passed a law requiring residents and businesses to separate recyclable material from other solid wastes. The law also mandates that 25 percent of the city's trash must be recycled rather than landfilled.

Solid waste produced within the former PATH Terminal resulted from trash receptacles located within the Project Site. A limited number of small businesses (e.g. coffee and news stands) located also contributed to the overall solid waste stream.

ENERGY

The New York State Conservation Construction Code was promulgated on January 1, 1979, and governs the requirements of heating, ventilation, and air conditioning systems. The Code requires that all new and recycled, public, and private buildings be designed to ensure the adequate resistance to heat loss and infiltration. Further, it provides requirements for the design of electrical, mechanical, and lighting systems to be implemented within the building.

Con Edison supplies electricity to New York City and almost all of Westchester County. Further, Con Edison supplies gas, electric, and steam energy to the WTC site. However, PATH was serviced by Public Service Energy & Gas (PSE&G). PSE&G also supplied traction power for PATH train operations with a substation located on the WTC site.

CHANGES IN THE AFFECTED ENVIRONMENT SINCE SEPTEMBER 11, 2001

The September 11, 2001 attacks resulted in the collapse of the WTC complex, including the majority of the sub-grade structures located beneath the buildings. The Project Site (PATH Terminal portion of the Project Site) currently lies at a maximum depth of approximately 65 to 70 feet below street grade. The portions of the site that would contain the tracks, platforms, mezzanine, and substation of the Preferred Alternative now house the temporary station and its support facilities. The discussion of affected environment under pre-September 11, 2001, includes information on the water supply, sanitary sewage and stormwater disposal, solid waste, and energy required to operate the previous PATH Terminal. The following section discusses the same topics with respect to the Project Site limits, including the temporary station.

WATER SUPPLY

City water service has only recently been required at the Project Site following the terrorist attacks. The temporary PATH station currently has a minimal number of sanitary facilities and an emergency fire protection system. Furthermore, the temporary station is an "open air" facility and does not require the use of heating, ventilation and air conditioning systems (HVAC).

Overall, minimal quantities of city water are required in the operation of the temporary PATH station.

SANITARY SEWAGE AND STORMWATER DISPOSAL

Currently, the Project Site is tied to the city's sanitary sewage system. Several sanitary facilities are located at the temporary PATH station on the mezzanine and substation levels. Furthermore, stormwater is collected for the entire site and pumped to the city sewer connection.

SOLID WASTE

The temporary PATH station generates minimal quantities of solid waste from operations. The waste is collected in trash and recyclable receptacles located throughout the station. Given the reduced passenger loads at the temporary PATH station, quantities of solid waste generated are less than before September 11, 2001.

ENERGY

The temporary PATH station is "open air" with no cooling system. Although energy is needed for lighting, heating systems in employee-based areas, and electrical equipment (i.e., escalators, elevators, etc.), demand is less than prior to September 11, 2001, especially with consideration to the more stringent standards and use of "green" measures set for current construction. Further, similar to conditions before September 11, 2001, traction power for train operations is provided by PSE&G with a reconstructed substation on the WTC site capable of supplying energy to the station. The PANYNJ is currently working with Con Edison to provide a connection between the WTC PATH substation and the New York City power grid. Although PSE&G can adequately supply the PATH system, a connection with Con Edison would provide for redundancy allowing for backup power in the event of a shortage or other emergency.

D. PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

CONSTRUCTION PERIOD (2006)

FUTURE COMMON TO ALL ALTERNATIVES

In 2006, development activities for the WTC Memorial and Redevelopment Plan will occur on the WTC site, independent of the Preferred Alternative. Reconstruction of 7 WTC and its associated Con Edison substations will have been completed and may be used to power the temporary station in conjunction with the existing power supply from PSE&G.

Construction of the Route 9A short-bypass alternative would encounter several utilities located beneath the existing roadway. These include:

- A 66-inch city water line;
- A 78-inch city sewer main;
- A 48-inch city water main, and
- An 84-duct Verizon telephone utility.

These utilities would be relocated during construction. Other temporary relocation efforts may also be required for some minor utility lines located in the vicinity of the Route 9A. The relocation of utilities along Route 9A would be undertaken by the New York State Department

of Transportation (NYSDOT) as part of their reconstruction of Route 9A. However, if NYSDOT pursues the no action or at-grade alternative for the reconstruction of Route 9A, these utilities would remain in situ.

NO ACTION ALTERNATIVE

Under the No Action Alternative, temporary PATH service would continue to operate to the WTC site and there would be no construction activities with respect to Preferred Alternative. Thus, this alternative would not result in adverse impacts to infrastructure and energy issues during the construction period.

PREFERRED ALTERNATIVE

As described in Chapter 2, "Project Alternatives," the Preferred Alternative would include elements on the WTC site as well as connections beneath Route 9A to the World Financial Center. The following description of potential impacts to infrastructure and energy during the construction period addresses general issues for the construction of the entire Permanent WTC PATH Terminal and then specifically describes potential conflicts with existing infrastructure outside the limits of the WTC site.

Portions of the temporary PATH station would operate during the construction period. The design of the Preferred Alternative includes construction sequencing to ensure continuous PATH system operation at the Project Site. For the purpose of the infrastructure assessment, it has been assumed that the temporary WTC PATH station would use the utilities/infrastructure currently in place until the completion of the Preferred Alternative. Therefore, changes in infrastructure/utility requirements and systems for the Preferred Alternative are addressed below under the opening and design year. Therefore, utility usage associated with temporary station operations during the construction period would be essentially the same as today.

Various construction activities on the WTC site would be occurring in conjunction with the building of the Preferred Alternative. Overall, impacts to infrastructure for construction activities are anticipated to be minimal and would be addressed by the firms retained to perform construction activities. As described in Chapter 2, "Project Alternatives," and Chapter 3, "Construction Methods and Materials," PANYNJ would incorporate specifications into contracts to ensure that the following "green" and sustainable design strategies are met during the construction period. All sustainable strategies investigated for implementation, and as noted in this chapter exceed the expectations of the USGBC and the LEED Green Building Rating System.

- PANYNJ would provide for a Construction Stormwater Pollution Prevention Plan to conform to requirements of U.S. Environmental Protection Agency (EPA) 832/R-92-005.
- PANYNJ would investigate waste management strategies to reduce deposits to landfill. A minimum goal of 50 percent (calculated by weight) of construction, demolition, and land clearing debris would be recycled or salvaged.

Limited quantities of solid waste and sanitary sewage would be generated during construction. Stormwater is not anticipated to increase substantially as a result of construction activities and would continue to be addressed through previously described methods. Energy used to power on-site construction equipment would be provided by the contractor or through agreements with local power companies. Specifically, energy consumption would be a combination of; mobile sources, self-generating sources, and the New York City power grid.

During construction of the Route 9A concourse, groundwater and stormwater may be discharged. These waters would be treated (essentially requiring settling prior to discharge). This portion of the project may be undertaken by NYSDOT as part of their proposed Route 9A short bypass or by PANYNJ. Regardless, as described in NYSDOT's 1994 *Route 9A Reconstruction Final Environmental Impact Statement*, treated water would be cleaner than standard discharge and would therefore not adversely affect the City's sanitary systems.

As described above, there are numerous utilities beneath Route 9A in the vicinity of the WTC site. If NYSDOT moves forward with the short-bypass alternative for the reconstruction of Route 9A, then they would relocate these utilities prior to the construction of PATH's east-west connection to the Word Financial Center. If NYSDOT pursues an at-grade alternative, then the east-west connection would be built without utility relocation. However, in this scenario, PANYNJ would provide for construction protection measures to ensure that the utility lines would not be disturbed.

There may be minor utility conflicts in the vicinity of PATH's connection to the Dey Street Concourse of the Fulton Street Transit Center. These utilities would have to be either temporarily supported or relocated during construction to maintain existing service and minimize interference with the construction of the PATH Terminal. This work would be in cooperation with MTA as part of their construction of the Fulton Street Transit Center.

Overall, the review of infrastructure during the construction period has identified potential conflicts with existing utility lines at and along certain areas of the proposed concourses and pedestrian egress routes. In those instances where existing utilities occupy the same areas as permanent elements of the Preferred Alternative, they would be permanently relocated. Other conflicts would be addressed through temporary relocation and/or supporting utility lines. These actions would be undertaken to avoid disruption/interruption of service to sites within the vicinity of the Preferred Alternative. Furthermore, the relocation of any utility lines would be performed in coordination with the New York City Department of Environmental Protection, New York City Department of Transportation, NYSDOT, and the appropriate owner of that utility line (i.e., Verizon, Con Edison, etc.). Relocation efforts would be performed to not interrupt service to the surrounding area. Each utility interference would be assessed on an individual basis and adjusted as to limit the impacts to the utility and to the service it renders. Support of the utilities, if necessary, would be provided until the utility can be returned to its original position or until a relocation path is determined.

OPENING YEAR (2009)

FUTURE COMMON TO ALL ALTERNATIVES

Development activities will continue to occur on the WTC site as part of the WTC Memorial and Redevelopment plan. With respect to activities, current schedules for the project indicate that any conflicts with utilities will be addressed prior to the opening year for the Preferred Alternative.

NO ACTION ALTERNATIVE

Under the No Action Alternative, temporary PATH service would continue to operate to the WTC site and would not change regional fuel consumption and energy demand. Therefore, this alternative would not result in adverse impacts to infrastructure and energy issues in the opening year.

PREFERRED ALTERNATIVE

In the opening year, energy requirements for the Preferred Alternative would be consistent with or less than the energy requirements under the pre-September 11, 2001 conditions. Construction of the utility systems located in and servicing the WTC site would be completed. Additionally, the use of proposed "green" measures, such as the reuse of stormwater, would reduce energy demand as compared to a terminal without such measures.

Green Design

As described in Chapter 2, "Project Alternatives," PANYNJ would incorporate environmentally friendly ("green") and sustainable development principals into the design, management, and operation of the Permanent WTC PATH Terminal. These measures would reduce demand for resources and infrastructure. They would also integrate many of the Terminal's energy needs with those of the WTC site as a whole to result in a more efficient operation.

PANYNJ would prepare and implement a comprehensive resource management plan for the integrated consideration of water, materials, and energy resources with the goal of identifying, evaluating, and optimizing the use of all resources on the site. Specific measures to accommodate this plan are described below.

Water Supply

The Preferred Alternative would demand potable water for restroom facilities, human consumption, and station maintenance and cleaning. However, PANYNJ would implement strategies to reduce the Terminal's demand for potable water from the City's system. A combination of strategies would be employed to reduce demand as described below.

- During the Project's design phase, PANYNJ would prepare a Comprehensive Water Management Plan that evaluates the use of storm water, waste water, and potable water. This plan would identify measure for the onsite reclamation of wastewater. This study would investigate EPA's recommendations described in Executive Order 12123 (June 1999) and other Best Management Practices.
- PANYNJ would use Hudson River water for the cooling of the Terminal's HVAC system would negate the need to draw potable water for this purpose.
- PANYNJ would collect stormwater from surfaces of the Terminal Hall and adjacent plaza. A tank would be constructed with a capacity to accommodate a 2-year/24-hour storm. The collected water would be used for year-round flushing supply to urinals and toilets within the Terminal; year-round washing of the adjacent plaza and sidewalks; irrigation of plantings in summer months; and occasional use for façade washing.

Sanitary Sewage and Stormwater Disposal

As before September 11, 2001, only a limited number of facilities would be located within the Preferred Alternative that would generate sanitary sewage i.e. (public and private bathrooms, small utility closets with sinks). Given the similar magnitude of sanitary sewage and stormwater produced at the pre-September 11, 2001 terminal and the Preferred Alternative, no adverse impacts would occur.

However, PANYNJ would provide for the collection of stormwater from surfaces of the Terminal's Transit Hall and adjacent plaza for reuse on-site. Furthermore, PANYNJ would filter

this water to remove 80 percent of the total suspended solids. The implementation of these measures would reduce demand on the City's sewer system and treatment facilities.

Solid Waste

The Preferred Alternative is expected to generate nearly the same amount of solid waste as the temporary WTC PATH station resulting in equivalent/lesser quantities of solid waste as compared to pre-September 11, 2001, conditions. However, PANYNJ would strive to further reduce solid waste through an active, on-site recycling program. This would include a centralized space within the Terminal for the collection, sorting, and storage of recyclables as well as public recycling receptacles throughout the building.

Energy

Energy requirements for the Preferred Alternative would require a 20 percent reduction in demand, resulting in an energy demand equivalent to or less than the pre-September 11, 2001 terminal. Energy demands for the former PATH Terminal were met by PSE&G from a substation on the WTC site. The PSE&G substation, which was destroyed on September 11, 2001, has been reconstructed to serve the temporary WTC PATH station. This substation would be retained and would serve the Permanent Terminal. Redundancy with Con Edison would be provided from substations beneath 7 WTC that are currently under construction.

The energy needs of the Preferred Alternative are anticipated to be the same or less than they were prior to September 11, 2001. Technologies have become more energy efficient since the original PATH station was constructed. The new technological advances would be implemented during construction of the Preferred Alternative. Further, the Terminal would be constructed within the footprint of the original PATH station, with the addition of one extra platform. Moreover, the implementation of "green" measures including, but not limited to, energy-efficient lighting, heating, and ventilation systems, etc., would contribute to the conservation of energy and may lead to a decrease in the Project Site energy requirements. Further, an energy budget for the first year of operation and annual updates on budgeting and performance for energy resources for years thereafter would be examined for implementation. A building energy modeling system would also be considered. This system would allow for comparison of alternative strategies for energy efficiency and load reduction.

As described in the Chapter 2, "Project Alternatives," the Terminal would eventually use Hudson River water for the cooling of its heating, ventilation, and air conditioning (HVAC) systems. The reuse of the existing Hudson River water intakes and outfalls is an economical and energy-efficient method to provide cooling for the components of the Permanent WTC PATH Terminal. The intakes, pumps, outfalls, and associated pipelines that existed prior to September 11, 2001, remain largely intact. Furthermore, since river water, on average, provides lower supply temperature than other alternatives, greater energy efficiency during the heat transfer process would be achieved. Finally, river water cooling reduces the Terminal's demand on the city's water supply and electric grid as compared to conventional cooling methods.

A number of sustainable design measures would also reduce the Terminal's demand for energy. The abundant use of natural light within the Terminal would reduce daytime demand for energy. Furthermore, control and monitoring methods would regulate energy consumption and would help PANYNJ and PATH to periodically adjust operating procedures to reduce demand. These control measures include:

- A computerized, fully-integrated Building Management System (BMS) with energy and fluid flow measurement capabilities for all major energy consuming systems;
- A maintenance plan for ongoing measurement, verification, and maintenance of equipment efficiencies, and resource use;
- Programmable controls for devices;
- A permanent monitoring systems to track energy performance;
- Maintenance and operational continuity through manuals and staff education; and
- Continuous monitoring equipment for a representative sample of equipment (e.g., lighting systems, motors, drives, air distribution systems, and boilers);

PANYNJ would also purchase a portion of the Terminal's power from a supplier that uses renewable energy sources. A portion of the Terminal's mechanical area would also be set aside to accommodate future technologies that would provide for efficient, on-site, renewable energy.

WTC Site Infrastructure

As described in Chapter 6, "Cultural Resources," the project would include utility lines within the PATH right-of-way beneath the Terminal's platforms. Additional infrastructure, such as the existing PATH substation and mechanical rooms would also be located within the PATH right-of-way on the western portion of the WTC site. At elevation 242 (58 feet below sea level), all infrastructure associated with the PATH Terminal would be within PATH's right-of-way. At higher elevations (Elevation 264 or above), it may be necessary to construct utility lines for the coordination of infrastructure between PATH and the WTC Memorial and Redevelopment Plan. Such work would be implemented in coordination with LMDC, pursuant to the stipulations of the project's executed Memorandum of Agreement (see Appendix B).

While maintaining the ability to advance the Permanent WTC PATH Terminal's construction independent of the WTC Memorial and Redevelopment Plan, PANYNJ continues to explore opportunities for joint infrastructure to serve both the PATH Terminal and elements of the WTC Memorial and Redevelopment Plan. Examples of these opportunities include a central chiller plant for the WTC site; river water cooling; centralized recycling and waste collection; centralized security checkpoints, and a stormwater collection and distribution system. Joint infrastructure would reduce infrastructure demand through efficiencies and economies of scale that would not be achieved on a project-by-project basis. Therefore, the use of joint infrastructure in conjunction with the WTC Memorial and Redevelopment Plan would further reduce the infrastructure and energy needs of the Terminal as compared to a wholly, stand-alone facility.

DESIGN YEAR (2025)

FUTURE COMMON TO ALL ALTERNATIVES

All development efforts on the WTC site would be completed before the design year. Furthermore, any utility conflicts, such as relocation or shoring, will be resolved prior to the opening year. Although demand for infrastructure and energy will be greater following the full reoccupation of the site than it is today, advances in building construction and the sustainable design measures that will be implemented as part of the WTC Memorial and Redevelopment Plan are expected to reduce levels of consumption as compared to pre-September 11, 2001 conditions.

NO ACTION ALTERNATIVE

The No Action Alternative may result in the full disruption of PATH service to Lower Manhattan by the design year. As described in Chapter 8, Section B, "Vehicular Traffic and Parking," the absence of PATH service to Lower Manhattan would result in the diversion of PATH riders to private automobiles, buses, and vans, resulting in approximately 1,200 new vehicle trips in the AM peak hour. There may also be an increase in ferry ridership, which would necessitate additional operation of vessels between New Jersey and New York. These vehicles would require fuel and would therefore expend energy. Because these diverted trips would not be anticipated if PATH were operational, they would use energy sources that would not be needed for the Preferred Alternative.

PREFERRED ALTERNATIVE

Because the Terminal would be fully operational in both the opening and design years, its demand for infrastructure and energy would be quite similar.

Water Supply

As in the opening year, the Preferred Alternative would demand potable water for restroom facilities, drinking, and station maintenance and cleaning. Thus, combined with implementation of the previously discussed "green" measures would likely result in a reduced demand for water supply from the City in the design year as compared to pre-September 11, 2001 conditions.

Sanitary Sewage and Stormwater Disposal

Minimal changes to sanitary sewage generation or disposal method are anticipated in the design year. However, a complete system of storm drainage would be provided for surrounding plaza and roof areas. Areas located below the levels of the city sewers would drain to sump pits, which would be pumped to the storm sewers leaving the site. Drainage from the roof areas and waste steam condensate would be piped to stormwater retention tanks. All water would be filtered and pumped via non-potable piping for reuse at the site (water closets and urinals). Given the reuse of stormwater at the site through the previously described means, a reduction in stormwater disposal is anticipated for the city sewer system servicing the area in the design year. Thus, no impacts are anticipated with regard to sanitary sewage and stormwater disposal in the design year.

Solid Waste

An increase in ridership is anticipated between the opening year and the design year. As such, the quantities of solid waste expected to be generated from the resultant ridership would slightly increase. However, the implementation of "green" measures would reduce the overall amount of solid waste produced and removed from the Terminal. Therefore, this alternative would not result in impacts from solid waste generation in the design year.

Energy

Energy loads, including those needed for traction power, are expected to be similar to those in the opening year and that which was demanded prior to September 11, 2001. Thus, with the implementation of "green" measures, such as energy efficient lighting and renewable energy, and the expectations of the Con Edison and PSE&G substations to supply energy at or above previous quantities, the fully operating Permanent WTC PATH Terminal in the design year would not adversely impact energy supply in the surrounding area.

E. MITIGATION

No additional mitigation would be required for infrastructure and energy for the elements of the Preferred Alternative due to the sustainable strategies that would be implemented in the design, construction, and operation of the Preferred Alternative. These strategies would result in a reduction of water usage of the City's water supply, solid waste production, sanitary sewage production, and energy consumption. ✳

A. INTRODUCTION

As previously described, the Project Site is located in an area that has a long development history. The Project Site has undergone various phases of development, including a mixture of residential and commercial (pre-1950s), increased commercial intermixed with limited residential and light industrial (1950–1970s) and, ultimately, primarily commercial, combined commercial/residential and community uses (post-1970s to current).

Given the former uses and sustained urban history of Lower Manhattan, the potential exists that contaminated (or hazardous) materials may have been used in connection with development and/or facility operations at and in the vicinity of the Project Site. Furthermore, based on the age of the structures, building materials on the site are likely to have included asbestos (insulation, roofing, etc.) and/or lead (paint). The presence of contaminated materials is not uncommon or unexpected at urban sites and is generally regarded as a function of prior usage. The presence of any contaminated materials would be addressed prior to or in conjunction with the development of a Permanent World Trade Center (WTC) PATH Terminal and efforts would be undertaken by conducting appropriate engineering and construction practices to eliminate worker and public exposure to such materials. Further, the potential presence of contaminated materials at the Project Site has been virtually eliminated as a result of the rescue and recovery effort undertaken subsequent to the terrorist attacks of September 11, 2001.

This chapter documents the consideration and evaluation of contaminated materials impacts for the Project Alternatives including an assessment of potential risks to public health, safety, and the environment.

B. METHODOLOGY

This chapter describes the affected environment (i.e., baseline environmental conditions) of the WTC site and areas that would be affected by the proposed off-site pedestrian connections as related to contaminated materials. This chapter then provides an assessment/evaluation of impacts associated with potential or identified contamination issues, particularly with regard to construction. The objective of the assessment is to identify any contaminants, which would be disturbed during construction or facility operation, and to fully assess any potential risks to human health, safety, and the environment. As necessary, this chapter identifies measures that would be undertaken to eliminate or mitigate the potential contaminated materials impacts.

Information gained through the performance of the following tasks was relied upon in the preparation of the contaminated materials assessment:

- Review of the physical setting of the proposed project;

- Review of the historical uses within the Project Site limits, the WTC site, and at surrounding areas using aerial photographs, Sanborn Fire Insurance Maps, United States Geological Survey (USGS) topographic maps, and historical reports;
- Reconnaissance of the Project Site, WTC site, and surrounding areas;
- Review of regulatory agency correspondence and reports pertaining to the post-September 11, 2001 cleanup activities;
- Review of federal and state regulatory databases and records; and,
- Review of the New York City Building's Department Archives (file access provided on November 21, 2003) including mapping and documentation of Battery Park City development and maps presenting geologic cross sections of Route 9A and intersecting east-to-west streets.

C. DESCRIPTION OF THE AFFECTED ENVIRONMENT

PRE-SEPTEMBER 11, 2001 BASELINE CONDITIONS

The Project Site is located in an area that has a long history of various development and transportation uses. The following description of the affected environment includes its geology and landform, historical uses, and environmental conditions with respect to potential contaminants prior to September 11, 2001.

GEOLOGY AND LANDFORM

Regional Geology

The Project Site and surrounding area are located within the Manhattan Prong of the New England Upland Physiographic Province of the Northeastern United States. This vast province includes all of New England as well as parts of New York, New Jersey, and Pennsylvania. The Manhattan Prong is categorized as igneous and primarily metamorphosed bedrock. The early development of this province occurred during the early Paleozoic Era (~550 million years ago) when sediments from structural ridges and volcanic islands eroded into the Appalachian eugeosyncline. As eroded sediment accumulated in this trough-like depression, the overlying weight caused the lower most sediment to compress, thus allowing more sediment to accumulate. This process occurred repeatedly and allowed for enormous volumes of sediment to accumulate. The compression forces generated by the weight of this overlying material eventually resulted in the metamorphism of the deepest sediments. Further faulting and deformation occurred during the late Taconic Orogeny or mountain building episode of the Ordovician-early Silurian Periods (450-460 million years ago). Overlying layers of rock and sediment were eroded as the region was slowly uplifted, exposing the highly fractured metamorphic rocks below. These metamorphic rocks form the present day island of Manhattan.

Bedrock Geology

The total thickness of bedrock underlying the Project Site and surrounding area is estimated to be approximately 1,600 feet. These formations are interpreted as large northeast/southwest-oriented synclines and anticlines. The synclines are composed of the harder, more erosion-resistant Manhattan schist and Fordham gneiss while the valleys are subsequently composed of less resistant Inwood marble. The Manhattan schist (Lower Cambrian), which directly underlies

the Project Site, is predominantly well-foliated sillimanite-muscovite-biotite-kyanite schist with inter-bedded black gneiss and amphibolite. At its thickest point, this formation is approximately 200 to 750 feet thick. Throughout the Manhattan schist are zones of non-foliated granitic igneous rocks composed of quartz, feldspar, muscovite and biotite-mica. Extending into the southeast corner of the subject site is a zone of igneous quartzite. This zone is believed to have formed in place rather than being an intrusive feature. The Waloomsac Formation (Middle Ordovician) underlies the Manhattan schist. This formation is approximately 250 to 750 feet in thickness and is composed of primarily plagioclase-garnet-muscovite-biotite-quartz schist. The Waloomsac Formation lays uncomformably above the Inwood marble (Ordovician to lower Cambrian). The Inwood marble is composed primarily of un-foliated dolomitic marble and ranges in thickness from 600 to 700 feet. The Fordham gneiss (Middle Proterozoic) underlies the abovementioned formations and consists primarily of well-foliated quartz and orthoclase feldspar.

Soil Characteristics

Soils overlying the bedrock at the surrounding area consist generally of glacial till, organic silts associated with shallow marine environments, and non-native fill material. The Laurentide Ice Sheet covered all of New York State during the Wisconsinan Stage and was completely retreated from New York approximately 10,000 years ago. As the ice sheet retreated, glacial till was deposited throughout New York, including Manhattan. Layers of gravel, sand, and silt are present on site and become thicker to the west. These layers create a lateral burden on the slurry wall that presently exists on site. Above the glacial till lays silts and clays associated with shallow marine environments. Some time after 1609 but prior to 1900, the eastern bank of the Hudson River was located where Greenwich Street is located today. Thus, the present location of the Project Site was historically "under water" during the time of deposition. Fill material was used to expand the western edge of Manhattan over 500 feet, including the Project Site and the surrounding WTC site. Fill material used in the surrounding area is reported to have consisted of a wide variety of material including dredged river sediment. During the development of the WTC complex much of the soil including the fill material was removed from within the limits currently occupied by the temporary WTC PATH station as part of the construction of the subsurface elements. Prior to the construction of the WTC complex, soil at the Project Site is reported to have consisted of 5 to 40 feet of glacial outwash and till covered by 10 to 30 feet of organic marine sediment with 20 to 35 feet of fill material. Soil conditions on other portions of the WTC site (i.e., the eastern portion) are reported to be similar to that which was formerly located at the Project Site with respect to thickness and distribution. At this time, the PATH Terminal portion of the Project Site is devoid of overburden soil as a result of the removal effort performed subsequent to September 11, 2001.

Bedrock exists at 55 to 75 feet below surface grade at the Project Site and at 65–80 feet below surface grade at the remaining portion of the WTC site. Further information on the affected environment subsequent to September 11, 2001 is provided below. Conditions of the surrounding area are expected to be similar to those at the Project and WTC sites.

The sub-grade Route 9A connection would be located on the western edge of the bathtub at Route 9A and would be constructed through three surficial soil deposits. Based on geologic cross sections compiled at the former Battery Place to Harrison Street bulkheads, the uppermost unit is composed of miscellaneous fill material including mixed clay, silt, sand, gravel, cinders and occasional boulders (Moran et. al., 1942). Historical cross-sections as well as the National Academy of Engineering refer to the deposits as "fill". This material is approximately 5-20 feet

in thickness (Tamaro, 2002). The second layer of sediment is up to 20 to 35 feet in thickness and consists of native soft dark gray, organic clayey silts with trace fine sand (Moran et. al., 1942). These deposits are associated with Hudson River channel deposits. The third layer of sediment underlying this location is native medium compact to compacted gray silty fine to coarse sand, with trace to some gravel. These deposits are also Hudson River channel deposits. It has been documented by the National Academy of Engineering that a quartzite knoll intrudes on the basin in the southwest corner of the site. The depth or size of outcrop in this area is unclear.

Ground Water

Due to the proximity of the Project Site to the Hudson River, uppermost ground water would be expected to be present relatively near the surface. However, given the presence of the slurry wall, ground water is precluded from entering the physical limits of the Project Site from perimeter areas. Ground water below the Project Site, within the underlying bedrock, is anticipated at approximately 100 feet below surface grade. Ground water at the surrounding WTC site is reported to be variable and controlled by dewatering at the Hudson & Manhattan Coffer Dam, located along Church Street between Vesey and Liberty Streets. The dewatering was performed prior to September 11, 2001 to prevent ground water infiltration into the subgrade structures and will be continued permanently. Ground water resources in Manhattan are not used for potable purposes.

HISTORICAL USES

The identification of historical uses provides essential information with respect to the potential for contaminated materials to be present at or in the vicinity of the Project Site as prior operations/activities often include the use of hazardous materials and may result in impacts to environmental media. Therefore, in conjunction with the environmental review process, historical information sources were reviewed to establish existing site and area conditions. The historical information sources used for this project included historical aerial photographs, Sanborn Fire Insurance Maps, historical topographic, and United States Geologic Survey (USGS) maps. Six historical aerial photographs (1943, 1953, 1966, 1976, 1985, and 1995), 156 Sanborn Maps (1894, 1922, 1923, 1928, 1950, 1977, 1978, 1979, 1980, 1981, 1983, 1985, 1987, 1988, 1991, 1992, 1993, 1994, 1995, and 1996) and five historical topographic maps (1900, 1947, 1955, 1967, and 1981) were reviewed to document historical uses of the Project Site and surrounding area. In addition, historical Jersey City, New Jersey, USGS Topographic Quadrangle Maps depicting the Project Site and the surrounding area were reviewed to obtain additional information with regard to prior area usage. The Jersey City, New Jersey, USGS maps are based on surveys dated 1900, 1947, 1955, 1967, and 1981 photo-revised from 1967.

Overall, a review of the various historical information sources identifies primarily mixed commercial uses as well as the presence of transportation elements such as the New York City Transit (NYCT) 1 and 9 line and the Hudson and Manhattan (H&M) Railroad Terminal at the Project Site prior to the development of the WTC complex. These data sources identify that coastal features (i.e., the Hudson River) were formerly located in closer proximity to the Project Site, thus providing the technical basis for the placement of fill at the Project Site in conjunction with initial development. Generally, most of lower Manhattan was raised in grade and extended westward by the emplacement of non-native fill material. Some time after 1609 but prior to 1900, the eastern bank of the Hudson River was located at the current location of Greenwich Street. Various sources document that fill material consisted of a variety of materials ranging from dredged sediment from the Hudson River to old shoes (Tamaro, 2002).

The historical information sources identify the presence of a combination of multi-family residential uses, commercial uses including retail shops, stores and restaurants, and Washington Square, as well as some light industrial uses at the Project Site during the late 1800s and early 1900s. Mapping for this era identifies boilers and tanks at individual sites, primarily south of Dey Street. These sources reveal an increase in commercial usage with a corresponding decrease in residential uses at the Project Site and during the 1940s and 1950s. In particular, a gasoline station is identified at the northwestern portion and a gasoline filling station including several aboveground storage tanks is identified at the southwestern portion of the Project Site during this time period. Review of the historical information sources does not identify any major changes in usage at the Project Site or the adjacent area to the east until the development of the WTC site in the mid- to late-1960s. Although contaminants associated with prior uses may have impacted environmental media, construction of the WTC site included the razing of structures, removal of most soil to bedrock, and installation of a concrete slab over much of the western portion of the Project Site. As such, a low potential for residual contamination existed during the time frame of the WTC site.

DOCUMENTED ENVIRONMENTAL CONTAMINATION ISSUES

To fully characterize the affected environment of the Project Site and surrounding area, it is necessary to determine if environmental contamination has been identified at the Project Site or sites in the surrounding area. Therefore, an electronic file search of federal and state regulatory environmental databases was obtained through a commercial source, Environmental Data Resources (EDR). The report provided as a result of the search includes information related to sites included on regulatory lists as well as a map identifying the location of the listed sites with respect to the Project Site. A copy of the electronic file search is provided in Appendix F. Review of the EDR Report did not reveal the inclusion of the PATH Terminal on any of the reviewed regulatory databases. However, the Port Authority of New York and New Jersey (PANYNJ) at the 1 WTC location is included on the New York State Department of Environmental Conservation (NYSDEC) Underground Storage Tank (UST) database. The listing identifies the former presence of a 55-gallon UST, which was removed by the PANYNJ. The listing also provides information related to aboveground storage tanks (ASTs) located at the WTC site. The listing identifies the presence of six ASTs containing petroleum products. The listing does not identify any environmental contamination issues with regard to the presence or use of these ASTs or the former UST. With regard to the surrounding area, a number of sites are included in the NYSDEC UST List. The listings do not identify any environmental contamination issues at area sites that have impacted the Project Site. However, the UST and ASTs are no longer on the site and there is a low potential for residual contamination.

Review of the EDR Report identifies a number of WTC site tenants on regulatory lists associated with the permitted use and storage of certain materials considered hazardous by the EPA and/or the NYSDEC. The EDR Report also identifies that several sites within the surrounding area that are also included in regulatory databases associated with the permitted use and storage of hazardous materials. No contamination issues are identified with respect to these listings. The WTC site is also included on the NYSDEC Spills List (NY SPILLS). Several occurrences of minor petroleum product discharges are identified during the 1990s. The specific locations of the spills within the WTC site are not identified in the database listings. It should be noted that a representative of the NYSDEC has stated all open tank and spill matters associated with the WTC have been closed. Confirmation of the case closure is forthcoming.

Overall, review of environmental database information has not revealed environmental contamination issues at the Project Site or issues within the surrounding area with the potential to impact the Project Site.

The potential presence of hazardous materials subsequent to September 11, 2001, including database listings on or after that date, is further described below.

HAZARDOUS MATERIAL STORAGE AREAS

The WTC site included areas used by the PANYNJ as well as numerous tenants. A Community Right-To-Know (RTK) Survey was performed for the areas of the complex occupied or used for storage of hazardous materials by the PANYNJ. Review of the Year 2000 RTK Survey did not reveal the presence of hazardous materials used or stored in the former WTC PATH Terminal located below the WTC site. According to information gained through the survey, maintenance of the PATH trains servicing the WTC site was performed at the PATH Harrison Maintenance Facility in New Jersey.

CHANGES IN THE AFFECTED ENVIRONMENT SINCE SEPTEMBER 11, 2001

The terrorist attacks of September 11, 2001 resulted in the collapse of the WTC complex and the majority of the subgrade structures located beneath the complex, including the PATH Terminal, components of the PATH system, and associated concourse, egress routes, etc. The Project Site (PATH Terminal portion of the Project Site) currently lies at approximately 65-70 feet below street grade. No permanent buildings are located within the limits of the Project Site or the adjacent eastern portion of the WTC site. The temporary PATH station is presently located at the Project Site. The discussion of the affected environment pre-September 11, 2001 included information pertaining to geology and landform, historical uses, and environmental conditions as identified through a review of regulatory databases and other information sources. The discussion of geology and landform and historical uses is not required for this further discussion of the affected environment. However, this section provides information pertaining to hazardous materials issues as a result of September 11, 2001 and the subsequent removal effort. Although hazardous materials issues resulting from September 11, 2001 are provided in this section for completeness, the subsequent recovery effort included the removal of all material, debris, and soil from within the Project Site, thereby eliminating environmental contamination issues with respect to the Project Site.

The collapse of the WTC site resulted in the identification of the following concerns with regard to hazardous materials:

- Debris, including asbestos, LBP and PCBs, deposited on the site due to the collapse and demolition of the buildings and structures located on the WTC site;
- Dielectric oils from transformers and cables feeding the WTC complex from the former 7 WTC building;
- Hazardous materials stored at the site and used by WTC site tenants; and
- Fill material reportedly located beneath the WTC complex buildings.

These issues are related to the entire WTC site and not specifically to the Project Site as defined for this Environmental Impact Statement (EIS).

As stated above, an electronic file search of regulatory databases was performed as part of the contaminated materials assessment of the EIS process. The EDR Report provides information pertaining to listings for both pre- and post-September 11, 2001 conditions. With respect to post-September 11, 2001 conditions, the EDR Report identifies the inclusion of the WTC site in the NYSDEC Spills List for September 11, 2001. The listings are consistent with the previously described hazardous materials concerns and identify the discharge of dielectric fluid, asbestos, and transformer oil. The presence of the documented materials has been addressed in conjunction with the removal efforts performed at the Project Site. In addition, a few sites within the surrounding area are listed with spills/discharges involving petroleum products, which occurred on September 11, 2001 or shortly thereafter. Generally, these occurrences appear to be associated with discharges of petroleum products from equipment and vehicles used in recovery efforts. The listings do not identify a continuing environmental contamination issue with regard to the occurrences and the NYSDEC reportedly closed the cases in December 2003.

Subsequent to the terrorist attacks, rescue, recovery, and removal efforts were undertaken from September 11, 2001 to June 30, 2002. Generally, the area defined as the Project Site was excavated to the remaining bottom slab of the former structures. Soils near the projections of the PATH tunnels were retained; however, the top 18 inches were removed and replaced with clean fill. The eastern portion of the WTC site was excavated to depths ranging from street grade to 35 feet below street grade.

According to regulatory agencies overseeing the removal efforts, soils and hazardous materials that may have been present in the western portion of the WTC site as a result of historical operations and the terrorist attacks have been either removed or burned, or a combination of the two. However, it has been acknowledged that soils located to the east of the NYCT's 1 and 9 line may contain residual contamination from historical operations and the terrorist attacks. This area is being addressed pursuant to a separate development action as part of the *World Trade Center Memorial and Redevelopment Plan Generic Environmental Impact Statement (GEIS)*. No changes have been identified with regard to the other pedestrian egress routes that extend from the PATH Terminal and which have been included as part of the Project Site. These additional areas have not been identified as having been impacted by hazardous materials with respect to the terrorist attacks.

Materials formerly present on the Project Site were subjected to the fallout (dust and debris) generated from terrorist attacks. Analytical results presented by the U.S. Environmental Protection Agency (EPA) indicated that the dust and debris resulting from the attacks potentially contained contaminants such as asbestos, dioxins, polychlorinated biphenyls (PCBs) and certain metals (EPA 2002 and 2003 Reports). However, as noted above, removal efforts that occurred during the nine months following the terrorist attacks resulted in the excavation/removal of the materials located within the limits of the Project Site as well as from area locations. As part of the *World Trade Center Memorial and Redevelopment Plan GEIS*, the Lower Manhattan Development Corporation (LMDC) performed a Hazardous Materials Screening Study, which included the conductance of soil and ground water sampling and analysis. The sampling was performed at locations at the eastern portion of the WTC site as well as at locations beyond the limits of the WTC site.

The results of the sampling are detailed in the *WTC Memorial and Redevelopment Plan GEIS*. Briefly, the soil sampling program revealed the presence of relatively few contaminants at concentrations above regulatory thresholds. In fact, the sampling revealed the presence of only metals at concentrations in excess of regulatory guidelines. Beryllium, chromium, copper,

magnesium, lead, mercury, nickel, selenium, and zinc were detected at elevated concentrations in surficial soils collected from the eastern portion of the WTC Site as well as from soil present at the former grade at 140 Liberty Street and at intersection of Washington and Albany Streets. The metals detected at elevated concentrations are considered typical fill contaminants and consistent with background conditions at urban sites. EPA air monitoring data revealed that beryllium, mercury, and selenium were not detected in samples collected in the vicinity of WTC Site subsequent to September 11, 2001. Chromium, copper, magnesium, nickel, selenium, and zinc were detected, but at low concentrations. The EPA detected elevated concentrations of lead in air, but the concentrations fell below the EPA's benchmark within one month of September 11, 2001. Although elevated concentrations of these metals may be present in surficial and subsurface soils, their absence or low concentrations in the air subsequent to September 11, 2001 indicate that they are not an ongoing source of exposure. The lateral and vertical distribution of these metals throughout the Project Site indicates that they are not likely to be associated with historic releases; rather that these metals' concentrations are representative of background conditions in the vicinity of the Project Site.

Elevated concentrations of arsenic, chromium, lead, manganese, mercury, nickel, and selenium were detected in samples collected from the surfaces of existing structures located along the perimeter of the eastern portion of the WTC Site. The concentrations of these metals exceed the EPA's benchmarks for residences. Based on their distribution and concentrations, it is likely that these samples reflect material deposited as a result of September 11, 2001. Trace concentrations of dioxin were detected in surficial soil samples and in samples collected from the surfaces of existing structures, significantly below EPA remediation criterion.

Soil sampling did reveal trace concentrations of asbestos in surficial soil collected from the eastern portion of the WTC site. However, the concentrations detected are considered typical background conditions in urban settings such as the Project Site. Further, EPA air monitoring performed at and in the vicinity of the WTC site has not revealed concentrations of airborne asbestos above screening level. In fact, asbestos has not been detected in the vast majority of air samples.

Similar to the soil results, the ground water sampling revealed the presence of relatively few contaminants. Specifically, ground water sampling revealed the presence of only a single volatile organic compound (VOC) at a concentration marginally above the NYSDEC GA standards in one sample from the eastern portion of the WTC site, but were below NYCDEP sewer discharge requirements. Chloroform was detected in a single sample collected from the eastern portion of the WTC site. The presence of chloroform in ground water is likely to be associated with the usage of buried/subsurface water lines holding and transferring chlorinated water; chloroform is a byproduct of the chlorinating process. In addition, chloroform, toluene, and benzene were detected at concentrations above NYSDEC regulatory standards for potable water in a sample collected from the intersection of Washington and Albany Streets, south of the WTC site. The presence of toluene and benzene may be the result of a petroleum discharge unlikely to be related to the Project Site, and the presence of chloroform is likely to be attributable to the extensive subsurface water lines in this portion of Manhattan.

D. PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

CONSTRUCTION PERIOD (2006)

FUTURE COMMON TO ALL ALTERNATIVES

The Future Common to All Alternatives considers actions undertaken by others, which are independent of the Preferred Alternative. No contaminated building materials or environmental media have been identified within the limits of the west "bathtub" of the WTC site, as remaining debris and soil material were removed in conjunction with the September 11, 2001 recovery effort. Therefore, development within the west "bathtub" in association with the WTC Memorial and Redevelopment Plan would not encounter hazardous materials.

As described above, portions of the WTC site east of the 1 and 9 line have the potential for residual contamination since debris and structures remain in this area. Similar to efforts associated with the Preferred Alternative, LMDC will prepare a Health and Safety Plan (HASP) that includes remedial measures for the excavation and removal of these materials in association with their demolition and subsequent construction efforts.

There is also the potential for contamination within the limits of the Route 9A Project, which also includes the area of PATH's proposed east-west connection to the World Financial Center and the north and south ventilation structures. The New York State Department of Transportation will also prepare a Health and Safety Plan (HASP) for the Route 9A Project that would include specific measures to remove and dispose of any contaminated soils or groundwater encountered during construction. If NYSDOT pursues the short-bypass alternative for the Route 9A Project, the HASP would include the areas of PATH's east-west connection beneath Route 9A and the north and south ventilation structures..

Overall, construction activities at the Project Site are not anticipated to create or exacerbate existing contaminated material conditions at other area project sites. Further, no major contamination issues have been identified at planned development or redevelopment sites in the surrounding area. Thus, development/redevelopment actions undertaken by others at area sites are unlikely to adversely impact the project site with respect to contaminated materials.

NO ACTION ALTERNATIVE

Under the No Action Alternative for the construction period, no construction activities would be occurring with respect to the Permanent WTC PATH Terminal. However, development activities would continue to occur at surrounding areas including the WTC site (WTC Memorial and Redevelopment Plan). Given the developed nature of the surrounding area, it is unlikely that development efforts at area sites would cause any contaminated materials issues at the Project Site. This conclusion assumes that all area development projects would use appropriate construction methods and remediation. With respect to activities assumed to occur in the redevelopment of the overall WTC site, the potential exists for any contaminants in soil remaining at that location to impact the Project Site. However, recent studies conducted for the *World Trade Center Memorial and Redevelopment Plan GEIS* did not reveal major contaminant issues at that site. Additional actions for that project would include further evaluation of soil quality and the removal and appropriate disposal of soil. Therefore, no adverse impacts with respect to contaminated materials are anticipated under the No Action Alternative.

PREFERRED ALTERNATIVE

The construction of the Preferred Alternative would result in minimal changes to existing environmental media within the "west bathtub" of the WTC site. As previously described, all debris from the September 11, 2001 attacks on the WTC site and most soil present at this portion of the site were removed during recovery efforts. Soils near the projections of the PATH tunnels were retained; however, the top 18 inches were removed and replaced with clean fill.

Portions of the basement wall within the WTC site were damaged during the attacks. As a result, PANYNJ has installed pumps to discharge any ground water that leaks into the site in addition to collected stormwater. As part of this project, PANYNJ would repair portions of the basement walls (see Chapter 2, "Project Alternative"). The rehabilitated basement walls would essentially eliminate the invasion of overburden ground water through the wall into the WTC site.

The Preferred Alternative includes the construction of pedestrian egress from the Terminal to street level at several locations as well as two ventilation structures within the median of Route 9A. The construction would include excavating/tunneling to the eastern portion of the WTC site beneath the existing 1 and 9 subway tracks as well as similar activities at perimeter locations along Route 9A.

There is potential that excavation/tunneling activities associated with the proposed egress routes on the eastern portion of the WTC site may encounter fill material, which could include contaminants and/or contaminated ground water. Given the urban nature of the project site and the perimeter areas, the presence of fill material containing low levels of contaminants is expected and, if identified, will be addressed in conjunction with the proposed project. Similar actions will be undertaken with respect to ground water. Actual construction activities at the Project Site will be performed using appropriate construction and engineering practices, which include awareness of contaminant issues.

The potential also exists that excavation/tunneling activities associated with the proposed Route 9A connection and the north and south ventilation structures may encounter fill material, which could include contaminants and/or contaminated ground water. The 1994 *Route 9A Reconstruction Final Environmental Impact Statement* showed testing results for the Route 9A alignment, including the area that would contain the ventilation structures and the proposed pedestrian connection. These results showed elevated levels of polycyclic aromatic hydrocarbons (PAHs) and metals at a depth of approximately 24 feet below the surface of Route 9A, and such contaminants are typical of fill soils in New York City.

Regardless of contaminant concentrations, construction activities would be performed using appropriate construction and engineering practices, which include awareness of contaminant issues. In addition, prior to the initiation of the construction activities at the perimeter areas, a site-specific HASP would be prepared and implemented to protect the general public and workers from exposure to contaminants present in air, soil, ground water, building materials, and buried structures (utilities) encountered at the site. The HASP would include worker training and required safety courses, monitoring requirements, use of personal protection equipment (PPE), contaminant action levels, and air monitoring equipment. Further, the HASP would address preventative measures to narrow down or eliminate potential exposure pathways and corrective actions if exposure occurs. If contaminant concentrations are exceeded during the construction phase, then all activities would cease and the appropriate remedial actions would be undertaken to address the issue at hand as noted in the HASP.

As part of the HASP, management plans for soil, dust, ground water, asbestos, and PCBs would be implemented. The management plans would contain the methods to be used in handling, staging, disposal, transportation, and decontamination of equipment and personnel in accordance with local, state, and federal regulations. Further, the management plans would contain a list of licensed waste haulers and disposal facilities that could legally accept hazardous materials that may remain on the Project Site.

The potential hazardous materials on the Project Site are typical for urban sites in New York City. Some of the federal, state, and local regulations that govern their proper handling, removal, and disposal include:

- U.S. EPA, Identification and Listing of Hazardous Waste (40 CFR Part 261);
- U.S. EPA, Standards Applicable to Generators of Hazardous Waste (40 CFR Part 262);
- U.S. EPA, Standards Applicable to Transporters of Hazardous Waste (40 CFR Part 263);
- U.S. EPA, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (40 CRF Part 264);
- U.S. EPA, Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (40 CFR Part 265);
- U.S. EPA, Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities (40 CFR Part 266);
- U.S. EPA, Land Disposal Restrictions (40 CFR Part 268);
- New York State Solid and Hazardous Waste Regulations (6 NYCRR Part 360) for remediation of soils that have elevated levels of metals as well as residual asbestos on the site.
- Procedures in Petroleum Cleanup and Removal (6 NYCRR Part 613 and 6 NYCRR Part 611) for removal of any storage tanks;
- Spill Technology and Remediation Series (STARS) Memo #1 for removal and disposal of petroleum contaminated soil; and
- Technical and Operations Guidance Series (TOGs) for removed of petroleum contaminated groundwater.

The Project's HASP would include procedures for the handling and disposal of any encountered materials in accordance with these regulations and with other guidance and protocols of EPA, NYSDEC, and the New York City Department of Environmental Protection.

Construction activities performed at the site are likely to include the use of petroleum products associated with equipment and machinery operations. All materials would be maintained in accordance with project health and safety plans and in conformance with the local, state, and federal regulations noted above. Adherence to applicable regulation and appropriate construction practices would avoid impacts to human health and the environment. The types of petroleum materials are similar to those used to fuel roadway vehicles present on a daily basis throughout the surrounding area. As such, it is not anticipated that the use of such materials would have a deleterious impact on the surrounding environment.

Overall, no contaminated materials issues are anticipated for this alternative during the construction period.

OPENING YEAR (2009)

FUTURE COMMON TO ALL ALTERNATIVES

Construction activities will continue in Lower Manhattan in the opening year, including the development of the WTC site as part of the WTC Memorial and Redevelopment Plan. However these area redevelopments are not anticipated to result in any contaminated materials impacts, as described in the "Construction Period" section above.

NO ACTION ALTERNATIVE

In the opening year, the temporary WTC PATH station would continue to operate in its current location. As stated above, development activities would continue in surrounding areas including the WTC site. It is unlikely that further development efforts would cause any contaminated materials issues at the Project Site based on the conclusion that all area projects would use appropriate construction methods and remediation. Therefore, no adverse impacts with respect to contaminated materials are anticipated with the No Action Alternative in the opening year.

PREFERRED ALTERNATIVE

Construction activities associated with the Preferred Alternative would be concluded by the opening year. Thus, no disturbance of environmental media would be anticipated under this scenario. If any contaminated materials were encountered during construction, such materials would have been removed or isolated in accordance with applicable regulations prior to and/or during the construction phase, and no potential would exist for workers or the public to contact same.

Operation of the PATH train system would include the use of limited quantities of hazardous materials and petroleum products. However, these materials are used for the current system and, as previously stated; such materials are not stored and would not be stored on the WTC site. The PANYNJ has not proposed any changes in materials handling for the PATH system; thus, hazardous materials storage would remain off-site. Although the general maintenance and cleaning of PATH trains would continue to occur at PATH's facilities in Jersey City and Harrison, limited emergency maintenance may occur at the WTC Terminal when trains must be pulled out of service. The PANYNJ has established a series of standard operating procedures, which include measures to be undertaken in the event of a discharge of hazardous materials or petroleum products. These procedures would continue to apply in the opening year, including future actions at the Project Site.

Thus, no adverse impacts with respect to contaminated materials are anticipated for the Preferred Alternative in the opening year.

DESIGN YEAR (2025)

FUTURE COMMON TO ALL ALTERNATIVES

Redevelopment performed at area sites in the time period between the opening year and the design year is not anticipated to result in any contaminated materials issues.

NO ACTION ALTERNATIVE

The No Action Alternative would not include the presence of a Permanent WTC PATH Terminal in the design year. Furthermore, the temporary WTC PATH station would not be in operation. All other portions of the WTC site redevelopment would be complete. With respect to these activities, any remaining contamination on the site would have been removed during the construction period. Therefore, no contaminated materials issues are anticipated under the No Action Alternative in the design year.

PREFERRED ALTERNATIVE

With respect to contaminated materials, the impact analysis for the Preferred Alternative for the design year is identical to that presented for the opening year. Thus, no adverse impacts with respect to contaminated materials are anticipated for this alternative in the design year.

E. MITIGATION

No adverse impacts with respect to contaminated materials are anticipated for the Preferred Alternative in the construction period, opening year, or design year. However, as previously stated, construction activities will be performed using appropriate construction and engineering practices, which include awareness of contaminant issues. In addition, prior to the initiation of the construction activities at the perimeter areas, a site-specific HASP will be prepared and implemented to protect the general public and workers from exposure to contaminants present in air, soil, ground water, building materials, and buried structures (utilities) encountered at the site. The HASP will include worker training and required safety courses, monitoring requirements, use of personal protective equipment (PPE), contaminant action levels, and air monitoring equipment. Further, the HASP will address preventative measures to eliminate or minimize potential exposure pathways.

The HASP will be required as part of contract documents and will be in conformance with the above described goals/objectives and will include elements outlined in the following framework:

- Identification of potential contaminants and, as necessary, development of a soil or ground water sampling plan to determine contaminant concentrations in environmental media;
- Identification of thresholds or action levels for contaminants and development of procedures for modification or cessation of work activities based on field screening result;
- Worker health and safety training including the identification of a project health and safety officer who will be responsible for overall oversight and will maintain all appropriate documentation of safe working conditions and permits/approvals for the management of construction related wastes and residuals;
- Development and implementation of field screening for contaminant detection and worker health and safety;
- Identification of PPE to be used (worn) during specified phases of construction;
- Development and implementation of a Soil Management Plan identifying the methods to be used in handling, staging, disposal, transportation, and decontamination of equipment and personnel in accordance with local, state, and federal regulations;

- Development and implementation of a Ground Water Management Plan to address dewatering actions from ground water infiltration and overland stormwater and the methods to be used in handling, staging, disposal, transportation, and decontamination of equipment and personnel in accordance with local, state, and federal regulations;
- Development and implementation of a Dust Management Plan to address dust generated through excavation or general construction activities;
- Development and implementation of management plans to address PCBs and asbestos; and,
- Identification of proposed licensed waste haulers and disposal/recycling facilities, for the transportation and disposal/recycling of waste materials generated from the project.

The project specific HASP will be in accordance with all applicable local, state, and federal regulations and will document that safe conditions relative to onsite workers and the public are maintained throughout the project. ✷

A. INTRODUCTION

This chapter assesses the potential impacts to terrestrial and aquatic natural resources from the construction and operation of the Preferred Alternative. With the exception of the terminal building, street-level entrances, emergency egress and ventilation structures, elements of the Preferred Alternative would be below ground.

The street-level terminal building would be located on the western side of Church Street between Dey and Fulton Streets (see Chapter 7, "Urban Design and Visual Resources"). As currently proposed, the above-ground terminal would comprise of an oblong glass and steel shell, the roof of which would contain two counterpoised glass wings that would rise more than 100 feet into the air and extend the length of the building (about 350 feet). The structure would allow natural light to illuminate the terminal concourse. The ceiling of the aboveground building may have the capacity to open up to the sky, between the two wing-like structures. It would not be higher than the towers proposed as part of the WTC Memorial and Redevelopment Plan that would be constructed near it. The perimeter of the street-level terminal would be landscaped.

The Terminal would include street-level access from other locations within the WTC site. These entrances would be located within the proposed offices towers and other structures associated with the WTC Memorial and Redevelopment Plan. An additional entrance would be provided west of Route 9A in front of the Winter Garden. Two ventilation structures with emergency egress would be located within the median of Route 9A. Two additional emergency egress stairways from the PATH platforms and mezzanine would be located within the WTC site west of the 1 and 9 line.

The Preferred Alternative would not involve any in-water construction in the Hudson River nor would it involve construction within a wetland. However, the Terminal would tie into the re-establishment of the river cooling system on the WTC site once it becomes available. The re-establishment of the river water cooling system is being undertaken as a separate action; therefore, as described in Chapter 2, "Project Alternatives," the Permanent WTC PATH Terminal would employ alternative cooling methods until the river water cooling system is fully operational. Additionally, the implementation of "green" design, "green" construction, and sustainable design principles described in Chapter 2, "Project Alternatives," would reduce the potential for adverse environmental impacts from the Preferred Alternative. Measures include, but are not limited to, energy-efficient lighting, heating and ventilation systems, and development of a Comprehensive Energy Management Plan, Comprehensive Resource Management Plan, and Water Management Plan, described in Chapter 11, "Infrastructure and Energy." These measures would contribute to the conservation of energy and water resources, thereby reducing potential environmental impacts associated with power generation on a regional scale, and possibly resulting in a decrease in the cooling water needs for the Preferred Alternative.

B. METHODOLOGY

DATA SOURCES

Natural resources within the affected environment (Project Site and the Hudson River in the vicinity of the WTC intake) are described for two baseline conditions: pre-September 11, 2001; and changes to the affected environment since September 11, 2001. The description of natural resources for these two baseline conditions was developed on the basis of:

- Existing information identified in literature and obtained from governmental and non-governmental agencies such as: Port Authority of New York and New Jersey (PANYNJ), NYSDEC, New York City Department of Environmental Protection (NYCDEP) Harbor Water Quality Surveys (NYCDEP 1998, 2000, 2001, 2002, 2003a and b), U.S. Environmental Protection Agency (EPA) (e.g., Regional Environmental Monitoring and Assessment Program (R-EMAP) (Adams et al. 1998)), U.S. Army Corps of Engineers (ACE), Federal Emergency Management Agency (FEMA) flood insurance rate maps, and the Interstate Environmental Commission (IEC).
- Observations made at the Project Site.
- Responses to requests for information on rare, threatened or endangered species within ½ mile surrounding the site of the Preferred Alternative and the WTC cooling water intake. These requests were submitted to the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and the New York Natural Heritage Program (NYNHP). NYNHP, a joint venture of NYSDEC and The Nature Conservancy since 1985, maintains an ongoing, systematic, scientific inventory on rare plants and animals native to New York State. NYSDEC maintains the NYNHP files. The NYNHP database is updated continuously to incorporate new records and changes in the status of rare plants or animals. In addition to the state program, the USFWS maintains information for federally listed threatened or endangered freshwater and terrestrial plants and animals, and the NMFS for federally listed threatened or endangered marine organisms.

REGULATORY FRAMEWORK

The following sections briefly describe the federal and state laws and associated regulations and regulatory programs that may apply to the Preferred Alternative with respect to terrestrial resources, water quality, and aquatic resources that are found within the vicinity of the WTC site and the WTC intake and outfalls. The regulations apply to certain activities in coastal areas and surface waters, and to the protection of species of special concern.

FEDERAL

The Clean Water Act (33 USC §§ 1251 to 1387)

The objective of the Clean Water Act, also known as the Federal Water Pollution Control Act, is to restore and maintain the chemical, physical, and biological integrity of U.S. waters. It regulates point sources of water pollution such as discharges of municipal sewage and industrial wastewater, and non-point source pollution such as runoff from streets, agricultural fields, construction sites and mining that enter waterbodies, from other than the end of a pipe. Section 402 of the Clean Water Act establishes the National Pollutant Discharge Elimination System (NPDES) which governs the review and issuance of permits for the discharge of pollutants to

surface waters. Section 402 also allows the EPA to delegate authority to states to carry out the NPDES program once they have met the specified requirements. New York has been delegated authority to implement NPDES, which it does through the State Pollutant Discharge Elimination System (SPDES), as discussed below in the section on New York regulations.

In addition, any applicant for a federal permit or license for an activity that may result in a discharge to navigable waters must provide to the federal agency issuing a permit a certificate, either from the state where the discharge will occur or from an interstate water pollution control agency, that the discharge will comply with Sections 301, 302, 303, 306, 307, and 316 (b) of the Clean Water Act. Applicants for discharges to navigable waters in New York must obtain a Water Quality Certificate from NYSDEC.

Coastal Zone Management Act of 1972 (16 USC §§ 1451 to 1465)

The Coastal Zone Management Act of 1972 established a voluntary participation program to encourage coastal states to develop programs to manage development within the state's designated coastal areas to reduce conflicts between coastal development and protection of resources within the coastal area. Federal permits issued in New York must be accompanied by a Coastal Zone Consistency Determination that evaluates consistency with New York's federally approved coastal zone management program.

Executive Order 11988, Floodplain Management

Executive order 11988 states that, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities."

Magnuson-Stevens Act (16 USC §§ 1801 to 1883)

Section 305(b)(2)-(4) of the Magnuson-Stevens Act outlines the process for the NMFS and the Regional Fishery Management Councils (in this case, the Mid-Atlantic Fishery Management Council) to comment on activities proposed by federal agencies (issuing permits or funding projects) that may adversely impact areas designated as essential fish habitat (EFH). EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 USC §1802(10)).

Endangered Species Act of 1973 (PL 93-205; 16 USC 1531 to 1544)

The Endangered Species Act of 1973 recognized that endangered species of wildlife and plants are of aesthetic, ecological, educational, historical, recreational, and scientific value to the nation and its people. The Act prohibits the importation, exportation, take, possession, and other activities involving illegally taken species covered under the Act, and interstate or foreign commercial activities. The Act also provides for the protection of critical habitats on which endangered or threatened species depend for survival. USFWS (non-marine plants and animals) and NMFS (marine plants and animals) are responsible for administering the Act. Section 7(a) of the Act requires federal agencies to consult with the Secretary of the Interior (through USFWS and/or NMFS) before project implementation to ensure that the proposed action will not jeopardize a species, or destroy or adversely modify the designated critical habitat of the species.

Migratory Bird Treaty Act (16 USC §§703 to 712)

The Migratory Bird Treaty Act implements the United States' commitment to four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. Each of the treaties protects selected species of birds and specifies basic closed and open seasons for hunting game birds. The Act makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations. Title 50, Section 10.13, of the Code of Federal Regulations (50 CFR 10.13) lists the bird species protected under the Act.

STATE

State Pollutant Discharge Elimination System (SPDES), Article 17 Title 8, ECL, Implementing Regulations 6 NYCRR Parts 750, 751, 752, 753, 754, 755, 756, 757.

Title 8 of Article 17, ECL, Water Pollution Control, was enacted to protect and maintain surface and ground water resources and authorized the creation of the State Pollutant Discharge Elimination System (SPDES) to regulate discharges to the state's waters. The following activities require SPDES permits: constructing or using an outlet or discharge pipe (point source) that discharges wastewater into surface or ground waters of the State; constructing or operating a disposal system (sewage treatment plant); or discharge of stormwater. Construction activities that disturb one acre or more must obtain an SPDES permit.

SPDES addresses thermal discharges in ECL §§15-0313 and 17-0301, and the implementing regulations in 6 NYCRR Parts 704 and 750. Title 3 (Powers and Duties) of Article 15 (Water Resources), ECL, and Title 3 (Jurisdiction of the NYSDEC Authority, Powers and Duties) of Article 17 (Water Pollution Control), ECL, authorizes NYSDEC to establish water quality standards for thermal discharges to the waters of New York State, as implemented in 6 NYCRR Chapter X (Division of Water Resources) Part 704 (Criteria Governing Thermal Discharges) and Part 750 (SPDES). The thermal discharge criteria established in 6 NYCRR Part 704 include general criteria for waters receiving thermal discharges; special criteria specific to different types of State waters receiving thermal discharges; mixing zone criteria; and the requirement that the location, design, construction and capacity of cooling water intake structures for a point source thermal discharge reflect the best technology available for minimizing adverse environmental impact.

Waterfront Revitalization of Coastal Areas and Inland Waterways Act (Executive Law Sections 910-921).

Under this Act, the New York State Department of State (NYSDOS) is responsible for administering the Coastal Management Program (CMP). The Act also authorizes the State to encourage local governments to adopt Waterfront Revitalization Programs (WRP) that incorporate the State's policies. New York City has a WRP administered by the Department of City Planning.

Floodplain Management Criteria for State Projects (6 NYCRR 502)

Under 6 NYCRR 502, all state agencies are to ensure that the use of state lands, and the siting, construction, administration and disposition of state-owned and state-financed projects involving any change to improved or unimproved real estate are conducted in ways that will minimize flood hazards and losses. Projects are to consider alternative sites on which the project could be

located outside the 100-year floodplain. Projects to be located within the floodplain are to be designed and constructed consistent with the need to minimize flood damage within the 100-year floodplain and include adequate drainage to reduce exposure to flood hazards. All public utilities and facilities associated with the project are to be located and constructed to minimize or eliminate flood damage. The regulations specify that for nonresidential structures, the lowest floor should be elevated or flood-proofed to not less than one foot above the base flood level so that below this elevation the structure, together with associated utility and sanitary facilities, is watertight, with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. No project may be undertaken unless the cumulative effect of the proposed project and existing developments would not cause material flood damage to the existing developments. In cities with a designated floodway, no portion of the project may be placed within the adopted regulatory floodway to result in any increases in flood levels. The only regulatory floodway in New York City is the Bronx River, which is outside the Project Site.

Endangered and Threatened Species of Fish and Wildlife; Species of Special Concern, ECL, Sections 11-0535[1]-[2], 11-0536[2], [4], Implementing Regulations 6 NYCRR Part 182.

The Endangered and Threatened Species of Fish and Wildlife; Species of Special Concern Regulations prohibit the take, import, transport, possession or selling of any endangered or threatened species of fish or wildlife, or any hide, or other part of these species as listed in Section 182.6.

C. DESCRIPTION OF THE AFFECTED ENVIRONMENT

PRE-SEPTEMBER 11, 2001 BASELINE CONDITIONS

TERRESTRIAL RESOURCES

Before the terrorist attacks, the Project Site was occupied by the WTC PATH terminal (track and platform level, mezzanine/fare-zone level, and sub-grade pedestrian connections to adjacent streets, subways, and the WTC) within the portion of the WTC complex known as the "bathtub." The terminal had no above-ground features and was accessed through buildings within the WTC complex. Overlying the WTC PATH Terminal were the WTC's office and retail space. The Project Site, including the proposed location for the street-level terminal building was characterized primarily by urban land uses that provided limited habitat for terrestrial plants and animals—mostly office space and commercial, residential, cultural, and institutional uses. The nine-story (approximately 100 feet) Northeast Plaza Building (5 WTC) was located in the northeast corner where the street-level terminal building has been proposed as part of the Preferred Alternative. Open space areas within and adjacent to the Project Site provided limited habitat for terrestrial biota. The largest open space area within the Project Site in the vicinity of the proposed location for the street-level terminal building (Church Street, between Fulton and Dey streets) was the nearly 4-acre Austin J. Tobin Plaza that was located at the center of the WTC complex (Figure 13-1). The plaza had limited access from adjacent streets, was isolated from other open spaces around the WTC complex, and was sparsely vegetated. Other open space areas on the Project Site included landscaped areas along Church, Vesey, and Liberty Streets that contained planters, and a 1.06-acre plaza at 130 Liberty Street south of the main WTC complex that contained planters with trees and a large fountain. One Liberty Plaza, a 0.64 acre plaza to the southeast of the Project Site, also had planters and trees.

The natural resources found within the open space areas of the Project Site were characteristic of those found in the urban landscape: shade trees, planters with ornamental vegetation, and wildlife tolerant of urban conditions such as house sparrows, European starlings, pigeons, and rodents such as squirrels. Breeding birds documented in western lower Manhattan (including the Project Site) in the early 1980s by the NYSDEC Breeding Bird Atlas (census block 5750B) include: pigeon (*Columba livia*), mourning dove (*Zenaida macroura*), chimney swift (*Chaetura pelagica*), blue jay (*Cyanocitta cristata*), American robin (*Turdus migratorius*), northern mockingbird (*Mimus polyglottus*), European starling (*Sturnus vulgaris*), common grackle (*Quiscalus quiscula*), house finch (*Carpodacus mexicanus*), and house sparrow (*Passer domesticus*). The peregrine falcon (*Falco peregrinus*), which is listed by the State of New York as endangered, is known to occur in the vicinity of the Project Site.

Migratory birds move through New York City during spring and autumn migrations between tropical Central and South American overwintering grounds and North American nesting grounds, and were known to use the limited habitat within the Project Site and surrounding areas as a resting habitat. Peak migration occurs between March and May in spring, and August and October in autumn. Examples of songbirds and other birds reported in bird strike data compiled by the New York City Audubon Society (NYCAS) at the WTC complex during spring and autumn migratory periods pre-September 11, 2001, include: white-throated sparrow (*Zonotrichia albicollis*), common yellowthroat (*Geothlypis trichas*), ovenbird (*Seiurus aurocapillus*), dark-eyed junco (*Junco hyemalis*), American woodcock (*Scolopax minor*), song sparrow (*Melospiza melodia*), swamp sparrow (*Melospiza georgiana*), gray catbird (*Dumetella carolinensis*), black-throated blue warbler (*Dendroica caeruluscens*), and black-and-white warbler (*Mniotilta varia*). Warbler and sparrow species constituted the majority of the species recorded during the NYCAS's 1997–2001 Project Safe Flight Program, as dead or injured from collisions with WTC complex buildings. No threatened, endangered, or special concern species were found dead or injured in the area during the program (NYCAS 2003).

FLOODPLAINS

Figure 13-2 indicates the location of the 100-year and 500-year floodplains within the Project Site. Prior to the September 11, 2001 attacks, a portion of the hotel (3 WTC), the western portion of Tobin Plaza, the pedestrian tunnel to the World Financial Center (WFC), and the western portion of the WTC PATH Terminal platform and tracks, were located within the 100-year floodplain. The pedestrian tunnel and WTC PATH Terminal platform and tracks were below grade. Flood protection measures in compliance with state and federal requirements were intact and operational. These included the bathtub walls and concrete slab to prevent ground water inundation, and the use of sump pumps.

WATER QUALITY AND AQUATIC RESOURCES

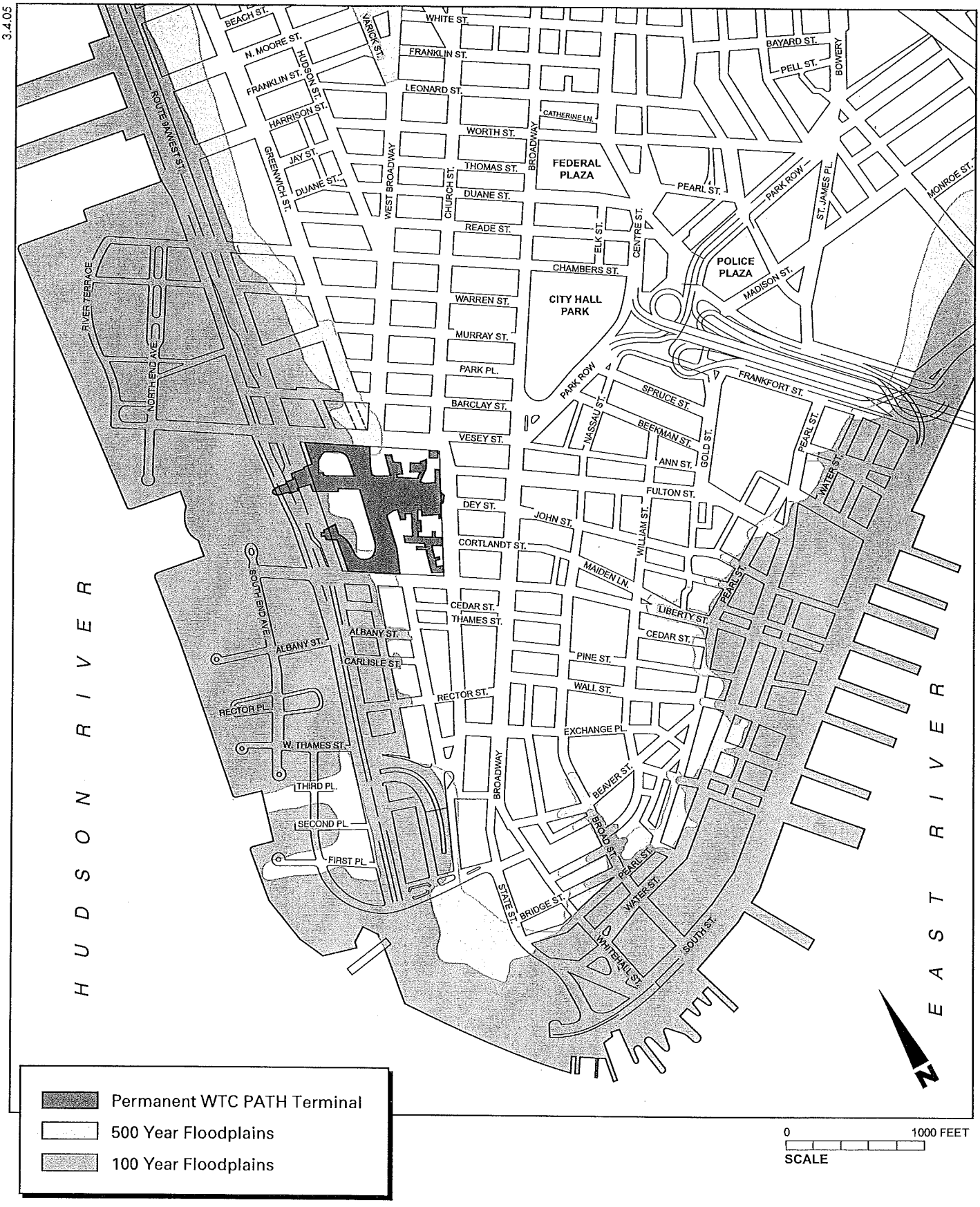
The WTC cooling water intake and outfalls, which were also used for the WTC PATH Terminal, are located at Battery Park City, in the lower Hudson River Estuary. The lower Hudson River Estuary is part of the New York/New Jersey Harbor Estuary, which also includes upper and lower New York Harbor, Arthur Kill, Kill Van Kull, East River, Raritan Bay, and Jamaica Bay. The Hudson River is the largest single freshwater input to this coastal plain estuary. The Hudson River Estuary extends approximately 150 miles upriver from the Battery to the Federal Dam at Troy, New York. The river gradient within the Estuary is very low, rising only 5 feet, and is tidally influenced throughout this extent (Moran and Limburg 1986).

Source: PANYNJ

Pre-September 11, 2001 photo showing the Austin J. Tobin Plaza

Figure 13-1

Austin J. Tobin Plaza Pre-September 11, 2001



PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 13-2
Floodplains

Salt water and tides dominate the flows and physical characteristics of the lower Hudson River Estuary. The estuary receives salt water from Upper New York Harbor during the flood phase of a tidal cycle, discharging less saline water to the Upper Harbor during the ebb phase (Moran and Limburg 1986). The Estuary is partially stratified; more saline waters are generally found toward the bottom and fresher waters toward the surface. However, under low freshwater flow conditions the fresh and saline waters are generally well mixed (Busby and Darmer 1970).

Water Quality

The City of New York has monitored New York Harbor water quality with an annual survey (Harbor Survey) for over 90 years. NYCDEP conducts the survey by collecting water samples at stations in four designated regions: Inner Harbor Area, Upper East River-Western Long Island Sound, Lower New York Bay-Raritan Bay, and Jamaica Bay (NYCDEP 2002). The WTC cooling water intake and outfalls are located in the Inner Harbor Area, which includes the lower Hudson River to the Harlem River, the East River to the Battery, the Kill Van Kull and Arthur Kill, and the Upper New York Harbor south to the Narrows.

Major improvements to water quality of the Lower Hudson River Estuary, indicated by lower fecal coliform bacteria concentrations and higher dissolved oxygen concentrations, occurred in the mid- to late-1980s. These improvements were primarily due to regional decreases in municipal and industrial discharges that occurred through the construction and upgrading of water pollution control plants (NYCDEP 1998 and 2003). While water quality continued to improve until the early 1990s, since that time improvements have been relatively small (NYCDEP 2003). Therefore, the water quality conditions described for pre-September 11, 2001 would be expected to be similar to the post-September 11, 2001 conditions. Additionally, because the operation of the WTC cooling water intake and outfalls was in compliance with the 1999 SPDES permit conditions (EPA 2003), discharges of cooling water through the WTC outfalls would not be expected to have affected water quality.

Recent survey data from the Harbor Survey station closest to the project area, mid-stream off of Pier A just to the south, indicate that the water quality in this part of the lower Hudson River is good. Water quality usually meets the dissolved oxygen, fecal coliform, total coliform, and other water quality standards for Class I saline surface waters. NYSDEC defines Class I waters as saline surface waters that are best used for secondary contact recreation and fishing, and are suitable for fish propagation and survival. Temporary increases in fecal coliform concentrations may occur during wet weather due to increased fecal coliform loadings following a rain event. Dissolved oxygen concentrations in bottom waters occasionally fall below 4 mg/L standard for Class I waters. Secchi transparency measurements, which are used to test water clarity, indicate periodic reduced water transparency (i.e., increased cloudiness) in this area.

Sediment

Typical of any urban watershed, New York Harbor Estuary sediments are contaminated from a history of industrial uses in the area. Contaminants found throughout the New York Harbor Estuary include pesticides (i.e., chlordane and DDT), metals (i.e., mercury, cadmium, lead, and copper), polychlorinated biphenyls (PCBs), and various polycyclic aromatic hydrocarbons (Rohmann and Lilienthal 1987). Adams et al. (1998) found the mean sediment contaminant concentration for 50 of 59 chemicals measured in sediment samples from the New York/New Jersey Harbor Estuary to be statistically higher than other coastal areas on the East Coast. While the sediments of the New York Harbor Estuary are contaminated, the levels of most sediment

contaminants have decreased on average by an order of magnitude over the past 30 years (Steinberg et al. 2002).

Aquatic Biota

The New York/New Jersey Harbor Estuary, including the lower Hudson River, supports a diverse and productive aquatic community of over 100 species of finfish, more than 100 invertebrate species, and a variety of phytoplankton and zooplankton. The following sections provide a brief description of the aquatic biota found in the Harbor Estuary, focusing on the lower Hudson River. While the following description is based on studies that have been conducted in this area from the 1980s through the present, the aquatic community is generally considered to have been stable over the this period, although there is considerable annual and seasonal variability, and the description of existing conditions presented below would apply to the pre- and post-September 11, 2001 conditions.

Phytoplankton are microscopic plants whose movements within the system are largely governed by prevailing tides and currents. Light penetration, turbidity and nutrient concentrations are important factors in determining phytoplankton productivity and biomass. Diatoms such as *Skeletonema costatum* and *Thalassiosira* spp. generally dominate the phytoplankton community, with lesser contributions from dinoflagellates and green algae (Brosnan and O'Shea 1995). While nutrient concentrations in most areas of New York Harbor are very high, low light penetration has often precluded the occurrence of phytoplankton blooms. Limited light penetration also restricts the distribution of submerged aquatic vegetation in the Harbor. Benthic macroalgae are large multicellular algae that are important primary producers in the aquatic environment. Species of macroalgae that occur in the Harbor Estuary include sea lettuce, green fleece, and brown algae (*Fucus* spp.) (PBS&J 1998).

Zooplankton are an integral component of aquatic food webs—they are primary grazers on phytoplankton and detritus material, and are themselves used by organisms of higher trophic levels as food. The higher-level consumers of zooplankton typically include forage fish, such as bay anchovy, as well as commercially and recreationally important species, such as striped bass and white perch during their early life stages. Crustacean taxa (copepods *Acartia tonsa, Acartia hudsonica, Eurytemora affinis*, and *Temora longicornis)* dominate the zooplankton community, with the dominant species changing with the season (Stepien et al. 1981, Lonsdale and Cosper 1994, Perlmutter 1971, Lauer 1971, Hazen and Sawyer 1983).

The major groups of benthic invertebrates collected in the estuary include aquatic earthworms (oligochaetes), segmented worms (polychaetes), snails (gastropods), bivalves, barnacles, cumaceans, amphipods, isopods, crabs, and shrimp (EEA 1988, EA Engineering Science and Technology 1990, Coastal 1987, and PBS&J 1998).

New York City is located at the convergence of several major river systems, all of which connect to the New York Bight portion of the Atlantic Ocean. This convergence has resulted in a mixture of habitats in the Harbor Estuary and lower Hudson River that support marine, estuarine, anadromous (fish that migrate up rivers from the sea to breed in freshwater), and catadromous fish (fish that live in freshwater but migrate to marine waters to breed).

According to Woodhead (1990), populations of numerically dominant fish within the Harbor Estuary (hogchoker, tomcod, winter flounder, white perch and striped bass) remain relatively stable from year to year. Studies at Pier 76 north of the WTC cooling water intake during the winter from 1982 to 1983 and 1988 and 1992, reported that the same four species of fish (striped bass, white perch, winter flounder, and Atlantic tomcod) comprised about 88 to 90 percent of the

fishes collected (EEA 1988; Stoecker et al. 1992). Although there are differences in abundance of fish among years and seasons, field investigations conducted by Able et al. (1995) in the Lower Hudson River (Piers 40 and 76) in 1993 and 1994 found that the composition and distribution of fish were similar to those reported in previous studies such as Beebe and Savidge (1988). Nine species comprised nearly 95 percent of the total number of fish collected, with juvenile striped bass the most abundant followed by Atlantic tomcod, American eel, seaboard goby, cunner, northern pipefish, naked goby, winter flounder, and tautog (Able et al. 1995).

Researchers have also found substantial differences in the use of interpier, underpier and pile field areas by fish within the lower Hudson Estuary (EEA 1988, EA Engineering, Science and Technology 1990, Able et al. 1995, Able et al. 1998, Able et al. 1999, and Duffy-Anderson and Able 1999). In general, abundance and variety of fish species was greater in open water habitats and pile fields than under platforms, and for juvenile fish, habitat quality under platforms greater than 20,000 square meters (5 acres) appeared to be poor (Able et al. 1998).

ESSENTIAL FISH HABITAT (EFH)

An essential fish habitat (EFH) assessment was prepared for the *WTC Memorial and Redevelopment Plan GEIS* to identify EFH designations for the Lower Hudson River Estuary in the vicinity of the WTC intake and outfalls, and potential impacts from the operation of the intake and outfalls. This area has been identified as EFH for 15 species of fish: red hake (larvae, juveniles, and adults), winter flounder (eggs, larvae, juveniles, adults, and spawning), windowpane (eggs, larvae, juveniles, and adults), Atlantic herring (larvae, juveniles, and adults), bluefish (juveniles and adults), Atlantic butterfish (larvae, juveniles, and adults), Atlantic mackerel (juveniles and adults), summer flounder (larvae, juveniles, and adults), scup (eggs, larvae, and juveniles), black sea bass (juveniles and adults), king mackerel (eggs, larvae, juveniles, and adults), Spanish mackerel (eggs, larvae, juveniles, and adults), cobia (eggs, larvae, juveniles, and adults), sand tiger shark (larvae), and sandbar shark (larvae and adults).

ENDANGERED, THREATENED, AND SPECIAL CONCERN SPECIES

Requests for information on rare, threatened or endangered species within the immediate vicinity of Project Site were submitted to USFWS, NMFS, and the NYSDEC Natural Heritage Program (NYNHP). Appendix G presents the responses from these agencies. USFWS indicated that no federally listed or proposed endangered or threatened species were currently known to exist in the vicinity of the Project Site (Stilwell 2003). NYNHP also indicated that they had no records of known occurrences of rare or state-listed animals or plants, substantial natural communities, or other substantial habitats, on or in the immediate vicinity of the Project Site (Conrad 2003). NMFS indicated that there may be seasonal use of the Hudson River by shortnose sturgeon (*Acipenser brevirostrum*), and occasional transient use by four species of marine turtle: loggerhead (*Caretta caretta*), green (*Chelonia mydas*), Kemp's ridley (*Lepidochelys kempii*), and leatherback (*Dermochelys coriacea*) (Rusanowsky 2003). Because the information supplied by these federal and state resource agencies is based upon current and past records and habitat and water quality conditions have not changed substantially since 1990, the species identified apply to the pre-September 11, 2001 and post-September 11, 2001 conditions.

Shortnose sturgeon (New York State and federally listed endangered) have the potential to occur within the Lower Hudson River Estuary as transient individuals to and from upriver spawning and nursery grounds and overwintering areas. These fish spawn, develop, and overwinter well upriver, and prefer colder, deeper waters. Out of the more than 1,000 trawls taken in the

Westway study in both the Hudson and East River, only one shortnose sturgeon was collected, in the deep water habitat, near the Peekskill-Haverstraw section of the Hudson River. Long-term Hudson River monitoring data, collected by the New York Utilities and others since the 1970s, have also indicated that shortnose sturgeon inhabit deep-water habitats, and occur in greatest abundance north of the Tappan Zee Bridge.

The four species of marine turtles, all state and federally listed, can occur in New York Harbor. Juvenile Kemps ridley and large loggerhead turtles enter the New York Harbor and bays in the summer and fall. The other two species, green sea turtle and leatherback sea turtle, are usually restricted to the higher salinity areas of the Harbor (USFWS 1997). In general, however, these four turtle species mostly inhabit Long Island Sound and Peconic and Southern Bays. They neither nest in the New York Harbor Estuary, nor reside there year-round (Morreale and Standora 1995). Turtles leaving Long Island Sound for the winter usually do so by heading east to the Atlantic Ocean before turning south (Standora et al. 1990). It is unlikely that these turtle species would occur in the lower Hudson River except as occasional transients.

While not identified by NYNHP as occurring in the vicinity of the proposed location for the Preferred Alternative (Conrad 2003), the peregrine falcon (*Falco peregrinus*), which is listed by the State of New York as endangered, was identified by the NYNHP as occurring in the vicinity of the elements of the WTC Memorial and Redevelopment Plan (Houle 2003). Preferred habitats for this raptor include open areas such as tundra, savannah, seacoasts, and open forests, and tall buildings. Peregrine falcons feed primarily on birds that they capture in the air. Nests are built on high ledges between 50 to 200 feet off the ground. Young falcons may stay in the vicinity of the nest for about six weeks after fledging, developing their flying and hunting skills. Peregrine falcons mate for life and generally return to the same nesting territory each year. The number of breeding pairs in New York has increased steadily since the first peregrines returned to nest in New York City in 1983 (NYSDEC 2003).

CHANGES IN THE AFFECTED ENVIRONMENT SINCE SEPTEMBER 11, 2001

TERRESTRIAL RESOURCES

The limited natural resources within the Project Site were destroyed as a result of the terrorist attacks and subsequent during recovery efforts. The original WTC PATH Terminal sustained extensive damage. The Project Site is currently vacant except for the temporary WTC PATH station and the No. 1 and 9 subway line crossing the site. Construction of the temporary WTC PATH station began in July 2002 and was opened on November 23, 2003. The temporary station stands at the site of the original terminal and comprises five levels—platform, mezzanine, 1 and 9 underpass, concourse, and street level. The street level portion of the station includes an entry plaza and canopy along the west side of Church Street near Fulton Street that has little landscaping. The temporary WTC PATH station mezzanine, station platform, and rail tracks are located at the western portion of the Project Site.

The Project Site is fenced off except for the temporary WTC PATH station and a newly constructed sidewalk and viewing area on the west side of Church Street. All passengers must access and leave the temporary WTC PATH station at the street-level entrance at Church and Fulton Streets. Currently, terrestrial resources within the Project Site are limited to pioneering plant species that are capable of growing in denuded areas, and possibly occasional individual animals that are tolerant of extremely disturbed conditions. Some shade trees exist on the perimeter of the demolition area. Therefore, the Project Site and the surrounding area to be

developed as part of the WTC Memorial and Redevelopment Plan currently contain extremely limited habitat for wildlife, and would not likely be used as a stopover area by migratory birds.

FLOODPLAINS

The pedestrian tunnel leading from the WTC PATH Terminal to the WFC and the station platform and tracks were damaged as a result of the September 11, 2001 attacks. The platform and tracks were repaired as part of the temporary WTC PATH station, which was opened in November 2003. The pedestrian tunnel to the WFC remains closed. As was the case prior to September 11, 2001, the western portion of the platform and tracks for the temporary WTC PATH station are within the 100-year floodplain (Figure 13-2). Other elements of the WTC complex that were partially located within the floodplain on the Project Site prior to September 11, 2001, 3 WTC and Tobin Plaza, were removed as a result of the terrorist attacks and restoration efforts. In addition to the flood protection measures that were in place pre-September 11, 2001, additional sump pumps have been installed to minimize water on the Project Site and sandbags would be manually placed on existing truck ramps in the event of the 100-year flood.

WATER QUALITY AND AQUATIC RESOURCES

As discussed previously, because the major infrastructure improvements were completed by 1990, water quality has remained fairly consistent since the early 1990s. Therefore, the post-September 11, 2001 water quality is not expected to have changed from that described previously under the pre-September 11, 2001 condition.

Because the dominant fish in the lower Hudson River and the New York/New Jersey Harbor Estuary have remained fairly stable since the late 1980s, when the majority of the substantial infrastructure improvements occurred in New York City (Woodhead 1990, ASA 2003), the aquatic biota for the lower Hudson River described under the pre-September 11, 2001 conditions scenario would also represent the post-September 11, 2001 conditions. No changes would have occurred other than the shut-down of the WTC cooling water intake. It is not expected that the shut-down of the WTC intake on September 11, 2001 would have affected the species reported to be present in the Lower Hudson River Estuary.

Sampling programs conducted in the Lower Hudson River Estuary post-September 11, 2001 have collected similar fish species to those conducted pre-September 11, 2001. Sampling conducted within the Hudson River Park to track changes to the aquatic community over time after the post-September 11, 2001 emergency dredging that occurred near Pier 25 (Meixler et al. 2003) recorded 41 fish species within the park. The most abundant species were bay anchovy (87 percent), striped bass (4 percent), Atlantic herring (4 percent), and alewife (2 percent). Bay anchovy adults are known to occur in high numbers in the Lower Hudson River Estuary in the summer, and are generally absent from the estuary in the winter (Woodhead et al. 1992). Sampling conducted for the Hudson River Utilities (ASA 2003) in the Lower Hudson River Estuary has also found that the same dominant fish species have been collected in the monitoring program since the mid-1980s, although variations do occur from year to year. Sampling conducted by the ACE from 2002 to 2003 (LMS 2003) found the most common fish collected in the Upper Bay to be striped bass (December through January), winter flounder (February), windowpane (February through March), spotted hake (April) and bay anchovy (May through June). Atlantic menhaden, bay anchovy, windowpane, and winter flounder, species that spawn in the Harbor, occurred in high densities during their spawning period (March through July).

ESSENTIAL FISH HABITAT (EFH)

As identified in the World Trade Center Memorial and Redevelopment Plan FGEIS, no substantial changes in the EFH of the Lower Hudson River Estuary have occurred since September 11, 2001.

ENDANGERED, THREATENED, AND SPECIAL CONCERN SPECIES

No changes to potential endangered, threatened, or special concern species in the lower Hudson River are anticipated to have occurred since the events of September 11, 2001.

D. PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

CONSTRUCTION PERIOD (2006)

FUTURE COMMON TO ALL ALTERNATIVES

Terrestrial Resources

As discussed in Chapter 4, "Land Use, Neighborhood Character, and Public Policy," several projects are planned for the Project Site and immediate vicinity during the construction period for the Preferred Alternative. Noise, vehicular traffic, and other human activity associated with these projects have the potential to affect some wildlife. However, individuals using the limited resources available on the site would be expected to be tolerant of urban conditions and would not likely be affected by construction activities.

Floodplains

As described previously, certain elements of the WTC Memorial and Redevelopment Plan located on the Project Site would be constructed during the construction period for the Preferred Alternative. Of these, only the Memorial and Liberty Park North would be located within the floodplain portion of the Project Site. Both of these elements would include pervious and impervious surfaces and appropriate drainage systems. Flood protection measures present prior to September 11, 2001 would remain and continue to control flooding. In addition, all areas developed within the Project Site as part of the WTC Memorial and Redevelopment Plan would be constructed with appropriate stormwater management measures. Appropriate stormwater management measures would also be implemented during the reconstruction of the Route 9A. Therefore, these projects would not be expected to adversely affect the water retention and flood control characteristics within or adjacent to the Project Site.

Water Quality and Aquatic Resources

Potential impacts to water quality and aquatic resources associated with the projects described above would be addressed in separate environmental reviews and permitting, as necessary. Any stormwater discharges would be managed with approved Stormwater Pollution Prevention Plans (SWPPPs) and established regulatory programs to minimize potential impacts to water quality and aquatic resources.

There are proposed and ongoing projects aimed at improving water quality and aquatic resources in the New York/New Jersey Harbor Estuary, several of which are sponsored by PANYNJ, which have the potential to result in water quality and aquatic habitat improvements in the Lower Hudson River Estuary, where the WTC cooling water intake is located. These projects

are independent of the Preferred Alternative. Improvements that result from these projects would occur without the Preferred Alternative and are expected to continue through the construction period.

Several of the future water quality improvement efforts in the Lower Hudson River Estuary will be coordinated by the New York/New Jersey Harbor Estuary Program (HEP). The Final Comprehensive Conservation and Management Plan (NY/NJ HEP 1996) for the HEP included a number of goals to improve water quality and aquatic resources in the area. The plan outlines objectives for the management of toxic contamination, dredged material, pathogenic contamination, floatable debris, nutrients and organic enrichment, and rainfall-induced discharges. The HEP Habitat Workgroup has developed watershed-based priorities for identifying acquisition, protection, and restoration sites for the preservation and enhancement of tidal wetlands that will provide improved habitat for fish and macroinvertebrates as well as birds, mammals, and reptiles that depend on these habitats. No NY/NJ HEP Acquisition and Restoration Sites have been identified near the WTC intake and outfalls. NY/NJ HEP Acquisition and Restoration Sites in closest proximity to the lower Hudson River are listed below. These NY/NJ HEP will occur independent of the Preferred Alternative.

- Liberty State Park—Located in the Upper New York Bay it has been identified for restoration, including permanent protection of natural areas, enhancement of emergent habitat, and restoration of oyster beds;
- Western Manhattan Island Parks—Several parks on the western shore of Manhattan (Riverdale Park, Inwood Park, Fort Tryon, Fort Washington Park, and Riverside Park) have been selected as priority restoration sites and are targeted for non-point source pollution reduction measures in addition to habitat restoration;
- Spuyten Duyvil—Located on the Harlem River near its confluence with the Hudson River, this park was chosen as a priority restoration site for salt marsh restoration; and
- Bush Terminal—Located in Upper New York Bay on the Brooklyn shoreline, it was chosen as a priority restoration site for salt marsh restoration.

The Contamination Assessment and Reduction Project, sponsored by PANYNJ, is a component of HEP focused on understanding the fate and transport of contaminants discharged to the estuary, and using this information to develop measures that may be necessary to reduce sediment contamination. The principal chemicals of concern include dioxins/furans, PCBs, polyaromatic hydrocarbons (PAHs), metals (mercury, cadmium, and lead), and pesticides (dieldrin and chlordane). Continued research and monitoring programs are anticipated to play a role in the development of future management strategies for Harbor sediments (NY/NJ HEP undated, ACE 1999).

The Hudson-Raritan Estuary Ecosystem Restoration Project is a cooperative project being led by the ACE that was funded by a U.S. House of Representatives Resolution on 15 April 1999. PANYNJ is a co-sponsor of this project. Other agencies involved in this project include EPA, USFWS, NOAA, National Resource Conservation Service, New Jersey Department of Environmental Protection (NJDEP), New Jersey Department of Transportation (Office of Maritime Resources), NYSDEC, NYSDOS, NYCDEP, New York City Parks and Recreation, and New Jersey Meadowlands Commission. The focus of the study is to identify the actions needed to restore the Hudson-Raritan Estuary and develop a plan for their implementation. The study area for the program includes all the waters of New York and New Jersey Harbor and the tidally influenced portions of all rivers and streams that empty into the Harbor and ecologically

influence the Harbor. The program will identify measures and plans to restore natural areas within the estuary and enhance their ecological value, and address habitat fragmentation, and past restoration and mitigation efforts that were piecemeal in nature. Thirteen initial representative restoration sites in New York and New Jersey have been targeted as the first sites for inclusion as potential restoration projects for feasibility level analysis. It is anticipated that expedited restoration of these representative restoration sites will provide substantial immediate value to the ecosystem. None of these sites occur in the vicinity of the WTC intake and outfalls. Therefore, actions taken by the Hudson-Raritan Estuary Ecosystem Restoration Project with respect to these sites would occur with or without the Preferred Alternative.

The New York sites include:

- Alley Pond Park (bordering western Long Island Sound),
- Old Place Creek (a tributary to the Arthur Kill),
- Newtown Creek (a tributary to the lower East River),
- Brookville Creek (a tributary to Jamaica Bay),
- Dreier Offerman Park (bordering Coney Island Creek near The Narrows),
- Sherman Creek (a tributary to the Harlem River),
- Pelham Lagoon and Turtle Cove (a tributary to western Long Island Sound), and
- Tallapoosa (a tributary to western Long Island Sound).

The New Jersey sites include:

- Leonardo (bordering Raritan Bay),
- Rahway River (a tributary to Raritan Bay),
- Marquis Creek (a tributary to Raritan Bay),
- Liberty State Park (on western Upper New York Bay), and
- Kearny Marsh (with tributaries that drain to Newark Bay).

In addition to the 13 representative sites, three spin-off sites have been identified. These are restoration sites being evaluated in parallel to the representative sites. They include the Lower Passaic River and Hackensack Meadowlands in New Jersey, and Gowanus Canal in New York (a tributary to the Upper New York Bay).

The Comprehensive Port Improvement Plan, sponsored by PANYNJ, is a multi-agency plan for implementing economic development and environment improvement decisions for PANYNJ. Among the priority objectives for the Plan are the identification and protection of significant habitats, the investigation of innovative best management practices for reduction of non-point sources of water pollutants, and the incorporation of green technologies in port improvement projects.

NYSDEC and NJDEP, in coordination with the IEC, will continue to develop total maximum daily loads and to identify priority waterbodies in bi-annual 305(b) reports to EPA. Total maximum daily loads, once implemented, will reduce the daily inputs of various contaminants in an effort to improve water quality. New York State provided $255 million to implement wastewater improvements, nonpoint source abatement and aquatic habitat restoration projects in 1998. The State intends to continue water quality improvement projects in the Harbor for the foreseeable future.

EPA's National Combined Sewer Overflow (CSO) Strategy of 1989 requires states to eliminate dry weather overflows of sewers, meet federal and state water quality standards for wastewater discharges, and minimize impacts on water quality, plant and animal life, and human health.

CSOs are the largest single source of pollutants and pathogens to the New York Harbor. NYCDEP has taken several steps in recent years to mitigate discharges from CSOs, which, in combination with improvements that have been made to water pollution control plants (WPCP), are expected to result in future improvement in coliform, dissolved oxygen and floatables levels in the New York Harbor area. The Multi-Year Intended Use Plan of the NYC Municipal Water Financing Authority has identified several CSO improvement and abatement projects, which will be completed between 2003 and 2010. NYCDEP plans to increase the track-down and control of pollutants of concern including mercury, polychlorinated biphenyls, and solvents.

NO ACTION ALTERNATIVE

Terrestrial Resources

Under the No Action Alternative, the temporary WTC PATH station will remain operable and construction activity associated with the WTC Memorial and Redevelopment Plan will occur on the WTC site. The temporary WTC PATH station includes an entry plaza and canopy along the west side of Church Street near Fulton Street that has little landscaping. The temporary WTC PATH station is not constructed of materials such as reflective glass with the potential to affect wildlife. Therefore, the continued use of the station will not be expected to result in adverse impacts to wildlife during the construction period.

Floodplains

Under the No Action Alternative, the temporary WTC PATH station would continue to exist on the Project Site. All flood protection measures currently present on the Project Site would be maintained. The continued use of the temporary WTC PATH station would not be expected to adversely affect the floodplain.

Water Quality and Aquatic Resources

Under the No Action Alternative, the temporary WTC station would continue to exist. No adverse impacts to water quality or aquatic resources would be expected to occur due to stormwater discharge. The temporary WTC station is not heated or cooled and therefore would not require the withdrawal of Hudson River water.

PREFERRED ALTERNATIVE

Terrestrial Resources

The majority of the Preferred Alternative would be built underground in the bathtub, including the PATH tubes, tracks, platform level, mezzanine/fare-zone level, sub-grade connections to adjacent streets, New York City Transit subways, and on- and off-site developments. The street-level terminal building would be constructed in the northeast corner of the Project Site at the western side of Church Street between Dey and Fulton Streets.

The use of bright lighting associated with nighttime construction has the potential to attract some birds and may result in collisions with construction equipment. The above-grade portion of the temporary WTC PATH station, the steel beam in cross form, and the remnants of the Vesey Street stairway to plaza level are the only structures on the Project Site above street level. The temporary station, however, does not contain walls or reflective glass surfaces, and would not be expected to cause bird strikes. Because of the lack of reflective surfaces, vegetation, and tall

illuminated structures at the Project Site that might attract birds during the construction period, it is unlikely that bird collisions would occur.

Noise associated with construction activities would have the potential to deter some wildlife species from using the site. As noted above, these effects would not likely be adverse, given that the Preferred Alternative is located in a densely urban area that is populated by urban-tolerant species. Therefore, adverse impacts to terrestrial resources would not be expected to occur during construction of the Preferred Alternative.

Floodplains

Elements of the Project located in the 100-year floodplain, as delineated by FEMA, include small portions of the platform level, mezzanine level, and the east–west concourse (see Figure 13-2). All of these areas are below grade and would not adversely impact the floodplain. In addition, flood protection measures currently on the Project Site would be repaired or maintained to control the introduction of ground water and control stormwater during construction. The street-level Terminal Building would not be located within the floodplain. Construction of the Preferred Alternative would not result in adverse impacts upon the floodplain due to the grades to be reconstructed on the Project Site.

Water Quality and Aquatic Resources

During construction, stormwater management would be in compliance with the approved SWPPP. Stormwater generated within the Project Site would not be discharged directly to surface waters, but would be directed to the municipal combined sewer system, as described in Chapter 11, "Infrastructure and Energy." Groundwater recovered during dewatering activities and stormwater generated by PATH's east–west connection beneath Route 9A would be treated by NYSDOT or PANYNJ, depending upon which agency is charged with its construction (see Chapter 2, "Project Alternatives"), prior to discharge to the city's combined sewer system. Implementation of best management practices for erosion and sediment control and other measures of the SWPPP would minimize potential impacts to the municipal combined sewer system. Construction activities are not expected to substantially increase stormwater volume.

Essential Fish Habitat Assessment

Because no in-water construction activities would be required as part of this alternative, no physical alteration would occur to EFH in the vicinity of the WTC site during the construction period. There would be no need for dredging or any extensive bottom disturbing actions that could negatively affect fish habitat. In addition, no adverse impacts to water quality are anticipated from construction of the Preferred Alternative. Therefore, no adverse impacts to EFH would be expected to occur due to construction of the Preferred Alternative.

Endangered, Threatened, and Special Concern Species

As indicated by USFWS and NYNHP, no endangered, threatened, or special concern species or significant habitats are known to occur within the Project Site.

NMFS (Rusanowsky 2003) indicated that shortnose sturgeon and four marine turtle species may occur seasonally in the Hudson River. Because no in-water work would be done during construction of the project, and no stormwater generated at the project site would be discharged directly to surface waters during construction, no adverse impacts would be expected to occur to these species during the construction period of the Preferred Alternative.

OPENING YEAR (2009)

FUTURE COMMON TO ALL ALTERNATIVES

Terrestrial Resources

It is expected that all proposed open space elements of the WTC Memorial and Redevelopment Plan would be completed by 2009. The planned parks—at 7 WTC and within the WTC site—would include shade trees and other plantings. These open space areas would have the potential to provide some limited terrestrial habitat for resident birds and other urban-tolerant wildlife such as squirrels and resting habitat for migratory songbirds.

The World Trade Center Memorial and Redevelopment Plan and the Route 9A Project, which are independent from the Preferred Alternative, may introduce additional habitats within the study area. Open space areas planned on the WTC site and within the median of Route 9A could total approximately 7 acres. The Route 9A project will also include upgrades to the existing stormwater drainage system and a bikeway/walkway along the west side of the highway and features landscaping and planters.

Construction activities associated with the elements of the WTC Memorial and Redevelopment Plan planned for completion in 2015 (Towers 2, 3, 4, and 5, and hotel) would be ongoing. Noise associated with construction activities would have the potential to deter some wildlife species from using the habitats available in open space areas near the Project Site. However, most wildlife with the potential to use these areas are tolerant of urban conditions.

Brightly illuminated buildings and towers can attract birds (Schmidt-Keonig 1979) and have the potential to result in bird strikes at night during spring and autumn migratory periods. Potential impacts to birds due to collisions with buildings proposed as part of the WTC Memorial and Redevelopment Plan, and measures to reduce the potential for bird strikes, would be evaluated as part of the separate environmental review for the WTC Memorial and Redevelopment Plan.

Floodplains

By 2009, it is assumed that several of the elements of the WTC Memorial and Redevelopment Plan project would be complete, including the open space areas, Memorial, museum and cultural facilities, retail, and some office space. The WTC Memorial and Redevelopment Plan project is being addressed under a separate environmental review process. However, as discussed previously for the construction year, adverse impacts to the floodplain due to changes to the water retention and flood control characteristics of the Project Site would not be expected to occur from WTC Memorial and Redevelopment Plan project.

Water Quality and Aquatic Resources

As described above for the No Action Alternative during the construction period, proposed and ongoing projects aimed at improving water quality and aquatic habitat in the New York/New Jersey Harbor Estuary have the potential to result in water quality and aquatic habitat improvements in the Lower Hudson River Estuary. These projects are independent of the Project Alternatives. Improvements that result from these projects would occur with or without the Project Alternatives and are expected to continue through the opening year.

Implementation of approved SWPPPs would minimize stormwater impacts of the various development projects discussed previously that would be expected to occur as part of the WTC Memorial and Redevelopment Plan on and in the vicinity of the Project Site. By 2009 some

portions of these projects would be operational. Stormwater would be discharged to the combined sewer system and would not be discharged directly to surface waters.

The heated effluent discharged through the existing WTC cooling water system outfalls as part of the cooling system for the elements of the WTC Memorial and Redevelopment Plan completed in the opening year (2009) would be expected to meet the thermal criteria developed by NYSDEC and specified in 6 NYCRR Part 704 and the thermal criteria and monitoring requirements specified in PANYNJ's 1999 SPDES permit (Table 13-1). Conditions issued in the 1999 SPDES permit were developed by NYSDEC so that the WTC thermal effluent would be in compliance with surface water standard for Use I saline surface waters. Compliance with the thermal criteria specified in 6 NYCRR Part 704 and the permitting conditions would be considered protective of the designated use of the Lower Hudson River Estuary, including fish survival and reproduction. An Essential Fish Habitat (EFH) Assessment was prepared for the Lower Hudson River Estuary as part of the World Trade Center Memorial and Redevelopment Plan Final Generic Environmental Impact Statement (FGEIS). The full text of the EFH appears in Appendix I of the FGEIS, which is available at www.renewnyc.com.

Table 13-1
World Trade Center Cooling Water Outfall Discharge Limitations

Parameter	Discharge Limitations			Minimum Monitoring Frequency
	Daily Average	Daily Max	Units	
Flow	Monitor	Monitor	MGD	continuous
Discharge Temperature	Monitor	91	°F	continuous
Intake-Discharge Temperature Difference	Monitor	17	°F	daily
Total Residual Chlorine[1]	Monitor	0.2	mg/L	3 times per week
pH[2]	Monitor	Monitor	SU	2 times per month

Notes:
[1] Total residual chlorine shall not be discharged more than two hours per unit per day. There shall not be simultaneous chlorination of separable portions of a single unit more than one unit at one time.
[2] The intake pH range shall not be extended more than 0.1 pH unit.
Other Limitations:
Intake velocity at each fixed and/or traveling screen and at the first set of bar racks shall not exceed 1.8 fps.
Only one outfall may be operated at a time. Simultaneous use of Outfalls 001 and 002 is not allowed.
Source: NYSDEC State Pollution Discharge Elimination System Discharge Permit effective 05/01/99.

Potential adverse impacts to aquatic life from the operation of the WTC cooling water intake is being assessed under an independent action as part of the permit renewal process.

NO ACTION ALTERNATIVE

Terrestrial Resources

As discussed previously with respect to the construction period, because the temporary WTC PATH station is not constructed of materials such as reflective glass with the potential to affect wildlife, the continued use of the terminal would not be expected to result in adverse impacts to wildlife during the construction period.

Floodplains

Under the No Action Alternative the temporary WTC PATH station would remain and continue to operate on the Project Site. All flood protection measures currently present on the Project Site would be maintained. The continued use of the temporary WTC PATH station would not be expected to adversely affect the floodplain.

Water Quality and Aquatic Resources

Under the No Action Alternative, the temporary WTC station would continue to operate. No adverse impacts to water quality or aquatic resources would be expected to occur due to stormwater discharge. The temporary WTC station is not heated or cooled and therefore would not require withdrawal of Hudson River water.

PREFERRED ALTERNATIVE

Terrestrial Resources

Because most of the Preferred Alternative would be below street level, potential impacts to terrestrial resources would only be associated with the above-ground components that include the street-level terminal building, the headhouse adjacent to the Winter Garden, street-level entrances and emergency egress on the WTC site, and the ventilation structures in the median of Route 9A. In the opening year, landscaping around the street-level terminal building would provide limited wildlife habitat to wildlife species that tolerate urban conditions. Examples may include birds such as mourning doves, American robin, pigeon, sparrow, and chimney swifts, and small mammals such as squirrels, mice, and other rodents. The habitat provided by the landscaping around the street-level terminal building would contribute to the increased habitat resulting from the open space elements that would have been completed as part of the WTC Memorial and Redevelopment Plan. While the wildlife habitat resulting from the landscaping surrounding the street-level terminal would be small, it would be greater than what is currently available on the Project Site, and would be expected to be an enhancement compared to pre-September 11, 2001 conditions when the nine-story 5 WTC was present in this location.

The increased habitat that would be present as a result of this alternative and the proposed WTC Memorial and Redevelopment Plan would also have the potential to provide resting or stop-over habitat to migratory songbirds during the spring and autumn migrations, which is not present under current conditions. Because the open space area for the WTC Memorial and Redevelopment Plan and the Preferred Alternative in 2009 would be greater than what was present at the WTC complex pre-September 11, 2001, the resting habitat for migratory songbirds would also have the potential to increase compared to pre-September 11, 2001. However, this increase in bird habitat for resident and migratory species would have the potential to result in bird strikes on glass surfaces associated with the street-level terminal building.

As currently proposed, the street-level terminal would comprise an oblong glass and steel shell, the roof of which would contain two counterpoised glass wings that would rise more than 100 feet into the air and extend the length of the building (about 350 feet). The structure would allow natural light to illuminate the terminal concourse. The ceiling of the aboveground building may have the capacity to open up to the sky, between the two wing-like structures.

Potential impacts to resident and migratory birds associated with the Preferred Alternative would be greater than under the No Action Alternative because the above-ground portion of the temporary WTC PATH station is small and not constructed of materials that would encourage

strikes. Nighttime lighting of the building, and the proposed use of glass and steel for the street-level terminal would have the potential to result in the loss of migratory bird individuals. While the proposed design of the street-level terminal would not pose the same potential for bird strikes as the taller towers proposed for the WTC Memorial and Redevelopment Plan, it would still have the potential to attract migratory birds during the spring and fall migratory periods if brightly illuminated at night. However, measures could be considered for the Preferred Alternative that would reduce potential impacts to birds.

As discussed previously, brightly illuminated buildings and towers can attract birds (Schmidt-Keonig 1979). Nocturnal migrants, because they use primarily visual cues in the sky such as the stars and the setting sun (Moore 1987 in Ogden 1996) and topographical features on the ground (e.g., water surfaces and trees) to orient during flight, have the greatest potential to be fatally entrapped by lighted structures (Ogden 1996). Nocturnal migrants have been found to be attracted to and trapped by artificial light sources during bad weather conditions, and under good weather conditions with low clouds and no moon (Martin 1990 in Ogden 1996). Because most nocturnal migrants are normally active during the day outside the migratory period, their night vision is believed to provide poor resolution of detail, allowing them to detect only the grossest detail and a spatial resolution (Martin 1990 in Ogden 1996). Birds migrating at night have been found to enter artificially lit areas and then become trapped there by the light (Avery et al. 1976 in Ogden 1996), appearing to be disoriented. Nocturnal migrants have been observed flying around the light source to the point of exhaustion, colliding with the structure and each other (Ogden 1996).

Table 13-2 presents bird strike data compiled by the NYCAS from May 2001 to December 2003 (NYCAS 2004) for buildings near the Project Site. Data for buildings within the WTC complex are not presented because the buildings were not present through the entire data collection time frame. Birds reported in building collisions in Manhattan by NYCAS were primarily migratory songbirds, mostly warblers and sparrows, but also included representatives from other groups. During the 2001 through 2003 period the 15 bird species reported by NYCAS in highest number of bird strikes for all buildings included white-throated sparrow, common yellowthroat, dark-eyed junco, ovenbird, Nashville warbler, American woodcock, hermit thrush, ruby-crowned kinglet, blackpoll warbler, black-and-white warbler, yellow-bellied sapsucker, gray catbird, northern flicker, swamp sparrow, and golden-crowned kinglet. Although the lowest building near the Project Site with bird strikes reported for the 2001 to 2003 timeframe, the World Financial Center (WFC) Winter Garden had the highest number of reported bird strikes. The WFC Winter Garden possesses some characteristics similar to the general concept proposed for the street-level terminal building. It is a glass and metal atrium, about 125 feet high and 197 feet long. Indoor lighting is located toward the top.

Measures that have the potential to decrease bird strikes of nocturnal migrants include:

- Minimize amount of light emanating upward from the structure at night during the migratory season;
- Extinguish interior lights at night during the migratory season;
- Minimize exterior floodlighting during the migratory season; and
- Install perches on tall buildings so birds captured by nighttime lighting can rest (Ogden 1996).

Table 13-2
Bird Strike Data Compiled by NYCAS From May 2001 Through December 2003 for Buildings in the Vicinity of the Project Site

Building	Location	Height (feet)[1]	Bird Strikes
WFC Winter Garden	World Financial Center	125	83
2 WFC	NW corner West & Liberty Streets	645	66
4 WFC	SW corner Varick & Route 9A	500	40
3 WFC	200 Vesey Street	739	38
26 Federal Bldg	26 Federal Plaza	587	18
1 WFC	200 Liberty Street	577	13
Empire State Bldg	350 Fifth Ave	1250	7
1 Battery Park Plaza	Whitehall/Pearl/ State Street intersections	495	5
Embassy Suites Hotel	across Vesey St from WFC	~140	3
Gateway Plaza Bldg 200	Battery Park City	~340	3
Two Penn Plaza	Two Penn Plaza	412	2
Citibank Bldg	111 Wall Street	344	2
100 Church Street	Church Street between Barclay St & Park Place	229	1
95 Wall Street	NW corner Wall & Water Streets	~220	1
100 Wall Street	100 Wall Street	365	1

Note: [1] estimations multiplied number of stories by an average of 10 feet per story
Source: NYCAS (2004)

The use of glass as the primary material comprising the street-level terminal has the potential to result in day-time bird strikes. Klem (1989) estimated that the number of birds (resident and migratory individuals) killed by day-time window collisions at low-level structures (such as individual residences) ranges from approximately 100 million to close to one billion per year in the United States. Bird fatalities from window collisions do not necessarily occur immediately following the collision (Klem 1990a). Klem (1990b) concluded that birds do not recognize clear or reflective glass as a barrier, with those species whose activities occur on or near the ground, such as thrushes, wood warblers, and finches, being most vulnerable to daytime bird strike injury. Anything that increases the density of birds near windows would be expected to increase the daytime strike rate. Measures to reduce potential strikes are described in Section F, "Mitigation."

As described in Chapter 2, "Project Alternatives," two 40-foot-tall vent structures are necessary for the safe operation of the Preferred Alternative (piston relief and smoke evacuation). These structures would be located above Tunnels E and F within the Route 9A median. They would be buffered by trees and other plantings and would not be expected to result in losses to birds resulting from strikes. Additionally, noise levels at the vent structures resulting from the use of the vents would not be expected to exceed surrounding noise levels. Therefore, adverse impacts to terrestrial resources would not be expected to occur from the vent structures associated with the Preferred Alternative.

Other above-ground structures proposed as part of the Preferred Alternative would be one-story tall and, therefore, would not pose a substantial risk for bird strikes.

Floodplains

All of the elements of the Preferred Alternative, including the street-level entrances, emergency egress, and ventilation structures, within the floodplain would incorporate federal, state, and local regulations pertaining to flood protection measures similar to pre-September 11 conditions. A flood-proofing system would be required and would be designed so as not to require human intervention or mechanical actions. Therefore, no adverse impacts would be expected to occur to the water retention and flood control characteristics of the Project Site.

Water Quality and Aquatic Resources

During operation of the Preferred Alternative, stormwater would be diverted to the city combined sewer system. No stormwater would be discharged directly to the surface waters. In addition, stormwater systems would be constructed to reduce the post-development flow of water from the site as compared to pre-September 11, 2001 conditions. Pretreatment systems would remove approximately 80 percent of total suspended solids and 40 percent of total phosphorus before being discharged to the combined sewer system at the Project Site. The combined sewer system at the Project Site is pumped to the Newtown Creek Water Pollution Control Plant at the Manhattan Pump Station. Strategies for reuse of stormwater (see Chapter 11, "Infrastructure and Energy") would be explored in keeping with the green design, green construction, and sustainable design principles that have been developed (see Chapter 2, "Project Alternatives"). Therefore, adverse impacts to water quality or aquatic resources would not be expected to occur as a result of stormwater generated during the operation of the Preferred Alternative.

The river water cooling system includes two intakes located on the eastern shore of the Hudson River near the World Financial Center. River water cooling was used prior to September 11, 2001 and would be reestablished as part of the current redevelopment of the WTC site. The New York State Department of Environmental Conservation is currently reviewing PANYNJ's application to renew their State Pollutant Discharge Elimination System (SPDES) permit for the river water cooling system. As part of this application, PANYNJ has prepared a Best Technologies Available (BTA) study, which will be made publicly available upon the completion of NYSDEC's review. The study specifies measures to protect fish eggs and larve from entrainment and entrapment associated with the systems intake grates. These measures include:

- Using 3 gallons per minute (gpm)/ton chillers;
- Variable speed pumps; and
- Modifying the intake structure with 2 millimeter (mm) wedgewire screens to reduce the approach velocity to 0.5 feet per second (fps) with a corresponding river water flow of 120,000 gallons per minute (gpm).

While some level of impact to aquatic organisms due to entrainment of fish eggs (and much smaller numbers of larvae) is unavoidable utilizing the selected design, overall aquatic impacts are materially reduced from pre-September 11, 2001 conditions. The proposed system would eliminate the potential for impingement and would reduce entrainment of yolk-sac and post-yolk sac ichthyoplankton from pre-September 11, 2001 levels by an estimated 93 percent and 97

percent, respectively. In fact, virtually all (approximately 98 percent) of the entrained organisms are eggs, which are subject to high rates of natural mortality and fecundity. By excluding life stages of entrainable organisms with higher natural survival rates, the selected design minimizes the adverse environmental impact of the cooling water intake structures.

The river water cooling system would be closed-circuit such that water extracted from the Hudson River would not be mixed with potable water or stormwater as it travels through the system. Therefore, the system would not alter the composition of Hudson River water.

Regulations set forth at 6 NYCRR Part 704 establish water quality standards governing thermal discharges to the waters of the state. They require that "all thermal discharges to the waters of the State shall assure the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife in and on the body of water" [6 NYCRR §704.1(a)]. Part 704 also sets forth specific criteria for discharges that, if met, would assure compliance with the standard. The criteria for estuarine discharges include a maximum surface temperature of 90°F, a limit on the lateral extent of a 4°F temperature rise to two-thirds of the width of the receiving river, and a limit on the cross-sectional area with a 4°F temperature rise to one-half of the river cross section. Because of Hudson River hydrodynamics, the maximum surface temperature of 90°F is the critical criterion to be met.

The BTA study specifies that the maximum designed change in temperature (ΔT) of the proposed river water cooling system is 10°F. Therefore, cooling water flow discharges would not result in temperatures in excess of the 90°F criterion, since the maximum ambient surface water temperature is 80°F.

Therefore, the cooling water discharges would have no potential impacts to water temperature and water quality within the Hudson River.

Endangered, Threatened, and Special Concern Species

As indicated by USFWS and NYNHP, no endangered, threatened, or special concern species or significant habitats are known to occur within the Project Site. Peregrine falcons that may occur within the vicinity of the Project Site would be expected to be acclimated to the urban conditions characteristic of the Project Site and adjacent areas. Therefore, they would not likely be impacted by the operation of the few above-ground features associated with the Preferred Alternative (e.g., street-level terminal building, north and south vent structures, or access to World Financial Center).

DESIGN YEAR (2025)

FUTURE COMMON TO ALL ALTERNATIVES

Terrestrial Resources

By 2025, it is assumed that the elements of the WTC Memorial and Redevelopment Plan would be complete, comprising open space areas, Memorial, museum and cultural facilities, retail, and up to 10 million square feet of office space in the five towers. The "green" corridors would also be complete between the Battery Park City and Route 9A. Draft plans for the WTC site include plantings at all of the new parks and along the reopened Fulton and Greenwich Streets. Because the elements of the WTC Memorial and Redevelopment Plan are expected to be completed and open by 2015, landscaped areas would have matured by 2025. These areas would be expected to provide some limited habitat for urban-tolerant wildlife, which include resident birds and small

mammals, and resting habitat for migratory songbirds in the spring and autumn, as discussed previously for the Future Common to All Alternatives in the opening year.

The proposed structures for the WTC Memorial and Redevelopment Plan would fully operational. The presence of all five proposed towers by 2025 would have the potential to result in more bird strikes than in the opening year of 2009. By 2025, potential operational measures that may reduce bird strikes, such as lighting modifications, would have been explored and implemented as appropriate to reduce the potential losses associated with bird strikes.

Floodplains

By 2025, the design year, it is assumed that all of the elements of the WTC Memorial and Redevelopment Plan would be complete. As indicated above, the WTC Memorial and Redevelopment Plan project is being addressed under a separate environmental review process. However, as discussed previously for the construction year, adverse impacts to the floodplain due to changes to the water retention and flood control characteristics of the Project Site would not be expected to occur from the elements of the WTC Memorial and Redevelopment Plan.

Water Quality and Aquatic Resources

As described previously for the Future Common to All Alternatives in the opening year, the reestablished cooling system on the WTC site would not adversely impact water quality and aquatic resources. Furthermore, proposed and ongoing projects aimed at improving water quality and aquatic resources in the New York/New Jersey Harbor Estuary have the potential to result in water quality and aquatic habitat improvements in the Lower Hudson River Estuary. These improvements would occur without the Project Alternatives, and some of the previously described project activities may continue through the design year.

NO ACTION ALTERNATIVE

Terrestrial Resources

Under the No Action Alternative, by the design year it is assumed that the temporary WTC PATH station would no longer be in operation. However, the discontinued use of the temporary station would not adversely effect terrestrial resources.

Floodplains

The discontinued use of the temporary WTC PATH station would not be expected to adversely affect the floodplain.

Water Quality and Aquatic Resources

No adverse impacts to water quality or aquatic resources would be expected to occur without operation of the temporary WTC station.

PREFERRED ALTERNATIVE

Terrestrial Resources

Because the only elements of the Preferred Alternative with the potential to affect terrestrial resources—the above-ground components, including the street-level terminal building at the northeast corner of the Project Site (west side of Church Street between Fulton and Dey streets), the vent structures, and the entrance adjacent to the Winter Garden—would not have changed

from the opening year evaluation, potential impacts in the design year would be expected to be similar to those of the opening year. Therefore, adverse impacts to terrestrial resources would not be expected to occur from the operation of the Preferred Alternative in 2025. Measures to reduce potential impacts to birds striking the surface of the street-level terminal, such as lighting modifications, would be explored to minimize potential impacts to resident and migratory birds from the operation of the street-level terminal building.

Floodplains

No changes to the floodplain in the Project Site are anticipated to occur as a result of the operation of the Project Alternatives between the opening year and the design year.

Water Quality and Aquatic Resources

Stormwater management for the Preferred Alternative in the design year would be similar to that described in the opening year. Stormwater would continue to be diverted to the city combined sewer system. Pretreatment systems would remove approximately 80 percent of total suspended solids and 40 percent of total phosphorus before being discharged to the combined sewer system at the Project Site. Strategies for reuse of stormwater (see Chapter 11, "Infrastructure and Energy") would be explored in keeping with the green design, green construction, and sustainable design principles that have been developed (see Chapter 2, "Project Alternatives"). Therefore, adverse impacts to water quality or aquatic resources would not be expected to occur as a result of stormwater generated during the operation of the Preferred Alternative.

Furthermore, as described under the "Future Common to All Alternatives," the reestablished river water cooling system would not adversely impact water quality and aquatic resources in the vicinity of the WTC site. Therefore, the Preferred Alternative's continued use of this system in the design year would also not result in adverse impacts.

Endangered, Threatened, and Special Concern Species

As indicated by USFWS and NYNHP, no endangered, threatened, or special concern species or significant habitats are known to occur within the Project Site. Peregrine falcons that may occur within the vicinity of the Project Site would be acclimated to the urban conditions characteristic of the Project Site and adjacent areas. Therefore, they would not likely be impacted by the operation of the few above-ground features associated this alternative in the design year.

E. MITIGATION

TERRESTRIAL RESOURCES

The preliminary design of the terminal building poses some concern for fatal strikes by migratory birds both during the day and at night. Measures that have the potential to reduce daytime bird strikes include:

- Place attractants (such as feeders or vegetation) either within 1 foot of the glass surface so that birds that have been attracted to them do not build up enough momentum to sustain serious injury if they hit the glass upon departure, or more than 33 feet from the glass surface;
- Transform glass into a recognizable obstacle by uniformly covering glass surfaces with a decorative grid with 2- to 4-inch intervals;

- Angle windows such that the panes reflect the ground instead of surrounding vegetation and sky;
- Minimize use of reflective glass; and
- Minimize the illumination of interiors behind clear glass and the visibility of indoor plants from outside (Klem 1990b, Klem 1991 in Ogden 1996).

Measures that have the potential to decrease bird strikes of nocturnal migrants include:

- minimize amount of light emanating upward during the migratory season; and
- minimize exterior floodlighting during the migratory season.

Measures to reduce potential impacts to birds from striking the surface of the street-level terminal, such as those presented above, and to minimize the potential for birds to enter the building through an opening in the top of the structure, would be explored during final design. PANYNJ will explore all feasible, cost effective, and practical measures for reducing bird strikes that are in keeping with the Terminal's design concept.

FLOODPLAINS

Existing and rehabilitated flood protection measures would be implemented as part of the Preferred Alternative. As such, flood control would meet or exceed pre-September 11, 2001 conditions. Stormwater discharges would be managed with an approved Stormwater Pollution Prevention Plans (SWPPPs) and established regulatory programs to minimize potential impacts to floodplains, groundwater, water quality, and aquatic resources. ✳

A. INTRODUCTION

The Preferred Alternative would be located within New York City's Coastal Zone Boundary as outlined in the Department of City Planning's Coastal Zone Boundary of New York City, June 1986 (see Figure 14-1). As such, this chapter examines the compliance of the Preferred Alternative with coastal zone policies.

B. METHODOLOGY

The federal Coastal Zone Management Act (CZMA) of 1972 was established to support and protect the distinctive character of the waterfront, and set forth standard policies for reviewing proposed development projects along coastlines. The CZMA emphasizes the primacy of state decision-making regarding the coastal zone. Section 307 of the CZMA (16 USC §1456), called the Federal Consistency provision, is a tool that states use to manage coastal uses and resources, and to facilitate cooperation and coordination with federal agencies. Federal Consistency is the CZMA requirement that federal agency activities having reasonably foreseeable effects on any land or water use or natural resource of the coastal zone must be consistent with the enforceable policies of a coastal state's federally approved Coastal Management Program (CMP). Federal Consistency reviews are the responsibility of the lead state agency that implements or coordinates the state's federally approved CMP.

The program responded to city, state, and federal concerns about the deterioration and inappropriate use of the waterfront. In response, New York State adopted its own CMP, designed to balance economic development and preservation by promoting waterfront revitalization and water-dependent uses while protecting fish and wildlife, open space and scenic areas, public access to the shoreline, and farmland; and minimizing adverse changes to ecological systems and erosion and flood hazards. CMP provides for local implementation when a municipality adopts a local waterfront revitalization program, as is the case in New York City. The program encourages coordination among all levels of government to promote sound waterfront planning and requires consideration of the program's goals in making land use decisions. The New York State Department of State (NYSDOS) administers the program at the state level, and the New York City Department of City Planning (NYCDCP) administers it in the city.

The *New York City Waterfront Revitalization Program* (WRP) is the City's principal coastal zone management tool. The WRP was originally adopted in 1982 and approved by NYSDOS for inclusion in the New York State CMP. The WRP establishes the City's policies for development and use of the waterfront and provides a framework for evaluating discretionary actions in the coastal zone. The WRP was revised and was approved by the City Council in October 1999. In August 2002, the NYSDOS and federal (i.e., the U.S. Army Corps of Engineers) authorities adopted the City's 10 WRP policies for projects located within its boundaries. This chapter reviews the 10 New York City coastal zone policies, which constitute the new WRP, and assesses, where applicable, the general consistency of the Preferred Alternative with these policies.

Potential effects on coastal resources include both direct and indirect impacts. Direct effects may result from temporary (construction) or permanent activities within the coastal zone or restriction of physical or visual access. Indirect effects may include the introduction of activities that result in growth-inducing impacts or may lead to other activities that further erode coastal resources. The potential effects on coastal resources from the Preferred Alternative are assessed for their consistency with the applicable WRP policies and to determine whether they would have an adverse effect on coastal resources.

C. DESCRIPTION OF THE AFFECTED ENVIRONMENT

As shown in Figure 14-1, the majority of the Project Site is located within the coastal zone. In the vicinity of the WTC site, the coastal zone boundary generally follows Greenwich Street. However, it expands eastward along Vesey and Liberty Streets to Church Street, and therefore includes the entire WTC site. This coastal zone boundary was not changed as a result of the terrorist attacks of September 11, 2001.

D. PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

New York City's WRP includes 10 policies designed to maximize the benefits derived from economic development, environmental preservation, and public use of the waterfront, while minimizing the conflicts among those objectives. Each Project Alternative is presented below, followed by a discussion of its applicability to and consistency with the appropriate policies.

NO ACTION ALTERNATIVE

The No Action Alternative may preclude PATH operations between New Jersey and Lower Manhattan at some point in the future and would result in the increased use of other modes of travel, such as automobiles, buses, subways, ferries, and commuter rail. The lack of subgrade pedestrian concourses, which would be constructed as part of the Preferred Alternative, would limit mobility through and around the WTC site, and, thus, access to the waterfront. Specifically, the No Action Alternative would not support the following policies of the WRP.

Policy 1: Support and facilitate commercial and residential development in areas well-suited for such development.

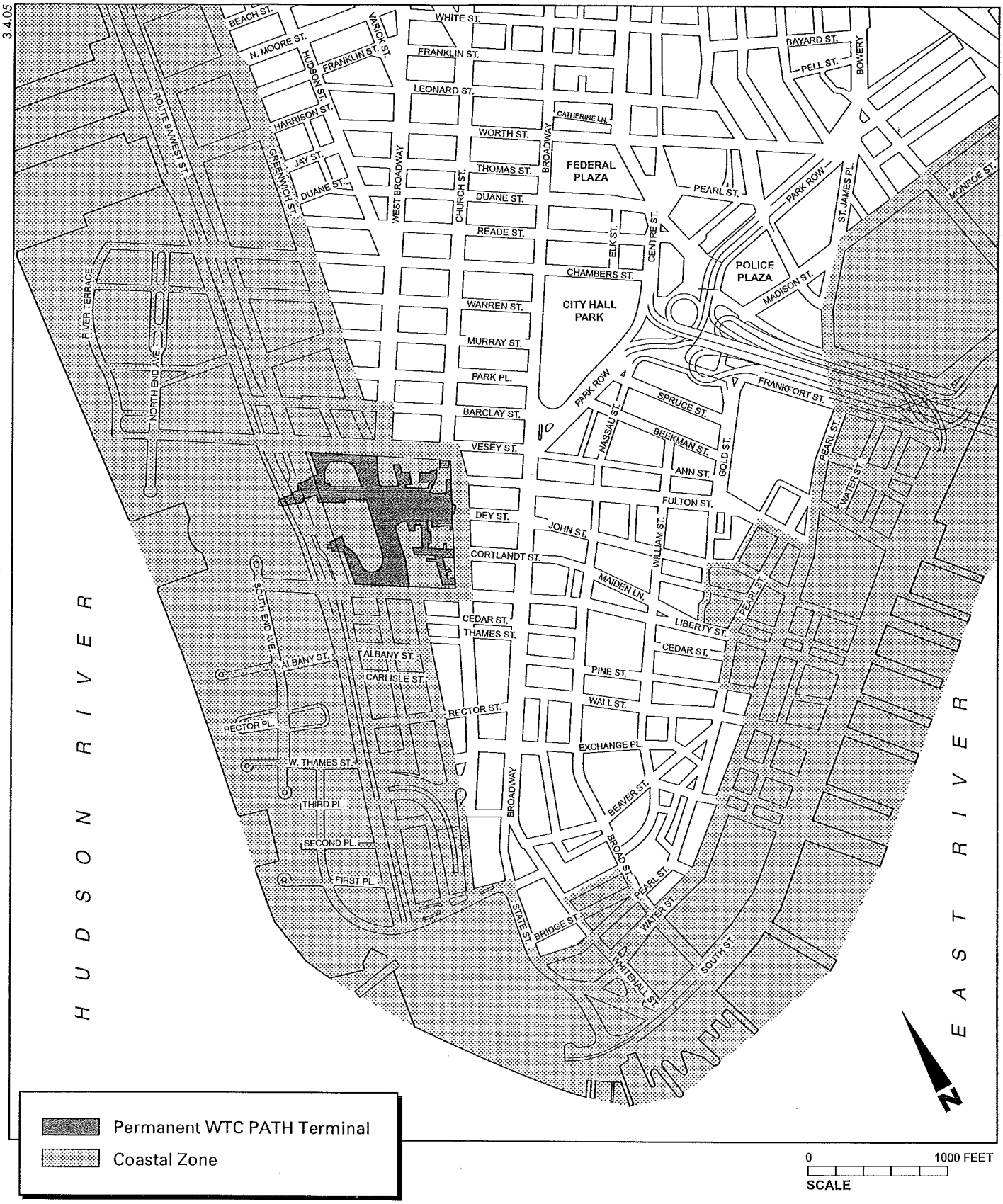
As described in Chapter 5, "Socioeconomic Conditions," the Preferred Alternative is a component of the economic revitalization and future development of Lower Manhattan.

Policy 8: Provide public access to and along New York City's coastal waters.

Although the No Action Alternative would not preclude waterfront access, it would eliminate subgrade concourses, which would improve access between the WTC site, points east, and the Battery Park City waterfront.

PREFERRED ALTERNATIVE

Policy 1: Support and facilitate commercial and residential development in areas well-suited to such development.



PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 14-1
Coastal Zone Boundary

Policy 1.1: Encourage commercial and residential redevelopment in appropriate coastal zone areas.

The Preferred Alternative would include approximately 5,000 square feet of accessory retail within the Terminal. This alternative would help to encourage commercial and residential development in the area by facilitating the movement of workers and visitors to the Project Site and surrounding area.

Policy 1.2: Encourage non-industrial development that enlivens the waterfront and attracts the public.

The Preferred Alternative would replace and enhance the preexisting transit facility. While the Terminal itself would not enliven the waterfront, it would facilitate the movement of people to and from the Project Site to the surrounding waterfront. The Permanent Terminal's underground pedestrian connection to the World Financial Center would facilitate movement of workers and visitors to the World Financial Center and the waterfront open spaces in Battery Park City and Hudson River Park.

Policy 1.3: Encourage redevelopment in the coastal area where public facilities and infrastructure are adequate or will be developed.

The construction of the Preferred Alternative would replace and improve the preexisting infrastructure damaged during the September 11, 2001 attacks on the WTC. This alternative would reestablish the critical connection between PATH and New York City subway lines (1, 9, E, R, and W) to facilitate movement of employees, commuters, and visitors to and around Lower Manhattan. In addition to reestablishing the connections that existed before September 11, 2001, the new facility would link with the Fulton Street Transit Center, Hudson River ferries, and a proposed commuter rail connection to JFK Airport. The infrastructure to serve the operation of the Preferred Alternative is consistent with this policy.

Policy 2: Support water-dependent and industrial uses in New York City coastal areas that are well-suited to their continued operation.

Policy 2.1: Promote water-dependent and industrial uses in Significant Maritime and Industrial Areas.

The Project Site is not located in a Significant Maritime and Industrial Area; therefore, this policy is not applicable.

Policy 2.2: Encourage working waterfront uses at appropriate sites outside the Significant Maritime and Industrial Areas.

The Preferred Alternative does not have direct waterfront access. However, the terminal would aid the movement of people to and from the Project Site to the surrounding waterfront.

Policy 2.3: Provide infrastructure improvements necessary to support working waterfront uses.

Construction of the Preferred Alternative is an infrastructure improvement that would facilitate the movement of workers between New Jersey and Manhattan. While it would not specifically support working waterfront uses, this alternative would introduce a pedestrian connection to the World Financial Center, which would enhance the

movement of workers and visitors to and from commercial uses in the World Financial Center, which is located in close proximity to the waterfront.

Policy 3: Promote use of New York City's waterways for commercial and recreational boating and water-dependent transportation centers.

Policy 3.1: Support and encourage recreational and commercial boating in New York City's maritime centers.

The Project Site, which is the site of the former WTC PATH Terminal, is in close proximity to the recreational/commercial boating and ferry transportation at the World Financial Center. This alternative will promote the use of this waterfront area by providing improved pedestrian access.

Policy 3.2: Minimize conflicts between recreational, commercial, and ocean-going freight vessels.

The Preferred Alternative does not involve recreational, commercial, or ocean-going freight vessels; therefore, the project would not create conflicts among these vessels.

Policy 3.3: Minimize impact of commercial and recreational boating activities on the aquatic environment and surrounding land and water uses.

The construction and operation of the Preferred Alternative would not involve any commercial or recreational boating activities; therefore, this policy is not applicable.

Policy 4: Protect and restore the quality and function of ecological systems within the New York City coastal area.

Policy 4.1: Protect and restore the ecological quality and component habitats and resources within the Special Natural Waterfront Areas, Recognized Ecological Complexes, and Significant Coastal Fish and Wildlife Habitats.

The Project Site is not located within a Special Natural Waterfront Area or Recognized Ecological Complex. However, the Preferred Alternative would use river water cooling for its Heating, Ventilation, and Air Conditioning (HVAC) systems, which may impact aquatic habitats within the Hudson River. The river water cooling system includes two intakes located on the eastern shore of the Hudson River near the World Financial Center. River water cooling was used prior to September 11, 2001 and would be reestablished as part of the current redevelopment of the WTC site. The New York State Department of Environmental Conservation is currently reviewing PANYNJ's application to renew their State Pollutant Discharge Elimination System (SPDES) permit for the river water cooling system. As part of this application, PANYNJ has prepared a Best Technologies Available (BTA) study that specifies measures to protect fish eggs and larve from entrainment and entrapment associated with the systems intake grates. These measures include:

- Using 3 gallons per minute (gpm)/ton chillers;
- Variable speed pumps; and
- Modifying the intake structure with 2 millimeter (mm) wedgewire screens to reduce the approach velocity to 0.5 feet per second (fps) with a corresponding river water flow of 120,000 gallons per minute (gpm).

While some level of impact to aquatic organisms due to entrainment of fish eggs (and much smaller numbers of larvae) is unavoidable utilizing the selected design, overall aquatic impacts are materially reduced from pre-September 11, 2001 conditions. The proposed system would eliminate the potential for impingement and would reduce entrainment of yolk-sac and post-yolk sac ichthyoplankton from pre-September 11, 2001 levels by an estimated 93 and 97 percent respectively. In fact, virtually all (approximately 98%) of the entrained organisms are eggs, which are subject to high rates of natural mortality and fecundity. By excluding life stages of entrainable organisms with higher natural survival rates, the selected design minimizes the adverse environmental impact of the cooling water intake structures.

Policy 4.2: Protect and restore tidal and freshwater wetlands.

There are no New York State Department of Environmental Conservation (NYSDEC) or U.S. Army Corps of Engineers (ACE) mapped tidal or freshwater wetlands on the Project Site. Therefore, this policy is not applicable.

Policy 4.3: Protect vulnerable plant, fish, and wildlife species, and rare ecological communities. Design and develop land and water uses to maximize their integration or compatibility with the identified ecological community.

Requests for information on rare, threatened or endangered species within the immediate vicinity of Project Site were submitted to United States Fish and Wildlife Service (USFWS), the NYSDEC Natural Heritage Program (NYNHP), and National Marine Fisheries Service (NMFS). USFWS indicated that no federally listed or proposed endangered or threatened species were currently known to exist in the vicinity of the Project Site. NYNHP also indicated that they had no records of known occurrences of rare or state-listed animals or plants, significant natural communities, or other significant habitats, on or in the immediate vicinity of the Project Site. NMFS identified seasonal use of the Hudson River by shortnose sturgeon and occasional transient use by four species of marine turtle. However, the Terminal is not directly located along the Hudson River waterfront; therefore, these intermittent transient species would not be disturbed. As a result, this alternative is consistent with this policy (see Chapter 13, "Natural and Water Resources").

Policy 4.4: Maintain and protect living aquatic resources.

See Policy 4.1, above.

Policy 5: Protect and improve water quality in the New York City coastal area.

Policy 5.1: Manage direct or indirect discharges to waterbodies.

Potential impacts to water quality and aquatic resources associated with construction and stormwater discharge from the Terminal would be managed with an approved Stormwater Pollution Prevention Plan (SWPPP), in conformance with NYSDEC SPDES permit requirements. Construction groundwater discharges and stormwater generated within the Project Site would be directed to the municipal stormwater system. Best Management Practices for erosion and sediment control would be implemented to minimize potential impact to the municipal stormwater system (see Chapter 13, "Natural and Water Resources").

As described above, for Policy 4.1, the Preferred Alternative would employ a river water cooling system. NYCDEC is currently reviewing PANYNJ's application to renew the SPDES permit for the WTC site. The application includes a BTA study that includes strategies to reduce impacts to water quality.

The river water cooling system would be closed-circuit such that water extracted from the Hudson River would not be mixed with potable water or stormwater as it travels through the system. Therefore, the system would not alter the composition of Hudson River water.

Regulations set forth at 6 NYCRR Part 704 establish water quality standards governing thermal discharges to the waters of the state that requires. They require that "all thermal discharges to the waters of the State shall assure the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife in and on the body of water" [6 NYCRR §704.1(a)]. Part 704 also sets forth specific criteria for discharges that, if met, would assure compliance with the standard. The criteria for estuarine discharges include a maximum surface temperature of 90°F, a limit on the lateral extent of a 4°F temperature rise to two-thirds of the width of the receiving river, and a limit on the cross-sectional area with a 4°F temperature rise to one-half of the river cross section. Because of Hudson River hydrodynamics, the maximum surface temperature of 90°F is the critical criterion to be met.

The BTA study specifies that the maximum designed change in temperature (ΔT) of the proposed river water cooling system is 10°F. Therefore, cooling water flow discharges would not result in temperatures in excess of the 90°F criterion, since the maximum ambient surface water temperature is 80°F.

Therefore, the cooling water discharges would have no potential impacts to water temperature and water quality within the Hudson River.

Policy 5.2: Protect the quality of New York City's waters by managing activities that generate non-point source pollution.

See policy 5.1, above.

Policy 5.3: Protect water quality when excavating or placing fill in navigable waters and in or near marshes, estuaries, tidal marshes or wetlands.

Construction of the Preferred Alternative would not require any excavation or the placement of fill in navigable waters or near marshes, estuaries, tidal marshes, or wetlands. Therefore, this policy is not applicable.

Policy 5.4: Protect the quality and quantity of groundwater, streams, and the sources of water for wetlands.

The site does not contain any potable groundwater, nor does it contain streams or the source of water for wetlands. Therefore, this policy is not applicable.

Policy 6: Minimize the loss of life, structures, and natural resources caused by flooding and erosion.

Policy 6.1: Minimize losses from flooding and erosion by employing non-structural and structural management measures appropriate to the condition and use of the property to be protected and the surrounding area.

The Project Site is partially located within the 100-year flood plain. The 100-year floodplain is regulated by the Federal Emergency Management Agency (FEMA), and is defined as areas that have a 1 percent chance of flooding each year due to storms. The 100-year floodplain is usually characterized by dry land, but has the potential of being covered with flood water. Executive Order 11988 and its implementing regulations, 24 CFR Part 55, require federal agencies to consider alternatives to avoid adverse effects and incompatible development in the floodplains.

The Preferred Alternative would not alter the natural features of the shoreline or any structural or non-structural flood or erosion control measures. The project would not increase the amount of impervious surface on the site as compared to the pre-September 11, 2001 condition, and thus would not increase flood hazards on or adjacent to the Project Site. Therefore, the buildings and facilities would be built to withstand these flood conditions so as not to be damaged in the event of a flood. Consistent with this policy, this will minimize the potential for property damage and endangering human life (see Chapter 13, "Natural and Water Resources.")

Policy 6.2: Direct public funding for flood prevention or erosion control measures to those locations where the investment will yield significant public benefit.

The Preferred Alternative does not involve public funding for such measures; therefore, the proposed policy is not applicable.

Policy 6.3: Protect and preserve non-renewable sources of sand for beach nourishment.

There are no non-renewable sources of sand on the Project Site; therefore, this policy does not apply.

Policy 7: Minimize environmental degradation from solid waste and hazardous substances.

Policy 7.1: Manage solid waste material, hazardous wastes, toxic pollutants, and substances hazardous to the environment to protect public health, control pollution, and prevent degradation of coastal ecosystems.

As discussed in Chapter 12, "Contaminated Materials," it is not anticipated that contaminated materials will be encountered within the western portion of the Project Site during construction of the Preferred Alternative. However, excavation/tunneling activities associated with the proposed egress routes may encounter fill material, which could include contaminants and/or contaminated groundwater. Construction activities would be performed using appropriate construction and engineering practices. In addition, a Health and Safety Plan (HASP) would be prepared and implemented (see Chapter 12).

Operation of both the Permanent WTC PATH Terminal, specifically the PATH train system, would include the use of limited quantities of hazardous materials and petroleum products. These materials are used in conjunction with the current system and such materials are not stored on the WTC site. No changes in materials handling for the PATH system are anticipated with the proposed project; thus, there would continue to be no materials storage at the Project Site. The Port Authority of New York and New Jersey (PANYNJ) has established a series of standard operating procedures, which include measures to be undertaken in the event of a discharge of hazardous materials or petroleum products. These procedures would continue to apply in the future with the Preferred Alternative.

Policy 7.2: Prevent and remediate discharge of petroleum products.

See Policy 7.1, above.

Policy 7.3: Transport solid waste and hazardous substances and site solid and hazardous waste facilities in a manner that minimizes potential degradation of coastal resources.

See Policy 7.1, above. The minimal waste generated by this alternative would be hauled by a licensed waste hauler according to applicable laws and regulations (see Chapter 12).

Policy 8: Provide public access to and along New York City's coastal waters.

Policy 8.1: Preserve, protect and maintain existing physical, visual, and recreational access to the waterfront.

The Project Site is located both above and below ground on a site that was previously the WTC and PATH Terminal. The original PATH terminal had no physical, visual, or recreational access to the waterfront to be preserved, protected, or maintained. As part of the Preferred Alternative, a pedestrian connection would be constructed between the Terminal and Battery Park City. This connection would provide better access to the west side of Manhattan and the waterfront open spaces within Battery Park City and Hudson River Park.

Policy 8.2: Incorporate public access into new public and private development where compatible with proposed land use and coastal location.

See Policy 8.1.

Policy 8.3: Provide visual access to coastal lands, waters, and open space where physically practical.

The project has been planned in coordination with the redevelopment of the WTC. A master plan for the site will be implemented and includes approximately 5.5 acres of open space. The development of the Preferred Alternative would not preclude the WTC master plan.

Policy 8.4: Preserve and develop waterfront open space and recreation on publicly owned land at suitable locations.

The Preferred Alternative would be constructed on the site of the former World Trade Center and PATH Terminal. The Preferred Alternative would not preclude the construction of open space uses as part of the WTC Memorial and Redevelopment Plan.

Policy 8.5: Preserve the public interest in and use of lands and waters held in public trust by the State and City.

The Preferred Alternative would not hinder current accessibility to the waterfront nor interfere with the continued use or ownership of land and waters held in the public trust as the Preferred Alternative is not located directly along the waterfront. The underground pedestrian connection between the terminal and the World Financial Center would improve movement of workers and visitors to the waterfront. Thus, the public interest in the use of lands and water held in public trust (i.e., Battery Park City

esplanade and Hudson River Park) would be encouraged and preserved. As a result, this alternative would be consistent with this policy.

Policy 9: Protect scenic resources that contribute to the visual quality of the New York City coastal area.

Policy 9.1: Protect and improve visual quality associated with New York City's urban context and the historic and working waterfront.

The visual character of the Hudson River waterfront and Lower Manhattan consist of an urban landscape with tall commercial and industrial buildings. The only visible elements of the Permanent WTC PATH Terminal would be the terminal building, which would provide street-level access to the WTC site and to Greenwich and Church Streets and the north and south ventilation structures to be constructed in the Route 9A median. The Terminal would be modern in design and lower in height than the adjacent buildings to its north and south, and would be consistent with view corridors in the WTC master plan. The ventilation structures would replace two 12-foot ventilation structures for the original PATH terminal, would be of long and slender massing, and would stand 40 feet in height. It is anticipated that the structures would be clad in reflective material, in keeping with modern material used on buildings in the immediate area. The terminal and ventilation structures are in scale and character with existing visual resources in Lower Manhattan and would be consistent with protecting and enhancing the existing scenic values and character of the area. As discussed in Chapter 7, "Urban Design and Visual Resources," it is likely that the terminal would become an important visual resource on the Project Site.

Policy 9.2: Protect scenic values associated with natural resources.

There are no natural resources on the Project Site, nor is it located in a Special Natural Area District, Special Natural Waterfront Area, or Recognized Ecological Complex; therefore, this policy does not apply.

Policy 10: Protect, preserve, and enhance resources significant to the historical, archaeological, and cultural legacy of the New York City coastal area.

Policy 10.1: Retain and preserve designated historic resources and enhance resources significant to the coastal culture of New York City.

As discussed in Chapter 6, "Cultural Resources," to avoid, minimize, and mitigate adverse effects to historic resources during construction of the Preferred Alternative, a Memorandum of Agreement pursuant to Section 106 of the NHPA has been executed. As specified in the MOA, a Construction Protection Plan(s)—based on the requirements laid out in the "New York City Department of Buildings Technical Policy and Procedure Notice #10/88"—would be developed in consultation with the State Historic Preservation Officer (SHPO) and implemented before commencement of any excavation or construction. In addition, as described in Chapter 10, "Noise and Vibration," special vibration protection measures would be implemented to protect historic resources from increased vibration levels associated with construction activities. Implementation of the Construction Protection Plan(s) and the vibration protection measures would avoid or minimize the potential for adverse effects to historic resources during construction.

Measures to mitigate adverse effects to the National Register-eligible WTC site have been specified as part of the Memorandum of Agreement for the project (see Appendix B).

Once constructed, it is anticipated that the Preferred Alternative would continue the existing trend of modern buildings juxtaposed against the historic fabric of Lower Manhattan. The Terminal's design will also incorporate measures to avoid, minimize, or mitigate adverse impacts to remaining remnants and structures on the WTC site per the stipulations of the executed Memorandum of Agreement for the Permanent WTC PATH Terminal. The measures include the preservation of the passageway to the E train, architectural treatments on the platform level, and visual access to remaining resources, where possible. PANYNJ would coordinate with SHPO and the project's Section 106 consulting parties on the incorporation of these elements as the Terminal's design moves forward. Overall, the Terminal is not expected to have any contextual or visual effects on any known or potential historic resources (see Chapter 6, "Cultural Resources").

Policy 10.2: Protect and preserve archaeological resources and artifacts.

(See Policy 10.1, above.) PANYNJ would coordinate with the Lower Manhattan Development Corporation (LMDC) prior to the start of construction to determine whether any potentially sensitive areas have already been tested as part of the WTC Memorial and Redevelopment Plan. If necessary, Phase IB testing, which involves subsurface testing to try to determine whether any resources are actually present, would take place in potentially sensitive areas prior to the start of construction.

Construction of the pedestrian connection to the World Financial Center may affect a portion of the Hudson River Bulkhead, buried underground along the western edge of Route 9A. An agreement would be developed between PANYNJ, FTA, and SHPO in order to mitigate any adverse effects, if necessary (see Chapter 6, "Cultural Resources").

E. MITIGATION

The Preferred Alternative reflects a commitment to consistency with WRP coastal policies and the WRP's goals of enlivening the waterfront and attracting the public to the city's coastal areas. The Preferred Alternative would introduce a pedestrian connection to the World Financial Center, which would enhance the movement of workers and visitors to and from commercial uses in the World Financial Center, which is located in close proximity to the waterfront.

Under the policies of the CMP and WRP, the Preferred Alternative would not have an adverse impact on coastal resources. Therefore, the Preferred Alternative would be consistent with applicable policies in the CMP and WRP. ✳

A. INTRODUCTION

The federal Council on Environmental Quality's regulations implementing the procedural provisions of the National Environmental Policy Act (NEPA), set forth in 40 CFR Part 1500-1508, require federal agencies to consider the environmental consequences of their actions, including not only direct and indirect effects, but also cumulative effects.

The other chapters of this Environmental Impact Statement (EIS) assess the potential direct and indirect effects of the No Action Alternative and the Preferred Alternative for a range of technical areas. This chapter addresses cumulative impacts of the Preferred Alternative in combination with other reasonably foreseeable actions.

Cumulative impacts result from the incremental consequences of an action (the project) when added to other past and reasonably foreseeable future actions (40 CFR 1508.7). The cumulative effects of an action may be undetectable when viewed in the individual context of direct and indirect impacts, but when added to other actions can eventually lead to a considerable environmental change. Cumulative impacts are the net result of both the proposed project and the other projects that could affect the same resource.

The redevelopment of Lower Manhattan includes transportation and development projects being sponsored by both public and private groups. Although funded and planned separately, and having independent utility from each other, the construction and operation of these various projects would have a cumulative effect on the character and quality of Lower Manhattan and the region, as a whole, both during construction and in the long-term. Recognizing the potential impacts of such large-scale development in a relatively small geographic area, the lead federal agencies, in cooperation with the local project sponsors, developed a framework for the analysis of cumulative effects for projects being reviewed under the National Environmental Policy Act (NEPA). To guide this process, the U.S. Department of Transportation, Federal Transit Administration (FTA) prepared the *Approach to Cumulative Effects Analysis for the Lower Manhattan Recovery Effort* (July 2003).

The approach described in FTA's guidance ensures consistency among projects through a coordinated set of analysis assumptions and methodologies for all of the transportation recovery projects. As individual projects advance through the NEPA process, the analysis and any identified impacts are incorporated into the documentation of later projects to ensure a consistent, up-to-date, and comprehensive evaluation of potential cumulative effects.

This cumulative effects assessment considers the five major federally funded Lower Manhattan Recovery Projects as well as other public and private developments in the vicinity of the Port Authority of New York and New Jersey's (PANYNJ) Permanent World Trade Center (WTC) PATH Terminal (see Figure 15-1). This analysis also incorporates the assumptions and results from the following environmental documents, which are being prepared for the other, federally-sponsored Lower Manhattan Recovery Projects:

- *World Trade Center Memorial and Redevelopment Plan Final Generic Environmental Impact Statement (FGEIS)*, which was published by the U.S. Department of Housing and Urban Development (HUD) and the Lower Manhattan Development Corporation LMDC in April 2004;
- *Fulton Street Transit Center Final Environmental Impact (FEIS)* which was published by the FTA and the Metropolitan Transportation Authority (MTA) New York City Transit (NYCT) in October 2004;
- *South Ferry Terminal Environmental Assessment Statement (EA)*, which was published by the FTA and MTA/NYCT in May 2004; and
- *Route 9A Project Draft Supplemental Environmental Impact Statement (DSEIS)*, which was published by the U.S. Department of Transportation, Federal Highway Administration (FHWA) and the New York State Department of Transportation in May 2004.

This study focuses on subject areas with the most potential for cumulative adverse effects from the proposed projects in Lower Manhattan. The local project sponsors have coordinated amongst themselves and with federal agencies to develop consistent methodologies, assumptions, data sources, and impact criteria for the evaluation of impacts for the five cumulative effects subject areas: access and circulation; air quality; noise and vibration; cultural resources; and economic conditions. Furthermore, the project sponsors have agreed to a consistent set of Environmental Performance Commitments (EPCs) for these resource areas to be implemented as part of their projects in order to minimize or avoid adverse impacts during construction.

The coordination among the project sponsors began in the Spring of 2003. These efforts have included working group meetings with all of the project sponsors to address general coordination issues as well as technical subjects (e.g. construction assessment; traffic modeling; air quality emissions factors; etc.). Some of these coordination meetings have also involved participation from other local and state agencies such as the New York City Department of Transportation (NYCDOT), the New York State Historic Preservation Officer (SHPO), and the New York State Department of Environmental Conservation (NYSDEC). During the DEIS phase for the WTC Permanent PATH Terminal, these meetings were held at least weekly and sometimes two or three times per week.

Coordination efforts have continued since publication of the DEIS for the Permanent WTC PATH Terminal. As described in Chapter 9, "Air Quality" and Chapter 10, "Noise and Vibration," PANYNJ has worked with MTA/NYCT to refine EPCs and have furthered their commitment to reduce emissions, noise, and vibrations during construction. PANYNJ has also committed to the coordination of potential impacts to historic and archaeological resources through the execution of the Permanent WTC PATH Terminal Memorandum of Agreement (MOA), which was prepared pursuant to Section 106 of the National Historic Preservation Act. Furthermore, New York State Governor George Pataki has established the Lower Manhattan Construction Command Center, which will oversee coordination efforts among the Lower Manhattan Recovery Projects as efforts move forward.

B. METHODOLOGY

The cumulative effects analysis focuses on the five categories of concern identified in FTA's Approach to Cumulative Effect's for the Lower Manhattan Recovery Efforts, which are also

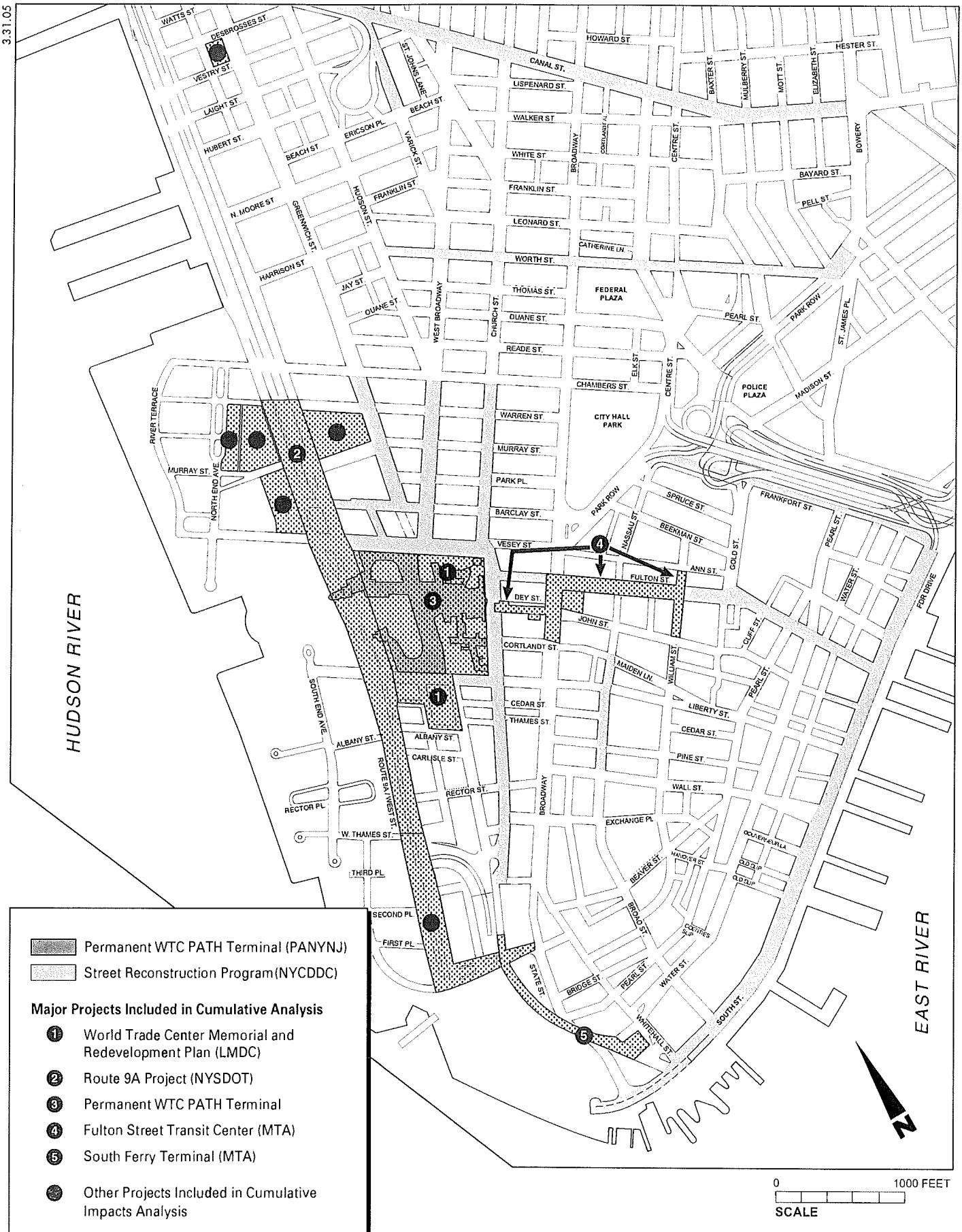


Figure 15-1

Lower Manhattan Projects Planned for Construction in the Critical Analysis Year

reflected in the Environmental Analysis Framework that was developed by PANYNJ, LMDC, MTA/NYCT and NYSDOT. As noted above, the five categories are:

- Air Quality
- Noise and Vibration
- Cultural Resources
- Access and Circulation
- Economics (e.g., Effects on Local Businesses)

It should be noted that the access and circulation category has been assessed under the typical methodology for projects in New York City of vehicular traffic, pedestrians, and transit services. Also, the nature of the cumulative effects analysis differs depending upon the category. For the transportation (i.e. traffic, pedestrians and transit), air quality and noise categories, predictive quantitative models were used extensively to determine the impacts. For cultural resources and economics a more qualitative approach was undertaken. With respect to cultural resources, the cumulative effects analysis focused on National or State Register listed or eligible and locally designated or eligible historic or archaeological resources within the Area of Potential Effect (APE) for each individual project and noted where effects may be cumulative. For the effects on local businesses, much of the analysis focused on commitments by project sponsors to maintain access during construction. Since much of these effects are site-specific (i.e., maintenance of specific sidewalk areas, curb-cuts, street closings, etc.) the necessary detail developed during the design phases was not available. As discussed in the individual environmental documents, the project sponsors are committed to developing a coordinated construction and traffic coordination plan which will ultimately mitigate potential adverse effects on access to local businesses and cultural sites during the construction period.

The cumulative effects analysis considers both the potential short-term (construction period) and long-term (operational period) beneficial and adverse impacts of the five Lower Manhattan Recovery Projects, as well as other projects that are anticipated to be undertaken in Lower Manhattan. However, it should be noted that the short-term or construction-related effects are generally adverse while the long-term effects are generally beneficial. The Lower Manhattan Recovery Projects have been planned with the specific purpose of supporting the economic recovery of Lower Manhattan while enhancing the environment of the area. This is particularly true with respect to the transportation projects that are expected to improve overall transportation service to the lower Manhattan area as compared to pre-September 11, 2001 conditions. However, to satisfy these objectives and needs, the area would experience an intense level of construction over the next several years. Therefore, in the cumulative effects analysis a greater focus has been given to the potential adverse effects during construction of these projects.

In addition, the long-term effects of the individual projects do not necessarily act in concert to the degree that the short-term effects do. For example, while undergoing construction, all of the proposed projects would lead to increases in traffic, air pollutant emissions and noise concurrently. These increases are additive and result in a higher level of impact than any project taken individually. However, the same is not necessarily true of the long-term effects since each project mostly affects different aspects of the Lower Manhattan environment. For example, the transit projects (with the exception of the No Action Alternative for the Permanent WTC PATH Terminal) would have a negligible effect on traffic and, therefore, air quality and noise levels on the major arterials (Route 9A, Church Street and Broadway) in Lower Manhattan. However, the different alternatives under study for Route 9A have a much more pronounced effect on conditions along the above-mentioned roadways. For street traffic and its related effects on noise

and air quality, the combined effect of Route 9A together with redevelopment of the WTC site would determine the long-term effects on these resources. This is not to say that the five major recovery projects do not have long-term cumulative effects that need to be considered. For example, each project affects pedestrian conditions that overlap in specific areas and need to be considered cumulatively.

With the above in mind, a coordinated effort was undertaken by the project sponsors of the Lower Manhattan Recovery Projects in an effort to provide consistency throughout the respective project's environmental reviews. While this coordination effort has resulted in very consistent findings between the documents, differences do occur. This is particularly true of the long-term effects where projects may have different future analysis years or use different criteria to evaluate their specific impacts. Some of these differences are discussed below. However, the construction impact assessment is nearly identical in each of the five documents with minor differences with respect to specific impact criteria (e.g., traffic and noise) used by the three different agencies (i.e., FTA, FHWA and HUD).

APPROACH TO CONSTRUCTION PERIOD EFFECTS

For the short-term impact assessment the analysis considered the cumulative effects of the five federally funded Lower Manhattan Recovery Projects described above. Other privately-funded initiatives were also considered but were not explicitly modeled as part of the impact assessment because these projects were either considered too small to influence the outcome or were part of the baseline (No Action) alternative on which the cumulative assessment was built.

DATA DEVELOPMENT AND BASELINE CONDITIONS

The following steps were performed to develop a consistent set of assumptions and baseline data to be used in each project's cumulative effects analysis:

Project sponsors provided information to allow development of a construction schedule for the five projects. A master schedule was developed showing major phases of construction for each project which was used in all the environmental documents.

- Once the schedules were developed, a critical analysis year was selected which was used in the modeling analyses to determine the greatest potential for construction-related impacts. For the Permanent WTC PATH Terminal DEIS, 2006 was determined as the critical analysis year and was used in the impact assessment to test the effectiveness of the EPCs and to determine whether additional mitigation was needed. As described in more detail below, the construction schedule for the Permanent WTC PATH Terminal, WTC Memorial and Redevelopment Plan, and Route 9A Project are delayed, and it is more likely that their construction would peak in 2007 or 2008, but construction of the South Ferry Terminal and Fulton Street Transit Center Projects is still expected to peak in 2006. Although the peak construction periods for the Lower Manhattan Recovery Projects would not overlap as predicted previously, this FEIS retains a critical analysis year that includes the peak construction activities for all five of the Lower Manhattan Recovery Projects.
- With the critical analysis year determined, the baseline conditions for the impact assessments were developed.
  - Access and Circulation – The project sponsors used the same set of baseline traffic, pedestrian and transit conditions to perform the impact assessment. Post-September 11, 2001 data collected by each project was assembled into one coherent set of data

representing conditions for the 2003 baseline. This included traffic volumes and speeds, pedestrian intersection and crosswalk data and usage for elements of nearby transit stations.

- Noise and Vibration – Project sponsors shared data on existing noise level measurements to develop a complete representation of existing conditions in Lower Manhattan.
- Air Quality – Project sponsors agreed upon background concentrations to be used in the impact assessment based on NYSDEC monitoring data.
- Cultural Resources – A list of resources (both historic structures and archaeological resources) were developed in concert and submitted to SHPO for concurrence. This resulted in one set of eligible resources in the study area. In addition, the federal project sponsors and the federal agencies prepared a coordinated Determination of Eligibility for the WTC site pursuant to Section 106 of the National Historic Preservation Act (NHPA).
- Economic Conditions – A comprehensive land use database was developed for existing conditions based on the NYC Real Property Assessment Database updated with field surveys. This data was then used in the MTA/NYCT's Regional Forecasting Model and shared with the project sponsors.

- Once the post- September 11, 2001 baseline conditions for 2003 were determined, the project sponsors developed the future (2006) conditions to be used in the construction impact assessment. This was accomplished by developing an agreed upon series of factors for traffic, pedestrians and transit usage based on known development projects and general background growth for the area.
- Once the 2006 critical analysis year was determined, the details of the construction activities for each project were developed. These details are necessary for completion of the traffic, air and noise impact assessment. Information for site-specific effects on local businesses was not generally available to the same level of detail. The information provided included the actual sub-phases of construction activity and what equipment would be required, for how long and where it would be generally operating. In addition, the total trucking activity for each sub-phase was determined and summed across all projects. The initial estimates were completed for the FGEIS for the WTC Memorial and Redevelopment Plan since it was published in April of 2004. Since that time, the information for the Route 9A Project has been updated by their design team. This information was shared among the project sponsors enabling the most current information on truck generation, equipment usage and placement to be used in each project's impact assessment.

IMPACT ASSESSMENT

Access and Circulation

Based on the information developed in the construction scenarios, an estimated 2,000 truck trips per day would be expected during peak conditions for the five projects. The project sponsors then developed an agreed upon set of truck routes, based on NYC truck routes, as well as the temporal distribution of the trips, for the traffic impact assessment. All traffic and pedestrian impacts were assessed based on methodologies from the Highway Capacity Manual. While some

projects employed different software versions for their analysis, the procedures were essentially the same.

For pedestrian access during construction, the project sponsors relied on the construction staging and the potential street/sidewalk closings to determine where pedestrian impacts may occur. In some cases, the issue may be related to a single project (Broadway and Fulton Street) rather than a cumulative effect (Church Street from Vesey to Liberty Streets). For the cumulative effects assessment, the analysis focused on specific corridors of movements that would be affected by more than one project. For example, the movement of pedestrians east-west from the subway stations on Church Street and Broadway to the WFC was of special concern since four projects would be working along this corridor.

One significant difference between the GEIS for the WTC Memorial and Redevelopment Plan and the four transportation projects is the criteria used in determining the severity of the traffic impacts. The four transportation projects use criteria that were originally developed for the Route 9A Reconstruction Project FEIS in 1994 and subsequently used in the EIS for the East Side Access Project and the Second Avenue Subway. The GEIS for the WTC Memorial and Redevelopment Plan uses criteria from the New York *City Environmental Quality Review (CEQR) Technical Manual.* These criteria were specifically tailored for development projects are more stringent than the criteria used on the transportation projects. The rationale for the difference in these criteria relates to a project's intended purpose and use. Transportation projects generally strive to improve or enhance the capacity of an existing system. However, development projects generate person-trips that will use a transportation system. Thus, the WTC Memorial and Redevelopment Plan applied the more stringent criteria since it would generate trips to Lower Manhattan, whereas the other recovery projects would enhance the area's transportation infrastructure. While the number of severely impacted intersections may differ between these two approaches, the need for a comprehensive construction and traffic management plan has been agreed to by the project sponsors.

Air Quality and Noise and Vibration

For the noise and air quality analysis, the project sponsors agreed upon the set of emission levels to be used for both the on-road and non-road equipment. As part of this analysis, the project sponsors reached agreement with respect to the effectiveness of the EPCs on reducing air pollutant emissions from certain pieces of construction equipment. Subsequent to the publication of the DEIS for the Permanent WTC PATH Terminal, PANYNJ and MTA/NYCT coordinated to further their commitments beyond the original EPCs in order to lower emissions of particulate matter, which was determined to be the critical pollutant.

Once emission levels were determined, each project sponsor performed the cumulative effects assessment in their respective area of potential effect. For example, due to its distance from the other projects, the analysis for South Ferry Terminal is not influenced much by other projects' construction in the critical analysis year. Therefore, in that document, the cumulative effects assessment for noise and air quality is almost entirely a result of the project itself. However, in the vicinity of the WTC site the cumulative effects of the projects are typically much greater than any individual project's effect. Though in some cases, a particular element of one project may highly influence the resultant cumulative effect.

The prediction methodologies for noise and air quality impact assessments were the same for the various projects. The same air quality emission (EPA's NONROAD, MOBILE6.2 and AP-42) and dispersion models (CAL3QHCR and ISC3) were employed for each project's cumulative

assessment. Similarly, for the noise impact assessment, roadway noise was predicted using the proportional method based on guidance from the *New York City Environmental Quality Review Technical Manual* for all projects. Each project also modeled the construction equipment using a simplified noise equation (from FTA's guidance manual) which sums each piece of equipment affecting sensitive receptors based on the agreed upon noise emission levels and hours of operation. Where the respective projects overlap the results are quite consistent.

The impact criteria for air quality were based on the NAAQS with the exception of $PM_{2.5}$ where the project sponsors employed New York City Department of Environmental Protection (NYCDEP) interim criteria.

For the noise analysis, the impact criteria are similar for the five projects but not exactly the same. The FSEIS for the Route 9A Project uses FHWA criteria for noise impacts while the transit projects use FTA's criteria. LMDC uses the FTA guidance with an additional assessment comparing noise increases to the criteria in the *New York CEQR Technical Manual.* The differences are relatively minor. FHWA uses a single definition of impact—maximum hourly noise levels (i.e., L_{eq}) should not exceed 85 dBA. FTA's criteria are more detailed and use three land use (only two apply in the area, residential and commercial) and two distinct time averaging periods (an eight-hour average and a 30-day average). For the eight-hour average, the criteria for residential and commercial land uses are 80 and 85 dBA, respectively. For the 30-day average, the criteria are 75 and 80 dBA. However, in urban areas with very high ambient noise levels, such as the project sites, the FTA guidance recommends using an increase in Ldn of 10 dBA over existing noise levels as the exceedance criterion. The net results for each project's cumulative assessment are, therefore, essentially the same with respect to the predicted noise levels and the need for mitigation.

Cultural Resources

For cultural resources the cumulative assessment considered effects on both historic structures and archaeological resources pursuant to Section 106 of the National Historic Preservation Act. For most historic structures in the vicinity of the project sites, the assessment focused on issues related to potential damage from construction-related ground-borne vibrations. For each project the area of potential effect from its construction activities was determined and shared among the sponsors. This enabled each sponsor to consider the effects of the other project's construction on buildings that may be affected by their own project. The sponsors have developed a map illustrating all of the potential ground-borne vibration effects from the projects, structures of concern, and the overlap between the various projects.

However, for the WTC site itself, this cumulative effects assessment considers both direct and indirect effects during and after the critical construction year. A coordinated assessment was undertaken by FTA, FHWA, LMDC, PANYNJ, and NYSDOT with regard to the eligibility of the WTC site. In a joint Determination of Eligibility issued in March 2004, FTA, FHWA, and LMDC determined the WTC site eligible for listing on the National Register of Historic Places. The environmental documents prepared for the Lower Manhattan Recovery Projects were consistent in noting the Site's eligibility although the determination of potential effects varies with each project. Each of the project sponsors has been and continues to coordinate with SHPO and the consulting parties, pursuant to the Section 106 Process regarding their respective potential effects to the site. LMDC and NYSDOT identified potential adverse effects with respect to the WTC site and have prepared and executed Programmatic Agreements that will guide the design and construction of their projects with respect to their potential impacts. FTA and PANYNJ have executed a Memorandum of Agreement to minimize and mitigate the

adverse effect from the construction and operation of the Preferred Alternative. The Fulton Street Transit Center and South Ferry Terminal Projects would not have an adverse impact on the WTC site.

The analysis of potential effects to historic resources considers the cumulative impacts and cumulative mitigation measures of the Lower Manhattan Recovery Projects on the historic resources within the Area of Potential Effect for the Permanent WTC PATH Terminal. The Preferred Alternative was determined to have an adverse effect.

For archaeological resources the cumulative effects analysis has been based on the data developed among project sponsors and agreed upon with SHPO. There are two areas of known or potential archaeological sensitivity within the Permanent WTC PATH Terminal's APE. The Hudson River Bulkhead (State and National Register-eligible) has been declared historic from Battery Place to 59th Street. Portions of the Bulkhead are visible, but it is buried in the vicinity of the WTC site. Therefore, it is considered an archaeological resource for purposes of these analyses (see Chapter 6, "Cultural Resources"). There is also potential for archaeological sensitivity on the eastern portion ("east bathtub") of the WTC site; which is also considered in this analysis.

Economic Conditions

Generally, the cumulative effects on local businesses in the environmental documents have been mostly qualitative. While the cumulative traffic impact assessment has been quantified, the specifics of the construction and traffic management plans have yet to be developed. Maintenance of access to businesses, whether for deliveries or customers, requires a level of detail that is not available without further engineering design. For example, the air quality and noise analysis has been conducted assuming that certain pieces of equipment are in located in a general area for several months. However, to develop the actual Maintenance and Protection of Traffic Plans (MPT), which would illustrate how access would be maintained to a specific building, requires much more specific details. Therefore, the cumulative assessment has been focusing on the general areas of concern (which streets, curbside lanes and block faces are affected) and the commitment to further develop measures to avoid or minimize adverse effects.

CUMULATIVE CONSTRUCTION ANALYSIS FRAMEWORK

As noted in Chapter 3, "Construction Methods and Materials," the construction schedule for the Permanent WTC PATH Terminal has been delayed and extended as compared to the analysis presented in the DEIS. Similarly, the schedules for the World Trade Center Memorial and Redevelopment Plan, and Route 9A have been delayed.

In April 2005, LMDC released the *World Trade Center Memorial and Redevelopment Plan Environmental Assessment for Proposed Refinements*, which reviews the analysis results from the *World Trade Center Memorial and Redevelopment Plan FGEIS* in light of recent changes to the WTC Master Plan, including its construction schedule. This document included a revised construction impacts assessment to determine if new impacts are predicted and concluded that their impacts would be similar to the analysis presented in the FGEIS.

The revised construction analysis showed that LMDC's construction schedule is delayed and that its construction is not likely to peak until 2007 or 2008. Given similar delays in the schedules for the Permanent WTC PATH Terminal and the Route 9A Project, the cumulative construction in Lower Manhattan is also not likely to peak until 2007 or 2008. However, because the construction of the South Ferry Terminal and the Fulton Street Transit Center would peak

early, the overall level of activity in 2007 is expected to be lower than was projected in the Permanent WTC PATH Terminal DEIS.

The cumulative effects analysis in the DEIS assumed construction of one or more of the Lower Manhattan Recovery Projects would begin in 2004 and that activities would peak in 2006. This analysis assumed a more fast-tracked approach for these projects. Therefore, the assumptions in the DEIS regarding construction scheduling and phasing represent higher peak daily traffic, noise, vibrations, and air pollutant emissions than would occur under the revised construction schedules. Furthermore, the mitigation measures developed with respect to these maximum predicted levels would be even more effective under the less aggressive construction schedules.

The construction period analysis presented below describes both the cumulative construction schedule developed for 2006, which considers the peak for all of the Lower Manhattan Recovery Projects. Following the detailed analysis is a qualitative description of anticipated changes with the refinement of construction schedules occurred following the Permanent WTC PATH Terminal DEIS.

Lower Manhattan Recovery Projects

The federal government is sponsoring five major Lower Manhattan Recovery Projects: Permanent WTC PATH Terminal; WTC Memorial and Redevelopment Plan; Fulton Street Transit Center; South Ferry Terminal; and Route 9A Project (see Figure 5-1). These projects are briefly described below along with the construction work that is expected to occur in the peak analysis year.

WTC Memorial and Redevelopment Plan (Figure 15-1, Reference No. 1)

Rebuilding of the WTC site would provide for the construction of a Memorial and memorial-related museum and cultural facilities, up to 10 million square feet of commercial office space, up to 1 million square feet of retail space, up to 1 million square feet of conference center and hotel facilities, new open space, and infrastructure improvements, including loading and parking facilities, advanced security systems, and new and reconstructed streets. For this cumulative effects analysis, it has been assumed that LMDC would pursue its "Proposed Action" alternative as presented in the *World Trade Center Memorial and Redevelopment Plan Final Generic Environmental Impact Statement.*

The rebuilding of the WTC would take place over approximately 11 years, from 2004 to 2015. For this analysis the following activities were assumed to occur in the peak construction year:

- Demolition of Hudson and Manhattan (H&M) Terminal and excavation of East Bathtub: This task involves the removal of existing structures between Church Street and the 1 and 9 line on the eastern portion of the WTC site to form new basement levels for the complex. Once the existing structures have been demolished and removed, a new slurry wall would be constructed and work would proceed on the basement levels of the future WTC towers. To maintain temporary WTC PATH service, the East Bathtub would be constructed in two zones: northeast and southeast. As excavation of these zones is completed and as additional access can be provided to the temporary WTC PATH station, the spoils beneath the station itself would be removed to complete the excavation of the East Bathtub.

  Subsequent to the publication of the DEIS, PANYNJ determined that portions of the east bathtub excavation, including demolition of the H&M Terminal, will be undertaken as part the Preferred Alternative for the Permanent WTC PATH Terminal (see Chapter 2, "Project Alternatives"). Excavation of some portions of the east bathtub could also be undertaken by

LMDC for the WTC Memorial and Redevelopment Plan, depending on the timing of this project and the Permanent WTC PATH Terminal. Although the scope of excavation to be undertaken by LMDC and/or PANYNJ is not certain at this time, the cumulative effect would not change. Therefore, the east bathtub excavation has been retained here as part of the cumulative construction analysis framework.

- WTC Concourse and Freedom Tower foundations: Work within the northwest quadrant of the WTC site, would include the construction of sub-grade concourses and retail as well as Freedom Tower (Tower 1) of the WTC complex. The construction of Freedom Tower is expected to follow typical skyscraper methods of construction. This would involve the construction of several floors of the tower at a given time. As the skeleton of the building moves upward, facades and interior work is conducted on lower floors. This process is repeated until top out is achieved, after which, finishing work proceeds throughout the building.
- Towers 2, 3, and 4 foundation and below grade retail: Upon completion of the East Bathtub foundations for Towers 2, 3, and 4 would be constructed. This would include preparation of spaces for below-grade retail and servicing areas, construction of concourses, and preparation of the bases for the eventual construction of the office towers.
- East Bathtub above grade retail: As the bases of the office towers within the East Bathtub are completed, work would begin on the above-grade retail levels.

Elsewhere on the site it is assumed that the expansion of the bathtub south of Liberty Street would have begun, and the sub-grade build out of that space would continue. The construction of the Memorial itself, and associated cultural and open spaces, would also commence.

Route 9A Project (Figure 15-1, Reference No. 2)

NYSDOT proposes to reconstruct Route 9A immediately to the west of the WTC site between Barclay and Albany Streets. NYSDOT is currently considering three alternatives for the reconstruction of Route 9A. A No Action Alternative would rehabilitate the existing roadway, which was reconstructed following September 11, 2001. An at-grade alternative would restore the roadway to its pre-September 11, 2001 condition with modifications to accommodate the future uses on the WTC site. The third alternative calls for approximately 75 percent of vehicular traffic to be re-routed through a short, sub-grade bypass and improve at-grade pedestrian connections between the WTC site and Battery Park City (BPC). The construction of this bypass includes the requirement to maintain access to the WTC site with four traffic lanes throughout the construction of the project. For this cumulative effects analysis, the short-bypass alternative was assumed.

For the purposes of this analysis, the Route 9A short bypass has been assumed since it would result in the highest level of construction activity along Route 9A, as compared to other alternatives, and the greatest potential for construction impacts. The project has been disaggregated into four construction stages as follows:

- Stage I; Construct temporary north and south roadways adjacent to the site of the proposed sub-grade bypass. This activity is expected to take around 6 months.
- Stage II; Construct the southbound lanes of the sub-grade bypass.

- Stage III; Construct the northbound lanes of the sub-grade bypass. Upon completion of the southbound lanes, traffic would be re-routed to create a clear zone for the construction of the northbound lanes.
- Stage IV; Surface and Tunnel Finishes. As the bypass is complete, permanent tunnel lining must be installed, and the local road surfaces reinstated at street level.

In the peak construction year for this impact assessment, Stage II would be under construction. The proposed bypass would be located in fill beneath the groundwater table. As such, the proposed structure is required to provide a contiguous hydrostatic barrier to prevent the ingress of water into the sub-grade roadway. For the purposes of assessment of environmental impacts, it is assumed that a slurry wall method of site retention would be employed. Slurry walls would be built first and then excavation and tunnel construction would proceed. The slurry wall would be excavated to bedrock to limit the drawdown of groundwater and to prevent the intrusion of Hudson River water into the excavation.

Construction of the slurry walls would be from within the Stage II Work Zone. Six traffic lanes would be maintained during the duration of this stage for the peak traffic periods. After the slurry wall is complete, the excavation for the southbound bypass tunnel would be performed. The entire width between slurry walls would be excavated to the proposed invert of the sub-grade for the tunnel. Additional excavation would occur in the location of the Preferred Alternative's Route 9A concourse. Excavated spoils would be removed from the site by dump truck following the proposed truck routes.

NYSDOT is also undertaking streetscape improvements for the portion of Route 9A south of Albany Street. This project, referred to as the Route 9A Promenade South, is being studied and designed independent of the proposed improvements in the vicinity of the WTC site. The construction of the Promenade South began in September 2004 with anticipated completion in early 2006. Since, the Promenade South would be finished before the peak construction year for the Preferred Alternative, it is not considered as part of the construction cumulative effects analysis presented below.

Fulton Street Transit Center (Figure 15-1, Reference No. 4)

This cumulative effects analysis of the Fulton Street Transit Center assumes that MTA/NYCT would pursue Alternative 10 as presented in the *Fulton Street Transit Center Final Environmental Impact Statement*. Similar to the above projects, the engineering is ongoing. However, for descriptive purpose, the project has been disaggregated into five components as follows:

- Element 1, Dey Street Passageway: This element would include the site preparation for and construction of the passageway beneath Dey Street from Broadway and Church Street linking the 4 and 5 line with the R and W line. The passageway would be constructed with cut and cover methods. Including utility relocation, passageway construction, and street reconstruction, this element has a 24-month duration.
- Element 2: Entry Facility: This element includes the demolition of existing structures on the east side of Broadway between Fulton and John Streets, site preparation, foundations, and above-grade construction of the new entry facility to the Fulton Street Transit Center. This element has a duration of 27 months.

- Element 3: A/C Mezzanine: This element includes the extension and widening of the A and C line mezzanine and includes slurry wall construction and utility relocation. The total duration of this element is 26 months.
- Element 4, Underpasses: This includes the construction of concourses beneath the R and W and 4 and 5 subway tracks to link the Dey Street Underpass with the WTC site and the new Entry Building east of Broadway. Both underpasses would require approximately 6 months for construction.
- Element 5, Other station improvements: This element includes rehabilitation of platforms and station elements on the 4 and 5, 2 and 3, and J, M and Z lines; new access to the 4 and 5, 2 and 3, and A and C lines; and a new below-grade connection between the Cortlandt Street (R and W) and WTC (E) stations. Portions of Element 5 would be undertaken throughout the duration of the Fulton Street Transit Center project.

In the peak construction year for this impact assessment, components of all elements may be under construction. The following describes the major activities included in this cumulative effects analysis.

- Tunneling For Underpasses. The current Transit Center conceptual design locates a concourse structure directly beneath the existing R and W line at Church Street and beneath the existing 4 and 5 line at Broadway. In addition, it is intended that the 4 and 5 line northbound platform be widened beneath the east side of Broadway. In order to maintain traffic on Broadway and Church Street, and to limit disruption to subway service, the tunneling operation would most likely require an incremental underpinning sequence of adjoining structures along the east side of Broadway between Fulton and John Streets, in conjunction with careful monitoring of vibration and subway track movement.
- Concourse Construction under Dey Street. The rock strata elevation below Dey Street lies beneath the proposed depth of excavation. Consequently, it is probable that the concourse would be constructed using "cut and cover" construction methods.
- Widening of A/C Line Mezzanine. The A/C line mezzanine would be widened and reconstructed using a "top-down" sequential cut and cover sequence similar to the concourse construction at Dey Street. While the amount of actual required volume of excavation is far less than that required for the Dey Street concourse, the A/C line mezzanine widening is complicated by the need to maintain operation of the A/C line platforms. In addition, the structure of the rail tunnel itself is extremely sensitive to reductions and increases of overburden stress applied to the modular tunnel rings.

Construction of this project would require staging areas that would be closed to pedestrian and vehicular traffic for the duration of the relevant construction activity. The following staging areas were assumed for this analysis:

- Fulton Street: One lane and the southern sidewalk would be reserved for truck parking and staging throughout the construction period for a distance of approximately 180 feet east of Broadway to the eastern extent of the FSTC site. The remainder of Fulton Street between Broadway and Nassau Street would be temporarily closed to vehicular traffic for the duration of the mezzanine widening. Lanes would be open for emergency traffic and deliveries, but through traffic would not be permitted.

- Dey Street: It is anticipated that full closure of Dey Street from Church Street to Broadway and sequential closure of entire segments of the north and south sidewalks would be necessary for the duration of construction. Pedestrian access would be restricted to a five-foot egress sidewalk on the north and south curbsides. Temporary track loading areas would be established on both ends of the street. A vehicle lane for emergency access and essential local deliveries would be maintained.
- John Street: Under the alternative considered for this cumulative impacts assessment, lane and sidewalk closures would not be required on John Street.
- Church Street: The eastern travel lane and sidewalk would be closed at the intersection with Dey Street and between Fulton and Dey Streets during the period of the Dey Street passageway construction. In addition, the western lane and sidewalk would need to be closed during construction of the R and W connection.
- Broadway: It is anticipated that one eastern lane and the eastern sidewalk would be closed from Fulton Street to John Street. It is expected that the sidewalk would be used for truck and equipment parking and that pedestrians would be re-routed onto the eastern traffic lane during this period. The construction of the 4 and 5 line underpass stairs at 195 Broadway would also require the closure of the entire western sidewalk of Broadway. The construction of the Dey Street underpass would also require the temporary closure of Dey Street at Broadway.
- Nassau, Dutch, and William Streets: Construction of certain elements of the FSTC would involve temporary closure of vehicle lanes and sidewalks along Nassau, Dutch, and William Streets.
- Intersection of Maiden Lane, Cortlandt Street, and Broadway: All four corners, sidewalks, and travel lanes would be subject to intermittent closure with construction of the 4 and 5 line mezzanine.

South Ferry Terminal (Figure 15-1, Reference No. 5)

The South Ferry Terminal would be constructed generally within the limits of Peter Minuit Plaza, Battery Park, and immediately north of Whitehall Ferry Terminal. Street preparation work for the South Ferry Terminal under Peter Minuit Plaza would occur first. Construction of the approach tunnels, including underpinning of the existing 1 and 9 loop track and the 4 and 5 subway tunnels in the eastern edge of Battery Park would occur next. Terminal construction would occur next and the bellmouth and fan plant construction would follow. Construction of the bellmouth would require reconstruction of about 275 feet of existing subway tunnel. The reconstruction would require demolition of portions of the subway roof and sidewalls. Finishing work would be ongoing during the project's final phase and would occur underground.

The cut and cover construction of the approach tunnels for the South Ferry Terminal would require the demolition and reconstruction of Battery Place near its intersection with Greenwich Street. MTA/NYCT, in cooperation with NYSDOT, would complete the portions of the Route 9A Promenade South between Route 9A and State Street as part of the South Ferry Terminal project. This work would occur following the construction of the bellmouth approach tunnels. MTA/NYCT and NYSDOT would also share staging areas in the vicinity of Battery Place to reduce the off-site impacts of their construction projects.

In the peak construction year for this assessment, the following elements were assumed to be under construction.

- Cut and cover tunneling operations;
- R and W Whitehall Station connection to South Ferry Station;
- Underpin of 1 and 9 line and 4 and 5 line for new station construction;
- Bellmouth construction; and
- Ventilation plant construction.

Other Lower Manhattan Projects

Lower Manhattan Street Reconstruction Program

The New York City Department of Design and Construction (NYCDDC) is undertaking an aggressive program to reconstruct the majority of local streets in Lower Manhattan. NYCDDC has prepared a preliminary phasing plan for this program, which covers the area south of Canal Street between the Hudson and East Rivers. The extent of street reconstruction varies depending on the type of roadway, its history of previous repairs, and the level of subsequent damage. In some cases streets would be repaved, but other streets would be fully reconstructed, including utility relocation, sidewalk reconstruction, and new pavement. Based on NYCDDC's preliminary program, the following streets may be reconstructed concurrent with the peak activity for the Preferred Alternative:

- Canal Street from Hudson Street to Bowery Street;
- Worth Street from Hudson Street to Park Row;
- Greenwich Street from Chambers Street to Barclay Street;
- West Broadway from Vesey Street to Chambers Street;
- Church Street and Trinity Place from Chambers Street to Morris Street;
- Barclay Street from Route 9A to West Broadway;
- Vesey Street from Route 9A to Broadway;
- Liberty Street from Route 9A to Broadway;
- Cedar Street from Route 9A to Washington Street;
- Washington Street from Liberty Street to Cedar Street;
- Washington Street from Vesey Street to Barclay Street;
- Fulton Street from Church Street to South Street Viaduct;
- Frankfort and Dover Streets from Park Row to South Street Viaduct;
- Dey Street from Church Street to Broadway, and;
- South Street Viaduct from Whitehall Street to Brooklyn Bridge.

It is assumed that the street reconstruction program would be fully coordinated with the Lower Manhattan Recovery Projects such that the rehabilitation of streets in the vicinity of the WTC site would be postponed until the major construction efforts at the site were fully or nearly completed. This coordination would avert damage from WTC and PATH construction to already reconstructed roadways. However, given the aggressive timeline for this program, it is anticipated that some street reconstructions would be underway during the construction period of the Preferred Alternative, but these activities are expected to be on a scale and at a pace similar to what was underway at the time of the existing conditions surveys for this project. Since the street reconstruction program is not anticipated to occur in the immediate vicinity of the WTC site during the construction period for the Preferred Alternative, but would occur at other locations in Lower Manhattan, it has been considered as part of the background conditions for this cumulative effects analysis.

Private Development Projects

Based on the analysis presented in Chapter 4, "Land Use, Neighborhood Character, and Public Policy," four projects may have construction activities that overlap with construction of the Preferred Alternative. These projects are as follows:

- Washington Street Urban Renewal Area (WSURA) Site 5B, a 438-unit residential building with 229,595 square-feet (sf) of retail;
- BPC Site 23, an approximately 280,000-sf residential building with ground floor retail;
- BPC Site 24, an approximately 260,000-sf residential building with ground floor retail; and
- BPC Site 26, an approximately 2.3 million sf office building with ground floor retail.

To estimate the potential cumulative impacts of these private developments, assumptions were made regarding the type, length, and stages of construction that would be required. In New York City, new commercial and residential construction typically requires 18 to 24 months from site preparation to final fit-out. To conservatively estimate peak conditions, it was assumed that the private developments shown in Figure 15-1 would have an 18-month construction period.

It is assumed that the construction of these private developments would follow typical methods and procedures for new buildings in Lower Manhattan. The *New York Stock Exchange New Facility Final Environmental Impact Statement* (December 13, 2000), described proposed activities for its construction. These general assumptions were used for the private developments identified above.

The New York Stock Exchange FEIS identified four major phases of construction: demolition, foundations, tower core and shell construction, and interior construction. The estimated truck activity for each of theses phases is presented in Table 15-1.

Table 15-1
Typical Construction Period Truck Trip Generation for Private Developments

Phase	Peak Average Daily Truck Trips (One-Way)
Demolition	30
Foundations	30
Tower core and shell construction	10 to 15
Interior construction	25 to 35

Source: *New York Stock Exchange New Facility Final Environmental Impact Statement* (December 13, 2000)

The New York Stock Exchange expansion would have been a 600,000 square foot building, which is considerably larger than is proposed for BPC Site 23 and 24 and is comparable to WSURA Site 5B. Thus, these projects would generate a similar or lesser number of trucks than is presented in Table 15-1. BPC Site 26 would be four times the size of the proposed Stock Exchange and would, therefore, generates a larger number of trips than presented in Table 15-1.

BPC Sites 23, 24, 26, and WSURA Site 5B would not require building demolition. Thus their construction would begin with the foundations phase. Based on a typical construction schedule for a high-rise building and on currently planned completion dates, it is assumed that BPC Sites 23 and 24 and WSURA Site 5B would be either nearing the end of the tower core and shell phases or in the interior phase concurrent with peak construction activity for the Preferred Alternative. Thus, only BPC Site 26 would potentially be in foundation construction.

Construction Vehicles and Truck Routes

The assessment of post-September 11, 2001 traffic conditions, which is the basis for the construction period traffic networks, was developed using counts conducted in Spring and Fall of 2003. At the time of these counts, there were several ongoing construction projects in Lower Manhattan, including the temporary WTC PATH station, Battery Park City sites, 10 Liberty Street, and 2 Gold Street. Thus, the construction period traffic associated with these projects was included in the counts and the resultant baseline traffic networks. All of the projects under construction in 2003 would be completed by the critical analysis year, meaning that they would no longer generate construction vehicles; however, these vehicles were not removed from the future baseline traffic network. Since it is expected that the private development projects described above would generate an equivalent or lesser volume of construction vehicle trips in the critical analysis year as those projects included in the base counts, the trips associated with the private developments described above are considered as part of the future baseline traffic network.

Table 15-2 presents the total peak daily construction related truck trips that would be generated by each of the Lower Manhattan Recovery Projects in the critical analysis year. The sponsors of the federally-funded, Lower Manhattan Recovery Projects have coordinated to establish routes for individual site access during construction. As shown in Figure 15-2, trucks would enter and exit Lower Manhattan from six principal gateways: Holland Tunnel, Manhattan Bridge, Route 9A, Brooklyn-Battery Tunnel, Bowery, and Broadway/Avenue of the Americas. Within Lower Manhattan, these trucks would use Route 9A, Church Street, Broadway, Water Street, and South Street.

Table 15-2
Total Peak Daily Truck Trips Generated By Lower Manhattan Recovery Projects—Critical Analysis Year

Project	Heavy Truck Trips	Light Truck Trips	Total Truck Trips
WTC Memorial and Redevelopment Plan	694	310	1004
Permanent WTC PATH Terminal	172	64	236
Route 9A Project	320	48	368
Fulton Street Transit Center	262	70	332
South Ferry Terminal	150	98	248
Total	1,598	590	2,188

On-Site Equipment

For three of the Lower Manhattan Recovery Projects–WTC Memorial and Redevelopment Plan, Route 9A Project, and Fulton Street Transit Center—that would be constructed concurrent with and in the vicinity of the Project Site, an estimate of on-site equipment was made to support the cumulative analyses. Because construction of the South Ferry Terminal would occur approximately ½ mile south of the Project Site, no overlapping effects with South Ferry Terminal's on-site sources are expected. Thus, South Ferry's on-site equipment was not included in the cumulative effects analyses for air quality, noise and vibration, and cultural resources.

Appendix D presents the on-site equipment that would be generated by the Lower Manhattan Recovery Projects identified above for the peak construction year. The table lists the work zones and the types, numbers, and durations of use for each piece of equipment. Although the duration

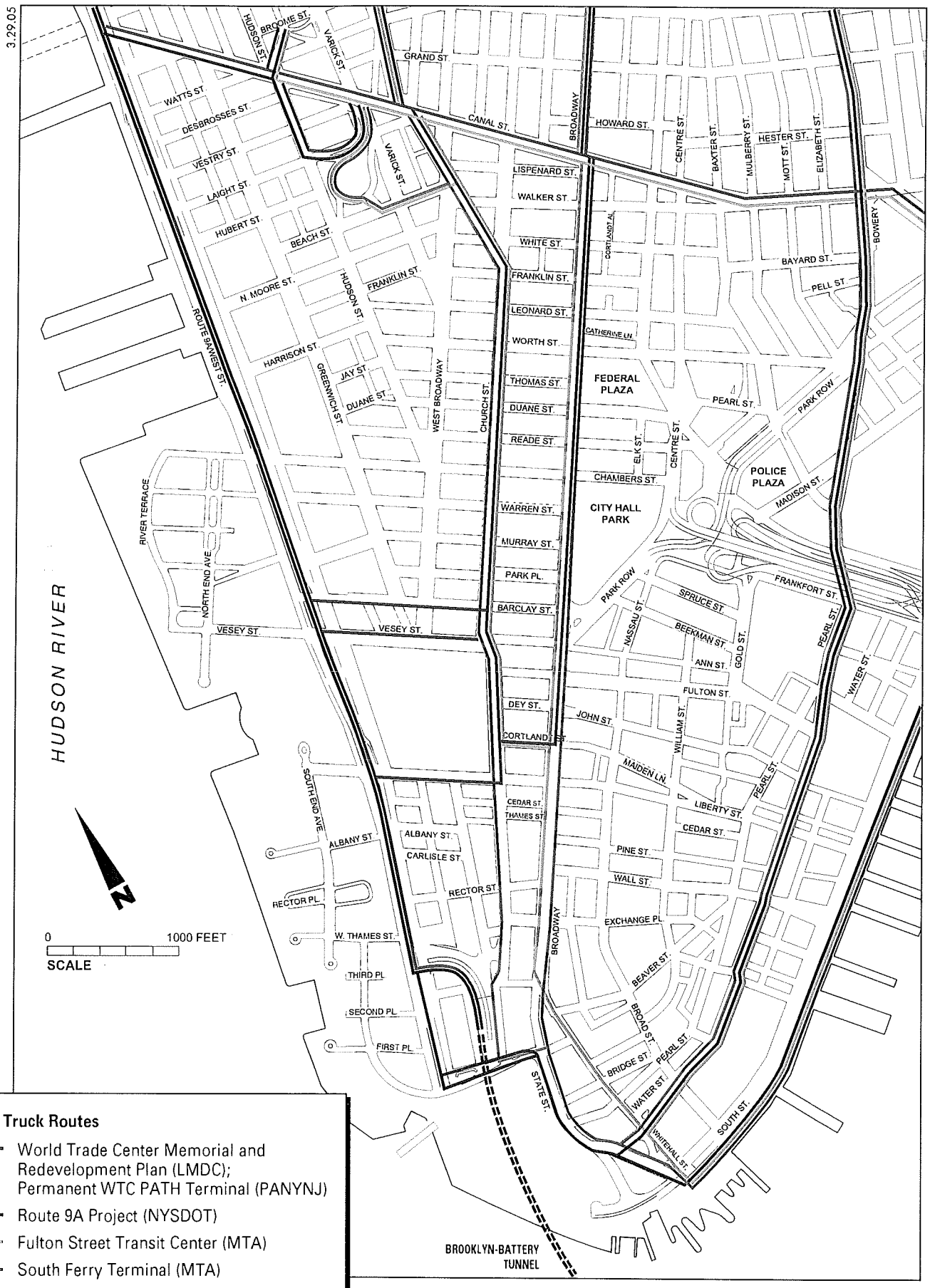


Figure 15-2

Truck Access Routes for the Lower Manhattan Recovery Projects

period (in months) is provided for summary purposes, many pieces of equipment may operate during only portions of the period. For additional details on the use of the equipment at each site, refer to Appendix D. The equipment that would be used for construction of the Preferred Alternative is presented in Chapter 3, "Construction Methods and Materials."

MITIGATION

Environmental Performance Commitments (EPCs)

The PANYNJ, LMDC, NYSDOT, and MTA/NYCT have developed a unified environmental analysis framework for the Lower Manhattan Transportation Recovery Projects, which is summarized in Chapter 2, "Project Alternatives." As part of this effort, these agencies developed EPCs that would be implemented during the construction of individual projects to avoid or minimize adverse effects to the environment. The EPCs and plans for their implementation are shown in Chapters 5, 6, 8, 9, and 10 of this FEIS for each of the five resource areas.

The EPCs that have been specified for the construction of the Preferred Alternative have been accounted for in the analysis of construction period impacts described in Chapters 4 through 14 of this EIS, where appropriate. These chapters also present mitigation measures to specifically address the potential construction-period impacts of the Preferred Alternative. However, in most cases and in particular with reference to the five resource areas identified above, the cumulative effect would result in more or greater impacts than would the Preferred Alternative alone. Thus, measures presented below to avert or minimize the adverse effects of the five Lower Manhattan Recovery Projects would also mitigate the project-specific impacts of the Preferred Alternative.

Similarly, the measures that have been committed to by the other agencies for their individual projects have been incorporated into the cumulative assessment of construction period impacts that follows below.

As part of the analysis, the project sponsors have and continue to consider the efficacy of the EPCs and additional mitigation. Leading up to the publication of this FEIS, extensive coordination and data sharing occurred among the agencies to develop a consistent set of specifications for the EPCs, as well as assumptions regarding their efficacy in reducing the adverse effects of construction. Most discussions centered on air pollution emission reduction measures, but also included traffic and noise reduction measures since the analysis shows a need to consider additional mitigation. Since the agencies were committing to measures beyond typical mitigation employed in the industry, it was necessary to make certain conservative assumptions about their effectiveness and availability. The details of these considerations are discussed in the technical analyses below. However, the result is that while the FEIS makes certain conservative assumptions, the project sponsors continue to meet to determine what can be realistically done to lower the predicted values.

Mitigation Measures under Consideration

Following the publication of the Draft EIS for the Permanent WTC PATH Terminal, the Lower Manhattan project sponsors continued to meet to further define the EPCs and their implementation. Areas of interest included:

- The development of a traffic management plan based on the current truck estimates;
- Development of a construction coordination plan focusing on individual stages of each project's plan;

- Application of diesel particulate filters (DPFs) to specific construction equipment with consideration for effectiveness and feasibility;
- Possible electrification of certain (e.g., welders, compressors, etc.) construction equipment to lessen the severity of potential adverse effects on concentrations of particulate matter and nitrogen dioxide; and
- Determining the critical equipment and activities that result in cumulative adverse noise effects at specific sensitive receptors. Based on the analysis to date, the project sponsors have now focused their concerns on specific locations.

This process has resulted in additional air quality and noise commitments as part of the Permanent WTC PATH Terminal, Fulton Street Transit Center, and South Ferry Terminal projects. The specific mitigation measures to be implemented are described in Section C, "Probable Construction Period Effects."

Also subsequent to the publication of the DEIS for the Permanent WTC PATH Terminal, FTA and PANYNJ executed a Memorandum of Agreement (MOA) pursuant to Section 106 of the National Historic Preservation Act. At the request of the Section 106 consulting parties, the MOA includes stipulations to coordinate potential cumulative effects to historic resources during and after construction. LMDC, NYSDOT, and MTA/NYCT were involved in developing these stipulations and have agreed to the process set forth in the executed MOA. Section C, "Probable Construction Period Effects," provides further information regarding the coordination commitments of the MOA.

Ongoing Coordination

The project sponsors have developed a framework for construction coordination, which includes establishing several working groups to address issues that have been identified in the individual environmental documents for the Lower Manhattan Recovery Projects and to implement the EPCs. While representatives of each of the sponsoring agencies are seated on each committee, one sponsor has been charged with coordinating the efforts of the individual working group. The following describes the construction working groups that have been formed and the principal goals and issues to be coordinated by the individual groups.

- Schedule Working Group: The schedule working group will coordinate construction schedules for the recovery projects. This group will develop and maintain and track a master construction schedule and will develop a geographic information system for Lower Manhattan to track construction activities.
- Logistics Working Group: The logistics working group will coordinate with the schedule working group to overlay construction activities, review phasing and staging plans, and to develop a master logistics plan for the recovery efforts. This group will seek opportunities to share construction facilities such as trailers, parking, and transport of workers and will coordinate the location and/or implementation of these shared facilities.
- Traffic Working Group: The traffic working group will develop the coordinated Traffic Management Plan for the Lower Manhattan Recovery Projects. This plan will compile the individual Maintenance and Protection of Traffic Plans for individual projects and will employ technologies to determine the best routes for delivery of goods and equipment and the removal of debris. This group will implement an Intelligent Transportation System (ITS)

system to communicate real time traffic information during the construction process and will coordinate the permitting of construction-related traffic issues (e.g., lane closures).

- Standards Working Group: The standards working group will coordinate the implementation of the EPCs through a consistent approach to construction contracts and specifications. The project sponsors have engaged the construction industry to determine the current and projected feasibility of the EPCs, and these efforts will be continued through the standards working group. The group will research available technologies and strive to implement appropriate advances to the extent possible during the construction process. Furthermore, this group will coordinate specifications for construction materials; will establish protocols for work hours, verification procedures, construction safety, cleanliness, signage, and public outreach; will develop requirements for construction contracts; and will centralize contract documents for the Lower Manhattan recovery efforts.

On November 22, 2004, New York State Governor George E. Pataki signed an Executive Order creating the Lower Manhattan Construction Command Center. The Command Center will administer the construction of project's within Lower Manhattan that either 1) have a construction value of more than $25 million; 2) require governmental actions or permits or; 3) require work within in a City or State street or highway. Of the projects noted above, the Command Center is expected to have oversight of the five Lower Manhattan Recovery Projects, the Route 9A Promenade South, Lower Manhattan Street Reconstruction, and the large private construction projects, including BPC Sties 24, 25, and 26, and the WSURA project.

The Command Center will coordinate community information, construction logistics, utility coordination, environmental compliance and safety, and diversity and equal opportunities in employment. The Command Center will be managed by an Executive Director to be appointed by the Governor and the Mayor of the City of New York. The Mayor will also appoint a Director of City Operations to act as a liaison between the Command Center and City officials. An Executive Committee, to be chaired by the Executive Director, will be appointed to facilitate communications between the Command Center, the Lower Manhattan Project Sponsors, and other key city and state departments and agencies.

As stated in the Executive Order, the functions of the Command Center will be:

- "Coordinating the work of the participants in the rebuilding process and ensuring that the construction in Lower Manhattan proceeds as scheduled by mediating conflicts in schedules and street and site access between construction projects, agencies, and the Lower Manhattan Community;"
- "Coordinating protocols, contract requirements and activities outside of individual project limits through planning on a daily basis throughout construction for government agencies, developers, construction managers, general contractors, and contractors;"
- "Coordinating construction projects to minimize inconvenience for residents, workers, pedestrians, vehicles, and commuters;"
- "Ensuring that the Lower Manhattan area remains neat, clean and orderly throughout construction;"
- "Communicating with residents, businesses, and the general public through a communications director working with each agency's communications and public outreach

personnel; providing a central focus on issues critical to the local community and the construction industry, by coordinating initiatives, public outreach, and information;" and

- "Utilizing technology to facilitate coordination of projects."

Governor Pataki appointed an Executive Director for the Command Center in February 2005, and the Command Center is working to formalize staff and structure. In the meantime, the Lower Manhattan project sponsors continue to coordinate through the vehicle of the Lower Manhattan Construction Coordination Group per their commitments within the Environmental Analysis Framework.

At this time, it is uncertain whether the role of the Lower Manhattan Construction Coordination Group will be assumed within the umbrella of the Command Center or if both will continue in tandem throughout the construction phase. However, one or both of these groups will ensure the coordination of construction issues between the Lower Manhattan project sponsors as their individual projects move forward.

APPROACH TO OPENING YEAR (2009) AND DESIGN YEAR (2025) EFFECTS

There are more differences among the projects with respect to the long-term assessments than what occurs with the short-term effects. In some ways, this is a result of the different types of projects and the need to focus on what each project may affect in the future and what is typically done in the environmental review process for that type of project. Some of the similarities and differences are discussed below.

While all five projects share a similar vision for the future development of Lower Manhattan and are based on the same future population, employment and land use projections, there are differences in how they are applied. The two MTA/NYCT projects use their own regional forecasting system to develop future (2025) transit ridership but the model does not include vehicular traffic forecasting. The supplemental DEIS (SDEIS) for Route 9A is more focused on roadway traffic and uses a model developed specifically for Manhattan's west side. It was developed for the 1994 *Route 9A Reconstruction FEIS*, focusing on travel patterns along Route 9A, and has been updated with the latest New York Metropolitan Transportation Council (NYMTC) forecasts. The GEIS for the WTC Memorial and Redevelopment Plan uses a methodology that is consistent with practices related to development projects in New York City. This methodology bases future traffic forecasts by adding known development projects to the baseline 2003 conditions. It does not consider modal or temporal shifts, or capacity constraints like the regional models used in the other projects. The different approaches result in differing future projections when comparing predicted traffic volumes at specific locations. However, in most cases these differences are not necessarily apparent since each project may or may not analyze the same set of circumstances as described below.

- The three transit projects would have a negligible effect on street traffic once completed and thus detailed traffic analysis for 2025 has not been conducted. The GEIS for the WTC Memorial and Redevelopment Plan analyzes traffic (and air quality) in 2009 and 2015 while the Route 9A Project provides estimates for 2007 and 2025, its opening and design year, respectively. The differences in predicted traffic volumes along Route 9A can be substantial. In addition, some street directions are different in the two EISs but the difference is more related to the timing of the analysis (and what was known at the time) rather than to any methodological difference.
- While the projections for vehicular traffic volumes in the EISs for Route 9A Project and the WTC Memorial and Redevelopment Plan differ, neither project predicts exceedances of the air quality standards as a result of cumulative effects. Furthermore, differences in predicted

noise levels are minor since it takes a doubling of traffic (which is much higher than the projected differences) to result in perceptible changes.

- Future transit ridership and pedestrian volumes in 2025 are the same in the projects since they were developed in concert by the sponsors of the transit projects (i.e., MTA/NYCT and PANYNJ). These volumes were then used in the GEIS for the WTC Memorial and Redevelopment Plan. The SDEIS for the Route 9A Project does not include a quantitative assessment of transit ridership, since this project would not directly alter existing transit service or induce new ridership. Because there would be changes in the pedestrian facilities along Route 9A, the SDEIS assesses pedestrians crossing Route 9A.

With the above in mind it should be noted that future traffic volumes along the major arterials in lower Manhattan (Route 9A, Church Street and Broadway) and their related effects on air quality and noise are more dependent upon the selection of an alternative for Route 9A than whether the FSTC or South Ferry Terminal are completed. This is also true for the Permanent WTC PATH Terminal, except under its No Action Alternative, which would have a measurable increase in traffic volumes on these roadways. Therefore, long-term future conditions of traffic, air quality, and noise are mostly a function of the commercial development of the WTC site and the selection of an alternative for the Route 9A Project.

Variations also exist for the Lower Manhattan Recovery Projects in terms of the underlying methodologies for long-term air quality and noise impacts since different agencies apply different evaluation criteria. However, these differences are inconsequential with respect to the Permanent WTC PATH Terminal FEIS since the Preferred Alternative's long-term effects on air quality are beneficial and since potential issues with respect to noise and vibration are related more to coordination with the design of the WTC Memorial and not to long-term impacts on existing and future residents and workers in Lower Manhattan.

As noted above, variations also exist in the evaluation of effects to the National and State Register-eligible WTC site. The Permanent WTC PATH Terminal DEIS identified a significant adverse impact on the site, and FTA and PANYNJ have an MOA executed to address these impacts. The Route 9A SDEIS and the World Trade Center Memorial and Redevelopment Plan FGEIS identify potential adverse effects; thus, these projects have executed Programmatic Agreements that will address effects if they are later determined to be adverse. Although the approach to identify these effects varies amongst the projects, the sponsors have agreed to stipulations, contained within the Permanent WTC PATH Terminal's executed MOA, to address cumulative effects on the WTC site. This commitment is described in more detail in Section C, "Probable Construction Period Effects."

C. PROBABLE CONSTRUCTION PERIOD EFFECTS

As described in this EIS, the No Action Alternative for a Permanent WTC PATH Terminal would not result in adverse impacts during the construction period. Thus, any cumulative adverse impacts in Lower Manhattan during this time would be attributed to other construction projects in the area. Thus, a construction period assessment for the No Action Alternative has not been addressed as part of this cumulative effects analysis.

ACCESS AND CIRCULATION

VEHICULAR TRAFFIC

Probable Impacts

The *WTC Memorial and Redevelopment Plan GEIS* contains a comprehensive examination of expected traffic conditions in the 2006 peak construction year for the combination of several major projects, including its own project's construction and that of the Fulton Street Transit Center, South Ferry Terminal, Route 9A Project, and the Permanent WTC PATH Terminal. All projects were closely coordinated with respect to construction year traffic projections and conditions. The information that follows was derived from that coordinated effort.

As described above, different traffic impact criteria were applied for the WTC Memorial and Redevelopment Plan and the Lower Manhattan Transportation Recovery Projects. The WTC Memorial and Redevelopment Plan used the *CEQR Technical Manual* guidance, which are more stringent and are typically applied to development projects that directly induce new vehicular traffic. These criteria are as follows:

- For a Level of Service (LOS) A, B, C condition, a project-generated increase in delay that results in mid-LOS D (45.0 seconds of delay) or worse is considered adverse.
- For a baseline LOS D condition, a project-generated increase of 5 seconds or more resulting in delays in excess of 45.0 seconds is considered adverse.
- For a baseline LOS E condition, a project-generated increase of 4 seconds or more of delay is considered adverse.
- For a baseline LOS F condition, a project-generated increase of 3 seconds or more of delay is considered adverse unless the baseline has more than 120.0 seconds of delay when a 1-second increase would be adverse.

To provide for consistency in this cumulative assessment, the CEQR impact criteria were used. It is expected that if the criteria described in Chapter 8, Section B, "Vehicular Traffic and Parking," had been used for this cumulative assessment, there would be fewer impact locations.

The analysis of cumulative traffic effects was conducted at a set of 24 intersections, 21 of which are signalized and three which are unsignalized. Overall, future conditions with construction of the above projects would create adverse traffic impacts at the following six intersections:

- Route 9A and Vesey Street (AM peak hour)
- Church Street and Chambers Street (AM and PM peak hours)
- Church Street and Barclay Street (AM peak hour)
- Church Street and Cortlandt Street (midday peak hour)
- Broadway and Canal Street (PM peak hour)
- Broadway and Worth Street (AM, midday, and PM peak hours)

Figure 15-3 shows the cumulative construction period truck trip generation for selected intersections in the vicinity of the Project Site. Table 15-3 shows delays and LOS for the vehicle movements that would be adversely impacted by cumulative construction based on analysis conducted for the *World Trade Center Memorial and Redevelopment Plan DGEIS.* Appendix C shows the delays and LOS results for all of the analysis locations.

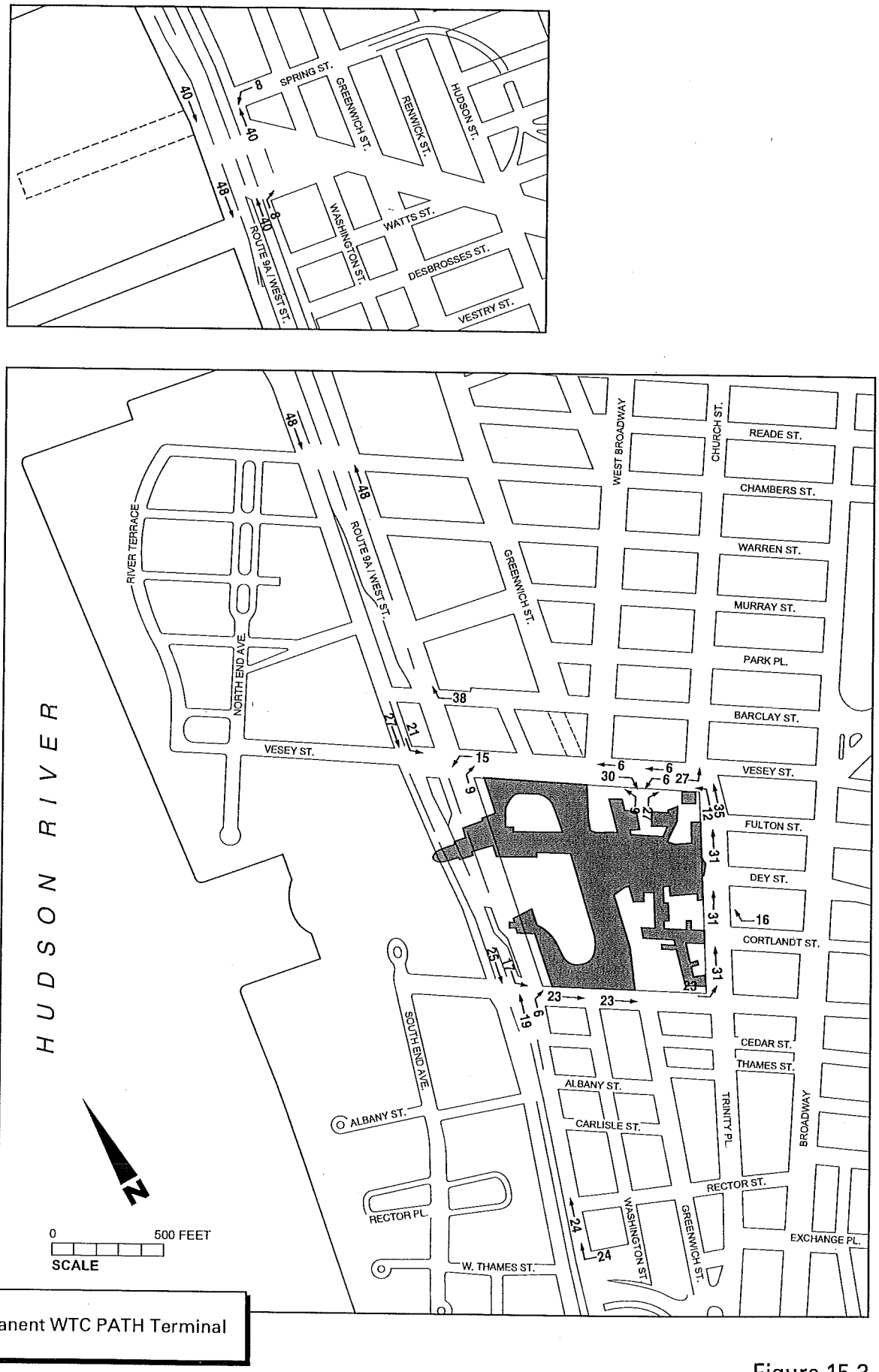


Figure 15-3

Cumulative Peak Hourly Construction Period Truck Trips

Table 15-3
2006 Construction Period: Summary of Peak Hour Adverse Impacts

Intersection	Peak Hour	Movement	Baseline LOS (Delay in seconds)	Cumulative Increase in Delay (seconds)
Route 9A and Vesey Street	AM	Northbound Thru and Right-Turn	F (150.3)	1.0
Church St and Chambers Street	AM	Northbound Approach	F (169.6)	1.8
Church St and Chambers Street	PM	Northbound Approach	F (162.7)	1.4
Church St and Barclay Street	AM	Northbound Approach	D (47.5)	12.5
Church St and Cortlandt Street	MD	Westbound Approach	F (85.5)	3.6
Broadway and Canal Street	PM	Westbound de facto Left-Turn	F (96.1)	4.3
Broadway and Worth Street	AM	Southbound Approach	F (290.2)	2.6
Broadway and Worth Street	MD	Southbound Approach	F (245.1)	5.6
Broadway and Worth Street	PM	Southbound Approach	F (295.3)	2.6

Note: The baseline LOS reflects conditions from which impacts are evaluated. Refer to Appendix C for detailed information on the baseline and cumulative Levels of Service (LOS).

Mitigation

The mitigation of cumulative traffic effects of the various Lower Manhattan construction activities would also be a coordinated effort under the auspices of both NYSDOT and NYCDOT, since both agencies have jurisdiction over the affected roadways—NYSDOT with regard to Route 9A and NYCDOT with regard to all other streets in the area.

- At Route 9A and Vesey Street, the cumulative effects of all construction vehicles (82 in the peak traffic hours) would create an adverse traffic impact along northbound Route 9A by creating a future condition with an incremental delay of one second. The Preferred Alternative's construction would contribute an estimated 12 vehicles out of the 82 and would, therefore, not be the major contributor to the impact.
- At Church Street and Chambers Street, PATH construction would generate just one vehicle through the impacted northbound approach out of the total of 24 construction vehicles expected to pass through the intersection along northbound Church Street in the AM and PM peak hours, with an increase in intersection delay of 1 to 2 seconds.
- At Church Street and Barclay Street, PATH construction vehicles would generate 8 of the 62 construction vehicles expected, with the northbound Church Street approach to the intersection deteriorating from level of service (LOS) D to LOS E.
- At Church Street and Cortlandt Street, PATH would generate 5 of the 57 construction vehicles expected along westbound Cortlandt Street in the midday peak hour, with the westbound Cortlandt Street approach expected to deteriorate by 3.6 seconds within LOS F.
- At Broadway and Canal Street, PATH would generate 2 of the 35 construction vehicles that would create an adverse impact in the PM peak hour along westbound Canal Street.
- At Broadway and Worth Street, adverse impacts are expected in the AM, midday, and PM peak hours along southbound Broadway with 27 construction vehicles generated overall.

As noted above, the cumulative construction of the Lower Manhattan Recovery Projects would require mitigation measures. These measures would be incorporated in a coordinated Maintenance and Protection of Traffic (MPT) Plan. As described in the Route 9A Project SDEIS, NYSDOT would prepare this plan on behalf of the Lower Manhattan project sponsors through either the Command Center or the Lower Manhattan Construction Coordination Group, as appropriate. The MPT Plan would include input from PANYNJ, MTA/NYCT, LMDC, and NYCDOT and would specify measures to stage construction areas (e.g., lane and sidewalk closures) while providing measures for the circulation of traffic through Lower Manhattan (e.g., traffic diversions, parking restrictions, and signal timing adjustments).

Conditions with the Revised Schedules

The refinements to the Lower Manhattan Recovery Projects' schedules would slightly alter the findings presented above. The cumulative peak hour truck trips would be approximately 9 percent lower in the peak construction year under the refined schedules as compared to the analysis presented above. As a result, the projected traffic impact at Canal Street and Broadway would not occur. However, increases in background traffic growth, combined with cumulative construction vehicle trips would result in an impact at the intersection of Canal and Hudson Streets in the AM peak hour. This impact could be mitigated with signal timing adjustments, which would be incorporated into the coordinated Maintenance and Protection of Traffic (MPT) Plan for the Recovery Projects.

PEDESTRIAN CIRCULATION

Probable Impacts

During construction of the Preferred Alternative, there would be additional construction associated with planned development in Lower Manhattan. A cumulative analysis of construction-period pedestrian level of service was conducted and the results are shown in Table 15-4.

In most cases, crosswalks would operate at LOS D or better during the critical construction year, and there would be no change in LOS as compared to baseline conditions. However, there would be deterioration to LOS E conditions at the intersections of Church Street and Dey Street and at Church Street and Cortlandt Street in the AM and PM peak hours.

Mitigation

Although no additional locations would deteriorate to LOS F due to Cumulative Construction Period effects, conditions at some locations would deteriorate to LOS E as compared to the baseline. As described above, a MPT Plan will be prepared for the Lower Manhattan Recovery Projects. This plan will include measures to ensure that safe and efficient pedestrian access and circulation is maintained throughout the construction period. Measures that may be incorporated could include signal timing adjustments; protected pedestrian walkways, and crossing guards. It is anticipated that the MPT Plan would be administered by the Command Center or the Lower Manhattan Construction Coordination Group in coordination with NYSDOT, NYCDOT, PANYNJ, LMDC, and MTA/NYCT.

Table 15-4
Comparison of Cumulative Construction Period Level-of-Service

Intersection	Crosswalk	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		2006 Baseline	2006 Cumulative	2006 Baseline	2006 Cumulative	2006 Baseline	2006 Cumulative
Route 9A and Vesey St	North	Out of service; pedestrians are and will be diverted to the Vesey Street pedestrian bridge and adjoining Vesey Street walkway.					
	East						
	South						
Route 9A and Liberty St	North	Out of service; pedestrians are and will be diverted to the Liberty Street pedestrian bridge and adjoining Liberty Street walkway.					
	East						
	South						
West Broadway and Vesey St	North	Out of service; pedestrians are and will be diverted to the Vesey Street pedestrian bridge and adjoining Vesey Street walkway.					
	East						
	West						
Greenwich St and Liberty St	East	Out of service; pedestrians are and will be diverted to the Liberty Street pedestrian bridge and adjoining Liberty Street walkway.					
	South						
	West						
Church St and Vesey St	North	B	B	B	B	B	B
	East	C	C	C	C	C	C
	South	C	C	B	B	D	D
	West	F	F	D	D	F	F
Church St and Fulton St	North	B	B	B	B	B	B
	East	D	D	D	D	E	E
	South	D	E	D	D	C	D
Church St at Dey St	North	B	B	A	A	B	B
	East	C	E	D	D	D	D
	South	D	D	C	C	D	D
Church St at Cortlandt St	North	B	C	B	B	B	C
	East	B	E	C	D	C	E
	South	B	E	C	D	B	E
Church St at Liberty St	North	E	E	C	C	E	E
	East	C	C	B	B	D	D
	South	C	C	B	B	B	B
	West	F	F	C	C	E	E

AIR QUALITY

The analysis of the potential cumulative air quality impacts of construction of the Preferred Alternative and the other Lower Manhattan Recovery Projects uses the methodology described in Chapter 9, "Air Quality." Additional information regarding air quality in the context of the aftermath of September 11, 2001; air quality standards and benchmarks for determining the significance of impacts; background pollutant levels; and general procedures for air quality modeling also appear in Chapter 9.

This cumulative air quality assessment was modified since publication of the DEIS to reflect mitigation commitments for the WTC Memorial and Redevelopment Plan as well as to describe both alternatives for the Route 9A Project. LMDC incorporated additional mitigation measures (e.g., electrification and diesel particle filters) in their ROD for the WTC Memorial and Redevelopment Plan. These measures were included in this cumulative effects analysis. Furthermore, analysis was prepared for both the at-grade and short bypass alternatives for Route 9A since construction methods for both Route 9A and PATH's east-west concourse would vary.

Since almost all construction equipment and trucks use diesel engines, the main pollutants of concern for local analysis are particulate matter, nitrogen dioxides, emitted as engine exhaust

and fugitive dust and analyzed as $PM_{2.5}$, PM_{10}, and NO_2. Neither onsite nor offsite parking would be provided for construction workers, other than for a few delivery vehicles; thus, most construction workers would arrive by public transportation. Therefore, no significant increase in light duty gas vehicle trips is expected. Since diesel engines emit very little carbon monoxide (CO) analysis of CO from construction engines on-site was not warranted. The combined impact of construction related traffic on intersections, which could potentially impact the running speeds or idling times of background traffic and the ensuing CO concentrations was analyzed. The diesel fuels used for on-road vehicles contain low concentrations of sulfur, and pursuant to the EPCs, the on-site non-road diesel construction engines would be using ultra low sulfur diesel (ULSD). Emissions of sulfur dioxide (SO_2) from the site are therefore not of concern.

The analysis of on-site sources for the Lower Manhattan Recovery Projects in the critical analysis year considered the numbers and types of equipment in each work zone at each of the sites; the period of use (e.g., days or months); the percentage of time it would be operated during the period; and the size of the equipment.* (See "On-Site Equipment" above and Appendix D for more information on the on-site and mobile sources assumed in the analysis.)

All diesel construction engines, excluding on-road trucks, would use ULSD. Furthermore, where practicable, engines larger than 50 horsepower (HP) would include emissions reduction measures to reduce emissions of PM and volatile organic compounds (VOCs). For the purpose of this analysis, it was assumed that PM emissions from all such engines would be reduced by 40 percent—the reduction achieved by using diesel oxidation catalysts (DOC). PM emissions may be reduced by 90 percent or higher in cases where diesel particle filters (DPF) would be used. (These reductions include a reduction of approximately 14 percent due to the use of ULSD, as compared to the baseline emissions using normal fuel.) Since it is uncertain at this time what emission reduction technologies would be most efficient with each equipment type, and since DOCs are more efficient at reducing VOC emissions, which are ozone precursors and are of regional concern, the EPCs provide the flexibility to utilize either DOC or DPF control technologies. Therefore, the minimum PM emissions reduction of DOCs was assumed for this analysis.

To predict average concentrations for the time periods corresponding to the appropriate standards and impact criteria, on-site emissions were modeled for two time periods: 24-hours for PM and annual averages for PM and NO_2. These emissions were based on the construction activity predicted for each of those time scales, as described above and in Appendix D. Typical daily activity emissions were calculated for the various phases averaged over the year to produce annual emission rates for each work zone. Peak day activity emissions were calculated for each phase, and the values calculated for the period with the highest total emissions from all work zones were used for the 24-hour emission rates. A detailed description of emission factors from the various models described above and total emission rates based on construction activities in each zone is presented in Appendix D.

Background annual average $PM_{2.5}$ concentrations in New York City currently exceed the NAAQS. Until the $PM_{2.5}$ NAAQS are fully implemented and NYSDEC adopts a State Implementation Plan covering $PM_{2.5}$, the assessment of potential impacts and mitigation regarding fine particulate matter has been conducted using the NYSDEC and New York City Department of Environmental Protection (NYCDEP) interim threshold criteria.

---

* Given its distance from the Permanent WTC PATH Terminal, the South Ferry Terminal was not included for the cumulative analysis of on-site equipment.

PROBABLE IMPACTS

On–Road Carbon Monoxide Analysis

Maximum predicted CO concentrations in the critical analysis year were predicted at two intersections along Route 9A, similar to the analysis for this project. These locations are of concern because of the high level of traffic currently using the roadway and the potential for construction vehicles to adversely affect traffic flow and thereby increase CO emissions at critical intersections. The analysis includes all construction vehicles from the five major Lower Manhattan Recovery Projects and total approximately 2,000 per day. Approximately, a third of the construction vehicles would use Route 9A to access the WTC, PATH, and Route 9A construction work areas. As shown in Table 15-5, maximum predicted 8–hour average CO concentrations would increase by 0.6 ppm over conditions without any activity from the five major projects. With that increase, total CO concentrations would still be well below the NAAQS.

Table 15-5
Critical Analysis Year: Maximum Predicted 8-Hour Average CO Concentrations

Site	Without Cumulative Construction	With Cumulative Construction
Route 9A and Liberty Street	5.1	5.7
Route 9A and Vesey Street	5.5	5.5
Note: National Ambient Air Quality Standard (NAAQS) for CO is 9 ppm.		

Particulate Matter and Nitrogen Dioxide Analyses

The highest predicted increase in pollutant concentrations from construction activity in the vicinity of the construction sites is presented in Table 15-6. The total predicted concentrations, including background levels and the increment from the projects, are presented in Table 15-7. The concentrations include both on–road sources and on–site construction activity emissions.

To illustrate the effects of the emissions from construction on ambient air quality in the vicinity of the project, isopleths (i.e., lines of equal concentration increases) were developed based on the results of the air quality dispersion modeling. Figures 15-4 through 15-13 show the increase in annual average PM_{10}, 24-hour average PM_{10}, annual average $PM_{2.5}$, 24-hour average $PM_{2.5}$ and annual average NO_2 concentrations from cumulative construction activity in the critical analysis year for both of the Route 9A alternatives.

Under the Route 9A short bypass alternative, the maximum increase in PM_{10} concentrations is projected to be 4.4 $\mu g/m^3$ and 86.5 $\mu g/m^3$ on an annual and 24-hour basis, respectively. When considered with background conditions, the total maximum PM_{10} concentrations would be 31.9 $\mu g/m^3$ and 146.9 $\mu g/m^3$ on an annual and 24-hour basis, respectively. Both the annual and 24-hour concentrations would be below the NAAQS. As shown in Figures 15-4 and 15-6, the maximum annual increase is predicted near the intersection of Route 9A and Vesey Street while the maximum 24-hour increase would be along the Route 9A bikeway adjacent to the World Financial Center. At residential receptors, the maximum increase would be significantly lower (17.1 $\mu g/m^3$ for the 24-hour period and 2.5 $\mu g/m^3$ on an annual basis).

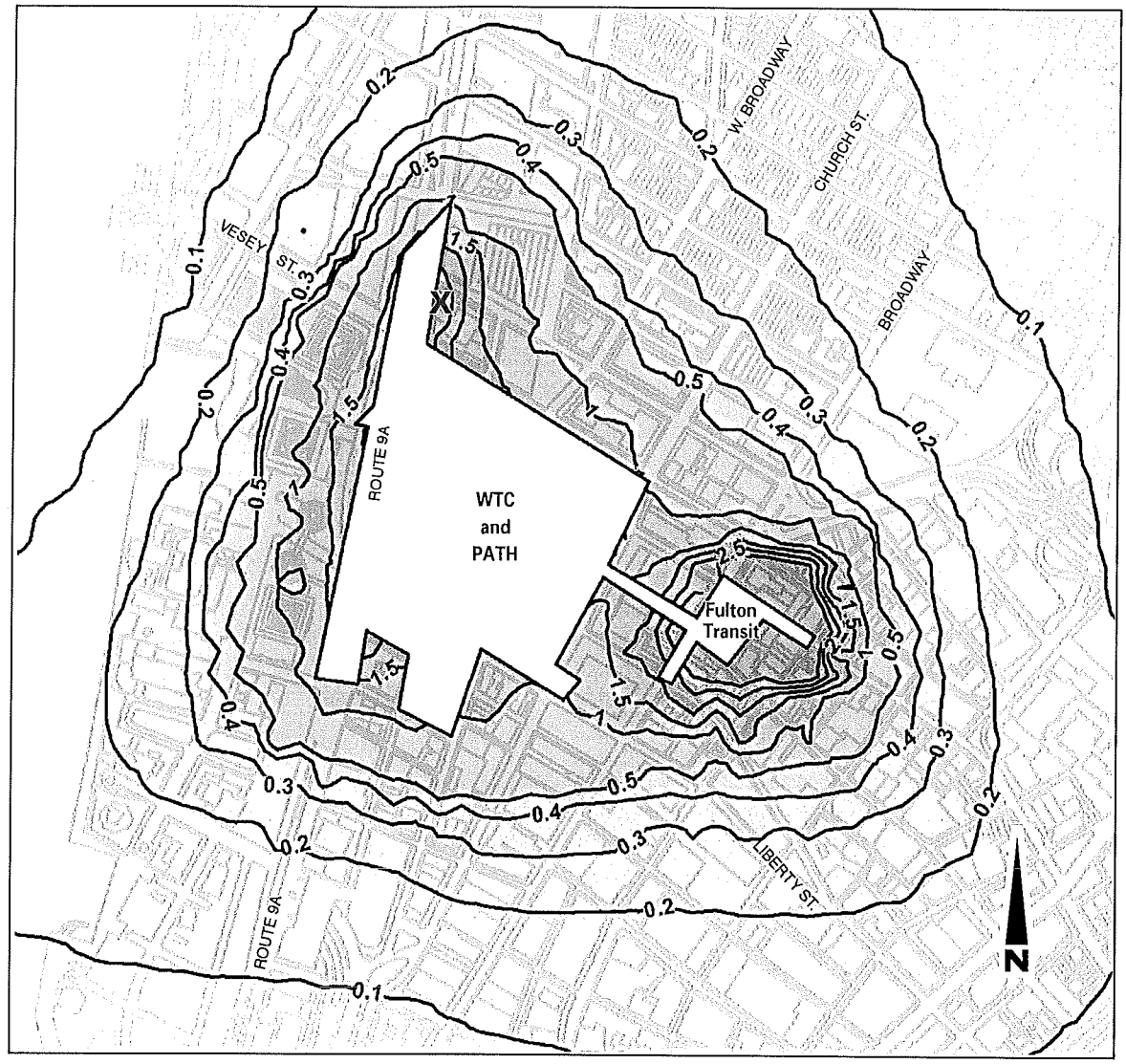
Table 15–6
Highest Predicted Increase in Pollutant Concentrations from Cummulative Construction of the Lower Manhattan Recovery Projects in the Critical Analysis Year

Pollutant	Average Period	Receptor Type	Maximum Increase [µg/m^3] With Route 9A Short Bypass	Maximum Increase [µg/m^3] With Route 9A At Grade
NO_2	Annual	Highest of All Receptors	24.3**	21.5**
		Residential Buildings / Hotel	22.2**	21.5**
$PM_{2.5}$	24–hour	Highest of All Receptors	68.4*	82.5*
		Residential Buildings / Hotel	11.3*	11.4*
		Other Locations on Access Routes	0.4	0.4
	Annual	Local Highest of All Receptors	2.4*	2.4*
		Local Highest Residential / Hotel	1.8*	1.8*
		Local on Access Routes	0.17	0.17
		Neighborhood Scale	0.42*	0.38*
PM_{10}	24–hour	Highest of All Receptors	86.5	117.9
		Residential Buildings / Hotel	17.1	26.5
		Other Locations on Access Routes	4.5	4.5
	Annual	Highest of All Receptors	4.4	4.0
		Residential Buildings / Hotel	2.5	2.5
		Other Locations on Access Routes	1.4	1.4

Notes:
Interim guidance threshold levels for $PM_{2.5}$ are 5 µg/m^3 and 0.3 µg/m^3 for 24–hour and annual increases respectively, and 0.1 µg/m^3 for neighborhood scale annual average. For determination of adverse impacts, these values are applied in the absence of specific criteria.

* Indicates substantial adverse impact–exceeding the interim guidance thresholds.

** Substantial adverse impact due to high increment predicted where existing background concentrations are high—not exceeding NAAQS (see table 15–7).



X Predicted Maximum Concentration

0 400 800 FEET
SCALE

0.0 0.1 0.2 0.3 0.4 0.5 1.0 1.5 2.0 2.5 3.0

Increase in Concentration ($\mu g/m^3$)

Figure 15-4

Maximum Predicted Annual Average PM_{10} Construction Increment

Cumulative with Route 9A Short Bypass Tunnel Alternative

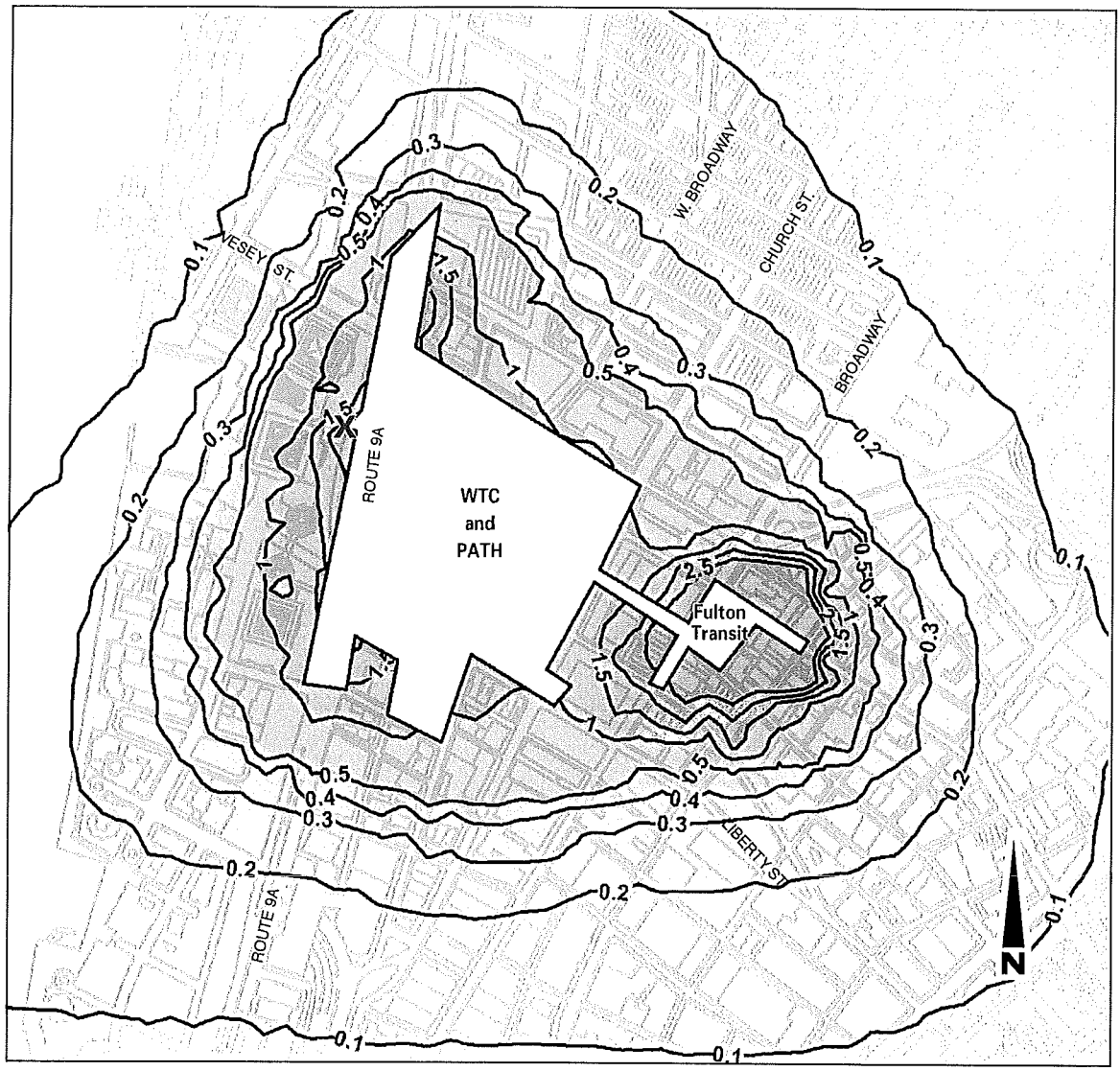


Figure 15-5

Maximum Predicted Annual Average PM_{10} Construction Increment

Cumulative with Route 9A At-Grade Alternative

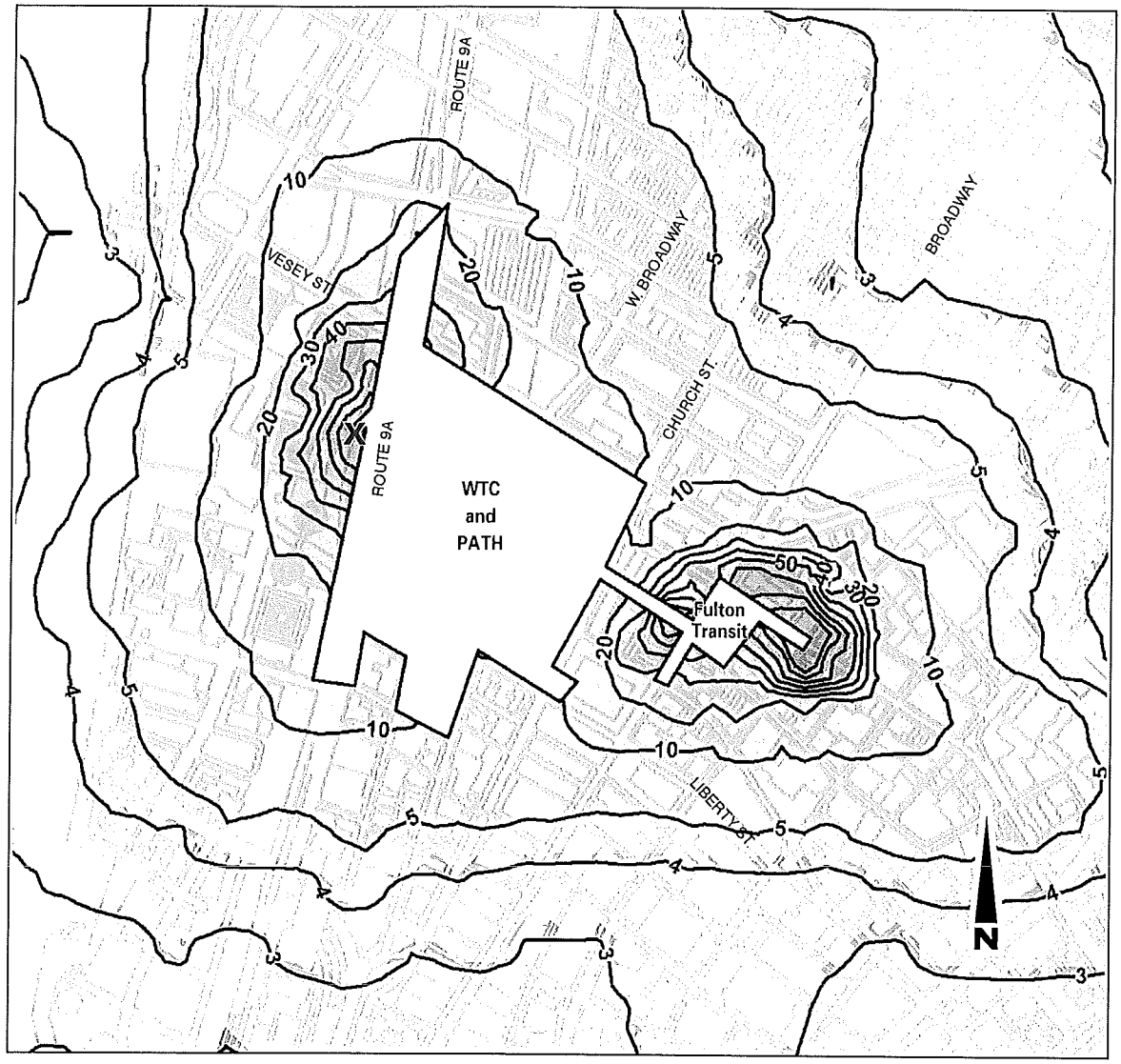


Figure 15-6

Maximum Predicted 24-Hour Average PM_{10} Construction Increment

Cumulative with Route 9A Short Bypass Tunnel Alternative

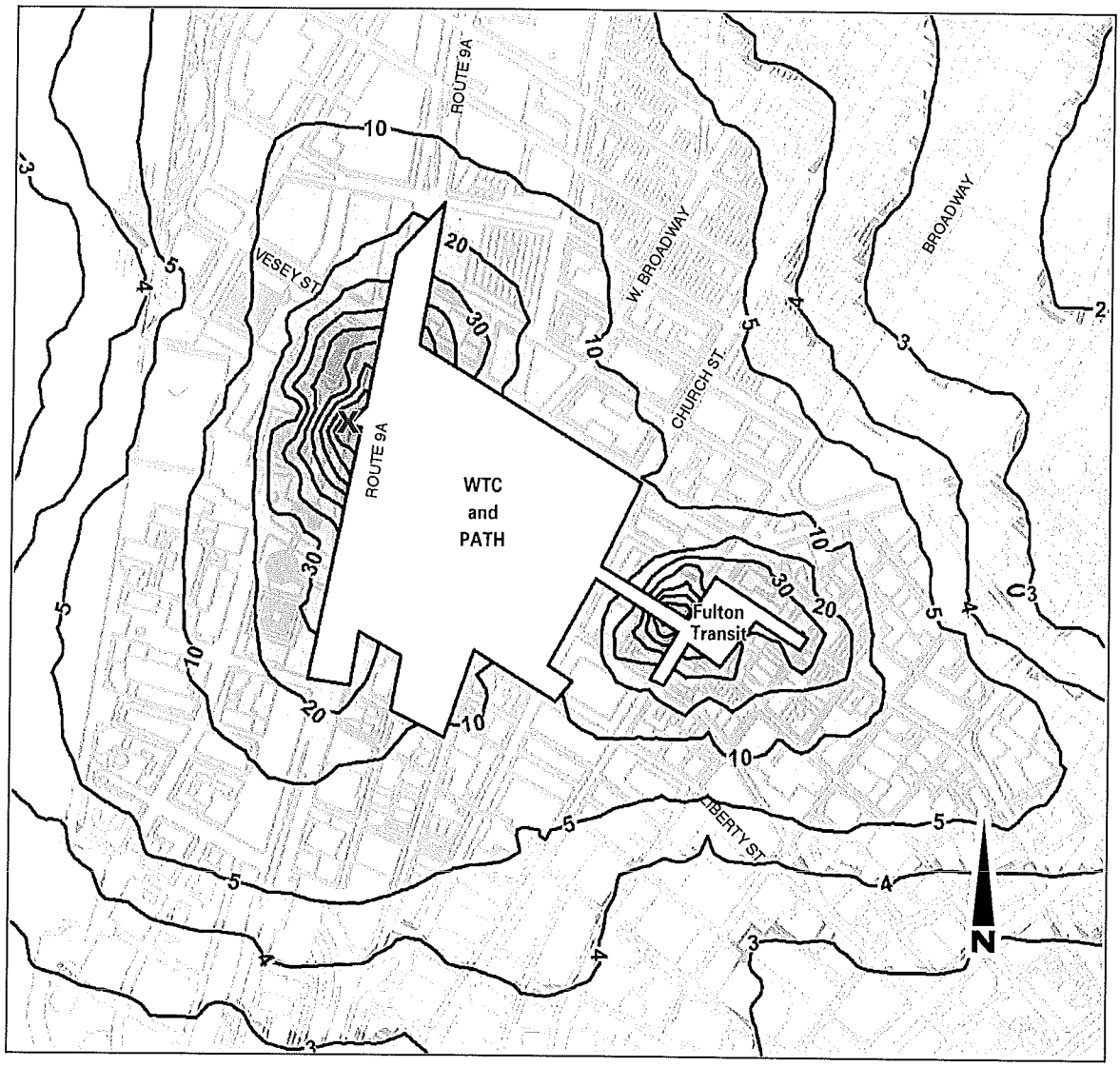


Figure 15-7

Maximum Predicted 24-Hour Average PM_{10} Construction Increment

Cumulative with Route 9A At-Grade Alternative

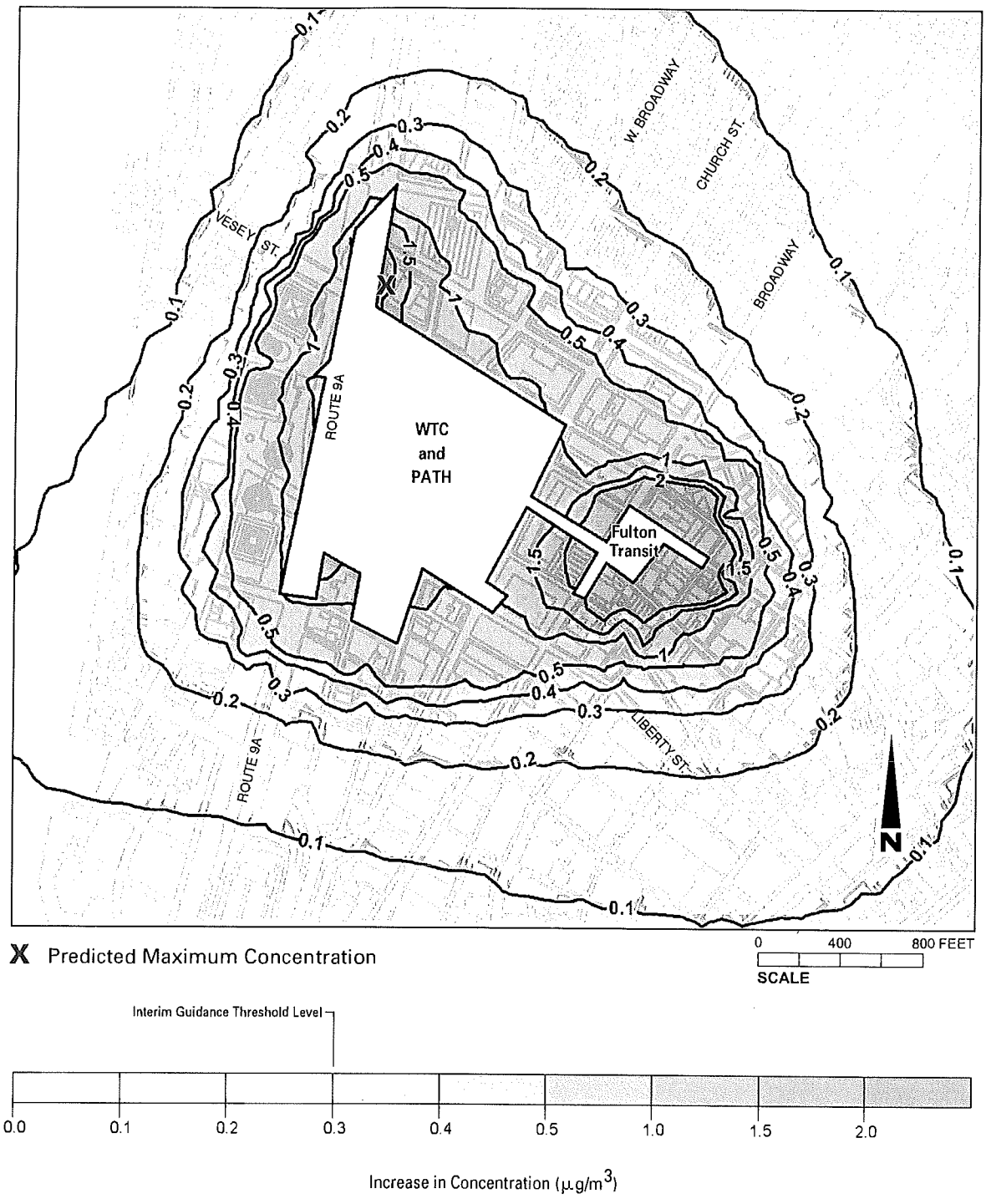
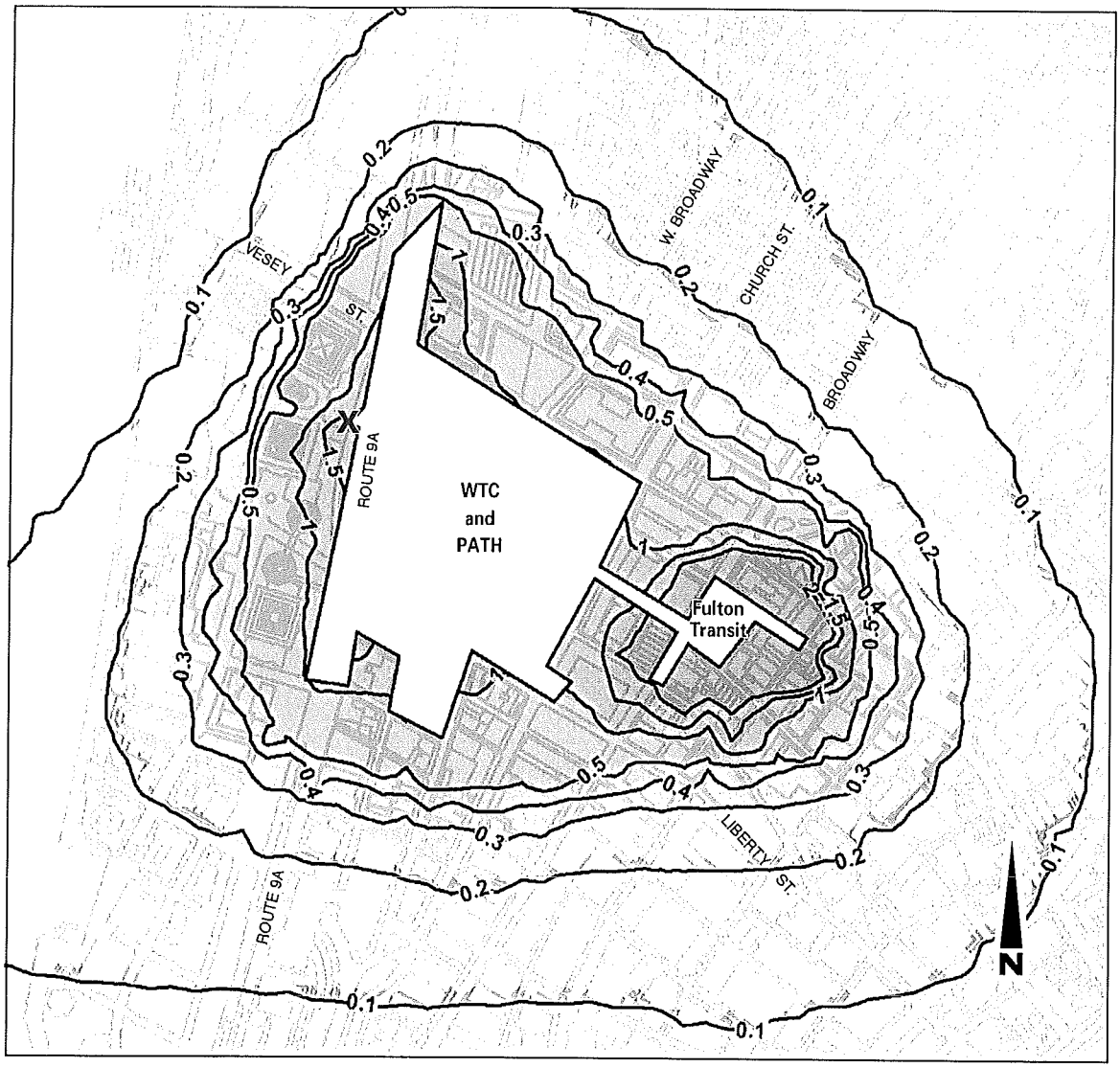


Figure 15-8

Maximum Predicted Annual Average $PM_{2.5}$ Construction Increment

Cumulative with Route 9A Short Bypass Tunnel Alternative



X Predicted Maximum Concentration

0 400 800 FEET
SCALE

Interim Guidance Threshold Level

0.0 0.1 0.2 0.3 0.4 0.5 1.0 1.5 2.0

Increase in Concentration ($\mu g/m^3$)

Figure 15-9

Maximum Predicted Annual Average $PM_{2.5}$ Construction Increment

Cumulative with Route 9A At-Grade Alternative

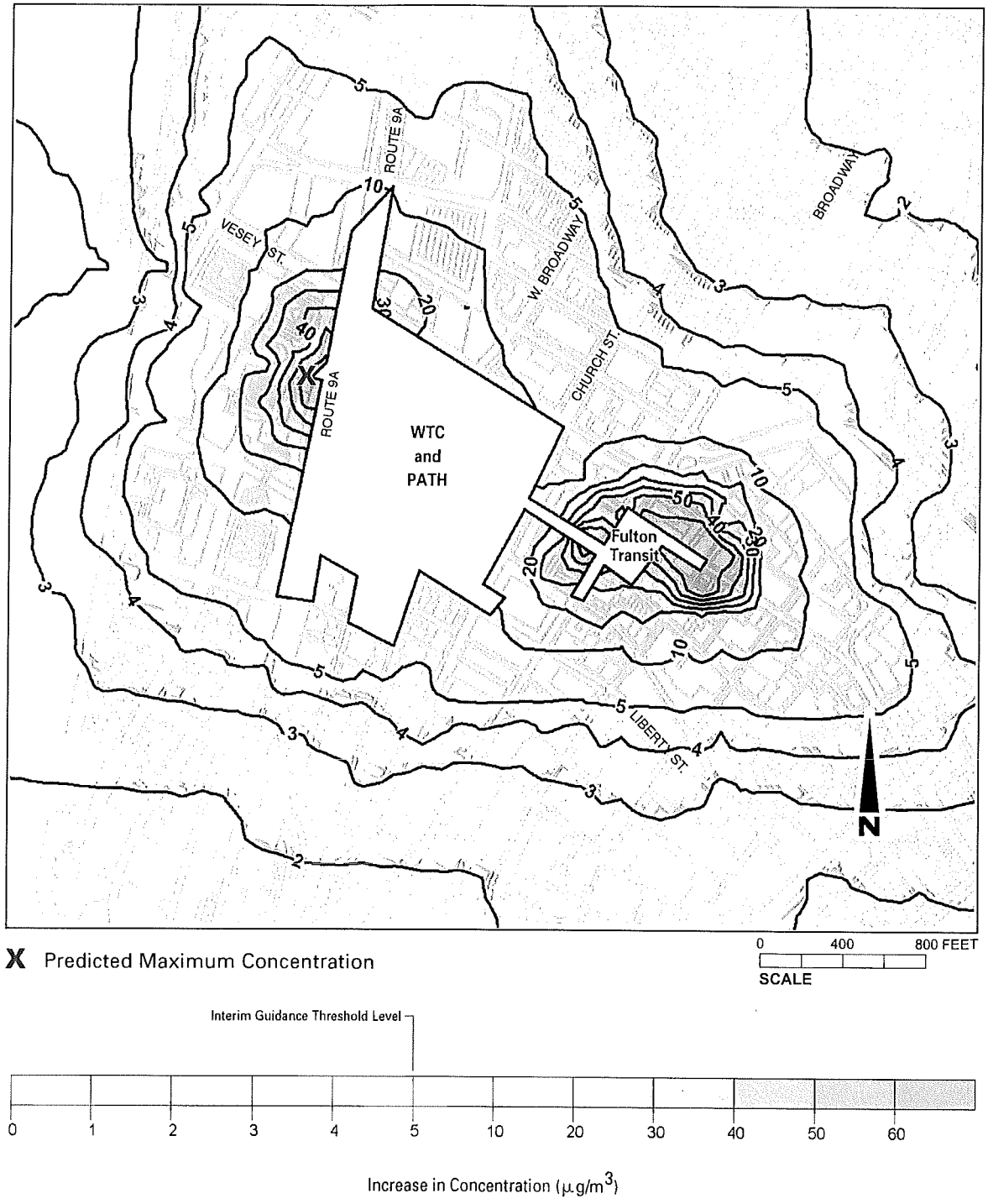


Figure 15-10

Maximum Predicted 24-Hour Average $PM_{2.5}$ Construction Increment

Cumulative with Route 9A Short Bypass Tunnel Alternative

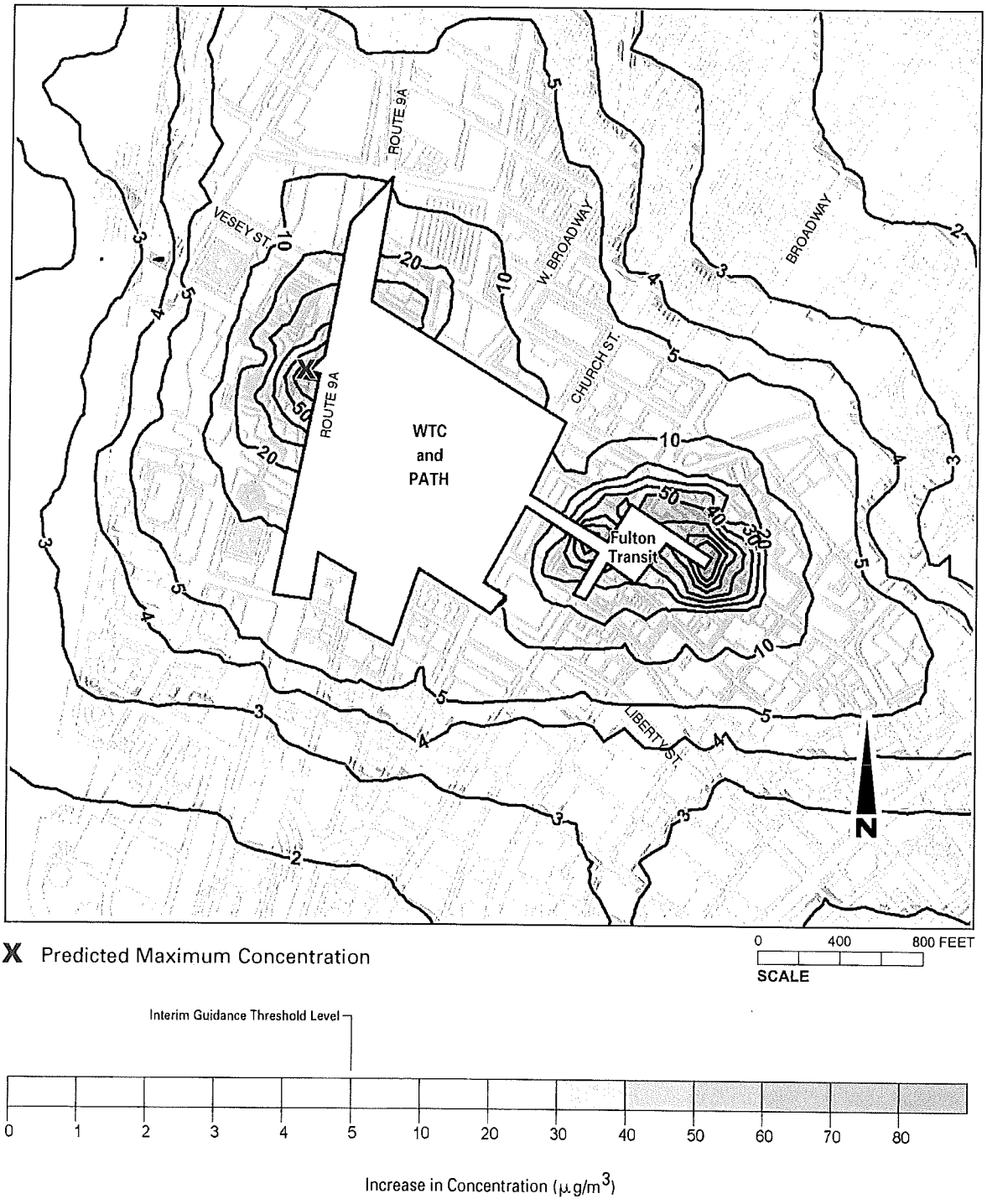


Figure 15-11

Maximum Predicted 24-Hour Average $PM_{2.5}$ Construction Increment

Cumulative with Route 9A At-Grade Alternative

3.29.05

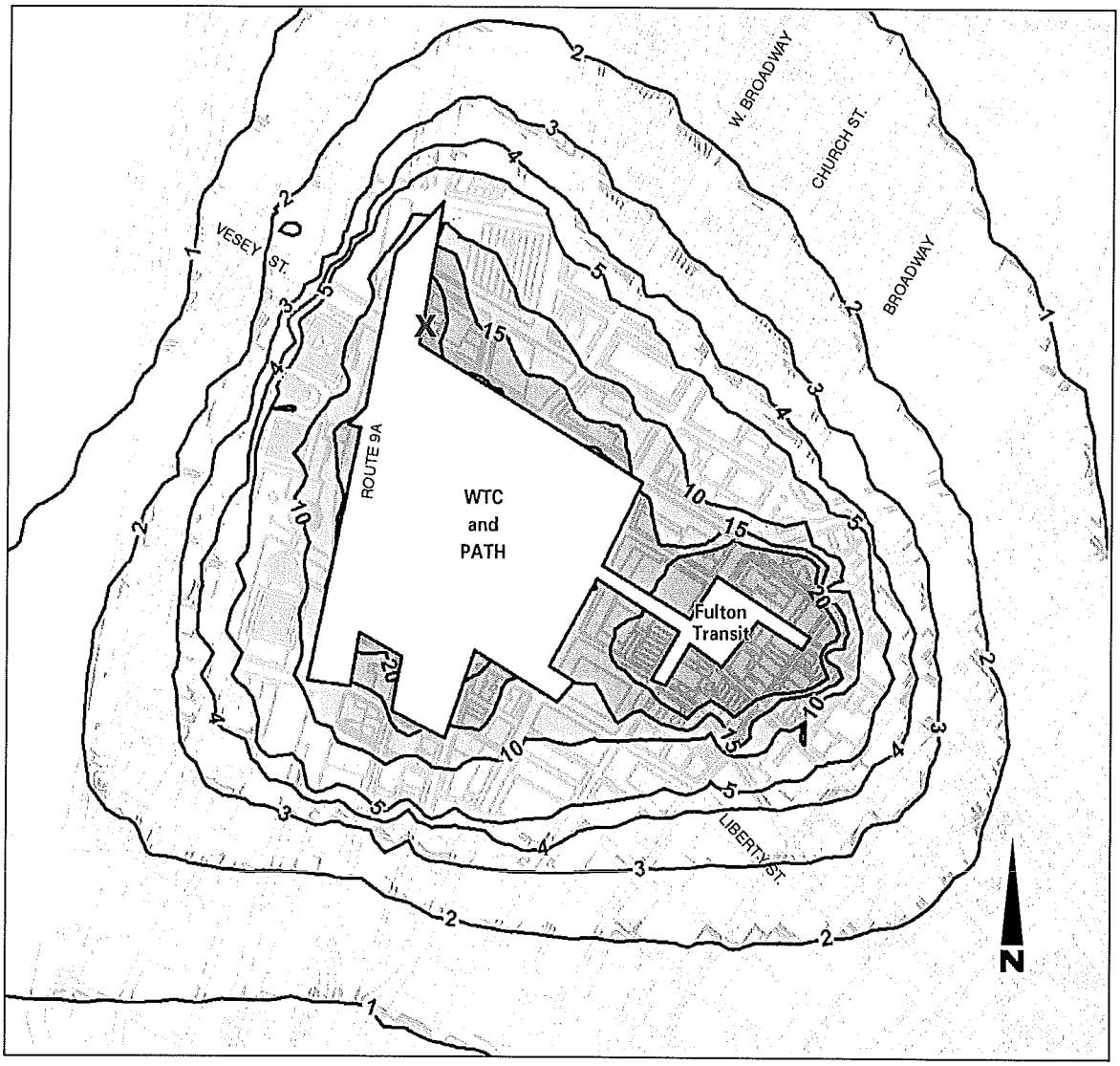


Figure 15-12

Maximum Predicted Annual Average NO_2 Construction Increment

Cumulative with Route 9A Short Bypass Tunnel Alternative

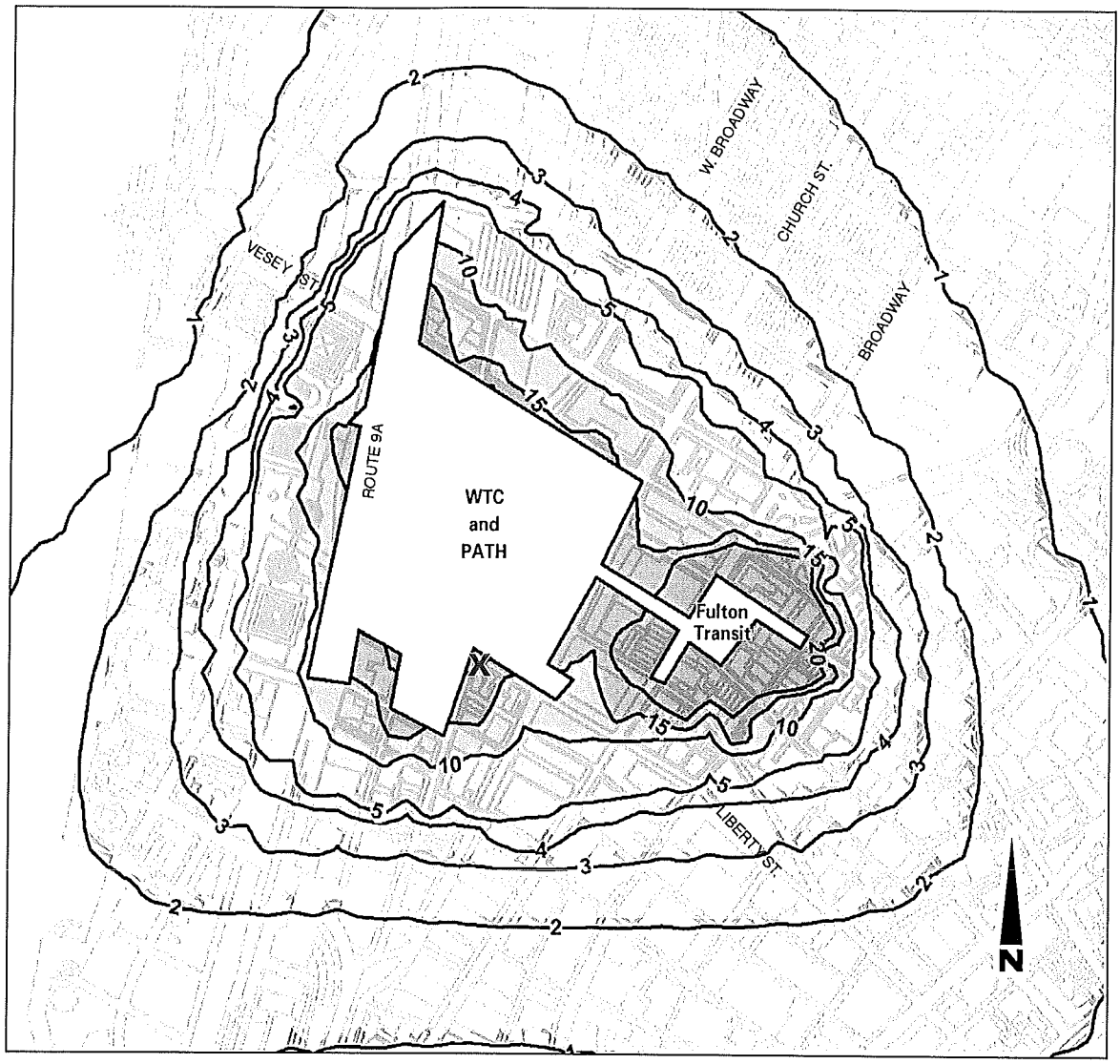


Figure 15-13

Maximum Predicted Annual Average NO_2 Construction Increment

Cumulative with Route 9A At-Grade Alternative

Table 15-7
Highest Predicted Total Pollutant Concentrations from Cumulative Construction of the Lower Manhattan Recovery Projects in the Critical Analysis Year

Pollutant	Average Period	Receptor Type	Maximum Increase [µg/m³]	
			With Route 9A Short Bypass	With Route 9A At Grade
NO_2	Annual	Highest of All Receptors	96.3	93.5
		Residential Buildings / Hotel	94.2	93.5
$PM_{2.5}$	24–hour	Highest of All Receptors	115.4*	129.5*
		Residential Buildings / Hotel	58.5	59.2
		Other Locations on Access Routes	47.3	48.1
	Annual	Highest of All Receptors	20.5**	20.5**
		Highest Residential / Hotel	19.7**	19.8**
PM_{10}	24–hour	Highest of All Receptors	146.9	178.3*
		Residential Buildings / Hotel	77.5	86.4
		Other Locations on Access Routes	63.6	63.6
	Annual	Highest of All Receptors	31.9	31.5
		Residential Buildings / Hotel	29.7	29.6
		Other Locations on Access Routes	28.8	28.8

Notes:

All total concentrations include calculated background contributions from local mobile sources, as well as measured regional background values as follows: NO_2—Annual average 72 µg/m³; $PM_{2.5}$—Annual average 17.1 µg/m³ (highest of 2000-2002 annual values); 24-hour average 44.0 µg/m³ (highest of the three 2nd highest 24-hour averages in 2000-2002); PM_{10}—Annual average 24 µg/m³; 24–hour average 50 µg/m³.

The NAAQS are as follows: NO_2—Annual = 100 µg/m³; $PM_{2.5}$—24–hour = 65 µg/m³ and Annual = 15 µg/m³; PM_{10}—24–hour = 150 µg/m³ and Annual = 50 µg/m³.

Cumulative and project–generated maximum concentrations may occur at a different time and/or location.

* Indicates predicted exceedance of new NAAQS for which the conformity process is not yet in effect.

** $PM_{2.5}$ annual average concentrations exceed the NAAQS in the existing background condition. See Table 15–5 for comparison with incremental thresholds.

Under the Route 9A at-grade alternative, the maximum increase in PM_{10} concentrations would be 117.9 µg/m³ on a 24-hour basis and 4.0 µg/m³ on an annual basis. These potential maximums could occur at the temporary bikeway along Route 9A (see Figures 15-5 and 15-7). As shown in Table 15-7, the maximum total 24–hour average PM_{10} concentration along the temporary bikeway could exceed the annual NAAQS under the at-grade alternative. However, this would only occur if peak construction occurs near that receptor when background levels actually reach 50 µg/m³. Increases at residential receptors would be significantly lower with a maximum of 26.5 µg/m³ and 2.5 µg/m³ on a 24-hour and annual basis, respectively.

Under the Route 9A short bypass alternative, the predicted increase in $PM_{2.5}$ concentrations in the immediate vicinity of the sites would be a maximum of 66.4 µg/m³ and 2.4 µg/m³ on a local 24-hour average and annual average basis, respectively. On a neighborhood scale, the maximum

annual increase would be 0.42 $\mu g/m^3$. These maximum predicted increases in $PM_{2.5}$ concentrations would exceed the interim guidance threshold values. As shown in Figures 15-8 and 15-10, the increase in $PM_{2.5}$ concentrations would exceed the 0.3 $\mu g/m^3$ annual and the 5 $\mu g/m^3$ 24–hour thresholds over a much larger area than shown previously for construction of the Preferred Alternative alone. The concentrations decrease rapidly with the distance from the sites, and no exceedance of the threshold values would be expected at a distance of approximately 1,300 feet from the sources.

Under the Route 9A at-grade alternative, the predicted increase in $PM_{2.5}$ concentrations in the immediate vicinity of the sites also exceed the interim guidance thresholds and would be a maximum of 82.5 $\mu g/m^3$ and 2.4 $\mu g/m^3$ on a local 24-hour average and annual average basis, respectively. On a neighborhood scale, the maximum annual increase would be 0.38 $\mu g/m^3$. However, similar to the short bypass alternative, the concentrations decrease rapidly with the distance from the sites, and no exceedance of the threshold values would be expected at a distance of approximately 1,300 feet from the sources (see Figures 15-9 and 15-11).

Without further mitigation, cumulative construction of the Lower Manhattan Recovery Projects would result in an adverse impact on $PM_{2.5}$ concentrations. However, the total $PM_{2.5}$ concentrations presented are conservative since they are based on the highest monitored level in the years 2000-2002. Based on the highest monitored annual average $PM_{2.5}$ concentration of 17.1 $\mu g/m^3$, the annual local $PM_{2.5}$ concentration could total a maximum of 20.5 $\mu g/m^3$, and the annual neighborhood scale $PM_{2.5}$ concentration could increase to 19.8 $\mu g/m^3$. It should be noted that the current annual measured background levels of $PM_{2.5}$ exceed the NAAQS of 15 $\mu g/m^3$.

Based on the highest measured 24-hour background concentration of 44 $\mu g/m^3$, the predicted 24-hour average $PM_{2.5}$ concentrations at locations immediately adjacent to the site could potentially exceed 129.5 $\mu g/m^3$ without further mitigation. As shown in Figure 15-10 and 15–11, these exceedances would not be expected at residential locations surrounding the WTC site, but would occur at two locations—along Route 9A and near the Fulton Street Transit Center.

The 24-hour average PM concentrations exhibit local maximums, reflecting specific wind directions and local activity; thus, they are much more influenced by a single activity that may produce higher short–term concentration increases. Annual average PM concentrations, however, are more uniform over the study area. This is expected, since over the long-term, the influence of wind directions and the scattering of construction equipment throughout the area would result in a more uniform distribution of the concentrations. In any event, these results indicate that additional mitigation is necessary to decrease concentrations of particulate matter beyond the 40 percent reduction assumed with the use of DOCs in order to minimize impacts and to ensure that 24–hour concentrations of $PM_{2.5}$ and PM_{10} do not exceed the NAAQS.

Annual average NO_2 concentrations were predicted to increase substantially by up to a maximum of 24.3 $\mu g/m^3$ in the immediate vicinity of the site, with the total concentration, including background levels, potentially reaching 96.3 $\mu g/m^3$. As described above, the maximum NO_2 concentrations are conservatively high since they assume a NO to NO_2 conversion rate which is higher than that which would occur at the nearest receptors where the highest values were predicted. Although exceedance of the NO_2 standard is not predicted, mitigation proposed to reduce PM (e.g. electrification) may also reduce NO_2 emissions.

Mesoscale Emissions Analysis

The total predicted emission of PM_{10}, $PM_{2.5}$, NO_2 and VOCs by year due to the proposed construction activity with implementation of the EPCs, including both on–site activity and

related on–road emissions, are presented in Table 15-8. Of the total construction period emissions, approximately 50 to 60 percent of VOC, 70 to 85 percent of NO_2, 60 to 70 percent of PM_{10} and 80 to 90 percent of $PM_{2.5}$ would be from on–site sources.

Table 15–8
Total Mesoscale Direct and Indirect Emissions from Cumulative Construction of the Lower Manhattan Recovery Projects in the Critical Analysis Year

Pollutant	2005	2006	2007	2008
PM_{10}	8.3	9.9	2.7	2.3
$PM_{2.5}$	5.3	5.5	1.4	1.1
NO_2	267.2	287.5	70.4	58.2
VOC	19.3	19.2	6.2	4.9

Notes:
The above results were estimated using the construction analysis framework developed for the Permanent WTC PATH Terminal DEIS. This analysis framework considered 2006 as the peak cumulative construction year for the Lower Manhattan Recovery Projects.

The results presented in Table 15-8 for the PM_{10} emissions include both engine emissions and resuspended road dust. The results also reflect only the Short Bypass Alternative for Route 9A. The South Ferry Terminal construction emissions are estimate based on the worst-case emissions published in the Environmental Assessment, which were based on the assumption that all of the most intense construction activities will take place within one 12-month period in 2005–2006. However, these emissions would not actually occur during one calendar year, and would not persist at the same level over both years as presented here. Therefore, emissions presented in Table 15-8 are a conservative annual estimate for the peak construction year.

As compared to the projected regional emissions inventory in the New York ozone SIP for the same years—the on-road portion of the emissions is estimated at less than 0.06 percent and 0.02 percent of the SIP mobile source NO_2 and VOC emissions, respectively; the on-site portion of the emissions would be 0.4 percent and 0.03 percent of the non-road SIP NO_2 and VOC emissions or less (depending on the year), respectively.

MITIGATION

The EPCs and LMDC's enhanced mitigation commitments were incorporated into the baseline analysis of construction period air quality described above. As described, Chapter 9, "Air Quality," PANYNJ would also commit to additional mitigation measures to reduce the potential construction-period impacts of the Preferred Alternative. Similarly, since publication of the Permanent WTC PATH Terminal DEIS, MTA/NYCT, and NYSDOT have committed to a higher level of mitigation than originally contemplated with the EPCs. The following describes these commitments.

- Electrification: Certain construction engines that operate in a fixed or temporarily fixed position, such as welding machines and compressors, could potentially be connected to the City's power grid if available by Con Edison at the start of construction. The electrification of this equipment would eliminate the on–site diesel exhaust from these sources. However, in some cases, electrification may not prove effective due to the need for mobility, and some local power generation may be needed when access to connection points is not feasible. PANYNJ and MTA/NYCT would require all contractors and subcontractors to use

electrically powered equipment wherever technically feasible, for air compressors, pumps, mixing, desanding and grout plants, welding machines, and any other diesel powered equipment that can be replaced with an electrically powered version. However, this does not apply to PATH's pedestrian concourse beneath Route 9A since NYSDOT has not yet finalized what level of electrification would be possible for its projects.

- Diesel Particle Filters: Technologies are available that can achieve greater reductions in particulate matter emissions as compared to DOCs. DPFs, for example, can reduce particulate matter emission by at least 85 percent and as high as 98 percent. However, DPFs are not effective for every type of engine operation, and there may be technical difficulties in applying DPFs to some engines. The Lower Manhattan project sponsors would require the use of DPFs or other measures with equivalent PM removal efficiency for all nonroad diesel engines of 50 horsepower or greater wherever the implementation of such a device is available and practical. It is assumed that DPFs can be practically used on 75 percent of nonroad diesel engines and that the remaining 25 percent could employ DOCs.

- Newer Engines: The use of new construction engines would ensure that older, higher emitters are not operating on–site and would make the operation of added control technologies easier and more efficient. The Lower Manhattan project sponsors would require the use of post-1995 fuel injection engines, which meet the Tier II engine emissions standards, as defined in Title 40, Part 89.112. Exceptions will be made only for specific engines that are not yet available as Tier II, where the task cannot be reasonably accomplished using alternative engines or means comply with these demands. However, given current technology, it is assumed that all engines would be Tier II compliant.

- The Lower Manhattan project sponsors are investigating the use of other methods to reduce NO_2 emissions. However, given the current uncertainty, additional NO_2 reduction techniques were not assumed as part of the cumulative mitigation analysis.

To model the effectiveness of these enhanced mitigation measures, it was assumed that all engines used for construction of the Fulton Street Transit Center, Route 9A, and the Permanent WTC PATH Terminal construction would be Tier II compliant. Furthermore, it was also assumed that by the critical analysis year, half of all air compressors, pumps, mixing, desanding and grout plants, and welding machines used to construct the Permanent WTC PATH Terminal, excluding the pedestrian concourse beneath Route 9A, would be electrically operated.

Table 15-9 and Figures 15-13 through 15-23 show the predicted increase in pollutant concentrations at Lower Manhattan receptors accounting for the enhanced mitigation measures described above. Total concentrations, including background levels, are presented in Table 15-10. The concentrations at locations adjacent to the construction sites include contributions from both on-road sources and on-site construction activity. The concentrations marked "Other locations Along Access Routes" represent the highest predicted impacts from on-road sources at more distant locations that would not be impacted by the construction activity on-site.

The maximum predicted $PM_{2.5}$ increments with enhanced mitigaiton are significantly lower than those predicted without the further commitments of PANYNJ, MTA/NYCT, and NYSDOT.

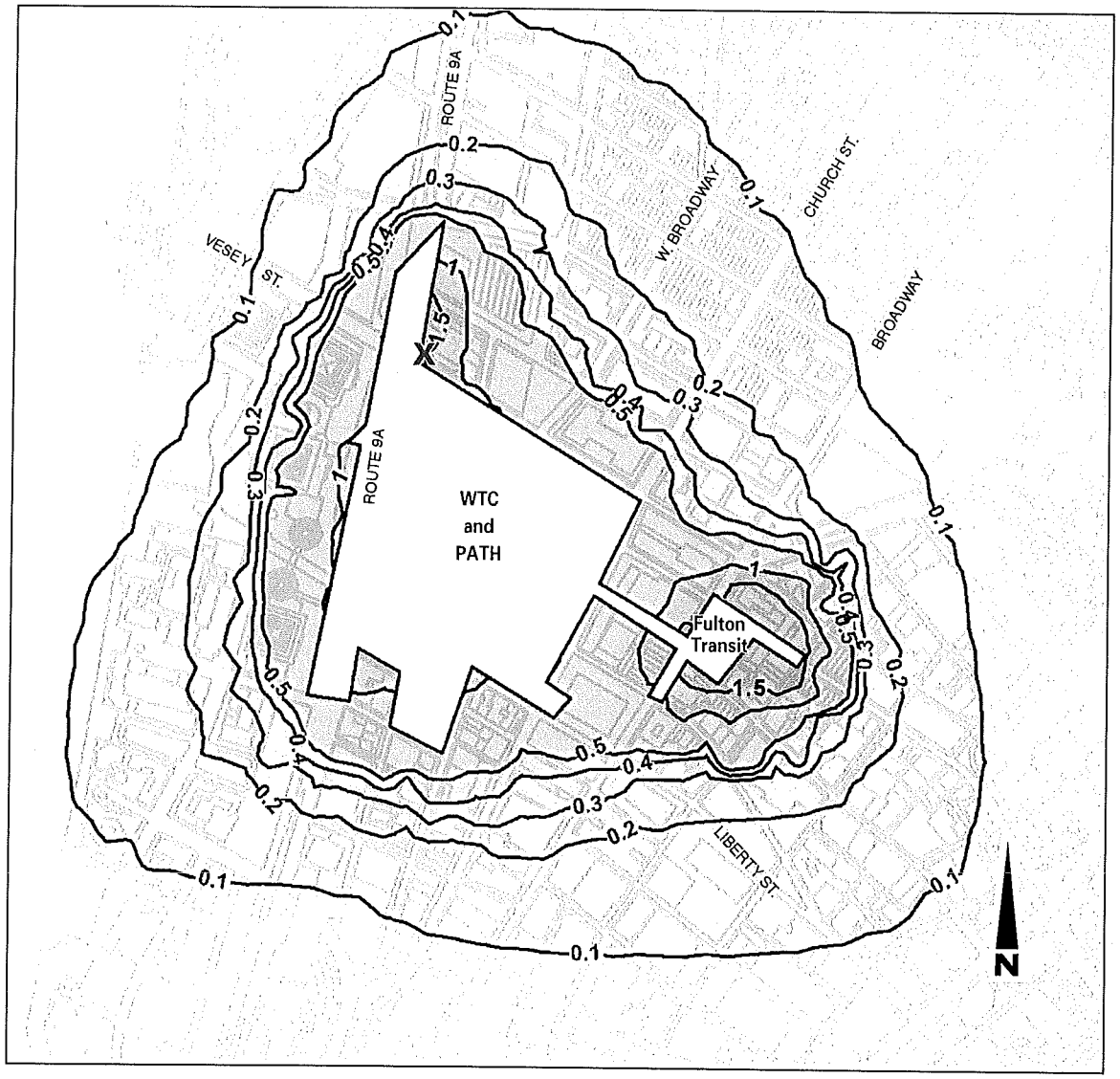


Figure 15-14

Maximum Predicted Annual Average PM_{10} Construction Increment

Cumulative with Route 9A Short Bypass Tunnel Alternative and Mitigation

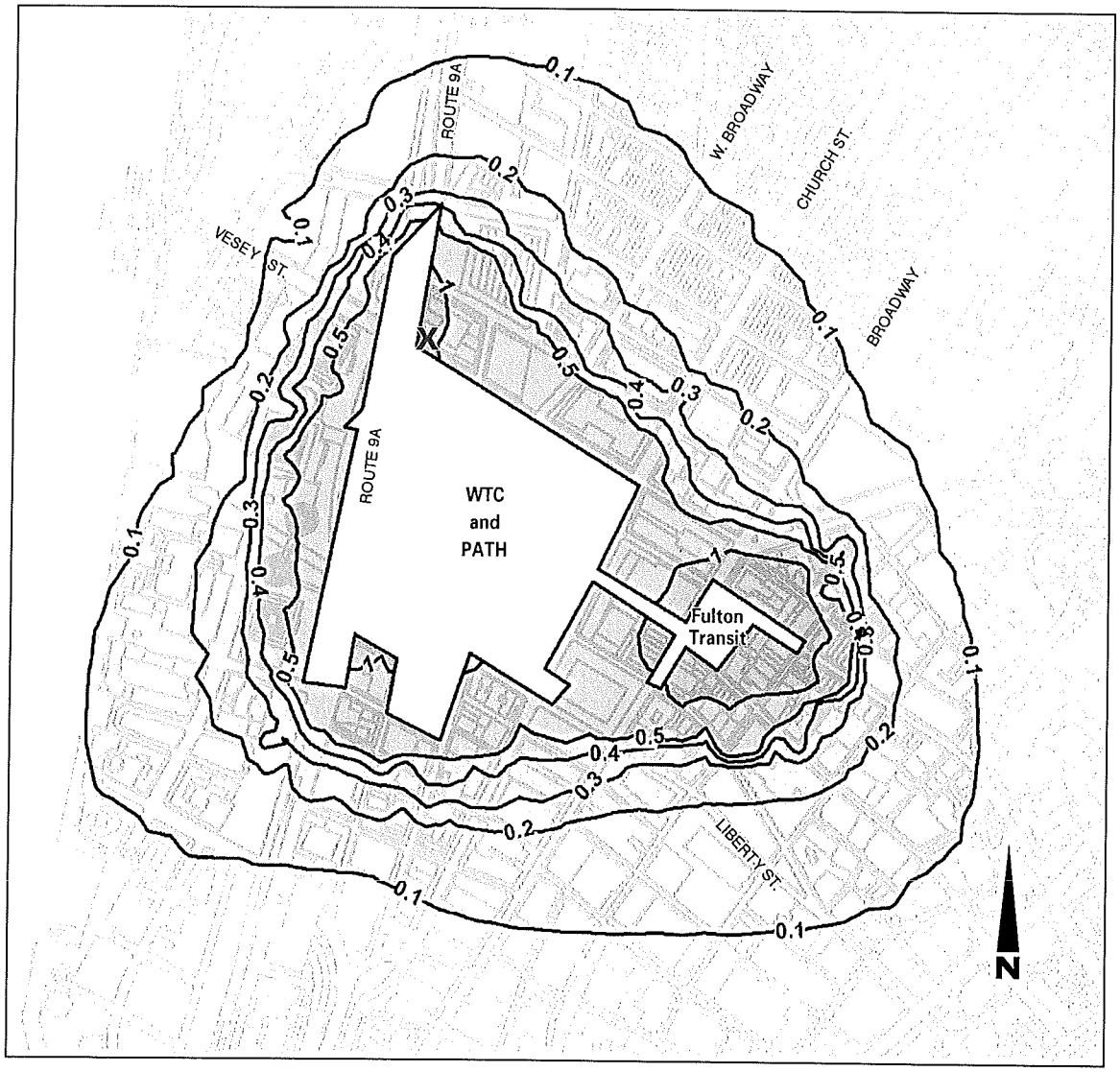


Figure 15-15

Maximum Predicted Annual Average PM_{10} Construction Increment

Cumulative with Route 9A At-Grade Alternative and Mitigation

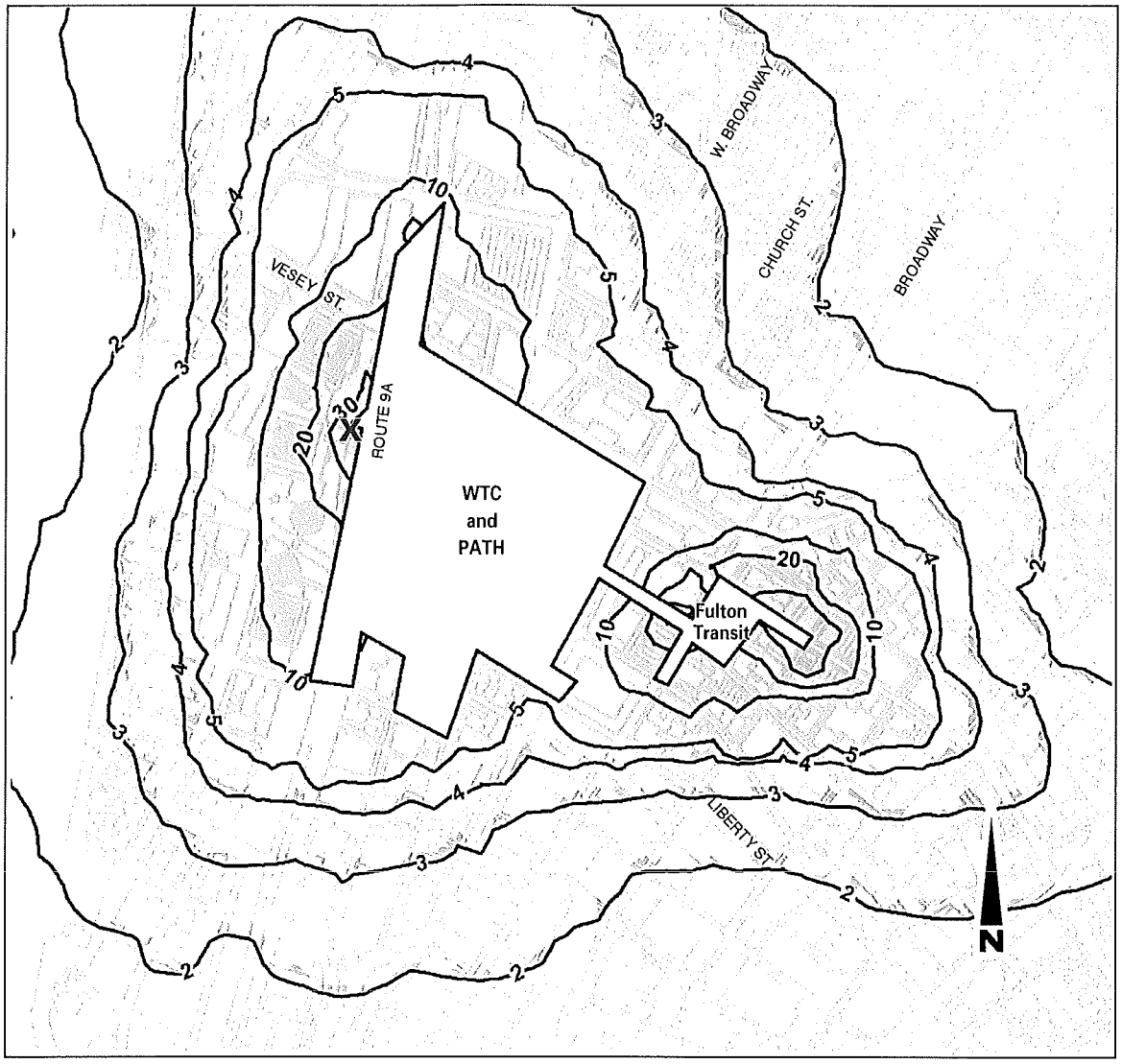


Figure 15-16

Maximum Predicted 24-Hour Average PM_{10} Construction Increment

Cumulative with Route 9A Short Bypass Tunnel Alternative and Mitigation

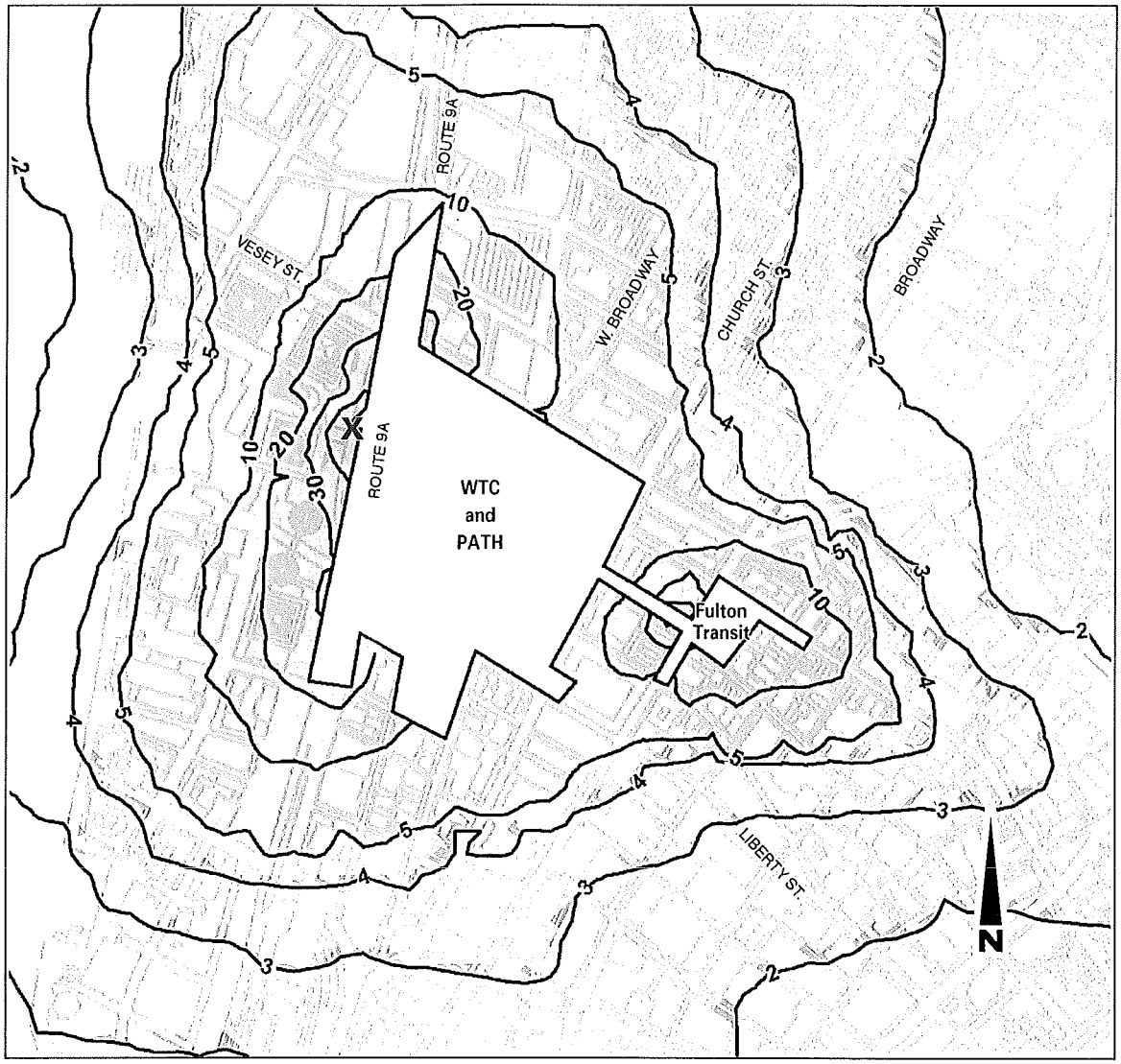


Figure 15-17

Maximum Predicted 24-Hour Average PM_{10} Construction Increment

Cumulative with Route 9A At-Grade Alternative and Mitigation

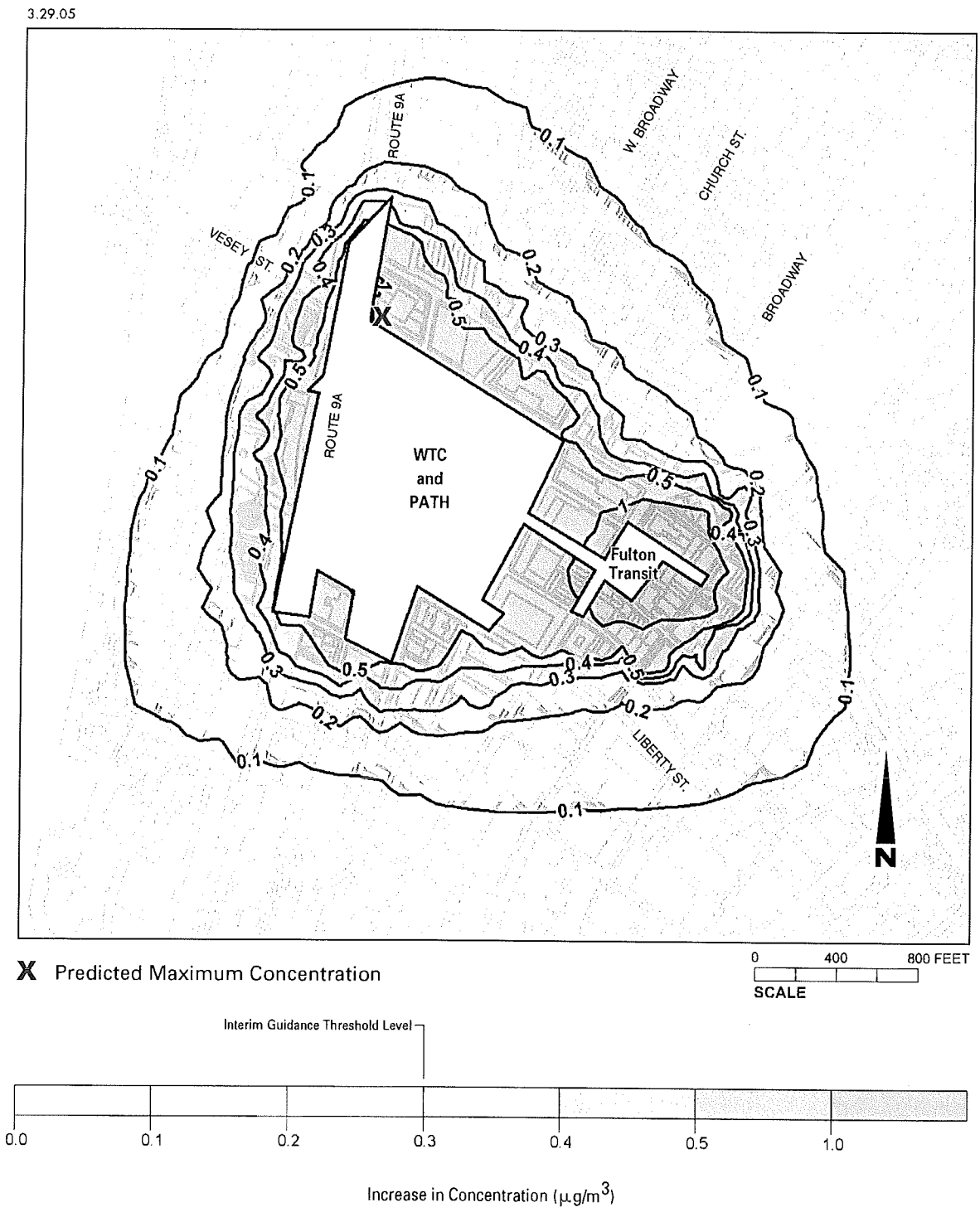
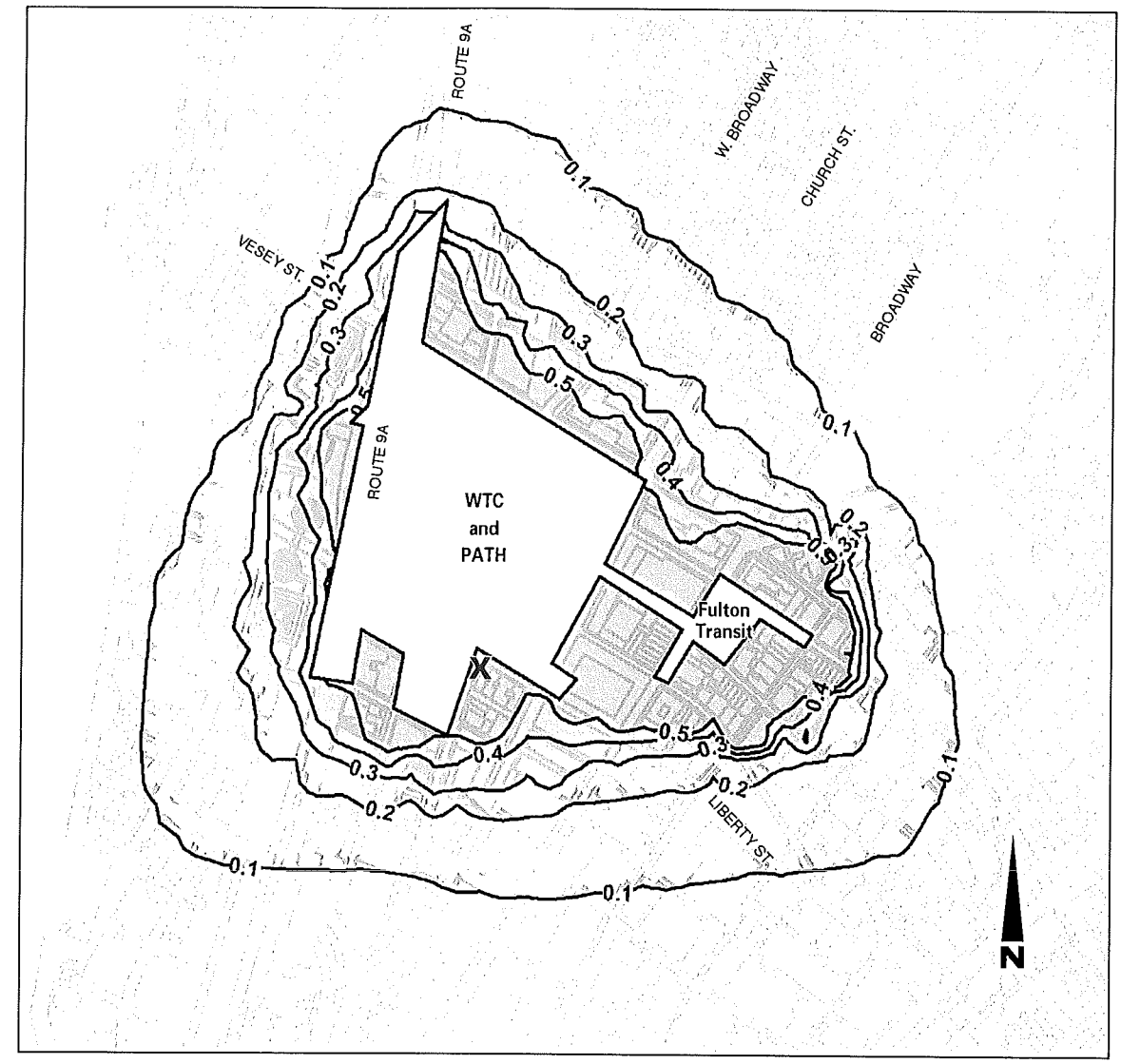


Figure 15-18

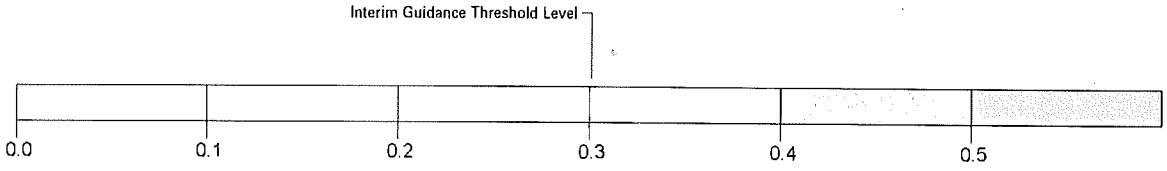
Maximum Predicted Annual Average $PM_{2.5}$ Construction Increment

Cumulative with Route 9A Short Bypass Tunnel Alternative and Mitigation



X Predicted Maximum Concentration

0 400 800 FEET
SCALE



Increase in Concentration ($\mu g/m^3$)

Figure 15-19

Maximum Predicted Annual Average $PM_{2.5}$ Construction Increment

Cumulative with Route 9A At-Grade Alternative and Mitigation

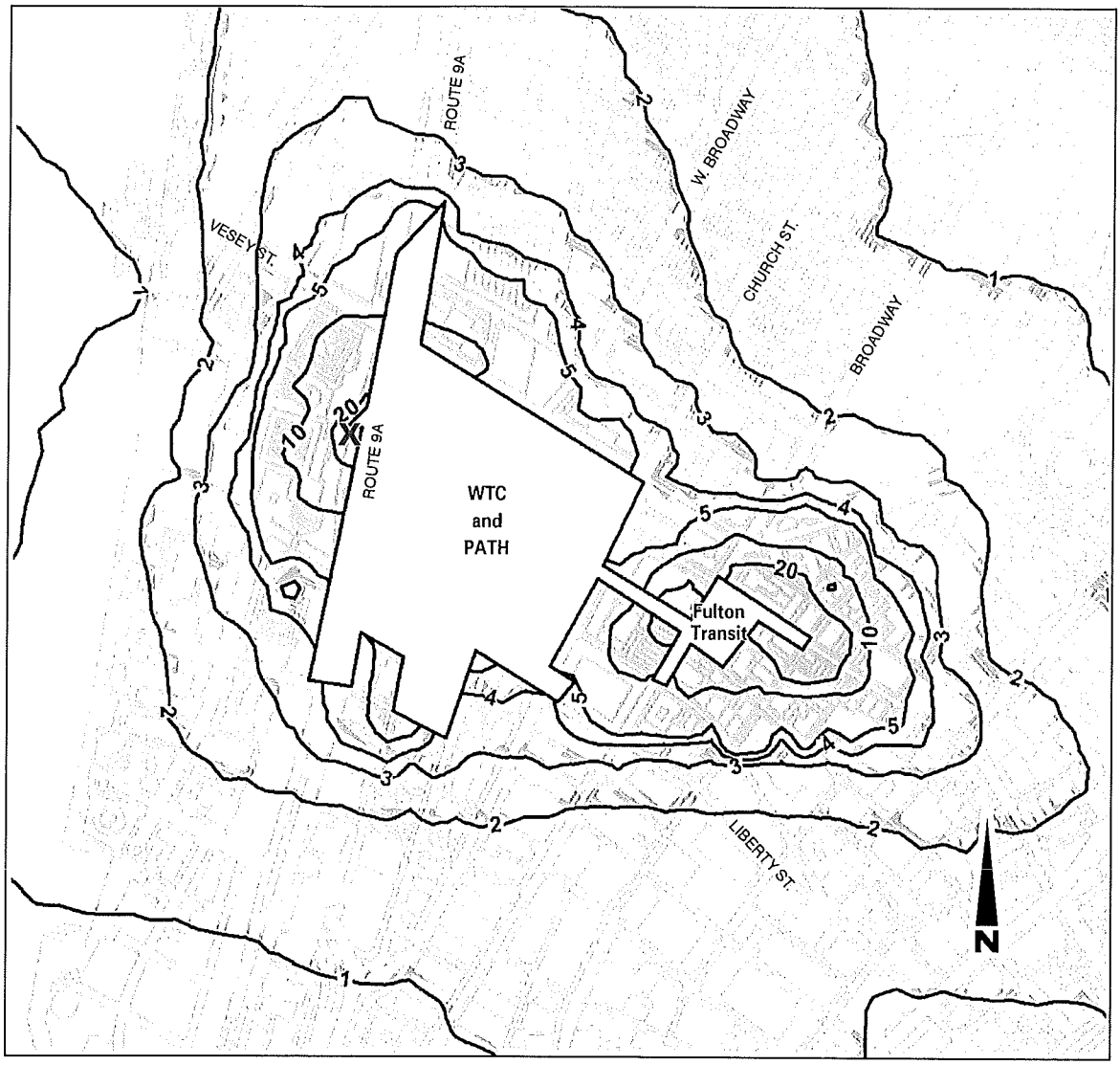


Figure 15-20

Maximum Predicted 24-Hour Average $PM_{2.5}$ Construction Increment

Cumulative with Route 9A Short Bypass Tunnel Alternative and Mitigation

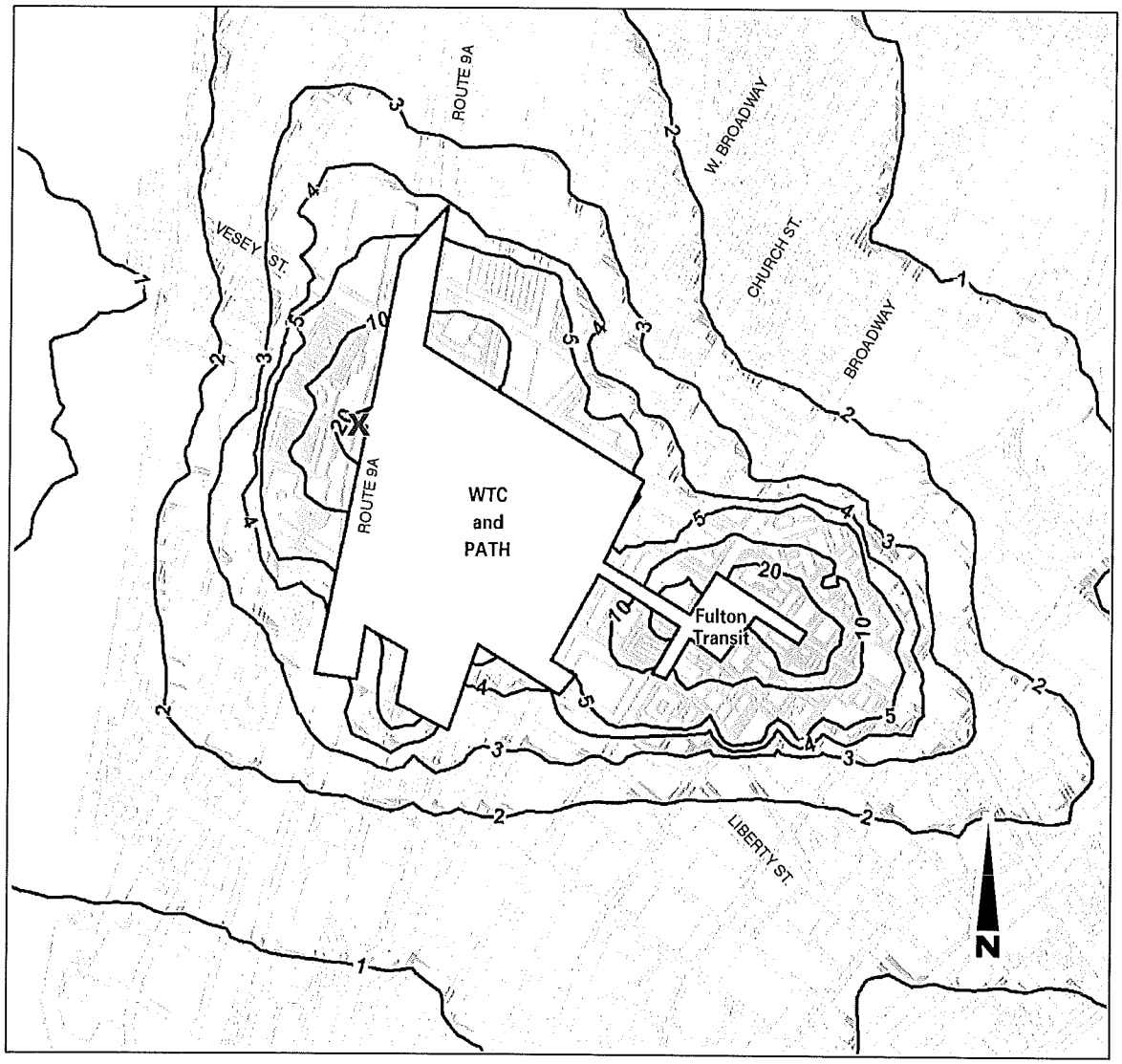


Figure 15-21

Maximum Predicted 24-Hour Average $PM_{2.5}$ Construction Increment

Cumulative with Route 9A At-Grade Alternative and Mitigation

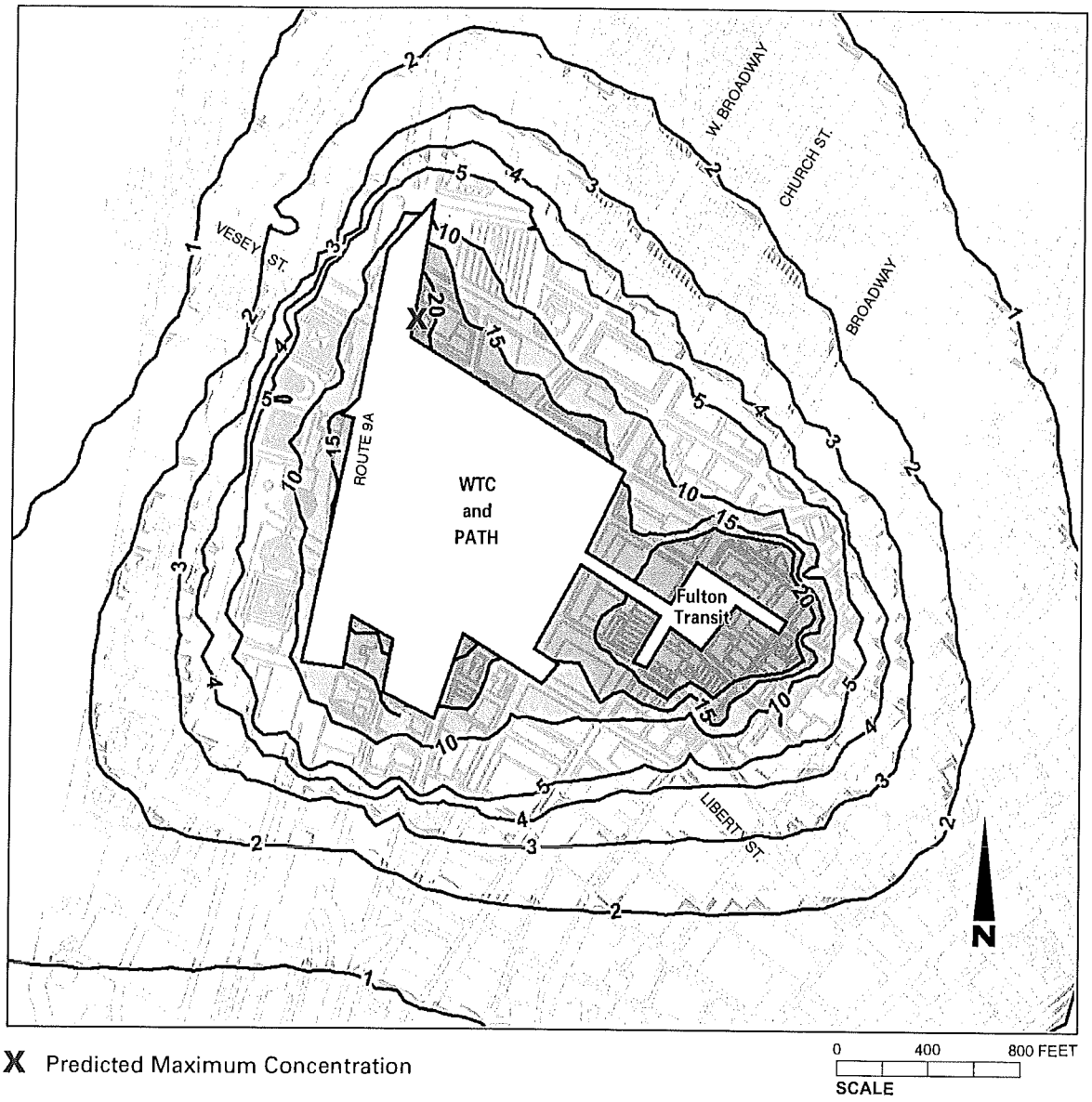


Figure 15-22

Maximum Predicted Annual Average NO_2
Construction Increment

Cumulative with Route 9A
Short Bypass Tunnel Alternative and Mitigation

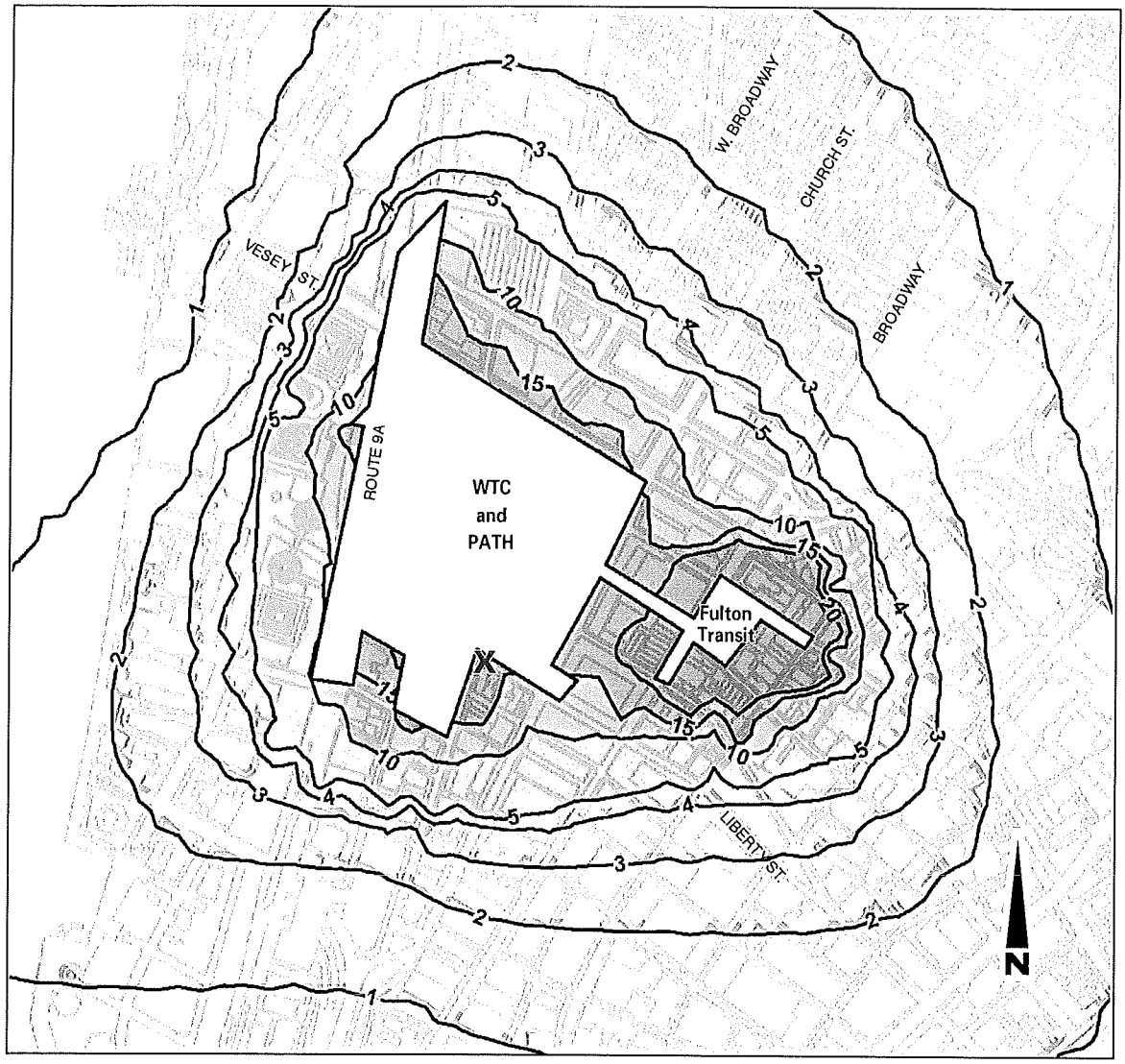


Figure 15-23

Maximum Predicted Annual Average NO_2 Construction Increment

Cumulative with Route 9A At-Grade Alternative and Mitigation

Table 15–9
Highest Predicted Increase in Pollutant Concentrations from Cumulative Construction of the Lower Manhattan Recovery Projects with Mitigation in the Critical Analysis Year

Pollutant	Average Period	Receptor Type	Maximum Increase [µg/m³]	
			With Route 9A Short Bypass	With Route 9A At Grade
NO_2	Annual	Highest of All Receptors	24.1**	21.3**
		Residential Buildings / Hotel	21.9**	21.3**
$PM_{2.5}$	24–hour	Highest of All Receptors	24.7*	28.2*
		Residential Buildings / Hotel	5.8*	5.7*
		Other Locations on Access Routes	0.4	0.4
	Annual	Local Highest of All Receptors	1.2*	1.1*
		Local Highest Residential / Hotel	1.0*	1.0*
		Local on Access Routes	0.17	0.17
		Neighborhood Scale	0.24*	0.25*
PM_{10}	24–hour	Highest of All Receptors	41.3	58.8
		Residential Buildings / Hotel	10.9	26.5
		Other Locations on Access Routes	4.5	4.5
	Annual	Highest of All Receptors	3.1	2.7
		Residential Buildings / Hotel	2.2	2.2
		Other Locations on Access Routes	1.4	1.4

Notes:
Interim guidance threshold levels for $PM_{2.5}$ are 5 µg/m³ and 0.3 µg/m³ for 24–hour and annual increases respectively, and 0.1 µg/m³ for neighborhood scale annual average. For determination of adverse impacts, these values are applied in the absence of specific criteria.

* Exceeds the interim guidance thresholds.

** Substantial adverse impact due to high increment predicted where existing background concentrations are high—not exceeding NAAQS (see table 15–10).

With mitigation, the maximum cumulative $PM_{2.5}$ increments would be reduced by approximately 66 percent. More importantly, the exceedance of the PM_{10} 24–hour NAAQS would be eliminated.

As shown in Figures 15-20 and 15–21, the extent of increments above local threshold levels would be significantly reduced, and the potential for exceedance of the $PM_{2.5}$ 24–hour NAAQS would be limited to a single location along the Route 9A bikeway. However, the occurrence of such high levels would depend on the coincidence of peak background levels above the 98th percentile together with peak construction activity and the extreme meteorological conditions that led to the concentration predicted in the model. Such an occurrence, although possible, would be rare. Furthermore, it would be a temporary situation, limited to a small area immediately adjacent to the Route 9A construction site and would not be expected to occur in subsequent years when construction activity would be reduced.

Table 15–10
Highest Predicted Total Pollutant Concentrations
from Cumulative Construction of the Lower Manhattan Recovery Projects with Mitigation in the Critical Analysis Year

Pollutant	Average Period	Receptor Type	Maximum Increase [µg/m³]	
			With Route 9A Short Bypass	With Route 9A At Grade
NO_2	Annual	Highest of All Receptors	96.1	93.3
		Residential Buildings / Hotel	93.9	93.3
$PM_{2.5}$	24–hour	Highest of All Receptors	71.7*	75.2*
		Residential Buildings / Hotel	52.8	52.9
		Other Locations on Access Routes	47.3	47.3
	Annual	Highest of All Receptors	19.3**	19.3**
		Highest Residential / Hotel	19.2**	19.2**
PM_{10}	24–hour	Highest of All Receptors	101.7	119.2
		Residential Buildings / Hotel	70.5	86.4
		Other Locations on Access Routes	63.6	63.6
	Annual	Highest of All Receptors	30.6	30.2
		Residential Buildings / Hotel	28.8	28.6
		Other Locations on Access Routes	28.8	28.8

Notes:

All total concentrations include calculated background contributions from local mobile sources, as well as measured regional background values as follows: NO_2—Annual average 72 µg/m³; $PM_{2.5}$—Annual average 17.1 µg/m³ (highest of 2000-2002 annual values); 24-hour average 44.0 µg/m³ (highest of the three 2nd highest 24-hour averages in 2000-2002); PM_{10}—Annual average 24 µg/m³; 24–hour average 50 µg/m³.

The NAAQS are as follows: NO_2—Annual = 100 µg/m³; $PM_{2.5}$—24–hour = 65 µg/m³ and Annual = 15 µg/m³; PM_{10}—24–hour = 150 µg/m³ and Annual = 50 µg/m³.

Cumulative and project–generated maximum concentrations may occur at a different time and/or location.

* Indicates predicted exceedance of new NAAQS for which the conformity process is not yet in effect.

** $PM_{2.5}$ annual average concentrations exceed the NAAQS in the existing background condition. See Table 15–9 for comparison with incremental thresholds.

Without enhanced mitigation measures, the predicted cumulative increase in NO_2 would not exceed the NAAQS. However, the use of electrification would reduce mesoscale NO_2 emissions substantially. Should this strategy be applied to the Route 9A Project, additional reductions in maximum NO_2 concentrations would be expected.

CONDITIONS WITH THE REVISED SCHEDULES

As described above, maximum $PM_{2.5}$ concentrations, including background and emissions from all construction projects, would increase significantly during construction, and in rare circumstances would exceed the 24-hour standard. NO_2 concentrations were also predicted to increase significantly but would not exceed the NAAQS. These results were predicted both with and without the additional mitigation measures.

Under the revised construction schedules, overall annual NO_x emissions would be lower. PM emissions from the construction of the WTC Memorial and Redevelopment Plan may be 8 percent higher than projected above; however, cumulative short-term PM concentrations should be somewhat lower since peak construction for the Fulton Street Transit Center would not overlap with peak construction for the WTC Memorial and Redevelopment Plan, Permanent WTC PATH Terminal, and Route 9A.

Annual PM emissions from the WTC Memorial and Redevelopment Plan would also be somewhat higher in the peak construction year. However, much of those emissions would be from equipment used to construct the towers, and the vertical dispersion of these emissions throughout the towers would result in lower ground-level results than if construction were concentrated at-grade. When considered cumulatively, the net result would likely be maximum annual $PM_{2.5}$ concentrations similar to those predicted above.

Therefore, the mitigation measures presented above would still be needed to ensure that potential exceedances are limited to the smallest area and shortest duration possible.

NOISE AND VIBRATION

PROBABLE IMPACTS

As discussed in Chapter 10, "Noise and Vibration," construction of the Preferred Alternative would result in adverse noise impacts at sensitive land uses in close proximity to the construction site. These results were based on an analysis of the expected construction activities and duration for the year 2006. The combination of noise from all pieces of equipment operating during the same time period was obtained from adding the L_{eq} values for each piece of equipment. Similarly, a cumulative noise analysis for the Lower Manhattan Recovery Projects has been conducted for a series of receptor locations, which are shown in Figure 15-24. (See Appendix D for information on the on-site and mobile sources assumed in the analysis.)

Table 15-11 shows maximum predicted 8-hour L_{eq} and 30-day L_{dn}/L_{eq} noise levels resulting from construction of the Lower Manhattan Recovery Projects, without mitigation. The predicted construction noise levels generated by the Preferred Alternative, without mitigation, are also shown for comparison. The predicted cumulative levels would exceed the recommended 8-hour L_{eq} and 30-day L_{dn}/L_{eq} thresholds at Sites 1, 2 and 3 but would not exceed the thresholds at Sites 4 and 5.

Table 15-12 shows the cumulative analysis at receptors further from the Project Site. The results at PS 89 indicate that construction traffic along Route 9A in conjunction with equipment several blocks away would not adversely affect ambient noise levels. Similarly, the results at the Embassy Suites and Gateway Plaza indicate that levels one block from the WTC site, west of Route 9A, would also not be adversely affected. The results do indicate that cumulative construction noise levels would exceed impact thresholds at 4 Albany Street and St. Peter's Church. However, the Permanent WTC PATH Terminal's construction would not be a major generator of these noise levels.

The cumulative analysis shows that construction operations would have adverse noise impacts at sensitive receptors adjacent to the various construction sites. In addition, these impacts would occur for a considerable period of time. Similarly, these projects would result in varying degrees of ground vibration, depending on the stage of construction, the equipment and construction

Table 15-11

2006 Cumulative Construction Noise Impacts at Permanent WTC PATH Terminal Receptors (in dBA)

Receptor Site	Location	Land Use Category	FTA Impact Criteria		Cumulative Noise Levels		PATH-Generated Noise Levels		Cumulative Impact	
			8-hour L_{eq}	30-Day *L_{dn}/ L_{eq}	8-hour L_{eq}	30-Day *L_{dn}/ L_{eq}	8-hour L_{eq}	30-Day *L_{dn}/ L_{eq}	8-hour L_{eq}	30-Day *L_{dn}/ L_{eq}
1	Hilton Millennium Hotel	Residential	80	84	95	93	80	74	Yes	Yes
2	114 Liberty Street	Residential	80	81	88	82	80	74	Yes	Yes
3	World Financial Center/Dow Jones, on West Street	Commercial	85	80	88	82	88	81	Yes	Yes
4	Barclay Street and Washington Street Intersection	Commercial	85	80	71	67	69	62	No	No
5	180 Broadway	Residential	80	89	79	77	66	60	No	No

Notes: The 30-day L_{eq} is for commercial uses and the 30-day L_{dn} is for residential uses. At sites 1, 2, and 5 with high ambient noise levels (L_{dn} > 65 dB), the recommended residential uses 30-day L_{dn} thresholds would be existing ambient + 10 dB (e.g. 74 dBA + 10 dBA = 84 dBA at Site 1).

Table 15-12

2006 Cumulative Noise Impacts at Other Nearby Receptors (in dBA)

Site	Location	Land Use Category	FTA Impact Criteria		Cumulative-Generated Noise Levels		Impact	
			8-hour L_{eq}	30-Day *L_{dn}/ L_{eq}	8-hour L_{eq}	30-Day *L_{dn}/ L_{eq}	8-hour L_{eq}	30-Day *L_{dn}/ L_{eq}
6	PS89 Playground	Public Facility	80	87	66	62	No	No
7	Embassy Suites	Hotel	80	81	75	71	No	No
8	Gateway Plaza	Residential	80	77	69	65	No	No
9	4 Albany Street	Residential	80	79	92	87	Yes	Yes
10	95 Trinity	Institutional	80	88	72	66	No	No
11	St Peter's	Church	80	85	81	76	Yes	No
12	West Broadway/Park Place	Residential	80	83	68	63	No	No

Notes: L_{eq} for commercial uses and L_{dn} for residential uses. Results are cumulative without mitigation measures.

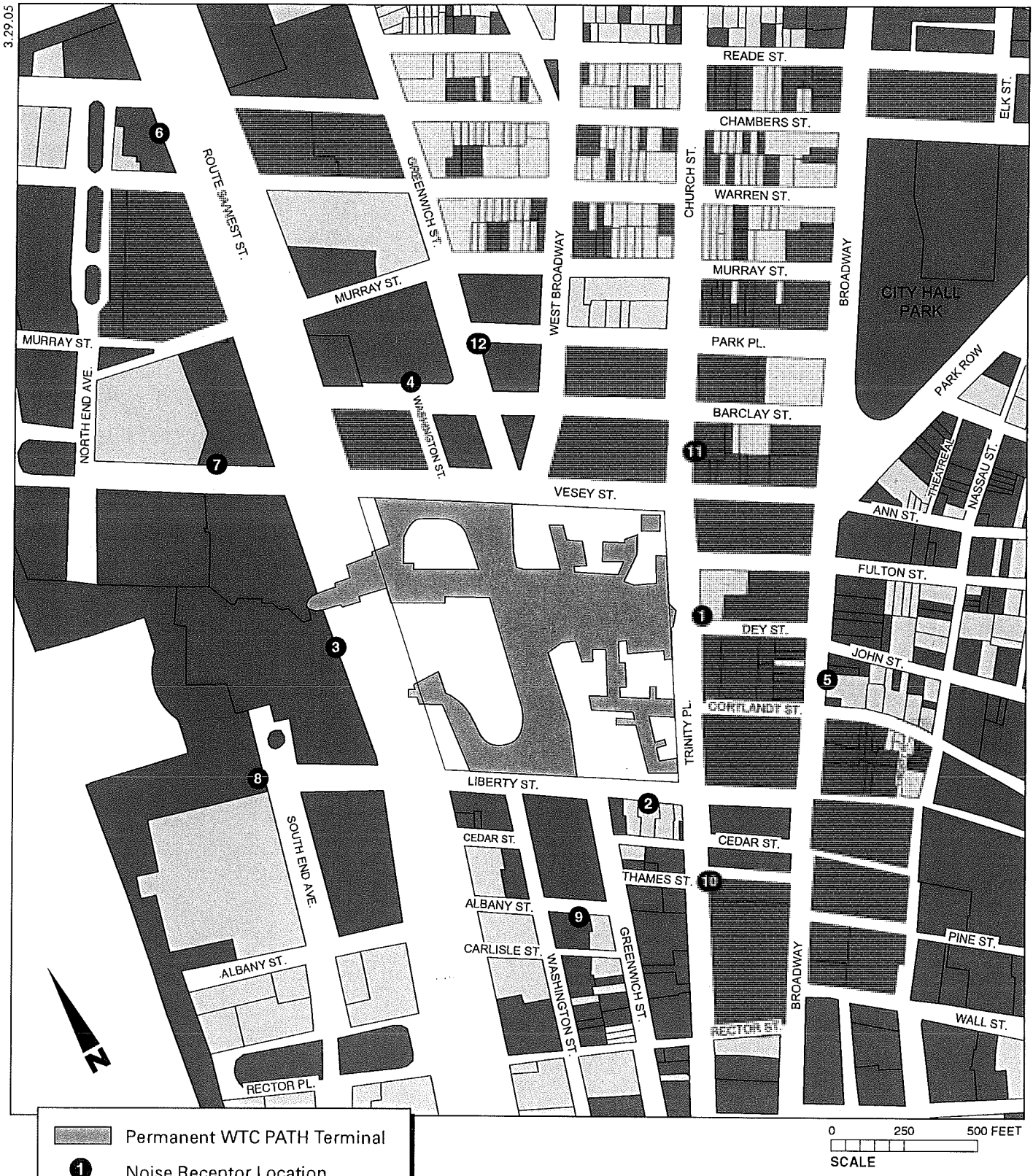


Figure 15-24

Cumulative Noise Receptor Locations and FTA Land Use Categories

methods employed, and the distance from the construction to buildings and vibration sensitive structures. Construction equipment such as pile drivers can produce levels that exceed the 0.12 and 0.20 inches per second vibration damage threshold criterion for fragile buildings at distances of 50 feet. At distances closer to the construction equipment (20 feet or less), additional equipment such as clam shovel drop, caisson drilling, and large bulldozers can produce levels exceeding the vibration threshold criterion for fragile and some extremely fragile buildings.

Figure 15-25 shows the historic/fragile buildings within a 90 foot radius from the Project Site, which captures any potential vibration problems from construction activity.

MITIGATION

As described in Chapter 10, "Noise and Vibration," the implementation of the mitigation measures listed in Table 10-15 would eliminate all construction noise impacts generated by the Preferred Alternative. As described in the executed MOA for the Permanent WTC PATH Terminal, PANYNJ, in consultation with the State Historic Preservation Officer (SHPO) and in coordination with other Lower Manhattan project sponsors, as appropriate, would develop a Construction Protection Plan (CPP) based on the requirements laid out in the "New York City Department of Buildings Technical Policy and Procedure Notice #10/88."

PANYNJ and the other Lower Manhattan project sponsors are also developing construction noise and vibration mitigation measures, examples of which are provided below. Implementation of these mitigation measures is expected to minimize or eliminate construction-related individual and cumulative noise and vibration impacts. The sponsors of the Lower Manhattan Recovery Projects—LMDC, MTA/NYCT, NYSDOT and PANYNJ—are coordinating their efforts through the Lower Manhattan Construction Coordination Group.

- The use of acoustic barriers and walled enclosures around certain construction activities. For example, noise tents/enclosures could be used around workers using jackhammers. A temporary noise barrier of 20-foot in height could be installed along the fence line/property line of the construction zone to reduce the noise levels. In addition, temporary barriers (e.g., wood panels on top of Jersey barriers) could also be positioned adjacent to and moved along slurry walls and other construction operations, etc.;
- The placement of construction equipment in shielded locations, such as below grade in the Project Site;
- The installation of silencers on jackhammers, air compressors, generators, light plants, and cranes to reduce noise levels at specific locations (i.e., adjacent to existing residential);
- The use of electrically operated equipment, rather than combustion equipment;
- The use of soil beds, timber planking and/or exterior rubber lining on truck body and aluminum carrying case to reduce rock impact noise during truck load/unloading operations;
- The use of drive-through street-level truck enclosures for truck loading and unloading;
- The use of sheds/enclosures at concrete pump sites during concrete truck unloading; and
- The placement of most loading/unloading inside the bathtub and away from areas at street level.
- The designation of central areas within projects for noisy activities, such as cutting steel or wood or use of noisy equipment such as impact wrenches. Use of pre-cut, pre-fabricated, or

modular construction materials that minimize need for on-site fabrication or cutting methods.

Measures to monitor construction noise levels would be undertaken throughout the construction period. These programmatic measures would be administered through either the Command Center and/or the Lower Manhattan Construction Coordination Group. These actions may include:

- Enforcement of designated truck routes during construction;
- Adherence to construction equipment noise performance standards specified by EPA and possible development of additional standards by the Lower Manhattan Construction Coordination Group;
- Noise monitoring before construction begins, to establish baseline noise levels, and ongoing monitoring during the various construction phases; and
- Evaluation of the noise reduction potential, and cost effectiveness, of alternative construction methods and/or changes to the sequencing of construction activities.

CONDITIONS WITH THE REVISED SCHEDULES

The analysis presented above showed 5 receptor sites that would experience significant adverse 8-hour L_{eq} noise impacts in the peak construction year without mitigation. Under the schedule refinements (see page 15-8), two of these sites, 4 Albany Street and 114 Liberty Street, would experience higher 8-hour L_{eq} noise levels than predicted above. However, there would be a slight decrease or no change in predicted levels for the World Financial Center, the Millennium Hotel, and St. Peter's Church; however, these sites would continue to exceed the FTA impact criteria.

The 30-day L_{dn}/L_{eq} noise levels would be higher with the schedule refinements at the 4 Albany Street, 114 Liberty Street, and 95 Trinity Street receptors as compared to the analysis presented above. These increases likely result from activities on the Deutsche Bank site that would occur in the peak year. Although the schedule refinements would result in some modest increases in noise levels, there would be no change in the number or location of 30-day, cumulative noise impacts in the peak construction year.

CULTURAL AND HISTORIC RESOURCES

PROBABLE IMPACTS

The EPCs specify that individual project sponsors consider the cumulative construction-period impacts to cultural resources within their respective Areas of Potential Effect (APEs). As described in Chapter 6, "Cultural Resources," the Permanent WTC PATH Terminal's APE contains 21 resources that are listed or are eligible for listing on the State or National Register of Historic Places. The assessments presented in Chapter 6 identified seven resources within the APE that may be impacted by the facility's construction. These resources are shown in Table 15-13 along with the potential impacts from the other Lower Manhattan Recovery Projects.

MITIGATION

Pursuant to the executed MOA for the Permanent WTC PATH Terminal, PANYNJ would prepare Construction Protection Plans (CPPs) for historic structures that may be impacted by construction period vibrations (see Appendix B). As stipulated in the MOA, these plans would

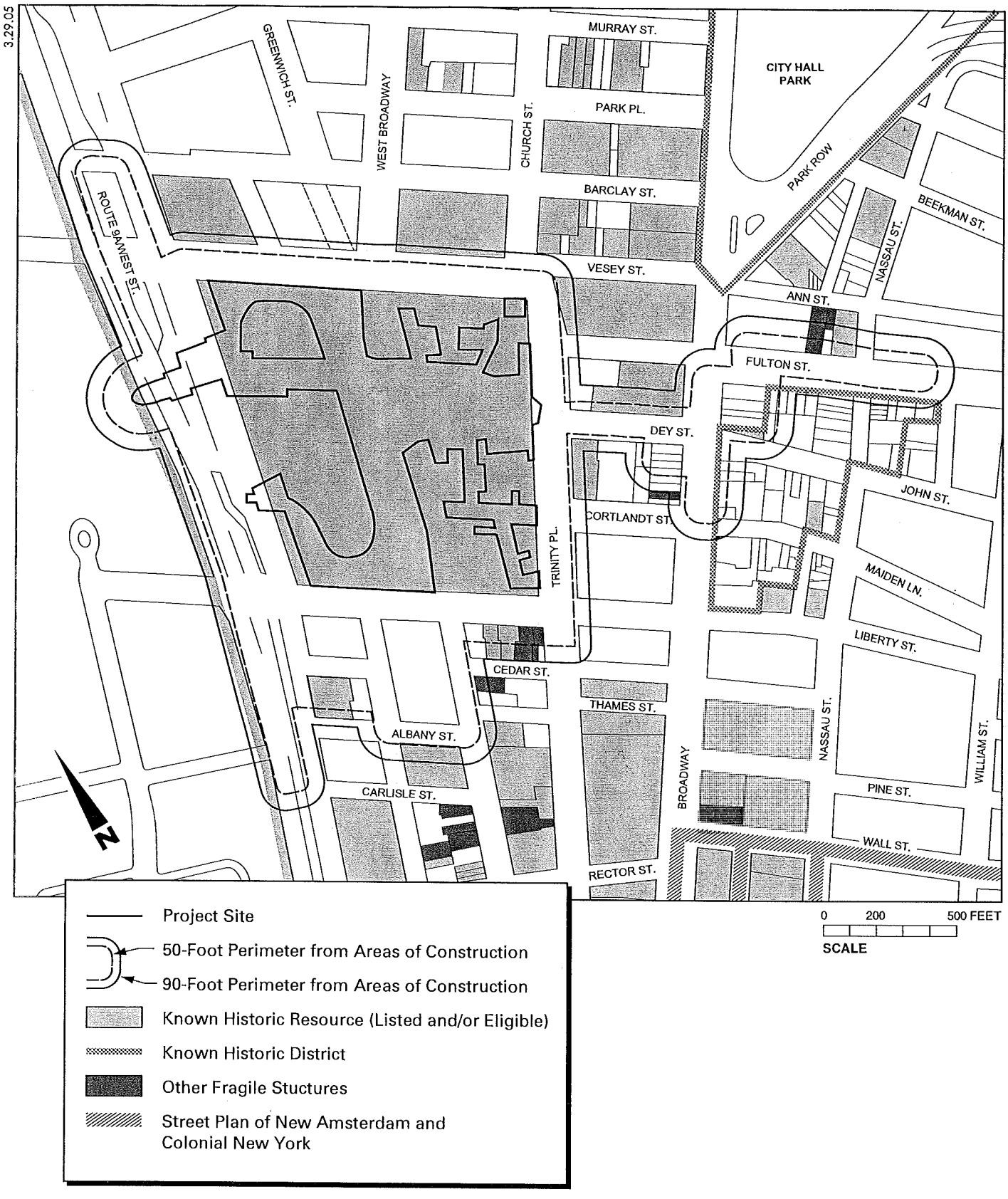


Figure 15-25

Known or Potential Historic Structures and Potential Vibration Areas from Cumulative Construction Activities

Table 15-13
Cumulative Effects to Known Historic Resources within the Area of Potential Effect for the Permanent WTC PATH Terminal

Resource	Project	Potential Impact
Hudson River Bulkhead Battery to West 59th St.	PATH	Potential disturbance during construction of the Route 9A pedestrian concourse
	Route 9A	Potential disturbance during utility relocation and potential vibration impacts
Barclay-Vesey Building 140 West Street	PATH	Potential vibration impacts
	Route 9A	Potential vibration impacts
	LMDC	Potential vibration impacts
St. Paul's Chapel and Graveyard	PATH	Potential vibration impacts
	LMDC	Potential vibration impacts
	FSTC	Potential vibration impacts
Former East River Savings Bank 26 Cortlandt Street	PATH	Potential vibration impacts
	LMDC	Potential vibration impacts
	FSTC	Potential vibration impacts
114-118 Liberty Street	PATH	Potential vibration impacts
	LMDC	Potential vibration impacts
Beard Building 125 Cedar Street	PATH	Potential vibration impacts
	LMDC	Potential vibration impacts
WTC Site	PATH	The Terminal's construction has an adverse effect on the WTC site; Potential archaeological sites in the eastern portion of the WTC site may be disturbed.
	Route 9A	The project has the potential to impact the site's west bathtub wall.
	LMDC	Potential archaeological sites in the eastern portion of the WTC site may be disturbed. The project has the potential to affect other remaining remnants and structures on the site.
	FSTC	The project would abut the Church Street frontage of the site.

Notes: PATH = Permanent WTC PATH Terminal (PANYNJ)
LMDC = World Trade Center Memorial and Redevelopment Plan (LMDC)
Route 9A = Route 9A Project (NYSDOT)
FSTC = Fulton Street Transit Center (MTA/NYCT)

be coordinated with NYSDOT, LMDC, and/or MTA/NYCT, as appropriate, for sites that may be cumulatively affected by construction. The CPPs would avoid or minimize the potential cumulative effects on seven of the nine historic properties identified in Table 15-13.

The Hudson River Bulkhead may be cumulatively affected by the construction of PATH's east-west concourse and by construction of Route 9A. As described in the executed MOA for the Permanent WTC PATH Terminal, PANYNJ would develop and implement a plan to locate and identify intact portions that would be affected by the concourse's construction. This plan would be developed in consultation with SHPO and in coordination with NYSDOT. In the event that intact portions of the Bulkhead are identified within the vicinity of the east-west pedestrian concourse, PANYNJ, in consultation with SHPO and in coordination with NYSDOT, would prepare a treatment plan for these portions of the Bulkhead.

The executed MOA also provides for stipulations to address potential cumulative effects from construction on the WTC site. As described in the MOA, PANYNJ would request that all agencies constructing projects within the WTC site submit preliminary and pre-final design documents to PANYNJ. PANYNJ and its designated historic preservation consultant would consult with SHPO and the Lower Manhattan Emergency Preservation Fund to asses whether there would be potential for a cumulative adverse effect from the Permanent WTC PATH Terminal and other WTC site projects based on the preliminary and pre-final plans. If SHPO and PANYNJ, agree that planned or completed activities would result in cumulative adverse effects on the WTC site, then PANYNJ would consider measures with respect to the Permanent WTC PATH Terminal to mitigate or minimize these effects, including technical or financial measures for the protection, stabilization, or repair of resources and/or modifications to the Preferred

Alternative's design. PANYNJ would make its documentation of potential cumulative effects and accompanying mitigation plans available for review by the National Park Service, the Advisory Council on Historic Preservation, the Lower Manhattan project sponsors, and the Section 106 consulting parties. PANYNJ's plans to minimize or mitigate adverse cumulative effects would also consider the stipulations within the Programmatic Agreements for the WTC Memorial and Redevelopment Plan, the Route 9A Project, and the Fulton Street Transit Center.

CONDITIONS WITH THE REVISED SCHEDULES

The refinements to the construction schedules would not alter the APEs for the Lower Manhattan Recovery Project or their potential impacts to the historic and archaeological resources identified in Table 15-13. Therefore, the cumulative effects findings presented above would not change with the schedule refinements.

ECONOMIC CONDITIONS

PROBABLE IMPACTS

The five Lower Manhattan Recovery Projects would create thousands of jobs during the construction period. Not only would these projects spur employment within Lower Manhattan, but they would provide jobs for the region, as a whole, with the off-site production of materials. These projects would also directly enhance the local economy with the expenditure of dollars for labor and materials and with the generation of tax revenues.

In addition to the effects on the local economy, businesses in Lower Manhattan would benefit from daily expenditures by the construction workforce induced by the recovery projects. This would provide an expanded customer base for retail and convenience stores, restaurants, delicatessens, and pharmacies.

Construction activities in general have the potential to disrupt business and retail operations as a result of restricted access for pedestrians (customers) and vehicles (deliveries). Construction of the Preferred Alternative itself is unlikely to directly restrict access for extended periods of time during its construction stage since most activities would be contained within the WTC site. Some access restrictions may occur on streets surrounding the WTC site with construction of the Route 9A pedestrian connection, but PANYNJ would work with NYSDOT and the NYCDOT to implement a Maintenance and Protection of Traffic (MPT) Plan to maintain movement through these areas to the extent possible (see Chapter 8, Section B, "Vehicular Traffic and Parking.")

Construction of the WTC Memorial and Redevelopment Plan is not expected to result in the long-term, full-closure of streets in Lower Manhattan because most construction activities would be within the WTC site itself. For activities that may require disruption to traffic, LMDC would develop a MPT Plan in coordination with the other project sponsors to ensure that access to local businesses is maintained throughout the construction period.

The Fulton Street Transit Center would include construction of the Dey Street Passageway between Broadway and Church Street and the pedestrian connector between the Cortlandt Street (R and W) subway station at Church Street and the E subway terminal on the WTC site. The construction at Dey Street would affect deliveries to Dey Street and in particular Century 21, a major department store in the area. Access to Century 21 could also be affected by construction truck traffic associated with the Preferred Alternative as well as the Fulton Street Transit Center,

the WTC Memorial and Redevelopment Plan, and NYCDDC's proposed reconstruction of Church Street.

Vehicular access to portions of Fulton Street would also be temporarily disrupted in certain locations; however, alternate access points would be made available for service and deliveries. For example, alternative loading areas could be established on the north side of Cortlandt Street during construction to enable truck access to Century 21.

As currently planned, NYSDOT would maintain four lanes of traffic through their construction zone during most periods of the day. In addition, NYSDOT has completed a pedestrian bridge across Route 9A at Vesey Street that would connect to an at-grade, protected pedestrian walkway along Vesey Street. Together these temporary measures would maintain access between Church Street and Battery Park City for businesses, workers, commuters, and residents.

MITIGATION

Chapter 5, "Socioeconomic Conditions," shows the EPCs and proposed implementation plans that pertain to business access and economic conditions. As per the guidance of the EPCs, the sponsors of the Lower Manhattan Recovery Projects are working with NYSDOT and NYCDOT to develop a Construction Management Plan (CMP) for Lower Manhattan that would coordinate the MPT plans of the individual projects. The CMP would ensure access is maintained through the area as individual projects proceed into their construction phases. This coordinated plan would help to minimize the potential adverse economic effects to business during the construction period.

The sponsors of the Lower Manhattan Recovery Projects would also provide for temporary signage to direct vehicles and pedestrians to businesses within the construction zone. These efforts would be coordinated between the sponsors and with the effected businesses to ensure that the maximum visibility for these businesses would be achieved.

CONDITIONS WITH THE REVISED SCHEDULES

The schedule refinements would delay construction of three of the five Recovery Projects, which could result in fewer cumulative effects in the peak construction year. However, these refinements would not alter the limits of the project site nor the necessary construction staging areas. As such, the effects to local businesses presented above would not change substantially with the schedule refinements.

D. PROBABLE OPENING YEAR (2009) AND DESIGN YEAR (2025) EFFECTS

The federal government has committed billions of dollars for the redevelopment and revitalization of Lower Manhattan. These funds recognize the devastating short- and long-term effects of the terrorist attacks to Lower Manhattan and the region, as a whole. As such, the five major Lower Manhattan Recovery Projects have been planned and coordinated to provide for the short-term recovery of facilities that were damaged or lost and the long-term economic vitality of Lower Manhattan, New York City, and the region as a whole.

Within the framework of each individual project's environmental review processes, alternatives are being evaluated for their potential direct and indirect environmental impacts. When considered cumulatively, some of these alternatives may limit the long-term benefits of the

Lower Manhattan recovery efforts. The assessment of short-term, construction-period impacts considered the cumulative effect of the Preferred Alternative, with the other Lower Manhattan Recovery Projects since this alternative would generate a greater number of impacts during the construction period than would the No Action Alternatives. Thus the above analysis is the most conservative of the alternatives for the Permanent WTC PATH Terminal. In the long-term, however, each of the alternatives for a Permanent WTC PATH Terminal has the potential for considerably different effects in the opening year (2009) and design year (2025). Thus, the long-term, operational effects discussion below provides a description of the potential benefits and limitations of both the No Action and Preferred Alternatives for the cumulative effects on the resource areas defined above.

NO ACTION ALTERNATIVE

In the long-term, the No Action Alternative would result in the full disruption of PATH service to Lower Manhattan at some point between 2009 and 2025. As such, the cumulative effect of the No Action Alternative on and with the other Lower Manhattan Recovery Projects would be detrimental.

The No Action Alternative could generate up to 1,200 new vehicle trips into Manhattan in the AM peak hour by 2025. These new vehicle trips would congest area roadways and would limit access to businesses for customers and deliveries. The No Action Alternative would also increase on-street pedestrian congestion since it would not provide for sub-grade concourses through the WTC site. Thus, there would be substantial crowding of crosswalks and sidewalks on and near the WTC site, resulting in reduced traffic flow. Furthermore, the larger volume of pedestrians that would cross Route 9A would limit the future roadway's ability to process vehicular traffic and may necessitate the construction of a pedestrian bridge.

Because the No Action Alternative would increase vehicular traffic in Lower Manhattan, it would increase emissions and noise levels. The cumulative effect of a No Action Alternative for the Permanent WTC PATH Terminal may degrade air quality and noise levels as compared to pre-September 11, 2001 conditions. Over the long-term, increased traffic congestion, reduced air quality, and higher noise levels would degrade the quality of life for Lower Manhattan's residents and workers.

Increased congestion associated with the No Action Alternative would limit access to, from, and within Lower Manhattan. This would degrade the ability of visitors to access the area's many cultural sites and would reduce the capabilities of local businesses to serve customers and get deliveries. Because the No Action Alternative may limit or fully disrupt direct transit service between Lower Manhattan and New Jersey, it may force residents, commuters, and visitors to use more costly or more time consuming modes of travel. By reducing access to and from Lower Manhattan, the No Action Alternative has the potential to stagnate the overall recovery of Lower Manhattan, including the full redevelopment of the WTC site.

PREFERRED ALTERNATIVE

The Preferred Alternative has been planned and designed in cooperation with the Lower Manhattan Recovery Projects in its vicinity including the Fulton Street Transit Center, Route 9A Project, and the WTC Memorial and Redevelopment Plan. In the long-term, these projects would collectively provide for the integration of land use and transportation in the vicinity of the WTC site and would be an enhancement over pre-September 11, 2001 conditions.

The Preferred Alternative would form a critical sub-grade pedestrian link between BPC, the WTC Site, PATH trains, and the Fulton Street Transit Center's Dey Street Underpass to provide all-weather access between Tran-Hudson Ferries and the World Financial Center and the majority of the subway lines that serve Lower Manhattan. Furthermore, the Route 9A connection would reduce at-grade pedestrian trips during peak commuter periods. As a result, traffic circulation would be improved in the vicinity of the WTC site, which has resultant economic, traffic, air quality, and noise benefits.

The collection of transit services that would be offered by the Preferred Alternative in concert with a new trans-Hudson ferry terminal; a Fulton Street Transit Center; and other potential transportation projects, such as JFK airport access, would strengthen Lower Manhattan's role as a regional transit hub. As such, the area would attract scores of daily commuters and visitors who would frequent local retail establishments such as shops and restaurants. Furthermore, the integration of numerous transit services with the ability to serve residents throughout the region would increase the attractiveness of Lower Manhattan as a center of commerce. ✳

A. INTRODUCTION

In accordance with the National Environmental Policy Act (NEPA) and the Council on Environmental Quality's implementing procedures under 40 CFR Part 1502, any environmental impact statement (EIS) prepared pursuant to NEPA must include an analysis of both the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity, and of any irreversible or irretrievable commitments of resources that would occur should the action be implemented (40 CFR 1502.16). This chapter addresses these concepts for the No Action and the Preferred Alternative. First, the permanent commitment of resources as compared to the benefits of the project is assessed. This analysis is followed by an analysis of the relationship between expending environmental resources in the short-term and gaining productivity in the long-term. This chapter ends with a description of the funding sources for the project and describes how the commitment of these funds may affect other proposals within the New York City region or elsewhere.

B. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The No Action Alternative, by definition, would not irreversibly or irretrievably commit resources for construction. However, this alternative would require a greater commitment of a variety of resources in the future due to its failure to improve the accessibility and efficiency of the Region's transportation system.

Resources that may be irreversibly and irretrievably committed to the Preferred Alternative include construction materials, energy, labor, funds, and land. Materials, energy supplies, and labor used to construct the Preferred Alternative are not in short supply, and their use would not have an adverse impact on their continued availability for other projects. Furthermore, construction expenditures are consistent with public policy initiatives to revitalize Lower Manhattan (see Section C, "Cost and Funding").

The total commitment of funds required for construction of the Preferred Alternative, including its pedestrian connections, is estimated at $2,138 billion in 2003 dollars. As described in Chapter 5, "Socioeconomic Conditions," this commitment of financial resources would add to local and regional economic activity and thus add employment and tax revenues in the region.

As shown in Table 16-1 the Preferred Alternative would generate 19,965 person-years of employment during the construction period, which would translate to $1,184.9 million in wages and salaries. The direct expenditures for construction combined with induced expenditures within the region from the employment it would generate would result in $3,970.6 million in expenditures within New York State. Government entities would also benefit from increased tax

Table 16-1
Employment and Fiscal Benefits from Construction of the Preferred Alternative

Employment (in person-years)*	
Direct (Construction)	10,533
Indirect (Secondary and Induced)	9,432
Total	19,965
Wages and Salaries (in millions of dollars)	
Direct (Construction)	$661.5
Indirect (Secondary and Induced)	$523.4
Total	$1,184.9
Total Economic Output or Demand** (in millions of dollars)	
(Millions)	
Direct (Construction)	$2,138.0
Indirect (Secondary and Induced)	$1,832.6
Total	$3,970.6
Tax Revenues***	
New York City Taxes	$46,485.5
MTA Taxes	$2,963.0
New York State Taxes	$96,809.5
Total	$146,258.0

Notes:

* A person-year is the equivalent of one person working full-time for a year.

** The economic output or total effect on the local economy derived from the direct construction spending.

*** Includes personal income taxes, corporate and business taxes, sales tax on indirect expenditures, and numerous other taxes on construction and secondary expenditures. Values are expressed in constant 2003 dollars.

Sources: The characteristics and construction cost of the Project Alternative; the Regional Input-Output Modeling System (RIMS II), U.S. Department of Commerce, Bureau of Economic Analysis; and the tax rates by applicable jurisdiction.

revenues resulting from construction. Under the Preferred Alternative, more than $146 million in tax revenues would be generated by construction-period payroll taxes, sales taxes, and other tax revenue sources.

As described in this EIS, construction of the Preferred Alternative would or potentially would adversely impact historic and archaeological resources, vehicular traffic circulation, access to local businesses, air quality, and noise and vibration.

The Port Authority of New York and New Jersey (PANYNJ) would endeavor to minimize impacts wherever practicable. To that end, it has established and implemented Environmental Performance Commitments (EPCs) and is developing Sustainable/"Green" Design Standards. Furthermore, the Federal Transit Administration (FTA) and PANYNJ have executed a Memorandum of Agreement (MOA) that stipulates measures to avoid, minimize, or mitigate specific impacts to historic resources during the project's construction.

As described in Chapter 2, "Project Alternatives," and Chapter 3, "Construction Methods and Materials," PANYNJ has coordinated with the Lower Manhattan Development Corporation (LMDC), New York State Department of Transportation (NYSDOT), and Metropolitan

Transportation Authority (MTA) to develop EPCs that would avoid or minimize the impacts to the environment during construction of their respective projects. These EPCs specifically address five key environmental concerns: air quality, noise and vibration, cultural and historic resources, access and circulation, and economic effects. Collectively, the EPCs would reduce traffic delays, air quality emissions, noise, and vibration and would minimize effects to the surrounding environment through efforts to maintain access to local businesses, residences, and cultural institutions and resources during the construction period.

The EPCs also established general guidance for the preparation of "green" design and sustainability principals to reduce the demand for and use of resources during construction and once projects are complete. As described in Chapter 2, "Project Alternatives," PANYNJ is developing sustainable design guidelines for the Preferred Alternative. Proposed principals and actions will be organized into six component areas: urban considerations, site, water, energy, materials, and indoor environment. These guidelines are consistent with criteria contained in the New York City Transit Environmental Guidelines, the U.S. Green Building Council's Leadership in Energy Efficiency (LEED) Guidelines 2.1, and requirements of New York State Executive Order 111 and the New York State Green Building Tax Credit. The guidelines would facilitate reuse of or reduced demand for water, energy, and solid waste when the Preferred Alternative is operational. Other measures would promote development that is sensitive to the environment by encouraging users to decrease their demand for nonrenewable resources. PANYNJ's would achieve these guidelines by implementing a number of plans and protocols to minimize demand for and use of resources during and after construction (see Chapter 2, Project Alternatives," and Chapter 11, "Infrastructure and Energy").

In the long-term, the Preferred Alternative would occupy land within and outside the WTC site. The proposed Terminal building and most of its sub-grade concourses would be located within the WTC site, which is owned by PANYNJ. The proposed Route 9A pedestrian connection would extend below Route 9A to a new head house in front of the World Financial Center. The Route 9A connection would occupy land that is not currently controlled by PANYNJ. However, PANYNJ would establish easements and agreements with the property owners prior to construction. The only portion of the Route 9A connection that would be located above-grade would be within the lawn in front of the Winter Garden. Although the new head house would irreversibly commit land to the project, it would provide for substantial benefits to current and future users of Battery Park City and the World Financial Center.

The Permanent WTC PATH Terminal would permanently occupy portions of the approximately 16-acre WTC site. Thus, the Preferred Alternative would irreversibly commit historic land to the project. However, the executed MOA provides for measures to avoid, minimize, or mitigate the project's long-term impacts to the WTC site. As described in Chapter 6, "Cultural Resources," the MOA includes stipulations to preserve certain remnants and structures that remain and to mitigate the project's impacts to other remnants and structures.

The Preferred Alternative would require the irreversible and irretrievable commitment of energy sources both during and after construction.

C. SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

Short-term effects on the environment result from construction impacts. Long-term effects relate to the maintenance and enhancement of long-term productivity—in particular, the consistency of the project with long-term economic, social, and regional and local planning objectives,

including sustainability. The short- and long-term effects of the Preferred Alternative are summarized below.

SHORT-TERM USES

As described elsewhere in this EIS, the Preferred Alternative would have greater "short-term" impacts during construction than the No Action Alternative. Generally, the short-term construction impacts of the Preferred Alternative would be associated with traffic circulation, noise and vibration, air quality emissions, and access to local businesses. PANYNJ would endeavor to reduce these impacts through the EPCs, stipulations of its MOA, and sustainable construction techniques identified in the design guidelines. The Project's construction would create economic benefits in the form of jobs and the subsequent direct and indirect demand for goods and services (see Table 16-1).

LONG-TERM PRODUCTIVITY

The ability of transportation systems to conveniently serve major residential and employment centers is one of the essential components in economic growth and productivity as well as a key factor in improving the livability of neighborhoods; this is particularly true for the New York metropolitan area, and for the economic engine represented by Lower Manhattan.

Before September 11, 2001, nearly 426,000 people worked south of Canal Street, representing 19 percent of Manhattan's total of 1.9 million private sector jobs. However, the terrorist attacks resulted in the loss more than 71,000 jobs south of Canal Street. The renovation and reoccupation of damaged buildings, construction of new buildings, and redevelopment of the WTC site would result in a total of approximately 422,000 jobs south of Canal Street by 2025, which represents a very slight decrease in Lower Manhattan's employment as compared to pre-September 11, 2001 conditions.

The anticipated return of Lower Manhattan's employment is dependent on access to the area from the region's major residential areas. As described in Chapter 1, "Purpose and Need," approximately 16 percent of Lower Manhattan's workforce resided in New Jersey before September 11, 2001, the majority of which traveled by PATH. By improving the transportation infrastructure, the Preferred Alternative would help maintain Lower Manhattan's attractiveness as a global center of finance and commerce. Furthermore, since Lower Manhattan and the City contribute greatly to the economy of the tri-state area, the region would see long-term productivity benefits from the project.

As described in Chapter 8, Section B, "Vehicular Traffic and Parking," the absence of a Permanent WTC PATH Terminal, the No Action Alternative, has the potential to generate new vehicle trips from the diversion of PATH customers to other modes of transit, private automobiles, buses, and commuter vans. By 2025, it is estimated that absent the Preferred Alternative, a total of 1,194 AM peak hour new vehicle trips may be generated. These new vehicle trips would contribute to congestion on local roads as well as at the major portals to Lower Manhattan from New Jersey. Thus, the No Action Alternative may have adverse impacts on regional traffic flow.

Absent the Preferred Alternative, new vehicle trips would contribute to degradation in air quality and noise in Lower Manhattan and the region as a whole. If PATH service between New Jersey and Lower Manhattan is not available in 2025, it is estimated that vehicle trips by diverted PATH customers would emit approximately 15.7 tons per year of volatile organic compounds,

18.0 tons per year of nitrous oxides, 1.5 tons per year or more of particulate matter, and 236.0 tons per year of carbon monoxide in 2025. These new vehicle trips would also increase noise levels near the major portals between New Jersey and Lower Manhattan as well as on the local streets in the vicinity of the WTC site.

As described in Chapter 8, Section A, "PATH" and Chapter 8, Section C, "Transit," the No Action Alternative may result in the overcrowding of the other transit modes that serve or conveniently connect with Lower Manhattan. By 2025, it is estimated that diverted PATH customers could increase ridership on the uptown PATH routes by 4,583, on New York City Tranist subways by 11,611, on New Jersey Transit Commuter rail by 5,500, on buses by 7,495, and on trans-Hudson ferries by 10,694. In order to accommodate this demand, operators would need to provide additional trains, buses, and vessels. Furthermore, the increased crowding of transit vehicles and stations would have adverse impacts to their operation.

The Preferred Alternative would not only avert the adverse impacts of the No Action Alternative but would also provide for improved PATH service as compared to the pre-September 11, 2001 and temporary WTC facilities.

- It would provide for an additional platform to increase capacity and reduce crowding during peak periods.
- It would fully restore the pedestrian connections that existed before September 11, 2001 and provide for new concourses to trans-Hudson ferries, and the Fulton Street Transit Center.
- It would replace the temporary station's 8-car platforms with 10-car platforms, which would allow PANYNJ to operate 10-car trains on the Newark-WTC route.
- It would provide for the operational flexibility to support PATH's long-term service plans.
- Its design would incorporate advanced technologies to enhance security and reduce energy demand.

As described above, the long-term benefits to productivity and related long-term increases in productivity, addressed by the Preferred Alternative, would include the following:

- Support the region's economic development;
- Improved regional and local accessibility;
- Reduced vehicle trips;
- Reduced congestion and overcrowding on other transit systems;
- Reductions in mobile source air pollutants;
- Reductions in traffic generated noise; and
- Improved PATH service.

Overall, the resources to construct and operate the Preferred Alternative would be committed to benefit commuters to and residents of Lower Manhattan. The Preferred Alternative would benefit the New York region by improving access to, from, and within Lower Manhattan. It would offer reductions in station crowding and operational delays as compared to pre-September 11, 2001 conditions. Furthermore, the Preferred Alternative would result in overall reductions in travel time and cost, vehicle trips, and air quality emissions as compared to the No Action Alternative.

SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

Local short-term impacts in use of resources resulting from the construction of the Preferred Alternative would be consistent with the maintenance and enhancement of long-term productivity for the city, state, and region. Some resources that would be valuable in the short term are being spent to achieve higher productivity in the long term. By investing these resources in future productivity, and over the long term, fewer resources would be needed to achieve the same level of productivity than if a No Action Alternative were pursued.

D. COST AND FUNDING

As described in Chapter 2, "Project Alternatives," the estimated cost to construct the Preferred Alternative is $2,138 billion. This cost includes constructing the terminal house; four sub-grade levels; rehabilitation of the tracks and platforms; off-site pedestrian connections; ventilation structures; and the necessary infrastructure work to support the PATH Terminal. The project cost also accounts for the advanced security measures that would be incorporated into the design as well as the sustainable design standards and mitigation of the adverse impacts of the Preferred Alternative.

A total of $1.75 billion would be funded by the Federal Transit Administration as part of the $4.55-billion dollar transportation recovery package, which was committed by the federal government to the City following the terrorist attacks of September 11, 2001. The remaining $388 million would be funded by PANYNJ through their capital improvement program.

The $4.55-billion transportation recovery package was committed to New York City by the federal government to fund transportation projects that support the City's long-term, economic recovery from the terrorist attacks. New York State Governor George Pataki identified four projects for early funding under the transportation recovery package as follows:

- Permanent WTC PATH Terminal;
- Fulton Street Transit Center;
- South Ferry Terminal; and
- The Route 9A Project.

Although Governor Pataki has identified other projects within New York City that may be supported with these funds, the four priority projects are being advanced first.

Because the transportation recovery package is dedicated to New York City, funds must support transportation projects that directly benefit the City. Should any of the four priority projects not advance as planned or if actual costs are lower than currently projected, the additional funds would be used to support the other transportation improvements that have been identified by Governor Pataki.

PANYNJ has planned for contingency costs within the project's budget should construction overruns occur. In the event that the project exceeds the estimated $2,138 budget, PANYNJ, the State of New York, and the federal government would cooperate to ensure that the project is completed. ✳

A. INTRODUCTION

This chapter identifies safety and security considerations related to the design, construction, and operation of the Preferred Alternative. The project would feature advanced safety and security systems and procedures to protect passengers, workers, and the local community. The chapter addresses procedures to be implemented both during the project's construction and once the Terminal is in operation.

B. CONSTRUCTION PERIOD (2006)

The Port Authority of New York and New Jersey (PANYNJ) and the Port Authority Trans-Hudson (PATH) Corporation have extensive experience managing safety and security in both the construction and operation of complex projects. Using this experience, as an initial and key step in the development of the construction plan for the Preferred Alternative, PANYNJ would develop a detailed, overall Health and Safety Program (HASP), which would consist of several individual HASP plans to be implemented throughout all aspects of the project's construction.

The HASP plans developed and implemented by each contractor would require that detailed work scopes be reviewed and approved by PANYNJ to ensure safety in each task, and that equipment, materials, controls, crew size, job responsibilities, operating procedures, and maintenance practices be addressed, implemented, and audited for safety. The HASP plans would identify potential safety concerns and describe methods to protect construction workers and the general public from exposure to contaminants present in air, soil, ground water, building materials, and buried structures encountered at the site. The management plans would contain the methods to be used in handling, staging, disposal, transport, and decontamination of equipment and personnel in accordance with local, state, and federal regulations. Further, the management plans would contain a list of licensed waste haulers and disposal facilities that would accept each of the above noted hazardous materials.

The HASP will include worker training and required safety courses, monitoring requirements, use of personal protection equipment (PPE), contaminant action levels, identification of potential contaminants, Soil Management Plan, Groundwater Management Plan, Dust Management Plan, development and implementation of management plans to address polychlorinated biphynels (PCBs) and asbestos, and air monitoring equipment. Further, the HASP will address preventative measures to narrow down or eliminate potential exposure pathways and corrective actions if exposure occurs. If contaminant concentrations are exceeded during construction, then all activities will cease and the appropriate remedial actions would be undertaken as noted in the HASP.

As described in Chapter 12, "Contaminated Materials," additional protocols would be established to protect the general public and the environment throughout the construction period with respect to the disturbance of any contaminants and/or hazardous materials. In addition, the

HASP plans would include and acknowledge compliance with specialized training requirements for track safety as set forth by PATH System Safety requirements for any construction along or adjacent to active PATH property. PANYNJ, through its contractors, would use preventative as well as responsive measures in managing and controlling hazards. These would include inspections, self-assessments, and testing to identify problem areas. PANYNJ would implement an audit program to ensure all contractors are in conformance with their individual HASP plans and the project-wide HASP. Contractors will also comply with safety aspects as they pertain to U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) or Mining Safety and Health Administration (MSHA) regulations.

The construction of the Preferred Alternative would occur within, above, and around the temporary WTC PATH station. PANYNJ has been and would continue to develop a detailed staging plan to both maintain and protect PATH operations during the construction period. This would include a Maintenance and Protection of Traffic (MPT) plan that provides specific measures to protect riders using the temporary WTC PATH station. Specific measures may include scaffolding, safety barriers, detour routes, safety officers, and informational and directional signage. Activities that pose greater risk to PATH customers would be conducted at night or on weekends with an adjusted service schedule to ensure the protection of riders. With these measures, access to the temporary PATH station would generally be maintained throughout the construction of the Preferred Alternative.

During the construction period, PANYNJ would maintain off-site pedestrian patterns similar to current conditions in Lower Manhattan. The existing perimeter wall surrounding the WTC site would be maintained both for public viewing of the site and the protection of pedestrians. Pedestrian diversions to Cortlandt or Cedar Street would be facilitated, if necessary, with traffic control officers, signage, and barricades, focusing on the safety of pedestrians crossing Church Street. For construction activities on Route 9A associated with the Permanent WTC PATH Terminal, PANYNJ would coordinate with New York State Department of Transportation (NYSDOT) to develop a plan to maintain and protect pedestrian access during the construction period, similar to methods that would be employed for the protection of pedestrians on Church Street.

Since September 11, 2001, PANYNJ and its contractors have implemented strict security procedures for access to the WTC site. These procedures include pre-clearance and photo identification for all personnel that visit the site, checkpoints and inspections of materials being delivered to the site, and 24-hour monitoring of activities on and near the site. PANYNJ would continue to use these procedures to protect the PATH riders, the general public, and construction workers during and after construction of the Permanent Terminal.

C. OPENING YEAR (2009) AND DESIGN YEAR (2025)

The terrorist attacks of September 11, 2001 have elevated national attention toward personal safety, and the security of the Preferred Alternative and the WTC site is of paramount concern to PANYNJ. From the inception of the design process, the development of the project has included safety security operations as a fundamental planning and programming element. Plans for all aspects of train safety, station safety, and safety in other facilities are a key component of the design for the Terminal. The safety and security benefits to be provided by the project would contain pre-September 11, 2001 standard security measures such as surveillance, lighting, emergency communications, and egress, but would also include advanced systems such as structural hardening, redundancy, and air monitoring and detection systems.

PANYNJ commissioned the creation of a security master plan document. This document was developed through the partnership of a team, which consisted of PANYNJ, architects, civil engineers, geotechnical engineers, structural engineers, landscape architects, electrical engineers, mechanical engineers, fire protection engineers, security engineers, transportation and traffic engineers, and numerous other specialists. The purpose was to reach an informed consensus of rational and justifiable threats, vulnerabilities, and mitigating strategies to be included as part of the design guidelines for the Preferred Alternative and the WTC Memorial and Redevelopment Plan. Absent the Preferred Alternative (the No Action Alternative), elements of the WTC Memorial and Redevelopment Plan, including their associated security measures, would be developed at the WTC site. However, the advanced security measures intended as part of the coordinated master plan may not be fully realized.

Safety and security considerations would be embodied in the Preferred Alternative's civil designs through consideration of vehicular access, control, and careful validation of their cargo. Utility type, redundancy, locational placement, and protection would also be managed under the security master plan guidelines. Control and management of vehicular access and approach to pedestrian plazas would be carefully regulated by urban-sensitive designed streetscape. The enforcement of vehicular standoff distances to critical utilities, infrastructure, and the iconic structures would be provided through integrated site civil and landscape design elements.

Architectural designs would include the specification of façade and exterior glazing systems responsive to exceptional natural events, as well as the additional design loads created by explosive events delivered by vehicles and/or persons with the consequent capability of greatly enhancing life safety. These designs would also respond to emergency evacuation and crowd management protocols based on historical experiences, governing codes, and security master plan guidelines that acknowledge a need for anticipating the failure of normally available systems, protective designs, and human management intervention. This would be achieved by the implementation of carefully planned emergency egress, including areas of refuge, increased stair and exit path sizing, exiting route locational diversity and redundancy, airborne contaminant compartmentalization and purging, way finding clarified through sight lines and destination recognition, signage, graphics, and other remaining architectural design features.

Mechanical, electrical, and fire protection systems shall be provided to achieve an enhanced level of fault tolerance, in excess of code requirements. This would be achieved through additional pressurization and purging of pedestrian environments and the implementation of additional heating, ventilation, and air conditioning (HVAC) control zones for unique areas that would be at an elevated level of risk, including vehicle screening areas, command and control centers, car parking areas, loading docks, mailrooms, messenger centers, and lobbies. Fire protection, detection, and associated emergency voice communication systems would have enhanced fault tolerant operational capabilities through the application of redundant water sources, pumps, distribution and control apparatus, bi-directional communication systems, and linkage to backup monitor and control sources. The roof of the Terminal's east-west connection to the World Financial Center, which is below the proposed extension of Fulton Street, will be reinforced to support the future roadbed. The hardened road bed of Fulton Street would provide for enhanced security within the Terminal's east-west concourse. The road bed would protect the concourse in the event of a fire or explosion at street level.

Electronic security countermeasures, including video surveillance, intrusion detection, control of both vehicular and pedestrian access, badge/identity authentication, and emergency voice communications are envisioned to be included as part of each stakeholder occupancy

(transportation terminal, commercial, retail, hospitality, cultural, memorial, and support infrastructure), as well as being centrally coordinated so that individual stakeholder facility security systems are competently managed as part of a WTC site-wide electronic campus master plan. This would provide the opportunity for each stakeholder's investment in security systems and staffing to be added to the collective investment made by all other WTC facilities, including the Permanent WTC PATH Terminal, essentially creating an efficiently managed security precinct. This would exceed the crime prevention performance of similar security programs embodied in the Business Improvement Districts (BIDs) currently in operation elsewhere in Manhattan.

The security design criteria to be incorporated at the WTC site, including the Preferred Alternative, is based on nationally recognized and accepted standards used by the U.S. General Services Administration, U.S. Department of State, U.S. Department of Interior, U.S. Department of Justice, U.S. Department of Homeland Security, U.S. Department of Transportation, Standard for Testing and Materials, American National Standards Institute, and other similar testing agencies and standard setting institutions. Criteria will also consider principles of Crime Prevention through Environmental Design.

The entire PATH system must conform to U.S. Department of Transportation Federal Railroad Administration (FRA) standards for safety and security. The system is regularly inspected; staff is frequently trained, and safety is a key component of PATH's operating and maintenance procedures. Recently, PATH underwent close inspection of its cars, equipment, and infrastructure as part of the restoration of service to the WTC site. PANYNJ and PATH collaborated with FRA through this process and results were positive, allowing for the station's opening.

PANYNJ commissioned training and coordination of communications and life safety systems prior to the opening of the temporary WTC PATH station. Similar procedures would be conducted as part of the planning, development, and opening of the Preferred Alternative.

The Preferred Alternative would meet National Fire Protection Association (NFPA) 130 standards for fixed guideway transit systems for fire protection and egress; and PANYNJ, in coordination with city, state, and federal law enforcement agencies, would develop detailed security plans for the Terminal. It is anticipated that the PANYNJ Police Department would be responsible for normal policing of the Terminal and that the New York City Police Department (NYPD) would provide support and/or command and control for exceptional emergency situations as determined by PANYNJ and the New York City Office of Emergency Management. To increase the effectiveness of police activities, it is envisioned that the resources of the PANYNJ Police Department, NYPD, Fire Department of New York, New York City Department of Transportation, NYSDOT, Metropolitan Transportation Authority, and other established law enforcement, transportation, emergency response, and planning agencies would contribute through an interactive process of standards development and design review, as facilities emerge from their respective design phases to implementation. The intention is to provide an unprecedented level of interagency interoperability, which would be more effectively managed by the design and construction of an innovative New York City neighborhood whose conception included security and safety design principle developed by a consortium of design, security, planning, law enforcement, and emergency response professionals. ✷

Chapter 18: Agency Coordination, Process, and Public Participation

A. INTRODUCTION

This chapter presents a summary of the process used to encourage public participation performed to date for the Permanent World Trade Center (WTC) PATH Terminal environmental review, including forums for agency and public participation. This chapter also describes the various regulatory approvals that are required by federal, state, and local agencies to construct and operate the Permanent WTC PATH Terminal. Finally, contacts are provided for the solicitation of further information.

B. PUBLIC INVOLVEMENT PROGRAM

A comprehensive public involvement program has been implemented for this project. The public involvement effort has been designed to help provide complete information, be early and continuing, timely in public notice, broad in public outreach, and responsive. The public participation process is one that requires extensive and intensive outreach to private citizens, local businesses and associations, development authorities, elected officials, affected government agencies and others in New York and New Jersey.

The overriding goal of the public participation process is to engage a diverse group of public participants in order to provide timely information and solicit relevant input throughout the environmental review process. In order to best accomplish this, the following objectives have been pursued:

- Establish ongoing, inclusive and meaningful two-way communication with stakeholders and the public.
- Inform the public about the environmental review process and the role of government, stakeholders and the general public.
- Clarify the role of this project relative to other Lower Manhattan projects and studies, while at the same time coordinate outreach activities with those efforts in order to best utilize the public's involvement.

MAILING LIST

The project mailing list was developed for the distribution of outreach materials related to the environmental review process for the Permanent WTC PATH Terminal. The mailing list currently contains more than 900 addressees representing elected officials; federal, state, and local agencies; Technical Advisory Committee (TAC) members; Section 106 consulting parties; community and interest groups; local property owners and managers; and any members of the public who have requested mailings, including those who attended the public scoping meetings and public hearings on the DEIS.

FLYERS

More than 8,000 flyers advertising the October 2003 scoping meetings and June 2004 public hearings in Jersey City and Lower Manhattan were distributed at key public facilities (i.e., libraries, municipal buildings, etc.) and at several PATH stations. The flyers were also available on the project web site at www.panynj.gov/pathrestoration.com. Flyers were available in both English and Spanish.

MOBILE PUBLIC INFORMATION CENTERS

The project's outreach plan included mobile public information centers. These centers were held at PATH stations and provided easy access to interested members of the community wishing to learn more about the study and its progress. Flyers advertising public meetings were distributed at these centers and personnel from the Port Authority of New York and New Jersey (PANYNJ) and PATH were on hand to answer questions. Four mobile information centers were held in September 2003 in New Jersey to advertise the public scoping meetings. A mobile information center was also held at the temporary WTC PATH station in June 2004 to advertise the public hearing on the DEIS.

NEWSLETTERS

The first in a series of project newsletters was published in October 2003. The newsletter was distributed via the project mailing list and at the scoping meetings, as well as being made available online. The newsletters will help keep the public and other stakeholders apprised of the progress of this project and inform them of how they can stay involved.

A second newsletter was published in June 2004, concurrent with the release of the DEIS. It was distributed to the project's mailing list and was made available at the public hearings. The newsletter described the scoping process for the DEIS, the Section 106 review process, and the temporary WTC PATH station. It also provided information on the public review process for the DEIS.

WEBSITE

Information about the project has been and will continue to be available on the project's website (www.panynj.gov/pathrestoration.com). The website includes the project's environmental documents including the scoping document, the DEIS, and the FEIS. The website was also used during the project's scoping and DEIS comment periods as a medium for the public to e-mail comments. In the future, the website will provide information to the project's Section 106 consulting parties and the general public regarding construction plans and protocols as well as the Terminal's design. The site will allow for an ongoing opportunity to submit comments and contact key project representatives.

C. PUBLIC INVOLVEMENT ACTIVITIES

AGENCY AND STAKEHOLDER COORDINATION

FEDERAL INTER-AGENCY REVIEW TEAM

As described in Chapter 1, "Purpose and Need," and Chapter 2, "Project Alternatives," the U.S. Department of Transportation, Federal Transit Administration (FTA) and PANYNJ have

organized and/or participated in several efforts to coordinate the planning and environmental review of projects in Lower Manhattan. On the federal level, the FTA has formed the Interagency Review Team (IRT). An outgrowth of the Memorandum of Understanding among the federal partners (August 2002) and Executive Order 13274 on Environmental Stewardship and Transportation Project Delivery, the IRT includes various federal oversight agencies involved in the review and approval of the environmental documents for the Lower Manhattan recovery efforts. The IRT continues to coordinate on the progress and results of ongoing environmental reviews in order to communicate and resolve issues throughout the process. This forum helps to expedite the formal review of these environmental documents by the respective oversight agencies.

LOWER MANHATTAN PROJECT SPONSORS

Community involvement has been considered crucial to developing a plan that addresses community concerns while addressing the transportation needs of an ever changing and evolving Lower Manhattan. On the local level, the project sponsors for the Lower Manhattan recovery efforts have been coordinating the planning and analysis of these projects. A bi-weekly meeting is held between project sponsors including the PANYNJ, Metropolitan Transit Authority (MTA), New York State Department of Transportation (NYSDOT), New York City Department of Transportation (NYCDOT), Lower Manhattan Development Corporation (LMDC), community board members, interest groups and the consultant teams to coordinate and consolidate data collection, analyze methodologies and assumptions, impact criteria, and technical results for the environmental documents being prepared under the National Environmental Policy Act (NEPA). This proactive effort is aimed at expediting the preparation of individual documents and ensuring the consistency of the environmental findings.

As described in the DEIS, the project sponsors developed a framework for construction coordination, which included several working groups to address issues that have been identified in the individual environmental documents for the Lower Manhattan recovery projects and to implement the EPCs. The sponsors established a Schedule Working Group, a Logistics Working Group, a Traffic Working Group, and a Standards Working Group. Through this coordinated approach to the construction of individual projects, the project sponsors strove to meet or exceed the EPCs to the extent possible and to investigate and remediate issues and concerns that could arise during the construction process.

As described in Chapter 2, "Project Alternatives," Governor Pataki has established, by way of an Executive Order, the Lower Manhattan Construction Command Center. This entity will coordinate the construction of the Lower Manhattan Recovery Projects but will also coordinate any other construction projects in Lower Manhattan with a value in excess of $25 million through 2010. The Command Center will have an Executive Committee consisting of representatives from the various project sponsors, including PANYNJ, MTA, LMDC, and NYSDOT, as well as other key state and local agencies. The Command Center and its Executive Committee will be managed by an Executive Director, who will be appointed by the Governor and the Mayor.

As the entity responsible for construction coordination, the Command Center will establish a master schedule for the Lower Manhattan projects and will work with project sponsors, contractors, and the public to alleviate potential conflicts.

TECHNICAL ADVISORY COMMITTEE

PANYNJ has established a Technical Advisory Committee (TAC) for the Permanent WTC PATH Terminal. The TAC provides federal, state, and local officials and agencies with an opportunity to learn the status of the project, and it serves as a forum to provide input and raise issues of coordination between this project and the other large projects in Lower Manhattan. To date, there have been two meetings for the project, one on Tuesday, September 30, 2003 and one on Tuesday, June 15, 2004. The following is a list of agencies that have been asked to participate in the TAC.

- Battery Park City Authority
- Empire State Development Corporation
- Lower Manhattan Development Corporation (LMDC)
- Metropolitan Transportation Authority (MTA)
- MTA, New York City Transit
- New Jersey Department of Transportation
- New Jersey Transit
- New York City Department of City Planning
- New York City Department of Environmental Protection
- New York City Department of Transportation
- New York City Economic Development Corporation
- New York City Fire Department
- New York City Landmarks Preservation Commission
- New York City Mayor's Office
- New York City Police Department
- New York Metropolitan Transportation Council
- New York State Department of Environmental Conservation
- New York State Department of Transportation
- New York State Office of General Services
- New York State Office of Parks, Recreation and Historic Preservation
- North Jersey Transportation Planning Authority
- U.S. Army Corps of Engineers
- U.S. Department of Housing and Urban Development
- U.S. Department of Transportation, Federal Highway Administration (FHWA)
- U.S. Department of Transportation, Federal Railroad Administration
- U.S. Environmental Protection Agency, Region 2

OTHER AGENCY/STAKEHOLDER OUTREACH

PANYNJ Offices of Government Affairs and Priority Capital Programs continue to conduct informal briefings with elected officials, Community Board members, and other key stakeholders to provide updates on the process, and to solicit their input. Efforts to date have included formal congressional briefings, presentations to Community Board #1 and its subcommittees, informal and formal project briefings to New York City agencies, and meetings with the Lower Manhattan Transportation Task Force. PANYNJ will continue to communicate with these groups as project planning and construction moves forward.

PUBLIC INVOLVEMENT MEETINGS

PUBLIC SCOPING

Public scoping first introduced the project formally and its purpose and need to the community. The scoping document, which was prepared as part of this process, outlined the project's purpose and need, its goals and objectives, alternatives under consideration, and the framework for the environmental analysis. The scoping document for this EIS was released on September 26, 2003, and on October 8 and 9, 2003, the FTA and PANYNJ held public scoping meetings in Jersey City and Lower Manhattan to present information and solicit comments on the environmental review of the Permanent WTC PATH Terminal. The meetings were promoted through the TAC, newspaper advertisements, media releases, newsletter, mailings, the web site, and the mobile public information centers.

The public was encouraged to submit comments at the scoping meetings or by mail, phone, fax, and e-mail. The close of the public comment period was Wednesday October 29, 2003. A total of 71 people submitted comments during scoping.

The key issues raised by the public during scoping were:

- The project's role in the revitalization of Lower Manhattan;
- Coordination with LMDC and other Lower Manhattan recovery projects;
- Preservation of the footprints of the former twin towers;
- Air quality, noise, and traffic and pedestrian circulation during construction; and
- Secondary and cumulative effects during construction.

Members of the public also commented specifically on the draft scoping document and the project alternatives that were presented at the scoping meetings. Some requested additional public information such as:

- Clearer demarcation of the World Trade Center 1 and 2 footprints on any graphics;
- Identification of what elements of the station might be within the footprints; and
- Blueprints of the original PATH train configuration.

Comments from public interest groups and the New York City Department of City Planning proposed two additional alternatives. The first requested that project team consider routing a new track connection between the Downtown PATH under Fulton Street and constructing a new PATH No. 6 station. As described in Chapter 2, "Project Alternatives," this alternative was considered but was eliminated due to engineering and other constraints. The second alternative recommended that the Terminal not include a connection to Liberty Plaza. As described in Chapter 2, "Project Alternatives," of this FEIS, this has become the Preferred Alternative for the Permanent WTC PATH Terminal.

Comments received during the scoping process were addressed within the DEIS. Appendix H of this FEIS includes the list of comments and responses from the public scoping process.

PUBLIC HEARINGS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT

Public hearings on the DEIS were held at City Hall in Jersey City, New Jersey on June 23, 2004 and at Saint John's University-Manhattan Campus in Lower Manhattan on June 24, 2004. The public was notified of the hearing locations, dates, and times through the variety of media including newspaper advertisements, posters and flyers at PATH stations, mobile public

information centers, and direct mailers. To maximize attendance from regional residents, stakeholders, commuters, and public officials, the meetings were held from 4PM to 8PM. PANYNJ staff made a presentation on the project at 4:30PM and 6:30PM during each of the hearing dates. A stenographer recorded all public comments, and the hearings were video taped. Presentation boards and computer animations were prepared for the public to view project plans and the findings of the DEIS, and PANYNJ and consultant staff were on hand to informally address questions.

A total of 15 persons spoke at the public hearings, and two members of the audience submitted written comments at the hearings. An additional 26 parties sent letters, e-mails, or faxes during the DEIS comment period. Comments addressed the alternatives considered for the project; methods of fare collection; integration of transit systems; air quality impacts and mitigation; preservation of historic resources; and overall project benefits. Comments made during the DEIS comment period have been summarized in Chapter 19, "Public Comments on the DEIS and Responses." The written transcript of the hearings as well as the letters, e-mails, and faxes sent during the DEIS comment period is shown in Appendix H.

THE SECTION 106 PROCESS

The National Historic Preservation Act (NHPA, 16 USC §470) of 1966 requires federal agencies to take into account the effects of their undertakings on properties either listed in or determined eligible for listing in the National Register of Historic Places. This process, commonly referred to as the Section 106 process, provides for review of any federally licensed, financed, or assisted undertaking. The FTA is the federal agency concerned in the case of the Permanent WTC PATH Terminal. In order to comply with the law, federal agencies follow Section 106 of the NHPA and their implementing regulations developed by the Advisory Council on Historic Preservation (36 CFR part 800). The process includes identifying historic properties, assessing adverse effects, and resolving adverse effects. The process involves consultation with State Historic Preservation Officers (SHPO), local governments, and members of the public.

The Section 106 review process for the Permanent WTC PATH Terminal began concurrent with its public scoping in September 2003. In order to facilitate the process for three of the Lower Manhattan Recovery Projects, FTA entered into a coordinated Section 106 review process with FHWA (lead agency for the Route 9A Project) and LMDC (lead agency for WTC Memorial and Redevelopment Plan) in December 2003. The three federal agencies jointly notified the SHPO and Advisory Council on Historic Preservation (ACHP) concerning these three Lower Manhattan undertakings and identified potential consulting parties to the Section 106 process. In January and February 2004, FTA, FHWA and LMDC hosted two meetings with consulting parties to discuss the projects and in particular the evaluation of the WTC site for eligibility for inclusion in the National Register of Historic Places. Consulting parties were also offered opportunities to comment on draft versions of the Coordinated Determination of Eligibility for the WTC site, which was issued in final form on March 31, 2004. At that time, the coordinated process effectively ended, leaving each lead agency to meet the remainder of its Section 106 responsibilities separately as appropriate to its respective undertaking.

Subsequently, the FTA has determined that the Permanent WTC PATH Terminal would have an adverse effect on the National Register-eligible WTC site and the National and State Register-eligible Hudson River Bulkhead. The FTA has also determined that the Permanent WTC PATH Terminal may have adverse effects to off-site historic resources during its construction (see Chapter 6, "Cultural Resources"). As such, PANYNJ and FTA prepared a draft Permanent WTC

PATH Terminal Finding of Effects pursuant to Section 106 of the National Historic Preservation Act, which was published as part of the DEIS. Consulting parties and the general public had the opportunity to comment on this draft Finding of Effects concurrent with the public comment period for this DEIS. FTA and PANYNJ hosted two Section 106 consulting parties meetings, one on June 14, 2004, and one on July 20, 2004. FTA and PANYNJ provided information at these meetings to further clarify the project's effects on historic resources. The consulting parties commented on the Finding of Effects and provided discussion on measures to minimize or mitigate these effects.

Following the close of the public comment period on the DEIS, FTA and PANYNJ continued coordination with the Advisory Council on Historic Preservation (ACHP), SHPO, and the other Section 106 consulting parties to develop measures to avoid, minimize, or mitigate adverse effects on the resources identified in the Finding of Effects. One consulting party meeting was held on August 19, 2004, one on November 4, 2004, and one on November 15, 2004 to solicit comments on the draft Memorandum of Agreement (MOA). Another draft version of the MOA was distributed to the consulting parties on December 16, 2004, and the consulting parties were invited to comment in writing.

The consulting parties provided input on the Draft MOA both at the meetings and in writing. The full transcripts of the meetings and the written comment letters appear in Appendix H of this FEIS. The following is a summary of the major issues raised by the consulting parties and how they are addressed in the executed MOA.

- ***Perimeter Column Remnants Outlining North Tower and South Tower Footprints and the Tower Footprint Areas:*** The treatment and accessibility of the perimeter column remnants and footprint areas in the context of the Permanent WTC PATH Terminal was raised at each of the meetings. In response, the MOA contains a set of stipulations regarding FTA and PANYNJ's commitment that, to the maximum extent feasible given project implementation requirements, the design of the Terminal will preserve in place 84 column base remnants in the North Tower and 39 column base remnants in the South Tower at the existing floor at elevation 242 (58' below Sea Level) that outline the footprints of the former Twin Towers at the WTC site and are not located in the PATH right-of-way. The MOA also sets forth the total, not-to-exceed, extent of each of the tower footprints that will be permanently occupied by any portion of the project, and specifies that the east-west pedestrian corridor will be constructed outside the North Tower footprint. The tower perimeter column bases that would remain in place but may be covered by the platform will have symbolic representation, through architectural treatments, of column remnants that may be obscured or permanently removed by the Terminal's platforms.

- ***Cumulative Effects:*** Consulting parties expressed concern about the cumulative effects of multiple undertakings in this area of Lower Manhattan on the WTC site and on other historic properties in the vicinity. Initial drafts of the MOA, as well as the DEIS and FEIS, specified that Construction Protection Plans (CPPs) would be prepared in advance of construction to ensure that buildings adjacent to areas of construction for the Permanent WTC PATH Terminal would not be inadvertently harmed by a variety of factors, including ground-borne vibration. The final MOA takes into account the need to coordinate development and implementation of the CPPs with LMDC, MTA/NYCT and NYSDOT. It also specifically provides for development and implementation of a plan for protection of historic elements of the WTC site during construction activities within the Site, including construction associated with the WTC Memorial and Redevelopment Plan and, as necessary, with the Fulton Street

Transit Center and Route 9A. The MOA also sets forth a detailed process for PANYNJ to address cumulative effects on the WTC site during design, and through the first six months of the Terminal's operation.

- ***WTC Site Artifacts:*** A number of consulting parties were concerned about "off-site" artifacts from the WTC site, many of which are in the interim care and custody of PANYNJ at Hangar 17 at JFK International Airport. The inventory and treatment of these off-site artifacts is not a part of the Permanent WTC PATH Terminal, and their possible use in the WTC Memorial will be coordinated by LMDC. However, the MOA provides a process to be followed in the event that elements now on the WTC site must be removed during construction of the Permanent WTC PATH Terminal.
- ***E-Train Subway Entrance:*** Responding to a number of comments regarding the E-train subway entrance, the MOA specifies that the remains of the pre-September 11, 2001 entrance to the E subway line from the WTC site will be incorporated, to the greatest extent possible consistent with current building codes and Americans with Disabilities Act requirements, into the new pedestrian connection between the Terminal and the subway.
- ***Recordation of the WTC site:*** Consulting parties were very interested in a comprehensive documentation of current conditions on the WTC site prior to construction, As such, recordation of the WTC site is a stipulation of the Permanent WTC PATH Terminal MOA.
- ***Continued Participation of Consulting Parties:*** Consulting parties raised concerns regarding their continued involvement following the execution of the MOA. Consistent with the regulations implementing Section 106 of NHPA, the MOA explicitly provides for continued participation of consulting parties throughout the design process and treatment plans development following the execution of the MOA.

The MOA among the FTA, ACHP, SHPO, PANYNJ, and concurring consulting parties was executed in April 2005. Chapter 6, "Cultural Resources" of this FEIS summarizes the measures specified in the MOA, which appears in full in Appendix B. A total of 69 organizations have participated in this process as consulting parties. The "List of Agencies and Organizations" section of this FEIS identifies the specific groups and individuals that have been consulting parties for this project.

D. ENVIRONMENTAL AND REGULATORY AGENCIES

During project scoping, preparation of the environmental documentation, and the public review process, PANYNJ has regularly coordinated with the relevant environmental and regulatory agencies with jurisdiction over issues of concern for the project. Further, as mentioned earlier, representatives of these and other federal, state, and local agencies are members of the project's TAC. Agencies with which consultation has occurred include:

- U.S. Environmental Protection Agency—Coordination related to EIS analyses.
- U.S. Department of Interior, U.S. Fish and Wildlife Service—Analysis of natural resources.
- U.S. Department of Transportation, Federal Railroad Administration (FRA)—As a commuter rail system, PATH operates according to policies and procedures set forth by the FRA.
- U.S. Department of Commerce, National Marine Fisheries Service (NMFS)—Analysis of essential fish habitats.

- U.S. Department of Interior—Review of potential effects on historic resources/and parklands under Section 4(f) of the U.S. Department of Transportation Act.
- Federal Interagency Review Team for Lower Manhattan Recovery Projects—Coordinated Assessment of Lower Manhattan Recovery Projects.
- Advisory Council on Historic Preservation—Review of effects on historic and archaeological resources.
- State Historic Preservation Office (SHPO) at the New York State Office of Parks, Recreation and Historic Preservation—Review of effects on historic and archaeological resources and agreements under Section 106 of the National Historic Preservation Act.
- New York State Department of State (NYSDOS)—Consistency with New York State's Coastal Management Program.
- New York State Department of Environmental Conservation (NYSDEC)—Issues related to hazardous materials, air quality, and natural resources.
- New York City and New York State Departments of Transportation (NYCDOT, NYSDOT)—Coordination related to potential construction activities. This includes detailed Maintenance and Protection of Traffic (MPT) plans that would be developed and provided to NYSDOT and NYCDOT for review and approval to ensure safe, efficient, and timely construction.
- New York City Landmarks Preservation Commission (LPC)—Review of effects on historic and archaeological resources.
- New York City Department of City Planning (NYCDCP, including in its role as administrator of the Coastal Management Program with the NYSDOS)—Review of zoning issues and consistency with New York State's Coastal Management Program and New York City's Local Waterfront Revitalization Program.

Descriptions of the relevant outreach and coordination are provided in the technical chapters of this FEIS. Copies of correspondence are included in the respective technical appendices that accompany those chapters.

E. LAWS, PERMITS, AND REGULATORY REQUIREMENTS

Numerous environmental and regulatory approvals will be required to construct the Permanent WTC PATH Terminal. A preliminary list of these permits and requirements is provided below. This list focuses on federal and state requirements, since New York State's Public Authorities Law Section 1266(8) exempts PANYNJ from local permit requirements. In addition to these items, the project must also comply with laws and policies regulating worker and public safety, and the project may require city franchises.

FEDERAL

- National Environmental Policy Act (NEPA) (42 USC §§4321 et seq.; 40 CFR Parts 1500-1508; 23 CFR Part 771; 49 CFR 622). NEPA requires federal agencies to assess the environmental impacts of major federal actions that may affect the environment before taking such an action through an environmental assessment or EIS unless the action is excluded or

exempt from NEPA. FTA is the lead federal agency for the NEPA review for the Permanent WTC PATH Terminal.

- Coastal Zone Management Act (16 USC §§1451 et seq.; 15 CFR Part 930; NY Executive Law Art. 42; 19 NYCRR Part 600). Projects affecting New York's coastal zone must be consistent with the Coastal Zone Management Act, through the New York State Department of State's Coastal Management Program and New York City's approved Local Waterfront Revitalization Plan. The New York State Department of State, in consultation with the New York City Department of City Planning, makes a determination of the project's consistency with the Coastal Zone Management Act.
- National Historic Preservation Act (16 USC §470A; 36 CFR Part 800). Projects potentially affecting historic and archaeological resources must comply with the National Historic Preservation Act Section 106 review process. FTA is responsible for carrying out the Section 106 review for the Permanent WTC PATH Terminal.
- Department of Transportation Act Section 4(f) (49 USC §303; 23 CFR 771.135). Section 4(f) prohibits the Secretary of Transportation from approving any program or project that uses any publicly owned land from a public park, recreation area, wildlife and waterfowl refuge, or historic site of national, state, or local significance unless there is no feasible and prudent alternative to the use of such land, and unless the program includes all possible planning to minimize harm to the site or resource. FTA will make the determination to reflect a Section 4(f) finding.
- Environmental Justice (Executive Order 12898 of 1994, 59 CFR 7629 (Feb. 16, 1994); 1997 USDOT "Order to Address Environmental Justice in Minority Populations and Low-Income Populations," 62 CFR 18377 (April 15, 1997)). These Orders require that impacts and benefits from a federal transportation project are equitably distributed among all population groups and that minority or low-income areas are not overburdened with the adverse aspects of proposed project alternatives. FTA is responsible for complying with this Executive Order.
- Endangered Species Act (16 USC §§1531-1544; 50 CFR Part 402). The act requires FTA to consult with the U.S. Fish and Wildlife Service for projects that may jeopardize threatened or endangered species, or destroy or adversely modify their critical habitat.
- Floodplains (Executive Order 11988 of 1977; USDOT Order 5650-2, "Floodplain Management and Protection," April 23, 1979). Federal and state agencies must regulate and limit the location of a project in a floodplain to avoid any adverse impacts associated with the occupancy and modification of floodplains. FTA will make the determination.
- Wetlands (Executive Order 11990 of 1977; USDOT Order 5660.1A, "Preservation of the Nation's Wetlands", August 24, 1978). An order for federal and state agencies to avoid the adverse impacts associated with the destruction or modification of wetlands. USDOT agencies are required to make a formal wetland finding for major projects.
- Clean Air Act and state air permits (42 USC §7506(c); 40 CFR Part 93; ECL Article 19; 6 NYCRR Parts 201). New transportation projects must conform to the applicable state implementation plan. However, as a result of the terrorist attacks of September 11, 2001, and the loss of New York Metropolitan Transportation Council (NYMTC's) files containing regional transportation and air quality data, combined with the damage incurred to the downtown mass transit system, the conformity requirements for the NYMA have been temporarily waived until September 30, 2005, pursuant to Public Law 107–230; Stat. 1469,

enacted October 1, 2002. As part of the waiver process, project sponsors are to consult with the Interagency Consultation Group (ICG) to determine if the project would be considered regionally significant and if additional data is required during the waiver period.

- Resource Conservation and Recovery Act (40 CFR Parts 260-281). Compliance is required with this Act, which regulates hazardous and solid waste activities and underground storage tanks, which may be required during project construction and operation. EPA delegates compliance to NYSDEC.
- Environmental Stewardship and Transportation Infrastructure Project Reviews (Executive Order 13274 of 2002). The Order requires federal agencies to take appropriate actions to promote environmental stewardship in the Nation's transportation system and expedite environmental reviews of high-priority transportation projects. USDOT is responsible for monitoring and reviewing the priority of transportation projects.

STATE

- State Pollutant Discharge Elimination System (SPDES) (ECL §17-0801 et seq.; 6 NYCRR Part 751). A SPDES permit is necessary for all industrial activity related storm water discharges, construction activity related water and storm water discharges, and other discharges into the waters of New York State. NYSDEC will issue SPDES permits for the project.
- Beneficial Determination (6 NYCRR Part 360) PANYNJ will apply to NYSDEC for a Beneficial Use Determination (BUD) for spoils material. Materials that will be beneficially reused and that receive a BUD designation are not under the jurisdiction of Part 360 Solid Waste Management facilities regulations.

F. FTA AND PANYNJ CONTACTS

For further information regarding this document, please contact:

Mr. Bernard Cohen, Director
Lower Manhattan Recovery Office
Federal Transit Administration
One Bowling Green, Room 436
New York, NY 10004
212-668-1770
www.fta.dot.gov

Mr. Anthony Cracchiolo, Director
Priority Capital Program
Port Authority of New York and New Jersey
115 Broadway, 10th Floor
New York, NY 10006
212-435-5599
www.panynj.gov/pathrestoration

✳

Chapter 19: Public Comments on the DEIS and Responses

A. INTRODUCTION

This chapter summarizes and responds to all substantive comments on the Draft Environmental Impact Statement (DEIS). The public comment period for the DEIS began on June 4, 2004 with the publication of a Notice of Availability in the Federal Register. The U.S. Department of Transportation, Federal Transit Administration (FTA) and the Port Authority of New York and New Jersey (PANYNJ) held public hearings on the DEIS on June 22, 2004 in Jersey City, New Jersey and on June 23, 2004 in New York City, New York. The public comment period closed on July 21, 2004 although comments received through the publication of this Final EIS (FEIS) have been incorporated herewith.

Hard copies and/or CD-ROM copies of the DEIS were circulated to involved and interested agencies, community and civic groups, elected officials, local property owners and residents, and other interested parties. In addition, more than 400 letters were mailed to advertise the availability of the DEIS. The DEIS was posted to PANYNJ's website and copies were made available at a total of seven (7) libraries in Manhattan and New Jersey.

A flyer and newsletter advertising the public hearings was sent to the 800 persons on the project's mailing list. The public hearings were also advertised in nine (9) local newspapers including *The New York Times, The Battery Park City Broadsheet, El Nuevo Hudson,* and *The Star Ledger* beginning on June 2, 2004. The PANYNJ and its consultants conducted a mobile information center at the temporary WTC PATH station to distribute over 7,000 flyers advertising the public hearings, and PANYNJ posted notices on PATHVision and in PATH stations.

This chapter identifies the organizations and individuals who commented on the DEIS, then summarizes and responds to their comments. The comments have been organized according to the pertinent subject area with the DEIS. Where comments did not specifically pertain to the scope of the Permanent WTC PATH Terminal, they have been grouped as "Other." All commenters are noted but individual comments have been consolidated where appropriate. The transcripts of the public hearing and all written comments have been included in Appendix H of this document. Where revisions to this document have been made to address specific public comments as well as new or refined information about the project, text has been double-underlined in this Final Environmental Impact Statement (FEIS).

B. LIST OF COMMENTERS

A total of 41 parties commented on the DEIS. Fifteen parties spoke at the public hearings for the DEIS. The remaining comments were mailed, e-mailed, or faxed to PANYNJ during the public comment period. The following is a list of the commenters, their affiliation, and the date and method in which their comments were received.

- Adler, Steve. Speaker at public hearing dated June 23, 2004.

- Anonymous 1. Facsimile dated June 16, 2004.
- Ayer, Sarah M, AT&T. Letter dated July 21, 2004.
- Bachmore, John, Verizon Communications, Inc. Letter dated July 21, 2004.
- Barzilai, Tal, E-mail dated July 21, 2004.
- Blackman, Laura, Hudson River Park Trust. E-mail dated July 8, 2004.
- Bowen, Douglas John. Speaker at public hearing dated June 22, 2004.
- Butziger, Alexander. E-mail dated July 21, 2004.
- Carey, Timothy S., Battery Park City Authority. Letter dated July 14, 2004.
- Coangelo, Kelly. Speaker at public hearing dated June 23, 2004.
- Epstein, Louis, The World Trade Center Restoration Movement. Speaker at public hearing dated June 23, 2004 and letter dated July 21, 2004.
- Gardner, Anthony, Coalition of 9/11 Families. Letter dated July 27, 2004. (Comments are herein noted as Gardner.)
- Gardner, Anthony, Coalition of 9/11 Families; Fetchel, Mary, Voice of September 11; Sally Regenhord, Sally, Skyscraper Safety Campaign. Letter dated July 16, 2004. (Comments are herein noted as Gardner et al.)
- Gaull, Marilyn. E-mail dated July 6, 2004.
- Goetz, Bernard. Speaker at public hearing dated June 23, 2004; written comments dated June 23, 2004.
- Gorsky, Steven, Barclay's. Written comments dated June 16, 2004.
- Haikalis, George, Regional Rail Working Group. Speaker at public hearing dated June 23, 2004; written comments dated June 23, 2004; e-mail comments dated August 4, 2004.
- Hargrove, Robert W., U.S. Environmental Protection Agency. Letter dated July 21, 2004.
- Hensley, Jen, The Alliance for Downtown New York, Inc. Speaker at public hearing dated June 23, 2004; written comments dated June 23, 2004.
- Hemric, Benjamin. Letter dated July 20, 2004.
- Jackson, Don, Local Union #3 IBEW. Written comment sheet dated June 23, 2004.
- Kornfeld Jr., Robert, The Historic Districts Council. Written comments dated July 6, 2004.
- Lachman, Seymour P., New York State Senate District 23. Letter dated July 21, 2004.
- Lictro, John. D. E-mail dated July 20, 2004.
- Love, Bill, Coalition to Save West Street. Letter dated July 5, 2004.
- Lustbader, Ken, Lower Manhattan Emergency Preservation Fund. Speaker at public hearing dated June 23, 2004; written comments dated June 23, 2004.
- Mason, Alan, Local Union #3 IBEW. Speaker at public hearing dated June 23, 2004.

- McArdle, Frank, General Contractors Association of New York. Speaker at public hearing dated June 23, 2004.
- Morrow, Yvonne. Written comments submitted on July 21, 2004.
- O'Shea, James P. Facsimile dated June 28, 2004.
- Olsen, Olaf, Local 14, Union 1456. Speaker at public hearing dated June 23, 2004.
- Orkin, Jenna. Speaker at public hearing dated June 23, 2004.
- Ormsby, Chris, Local Union #3 IBEW. Speaker at public hearing dated June 23, 2004.
- Papp Jr., Albert, New Jersey Association of Railroad Passengers. Speaker at public hearing dated June 23, 2004; e-mail comments dated August 4, 2004.
- Pasternack, Scott. E-mail dated June 21, 2004.
- Sanchis III, Frank E., Municipal Art Society; Breen, Peg, New York Landmarks Conservancy; Burnham, Bonnie, World Monument Fund; Merritt, Elizabeth, National Trust for Historic Preservation; Heyl, Scott, Preservation League of New York State. Letter dated July 8, 2004. ((Comments are herein noted as Sanchis III et al 1.)
- Sanchis III, Frank E., Municipal Art Society; Fenollosa, Marilyn, National Trust for Historic Preservation; Breen, Peg, New York Landmarks Conservancy; Burnham, Bonnie, World Monument Fund; Merritt, Elizabeth, National Trust for Historic Preservation; Heyl, Scott, Preservation League of New York State. Letter dated August 2, 2004. ((Comments are herein noted as Sanchis III et al 2.)
- Scian, Paul. E-mail dated June 21, 2004.
- Stilwell, David A., U.S. Department of the Interior, Fish and Wildlife Service. Letter dated June 15, 2004.
- Sulphin, Amanda, New York City Landmarks Preservation Commission. Letter dated June 17, 2004.
- Taylor, Willie R., U.S. Department of the Interior. Letter dated July 30, 2004.
- Todorovich, Petra, Regional Plan Association. Speaker at public hearing dated June 23, 2004.
- Yaro, Robert D., Regional Plan Association. Letter dated July 21, 2004.

C. COMMENTS AND RESPONSES

PURPOSE AND NEED

Comment 1: The World Trade Center Transportation Hub will restore long-term access to Lower Manhattan and connectivity to the New York City subway system, contributing to the revitalization and economic recovery of Lower Manhattan. The Santiago Calatrava design of the PATH Station could not be more fitting for the site of the former World Trade Center, a bird-like, fully functional structure with movable wings that look ready to soar. The Permanent WTC

PATH Terminal will be a grand and proper entrance to Lower Manhattan. It will create countless temporary construction jobs and countless permanent jobs, and its timely completion will demonstrate America's strength in the wake of tragedy. (Olsen, Todorovich, Ormsby, Mason, Hensley, Jackson, Carey)

Response: Comment noted.

PROJECT ALTERNATIVES

Comment 2: Since master plan seems to be in flux it may be prudent to wait upon finalization before building this hub.(O'Shea)

Response: As of September 15, 2003, the Lower Manhattan Development Corporation (LMDC), PANYNJ, and Studio Daniel Libeskind agreed to a plan for the programming of commercial, retail, cultural, and transportation spaces within the WTC site. As the site's owner, PANYNJ continues to be involved as plans move forward to ensure that the programming of uses on the WTC site can fully accommodate the spatial and infrastructure needs of the Permanent WTC PATH Terminal.

Comment 3: The Permanent WTC PATH Terminal needs at least two bathrooms for the convenience of the public. (Anonymous)

Response: The design of the Terminal's interior facilities will be closely coordinated with the amenities provided as part of the WTC retail complex. It is anticipated that adequate restroom facilities will be provided to accommodate both transit commuters and shoppers who visit the WTC Transportation Hub and its adjoining retail stores.

Comment 4: Drawings of the Permanent WTC PATH Terminal do not show integration of the existing subways into a regional subsurface transportation hub. Is the future integration of the various subway stations and PATH station with subsurface people movers no longer planned? If so, it would be a tremendous loss to the rebirth and economic vitality of both downtown and NYC as a whole. (Scian)

Response: Figures 2-4 and 2-5 show the all-weather connections between the Permanent WTC PATH Terminal and the Dey Street Concourse of MTA/NYCT's Fulton Street Transit Center (2, 3, 4, 5, A, C, E, J, M, and Z trains); MTA/NYCT's Cortlandt Street (R and W) station; MTA/NYCT's Cortlandt Street (1 and 9) station; and MTA/NYCT's World Trade Center (E) station. The Terminal also provides a connection to the trans-Hudson ferry terminal at Battery Park City. A multi-agency feasibility study completed in May 2004 identified two alignments for a possible Jamaica-JFK-Lower Manhattan transit route. The terminals of these proposed alignments were proximate to the Permanent WTC PATH Terminal. However, future planning and design efforts will refine these initial

concepts and could result in a new terminal location. It is premature to make specific design commitments for the integration of the Permanent WTC PATH Terminal and the Jamaica-JFK-Lower Manhattan Terminal; however, PANYNJ will coordinate with the other sponsors of the Jamaica-JFK-Lower Manhattan project as its future planning and design efforts move forward. Overall, the PATH Terminal will improve connectivity and wayfinding for the various transit services in the vicinity of the WTC site and Lower Manhattan in general.

Comment 5: It is imperative that the new station avoid hidden spaces, narrow corridors, steep stairwells, low ceilings and poor ventilation, all mistakes of the pre-September 11, 2001 PATH Terminal—the past station that we now have an opportunity to correct. (Todorovich)

Response: The preliminary design of the Preferred Alternative calls for the use of natural light on all levels, for the use of modern heating, ventilation, and air conditioning systems, and for the creation of well lit, visually-appealing pedestrian corridors that provide for safe and convenient circulation throughout the complex.

Comment 6: The design is too costly at $2 Billion. (Butziger; Epstein; O'Shea; Barzilai)

Response: In addition to the elements of the Permanent WTC PATH Terminal, such as tracks, platforms, mezzanine, concourses, and the Terminal Hall, the Preferred Alternative includes site preparation and repair work that is needed to support the WTC site's overall redevelopment. This includes repairs to portions of the WTC bathtub walls and portions of the demolition within the eastern portion of the WTC site. FTA and PANYNJ may fund these elements as part of the Permanent WTC PATH Terminal project.

Comment 7: The Libeskind plan will make the station nearly impossible to use. (Barzilai)

Response: FTA, PANYNJ, MTA, and the project's design team have been coordinating to develop a Terminal plan that will provide for easy navigation by its users. This plan has been closely coordinated with master planning for the WTC site and will result in the creation of an east-west concourse between the World Financial Center and the Dey Street concourse of the Fulton Street Transit Center and a north-south concourse between the World Trade Center (E) subway station and the southeast quadrant of the WTC site. The east-west and north-south concourses will cross within the transit hall. The concourses will have visual access to the outdoors to help guide pedestrians as they travel through the complex, and wayfinding signage will be provided throughout the complex.

Although being planned separately, the Permanent WTC PATH Terminal elements have been and will continue to be well coordinated with the WTC

Memorial and Redevelopment Plan to ensure easy access to the memorial, cultural centers, offices buildings, and retail that will be constructed on the WTC site. The concourses of the Terminal will provide sub-grade access to most of the uses planned for the site.

In addition, elements of the Permanent WTC PATH Terminal and the WTC Memorial and Redevelopment Plan will provide superior above grade access to PATH as compared to the pre-September 11, 2001 condition. The newly constructed transit hall in combination with the newly constructed Fulton and Greenwich Streets through the WTC site will provide much better visual and physical access to PATH and MTA/NYCT subway stations than the plaza level of the pre-September 11, 2001 WTC complex.

Comment 8: A location to the east of the planned Terminal in the original location of the Hudson Terminal would have greater connectivity to financial district, Fulton Street Transit Center, and transfer point to N and R subway line. (Epstein, O'Shea)

Response: As described in Chapter 2, "Project Alternatives," of the DEIS, the reconstruction of a Terminal immediately west of Church Street would be physically closer to MTA/NYCT"s Cortland Street (R and W) station and the Financial District. However, given the depth of the PATH platform level, a terminal at this location would require a less favorable pattern of vertical circulation as compared to the Preferred Alternative. Under the Preferred Alternative, patrons ascend toward street-level in their direction of travel. Thus, although the platforms are physically further from the Corlandt Street subway station and the Financial District, the ascension from platform level will be similar.

Comment 9: The Hudson River Park Trust requests to be included in any discussions involving the exact placement/location of pedestrian bridges, escalators and/or staircases adjacent to the Hudson River Park, which includes the bikeway west of Route 9A. (Blackman)

Response: The pedestrian bridge over Route 9A was studied as an option to a subgrade concourse. However, subsequent to the publication of the DEIS, PANYNJ has selected the sub-grade concourse as a component of the Preferred Alternative. However, PANYNJ will coordinate the location of the future entrance to the concourse with affected property owners including Brookfield Properties, the Battery Park City Authority, Hudson River Park Trust, and the New York State Department of Transportation (NYSDOT).

Comment 10: The success of Lower Manhattan's revitalization will depend greatly on the quality of the pedestrian experience at street level; therefore, PANYNJ should

pay great attention to the design of the public places surrounding the PATH pavilion as well as the public spaces throughout the WTC site. (Todorovich)

Response: PANYNJ and LMDC have been coordinating to develop design guidelines for the buildings and open space planned for the WTC site, including the Permanent WTC PATH Terminal. The approved Master Plan for the WTC site includes more than 7 acres of new open space as well as a streetscape plan for the extension of Fulton and Greenwich Streets. The proposed plaza adjacent to the Preferred Alternative's transit hall will comply with the design standards set forth for the open space contained in the approved Master Plan.

Comment 11: The Permanent WTC PATH Terminal is supposed to be a full-service hub, but on the proposed site plan both Church and Fulton streets are narrow without room for bus parking. Site plan changes should be implemented that widen Fulton and Church streets to provide adequate room for bus parking. (Goetz)

Response: The dimension of Church Street is not being changed as part of the World Trade Center Memorial and Redevelopment Plan or Permanent WTC PATH Terminal projects. Although not a part of the Permanent WTC PATH Terminal project, Fulton Street is being proposed as a new 30-foot, two-way roadway that adheres to the street grid east of Church Street. It is anticipated that buses will continue to operate along Church Street; however, at this time, a formal plan for routes along Fulton Street has not been decided.

Comment 12: The Permanent WTC PATH Terminal would be more environmentally appropriate if it did not seek to accommodate the Daniel Libeskind site plan. A new transportation system should be with the aim of furthering the "devehicularization" of Lower Manhattan, not opening more streets. Scrapping the official plan in favor of one centered on fewer taller buildings which would have their construction impact more localized and more in the spirit of what was destroyed in 2001 would be more appropriate. A more understated and physically responsible terminal would free valuable public resources for better use of the site. (Butziger; Epstein; Lictro)

Response: The scope of this environmental review process does not include the programming of streets and buildings within the WTC site. The plan for the Permanent WTC PATH Terminal incorporates pedestrian connections that will not only serve PATH users but will also provide access to, from, and within the WTC site for residents, workers, and visitors. The creation of a grand transportation hall will provide for a highly visible gateway to a revitalized Lower Manhattan.

Comment 13: The alternative with the Liberty Plaza connection is desirable. Prior to September 11, 2001, more than 40 percent of PATH users exited the WTC site

at the southeast corner, resulting in traffic and pedestrian congestion during rush hours. (Coangelo; Morrow)

Response: Although it is projected that 40 percent of the future PATH users will exit the Terminal in the direction of the Financial District, the Terminal with a Liberty Plaza Connection has not been selected as the Preferred Alternative for the Permanent WTC PATH Terminal. During and after the public comment period on the DEIS, FTA and PANYNJ considered local government and community concerns that the Liberty Plaza Connection would detract from the street-life and retail vitality of Lower Manhattan. Furthermore, the Terminal with a Liberty Plaza Connection was anticipated to result in higher or more intense air quality, noise, and vibration impacts during the construction period than the Preferred Alternative. Although additional pedestrian mitigation will be required with the Preferred Alternative, it has been determined to have greater short-term benefits to the community than the Terminal with a Liberty Plaza Connection Alternative.

Comment 14: While the EIS has demonstrated poor pedestrian levels of service at Church and Liberty streets without the Liberty Plaza Connection, the proposed mitigation measures of widening sidewalks and crosswalks are, in fact, extremely desirable. The Liberty Plaza connection if built would undermine the viability of street level retail. The Liberty Plaza connection would also require the appropriation of public open space in Liberty Plaza and would cost $81 million, which is not justified by its relatively slim benefit. (Todorovich)

Response: FTA and PANYNJ propose a Terminal without a Liberty Plaza Connection Alternative for the Permanent WTC PATH Terminal based on comments received during the public review of the DEIS. The selection of this alternative considered all of the issues raised by the above comment.

Comment 15: The No Build Alternative does not restore the capacity that existed previously nor does it enhance service to New Jersey. (McArdle)

Response: Comment noted.

Comment 16: The description of the No Action Alternative states that the temporary station would remain in operation until 1) its operation would be precluded by elements of the WTC Memorial and Redevelopment Plan, 2) it cannot safely accommodate passenger demand, or 3) its exceed its useful life. Since the LMDC has not yet completed detailed design, FTA should coordinate to ensure that their design leaves the option for future improvements to the temporary facility as to not limit alternatives for the Permanent WTC PATH Terminal. (Gardner)

Response: The No Action Alternative was prepared assuming the implementation of the September 15, 2003 master plan for the WTC site. The master plan has programmed spaces for the site, including the memorial and a PATH Terminal. As an independent action, this Environmental Impact Statement must consider the other proposed uses of the WTC site as part of the "Future Common to All Alternatives" for a Permanent WTC PATH Terminal. As such, the memorial is considered as part of the background condition in the location and configuration proposed in the September 15, 2003 Master Plan. The current, temporary PATH facility was constructed prior to the implementation of the master plan, and it cannot accommodate construction above its mezzanine level. Furthermore, the current alignment and configuration of PATH tracks and other PATH infrastructure within the west bathtub limits the placement of the memorial and memorial-related uses. Thus, certain elements of the temporary station must be removed or altered to successfully accommodate all of the uses intended for the WTC site as part of its approved Master Plan.

Comment 17: The EIS should reconsider a proposal to construct a physical track connection between PATH and the New York City Transit (MTA/NYCT) No. 6 Lexington Avenue subway line. This would require that PANYNJ and MTA/NYCT build a track, 3,000 feet in length, between the now refurbished PATH line and the No. 6 local subway in concert with the rebuilding of the World Trade Center site. Despite the comments expressed in the DEIS and correspondence with PANYNJ, we believe that construction of either a track connection or an across the platform transfer be named a viable option to enhance Trans-Hudson mobility and provide new transportation pathways to the residents of both New Jersey and New York. (Papp, Jr., Haikalis, Bowen)

Response: As described in Chapter 2, "Project Alternatives," and in Appendix H-1, "Response to Comments on the Draft Scope," the proposed direct track connection between PATH and MTA/NYCT's 6 subway line (Lexington Avenue Local) was eliminated from further consideration following scoping for the Permanent WTC PATH Terminal. The decision to eliminate this alternative was based on its cost, its engineering feasibility, and on its potential construction-period and long-term effects to the environment. Furthermore, a planned connection between PATH and the Dey Street concourse of the Fulton Street Transit Center will allow for a transfer between PATH and MTA/NYCT's 4 and 5 subway lines, which provide express service along Lexington Avenue to Manhattan's east side, and the recently approved Second Avenue Subway would also link between Lower Manhattan and the Upper East Side.

Comment 18: FTA, PANYNJ, and the other Lower Manhattan project sponsors should establish a coordinated planning approach to the World Trade Center Memorial

and Redevelopment Plan, the Route 9A Project, the Permanent WTC PATH Terminal, and the Fulton Street Transit Center. (Ayer; Carey)

Response: While planning for their independent projects, PANYNJ, MTA, LMDC, and NYSDOT have been continuously coordinating project designs, construction, and environmental review. For the Permanent WTC PATH Terminal, this coordination has led to modifications in the design and location of the Terminal's ventilation structures; accommodations within the concourse level to address modifications in the WTC Master Plan; a coordinated approach to design guidelines for the Terminal and the FSTC's Dey Street Concourse; a coordinated Determination of National-Register eligibility for the WTC site; and a coordinated set of Environmental Performance Commitments and refined mitigation measures. This coordinated planning will continue throughout design and construction of the Preferred Alternative via mediums such as the Lower Manhattan Construction Coordination Group and the Lower Manhattan Construction Command Center.

Comment 19: The DEIS does not seem to explain why a more permanent version of the current temporary terminal, one that would be in essence an upgrade of the pre-September 11, 2001 terminal concept but would fit into the present day plans for the site, was not analyzed for its environmental impacts and used as a point of comparison with the proposed action. (Hemric, Gardner, Kornfeld)

Response: Chapter 1, "Purpose and Need," describes various deficiencies of the temporary WTC PATH station over the long-term. The Permanent WTC PATH Terminal will reuse elements of the temporary station, where possible. However, the station would not allow for development above, as is planned for the WTC Memorial and Redevelopment Plan nor would it provide for sufficient access and egress points to meet growth. Furthermore, the temporary station would not allow for 10-car service on PATH's Newark-WTC Line nor sufficient platform capacity as planned to meet ridership growth. Thus, an expanded facility is needed to ensure the long-term accessibility and viability of PATH service to Lower Manhattan.

Comment 20: The DEIS does not evaluate the many feasible and constructible design alternatives that would result in the avoidance or reduction of effects to historic properties. The evaluation of alternatives to avoid or minimize Project impacts to the E-train passageway is an excellent example of alternatives that should be considered in regard to other historically significant features on the WTC site, notably the tower footprints. (Gardner, Sanchis III et al 2)

Response: The EIS considers alternatives for a Permanent WTC PATH Terminal and their potential effects. Design modifications have been proposed as part of the project's Section 106 consultation process. These modifications have been

implemented through the Project's Memorandum of Agreement and have been incorporated into the Preferred Alternative presented in this FEIS.

Comment 21: The DEIS should have considered an alternative that would not include a fourth platform. The DEIS should examine the degree to which this relatively modest increase in peak hour ridership can be accommodated through improved signalization, use of 10-car PATH trains, lengthening of platforms beyond pre-September 11, 2001 lengths, widening of platforms beyond pre-September 11, 2001 widths, and an increase in the size, number, and capacity of vertical elements beyond pre September 11, 2001 levels. These measures could preclude the need for a fourth PATH platform, which would reduce the project's effects on the Tower footprints. (Gardner, Epstein, O'Shea)

Response: The Preferred Alternative is being planned to support the PATH's system-wide improvements, PATH's operating requirements, and future ridership demand. Each of these factors results in specific requirements for the design of the Terminal's platforms and tracks, and as such, it has been determined that a 5-track, 4-platform station is needed. This configuration was selected after a careful consideration of several track and platform layouts as detailed in Appendix C of this FEIS.

PATH will implement improvements to increase capacity on trains operating between Newark and the WTC, by increasing their length from 8 to 10 cars. Not only will this improvement require that the WTC Terminal support 10-car operations but a consequence will be that more people will use the WTC PATH Terminal's platforms during peak travel periods.

All new PATH cars will have 3-doors per side allowing PATH to retire the portions of its current fleet with 2-doors per side. Three-door cars will decrease the boarding/alighting times of trains by 50 percent, which will improve dwell times at intermediate stations along the PATH route and could reduce the overall run time of trains. However, the new cars are not expected to improve the platform clearance time for passengers since they will not directly affect platform area or the provision or operation of stairways and escalators.

While PATH currently maintains 3-minute headways on its Newark-WTC Line and 4-minute headways on its Hoboken-WTC Line during portions of the peak hour, Communication-Based Train Control (CBTC) will facilitate such headways over a longer period with greater reliability and less potential for delays. CBTC in conjunction with the 10-car train program will have the ability to increase the throughput of the PATH system, to meet or exceed ridership demand and provide a higher frequency of service at the WTC Terminal than before September 11, 2001. As such, platforms at the WTC Terminal will need to clear more swiftly in the future in order to maintain safe and efficient operations.

PATH must plan for failure management to maintain reliable, on-time peak period service. Because the WTC is a terminal station, trains dwell for short periods to maintain the operating schedule. Thus, to maintain the headway and allow for the arrival of a subsequent train, PATH requires two tracks for each the Hoboken-WTC and Newark-WTC Lines. In the event that a train becomes disabled, a fifth track is needed. The fifth track allows the disabled train to remain in the Terminal while the remaining four actives tracks can be used to continue service.

PATH has limited capacity for train storage at its Newark, Harrison, and Journal Square Yards. Therefore, PATH would use the WTC Terminal for the overnight storage of 6 Hoboken-WTC trains. Four tracks are required for this overnight storage and a 5th track is needed for revenue service on the Newark-WTC Line. The overnight storage of Hoboken-WTC trains at the WTC Terminal would allow for a more efficient ramp-up to AM peak period revenue service and decreases the potential for weather-related delays on the Hoboken-WTC Line.

A principal consideration for the planning of the Terminal is the ability of platforms to safely accommodate peak period ridership. Because PATH is primarily a commuter system, the platform design must accommodate both AM and PM peak patterns of travel.

In the AM peak hour, trains unload passengers to the platform who must then ascend to mezzanine level. For this condition, the principal design criterion is the targeted time period within which all passengers exiting a train alight from the platform. As stairways and escalators become congested, passengers queue at the foot before they can ascend. Therefore, to avoid a lengthening of this back-up, it is important that all passengers clear the platform before arrival of the next train. The Transit Capacity and Quality of Service Manual states that a platform (and vertical circulation) should be planned to ensure full clearance of the platform before the next train arrives. However given that passengers may not use or may not be able to use all available exits, a safety factor of 20 to 30 percent is applied. Thus, a platform should clear fully within 70 to 80 percent of the scheduled headway.

The proposed frequency of Newark-WTC Line service requires that its platform clear within 126 to 144 seconds. However, based on projected ridership, a single Newark-WTC platform would require 213 seconds to clear. Thus, two Newark-WTC Line platforms are needed to meet platform clearance guidelines. A single Hoboken-WTC platform is sufficient to meet platform clearance criteria.

For the PM peak period, the planning of the platforms must also consider failure management in the event of a missed headway and subsequent delay in service. Thus, the platform must provide for adequate room to queue passengers waiting for the next arriving train.

Given ridership levels in 2025 and level of service standards, a minimum 15,264 square feet of platform area would be required for the Newark-WTC service in the event of a missed headway while 10,385 square feet would be required for the Hoboken-WTC service. However, accounting for the unusable areas of the platform (e.g., spaces occupied by escalators and elevators and the safety buffer along the platform edge), the Terminal's platforms would each provide for an effective area of 10,416 square feet. Thus, a single platform would be adequate for the Hoboken-WTC Line but more than one platform would be needed for Newark-WTC Line.

In order to maintain temporary PATH service during construction of the Preferred Alternative, PANYNJ would not relocate the existing PATH tracks. As such, Platform A cannot be widened beyond its current configuration, which is not adequate for normal revenue service. Since three full-size platforms are needed for peak period service, the Preferred Alternative would include a total of 4 Platforms. The 5 tracks that are currently part of the temporary station would be retained in their current alignment, which is adequate to meet PATH's operating requirements.

Comment 22: PANYNJ should not exclude other alternatives such as platforming on a higher level or east of the slurry wall, based on a subjective judgment on cost, or because it would necessitate design modifications. (Kornfeld)

Response: Platforming at a higher level is not feasible within the WTC "Bathtub" since there would not be sufficient space between the projections of the Hudson River tunnels and the Terminal to achieve PATH's design guidelines for grade and curvature.

As described in Chapter 2, "Project Alternatives," PANYNJ explore four alternative locations for the Permanent WTC PATH Terminal: Location 1, WTC "Bathtub"; Location 2, Church Street; Location 3, Broadway-Nassau; and, Location 4, Vesey Street. Locations 3 and 4 were determined to be flawed since they would fully disrupt temporary PATH service during construction. Furthermore, Location 3 would not meet the operational requirements for PATH. Locations 1 and 2 were evaluated more closely. Location 1 was considered advantageous for constructability, cost, and customer wayfinding, but it would result in a headhouse within the planned WTC Memorial zone. Location 2 would maximize train operations and would not require a headhouse within the Memorial zone, but it would have an inconvenient means of vertical circulation, would require the reprogramming of uses on the WTC site, and may have resulted in adverse contextual effects on the planned Memorial.

PANYNJ considered the advantages of Locations 1 and 2 and developed a "hybrid" alternative. The "hybrid" alternative combines the subgrade platform and mezzanine levels within the WTC bathtub with an above-grade headhouse east of MTA/NYCT's 1 and 9 subway line. It provides for the constructability,

cost, and wayfinding benefits of Location 1 without a headhouse in the Memorial zone. Because the platform and mezzanine levels would be located within the WTC bathtub, subgade levels east of MTA/NYCT's 1 and 9 line would be available for building services. This would eliminate the adverse contextual impacts to the Memorial zone that may have occurred with Location 2. PANYNJ advanced the "hybrid" alternative for detailed study in the Project's Draft and Final EIS.

Comment 23: PANYNJ should seriously consider a pedestrian bridge over West Street as an additional means to provide all-weather access between the World Financial Center and the Permanent WTC PATH Terminal. The bridge would supplement the proposed Route 9A connection. (Love)

Response: As described in Chapter 2, "Project Alternatives," a pedestrian bridge would not have the same level of customer convenience as a subgrade concourse since additional vertical moves would be required to travel between PATH and the WFC and Battery Park City. Furthermore, the subgrade concourse could fully accommodate the anticipated demand; thus, additional access across Route 9A is not considered necessary as part of the Preferred Alternative.

Comment 24: The DEIS discards Location 1, WTC "Bathtub", in favor of the Terminal with Liberty Plaza Connection ("Hybrid")Alternative despite the fact that the latter would be more expensive, require a longer construction duration, would have more below-grade infrastructure in the WTC bathtub, and would not allow for as much commercial development on the WTC site. The Location 1 alternative, which would not impinge upon the footprint of One World Trade Center is clearly "feasible" and should be considered as part of the DEIS. (Gardner)

Response: Location 1 would not meet the Purpose and Need of this project since 1) it would have 3 platforms and 5 tracks, which would not be adequate to serve future ridership on the PATH system and 2) its above-grade structures would be located west of Greenwich Street within the memorial zone, which is inconsistent with the WTC Memorial and Redevelopment Plan. As defined in Chapter 1, "Purpose and Need," the Preferred Alternative must meet the project's purpose and need. Specifically, Location 1 would not meet the following objectives:: Provide for additional capacity to support ridership growth; improve street-level visibility and access; construct a facility that is coordinated with the master plan for the WTC site; provide for connections to future WTC buildings and facilities, including the memorial; and coordinate PATH facilities with other sub-grade uses on the WTC site.

Comment 25: The encroachment of the upper level of the PATH station over the footprints and the potential of a support column within the footprints is not acceptable. (Kornfeld)

Response: As stated in the executed Memorandum of Agreement for the Permanent WTC PATH Terminal, the east-west pedestrian concourse to the World Financial Center would be designed and built in a manner that avoids the column remnants projecting above the concrete slab that outline the north perimeter of the North Tower. This corridor would be at least five (5) feet outside the North Tower footprint as measured from the center line of each projecting column base to the face of the nearest structural support wall.

The mezzanine level would be fully supported by the platform level below. As stated in the executed Memorandum of Agreement, the total extent of the North Tower footprint at this to be permanently occupied by any portion of the Project will be approximately 1,600 square feet and will not exceed 4 percent of the North Tower footprint area. The total extent of the South Tower footprint to be permanently occupied by the mezzanine will be approximately 21,615 square feet currently occupied by the WTC PATH facility, plus an additional 2,000 square feet required by the Project, and will not exceed 53 percent of the South Tower footprint area.

Up to a total of 5 column bases in the North Tower and up to a total of 3 column bases in the South Tower may be temporarily or permanently removed to construct PATH Platform D. Where Platform D would intersect the northeast corner of the North Tower footprint, the platform would be clear of vertical obstructions and architectural treatments would be used to symbolically represent the location of the footprint.

In addition, up to 4 column bases in the North Tower could be temporarily removed to install the foundation for the Terminal's support column. Those column bases that remain in situ undisturbed or are temporarily removed and returned to their original locations would be accessible following the completion of these foundations.

CONSTRUCTION METHODS AND MATERIALS

Comment 26: The construction of the Permanent WTC PATH Terminal should be coordinated by the forthcoming Lower Manhattan Construction Command Center. It is critical that issues such as worker transportation to and from the construction site, permitting, movement of materials and other logistical concerns be coordinated with the many other development projects happening in Lower Manhattan at the same time. (Hensley; Morrow)

Response: As part of the Lower Manhattan Construction Coordination Group, PANYNJ is working closely with the other Lower Manhattan Recovery Project sponsors to develop coordinated plans for individual project construction. The construction of the Permanent WTC PATH Terminal will be undertaken according to the coordinated efforts of the Lower Manhattan Construction Coordination Group and under the direction of a Lower Manhattan Construction Command Center.

(Refer to Chapter 3, "Construction Methods and Materials," for a description of the Lower Manhattan Construction Coordination Group and the Lower Manhattan Construction Command Center.)

Comment 27: Construction of the Permanent WTC PATH Terminal should occur with minimum disruption to existing PATH service, particularly during the weekday rush hours. (Hensley)

Response: PANYNJ has made provisions to allow for the uninterrupted operation of temporary PATH service during peak periods while the Permanent WTC PATH Terminal is under construction.

Comment 28: PANYNJ and the other Lower Manhattan project sponsors should work with the construction community to develop and implement noise plans and other protocols that will allow construction to move forward in an environmentally sound fashion. (McArdle)

Response: As part of the Lower Manhattan Construction Coordination Group, PANYNJ is and will continue to work closely with the other Lower Manhattan Recovery Project sponsors to develop coordinated noise monitoring and mitigation plans to alleviate potential impacts during the Preferred Alternative's construction.

To mitigate the Preferred Alternative's construction period noise impacts, PANYNJ would require contractors to use specific equipment during phases of construction to reduce noise levels below the FTA impact criteria. During the permanent track, platform, and mezzanine construction contractors would be required to use Impact wrenches with noise emission level of 82 dBA at 50 ft^2 and mufflers on pavement breaker cylinder. During the construction of the east-west concourse, contractors would be required to place drill inside acoustical enclosure. Although not required for the Preferred Alternative, PANYNJ is coordinating with the other Lower Manhattan Recovery Project sponsors to explore additional construction noise mitigation measures. These include:

- The use of acoustic barriers and walled enclosures around certain construction activities. Noise tents/enclosures could be used around workers using jackhammers. A temporary noise barrier of 20 feet in height could be installed along the fence line/property line of the Project Site to reduce noise levels. In addition, temporary barriers, such as wood panels on top of Jersey barriers could be positioned adjacent to and moved along slurry wall and other construction operations, etc.
- The placement of construction equipment in shielded locations, such as below grade in the Project Site, if possible.
- The installation of silencers on jackhammers, air compressors, generators, light plants and cranes to reduce noise levels at specific locations (e.g., adjacent to existing residential uses).

- The use of electrically operated equipment, rather than combustion equipment, wherever possible.
- The use of soil beds, timber planking and/or exterior rubber lining on truck body and aluminum carrying case to reduce rock impact noise during truck load/unloading operations.
- The use of drive-through street-level truck enclosures for truck loading and unloading.
- The use of sheds/enclosures at concrete pump sites during concrete truck unloading, and the placement of most loading/unloading inside the bathtub and away from street level noise receptors, if possible.
- The placement of most loading/unloading inside the bathtub and away from noise receptors located at street level.
- The designation of central areas for noisy activities, such as cutting steel or wood or use of noisy equipment such as impact wrenches. When feasible, use of pre-cut, pre-fabricated, or modular construction materials that minimize need for on-site fabrication or cutting methods.

Construction specifications will be developed for the project in coordination with the Lower Manhattan Construction Coordination Group and the Lower Manhattan Construction Command Center that will include the protocols required for site contractors. As per the Executive Order forming the Lower Manhattan Construction Command Center, this process will include consultation with and input from the construction community.

Comment 29: PANYNJ should strengthen the Environmental Performance Commitments to mitigate air pollution, noise and vibration during construction. (Todorovich)

Response: As described in Chapter 9, "Air Quality" and Chapter 10, "Noise and Vibration," PANYNJ has committed to additional measures beyond the Environmental Performance Commitments to avoid, minimize, or mitigate the potential construction-period impacts of the Preferred Alternative.

To reduce potential air quality emissions during construction: PANYNJ would implement mitigation as follows:

PANYNJ would implement the following mitigation measures to reduce project-generated emissions during the construction period. These measures include those previously identified as EPCs.

- Ultra Low Sulfur Diesel Fuel (ULSD): As described in the EPCs, PANYNJ would require that contractors use ULSD for all non-road vehicles that operate with diesel engines.
- Electrification: PANYNJ or its contractor would develop a plan, in consultation with Con Ed, as appropriate, to disperse grid power throughout the contraction zone for the Preferred Alternative. In its contract documents,

PANYNJ would require all contractors and subcontractors to use electrically powered equipment for air compressors, pumps, mixing, desanding and grout plants, welding machines, and any other diesel powered equipment that can be replaced with an electrically powered version. However, this does not apply to the east-west pedestrian concourse beneath Route 9A if the concourse is built by NYSDOT, since NYSDOT has not yet finalized what level of electrification would be possible for its projects. Given current conditions, it is expected that at lest 50 percent of the air compressors, pumps, mixing, desanding and grout plants, welding machines, and other diesel powered equipment that can be replaced with an electrically powered version would operate on electric power sources.

- Tailpipe Reduction Measures: In its contract documents, PANYNJ would require the use of Diesel Particle Filters (DPFs) or other measures with equivalent Particulate Matter (PM) removal efficiency for all nonroad diesel engines of 50 horsepower or greater wherever the implementation of such a device is feasible. However, there may be cases where DPFs would not be feasible for safety considerations, mechanical reasons, or where the technology would not function properly. In such cases, the constructor would submit a request for an exception for review and approval by PANYNJ prior to implementation, and in these cases, Diesel Oxidation Catalysts (DOCs) may be used. Only in cases where, for technical reasons, neither DPFs or DOCs can be used effectively, and where the operation cannot be performed by another engine or other means, would the use of diesel engines greater than 50 horsepower be allowed without tailpipe reduction measures, subject to the above-described approval process.

- Newer Engines: In its contract documents, PANYNJ would require the use of post-1995 fuel injection engines, which meet the Tier II engine emissions standards, as defined in Title 40, Part 89.112. Exceptions will be made only for specific engines that are not yet commercially available as Tier II, and where the task cannot be reasonably accomplished using alternative engines or means which do comply with these demands. In such cases, the contractor would submit a request for an exception for review and approval by PANYNJ prior to implementation.

- Diesel Emission Mitigation (DEM) Plan: PANYNJ would require contractors to prepare a DEM Plan that shall address the control of emissions from all engines and vehicles including those that are not equipped with emission control devices. As described in the EPCs, the DEM Plan would limit idling times on diesel powered engines to 3 minutes and would require that contractors locate diesel powered engines away from fresh air intakes.

- Dust Control Plan: As described in the EPCs, PANYNJ would require contractors to submit a Dust Control Plan. Among other things, the plan

would contain protocols and procedures for the spraying of dust piles, containment of fugitive dust, and appropriate adjustment measures to accommodate changes in meteorological conditions.

- Verification: The effectiveness of measures to reduce construction period emissions depends on compliance. To that end, verification procedures would be implemented through construction specifications and contract documents. PANYNJ would verify mitigation and would identify opportunities to expand its implementation as part of its ongoing oversight and auditing of the Project's construction. Furthermore, verification procedures would be implemented in accordance with decisions of the Lower Manhattan Construction Command Center, including procedures for reporting updates to the public.
- Other Emissions Reduction Technologies: PANYNJ is and will continue to investigate additional means (e.g., fuel emulsions) to reduce NOx (NO and NO2) emissions, but it is not yet known whether these measures would reduce the effectiveness of the above described mitigation. Therefore, specific means to further reduce NOx have not been identified in the mitigation plan for the Preferred Alternative at this time. If this investigation results in additional means to reduce NOx without jeopardizing the PM reducction measures and if other constraints such as technological availability are resolved, then PANYNJ would implement these additional mitigation techniques, as appropriate.

In addition to the noise mitigation measures identified in the above response to Comment 28, PANYNJ would require contractors to use specific equipment during phases of construction to reduce noise levels below the FTA impact criteria. During the permanent track, platform, and mezzanine construction contractors would be required to use Impact wrenches with noise emission level of 82 dBA at 50 ft^2 and mufflers on pavement breakers-+. During the construction of the east-west concourse, contractors would be required to place drill inside acoustical enclosure.

Per the stipulations of the executed Memorandum of Agreement for the Permanent WTC PATH Terminal, PANYNJ would prepare a Construction Protection Plan (CPP) for historic structures within 90 feet of the construction zone based on requirements in the "New York City Department of Buildings Technical Policy and Procedure Notice (PPN) #10/88" regarding procedures for the avoidance of damage to historic structures resulting from adjacent construction.

The CPP would describe in detail the construction procedures of the Preferred Alternative, as well as the construction procedures associated with other projects under construction in the vicinity of each of these historic properties. It would also provide for the inspecting and reporting of existing conditions at these properties, establish protection procedures, establish a monitoring program to

measure vertical and lateral movement and vibration, establish and monitor construction methods to limit vibration; and establish methods and materials to be used for any repairs. The plan shall also specify the implementation of special vibration protection measures to protect these historic properties from increased vibration levels associated with construction activities. The CPP would provide for a historical architect meeting the Secretary of Interior's Standards to supervise implementation of the CPP.

The CPP would empower the historical architect, in consultation with the Chief Engineer of PANYNJ to issue "stop work" orders to prevent any unanticipated damage to historic properties, and any recommencement of work shall only be permitted at such time that the Chief Engineer and historical architect have assurance that the appropriate modifications have been made to the construction technique to assure that no damage would occur to historic properties.

Comment 30: PANYNJ needs to ensure the implementation of the aggressive Environmental Performance Commitments established in the DEIS. (Carey)

Response: As described in Chapter 5, "Socioeconomic Conditions," Chapter 6, "Cultural Resources," Chapter 8, "Transportation," Chapter 9, "Air Quality," and Chapter 10, "Noise and Vibration," PANYNJ has committed to measures that would implement the EPCs. As appropriate, PANYNJ's implementation plans for the EPCs would be coordinated with the Lower Manhattan Construction Command Center.

Comment 31: As part its Environmental Performance Commitments, PANYNJ should include the Section 106 Consulting Parties in future discussions regarding potential impacts to historic resources. (Gardner)

Response: PANYNJ has committed to continued coordination with the Section 106 Consulting Parties per the stipulations of the executed MOA. The EPCs were intended primarily to protect access to cultural resources throughout the construction process. This will likely be coordinated through the LMCCC, which will provide for a public outreach officer to communicate with the local community and all other interested groups, including the Section 106 Consulting Parties.

LAND USE, NEIGHBORHOOD CHARACTER, AND PUBLIC POLICY

Comment 32: The DEIS should have examined how the occupation of a portion of the WTC site by the Terminal building limits the ability to develop the maximum commercial floor area on the WTC site. (Hemric)

Response: PANYNJ previously reviewed schemes for the development of a Permanent WTC PATH Terminal within the envelope of an office tower on the WTC site

or as part of a museum or cultural facility. However, consistent with the goals and objectives of this project, PANYNJ felt that the new terminal should have a visible, street-level presence to create a transportation gateway to Lower Manhattan. Thus, through a public planning process, PANYNJ and LMDC opted for a plan that would result in a separate PATH Terminal building and five office towers on the WTC site.

Comment 33: The DEIS did not examine how the Terminal building's lack of exterior street-level retail would negatively affect street life in the area (Hemric)

Response: Although the Terminal will have access to the street-level retail being planned as part of the WTC Memorial and Redevelopment Plan, street-level commercial space will not exist within the Terminal building itself. However, street-level retail will be located within the buildings immediately north and south of the Terminal. The area surrounding the Terminal building will be open space with amenities to serve the public. It is envisioned that the combination of street-level retail to the north and south of the Terminal and the plaza that will surround the Terminal building will create an active street life with functions that serve more than just retail.

Comment 34: The Permanent WTC PATH Terminal is primarily an underground infrastructure when complete and should not interfere with surface recreation such as park land, except at access or egress portals. For these locations, it would be appropriate to consider safety and resource loss mitigation during construction. (Taylor)

Response: The Preferred Alternative would not occupy public park land. The proposed headhouse adjacent to the Winter Garden would occupy private open space, and the location and construction of this headhouse is being coordinated with the property owner. The Project's Maintenance and Protection of Traffic (MPT) Plan will address pedestrian safety and access during the construction period.

Comment 35: The retail plan for the Terminal should complement the other retail components on the World Trade Center site and in the surrounding areas. Lower Manhattan should have a complete retail complex with shops and restaurants that serve the worker and residential populations Downtown, as well as commuters and the many visitors that will come to use the cultural and memorial spaces on the site and other attractions throughout the neighboring community. (Hensley)

Response: The Permanent WTC PATH Terminal, itself, will only include approximately 5,000 square feet of retail on its mezzanine level. This retail will cater to PATH users with services such as newsstands, sundries, and other convenience goods. The larger retail complex planned as part of the WTC Memorial and Redevelopment Plan will be closely coordinated with the Terminal's spaces to provide both above-grade and sub-grade access between the Terminal, its

concourses, office and cultural institutions on the WTC site, and the site's retail stores and restaurants.

SOCIOECONOMIC CONDITIONS

Comment 36: The DEIS should include an examination of "spontaneous", market-driven revitalization in Lower Manhattan and used that analysis to determine if an enlarged or enhanced PATH Terminal would be necessary. (Hemric)

Response: The DEIS applies an approach consistent with methodologies used for the environmental assessment of public and private projects in New York City. This approach develops a future population and employment projection based on a general background growth rate as well as any reasonably foreseeable residential and commercial development projects within the land use study area. The projections presented in the DEIS were based on land use projections prepared by the MTA on behalf of the Lower Manhattan Project Sponsors, and these projections have been used consistently in the environmental documents prepared for the Recovery Projects.

CULTURAL RESOURCES

Comment 37: FTA did not begin its Section 106 process in September 2003 concurrent with scoping for the Permanent WTC PATH Terminal project as stated in the DEIS. The first step in the Section 106 process is the identification of Section 106 Consulting Parties and the definition of an Area of Potential Effect. Section 106 Consulting Parties were not defined until January of 2004 and the APE was not defined until March 2004. (Gardner)

Response: FTA published its intent to prepare an EIS pursuant to the National Environmental Protection Act, Section 106 of the National Historic Preservation Act, and Section 4(f) of the U.S. Department of Transportation Act in its Notice of Intent, which was published in the *Federal Register* on September 26, 2003. The New York State Historic Preservation Officer (SHPO) was advised of the Notice of Intent and the scoping process for the DEIS at that time. Furthermore, public scoping meeting notices were sent to the project's mailing list, which included many of the individuals and organizations that would later serve as Section 106 consulting parties. FTA and PANYNJ received comments during scoping regarding potential effects to historic resources, which led to the formal solicitation of consulting parties pursuant to the preparation of a coordinated Determination of Eligibility, which began in December 2003.

Comment 38: The DEIS does not reference recent geoarchaeological research in Lower Manhattan that identifies a buried soil horizon. This soil horizon is believed to extend the length of Lower Manhattan and dates to approximately 2000 Before

Present. A determination of whether this soil horizon is present or has been intersection and removed by modern construction is essential to evaluating the archaeological sensitivity of the project outside the limits of the WTC bathtub. (Gardner)

Response: According to the geoarcheological report generated for the Worth Street site, which summarizes the studies conducted for the Foley Square project (Schuldenrein 2002), the buried soil horizon in question was found only in discontinuous locations within a geographically circumscribed portion of Lower Manhattan, bounded roughly by Broadway on the west, Worth Street on the north, and the Foley Square/Five Points area on the south and east. Furthermore, the report associates this buried soil horizon with specific geological formations (such as glacial kames, or low and steep-sided hills), found within the Worth Street study area vicinity, but not necessarily across all of lower Manhattan. Although the report claims that this soil horizon might be found throughout lower Manhattan, there is no evidence presented that confirms its location beyond the particular sites that were investigated. Last, it should be noted that although this buried soil horizon was documented at several locations, no precontact period archaeological resources were found in association with this soil in any of the samples. Thus, it appears that the possible presence of this soil horizon within the Project Site cannot necessarily be assumed, nor is there any evidence to date that confirms the presence of this soil horizon is directly related to the recovery of precontact archaeological resources.

The DEIS does specify potential adverse impacts to the Hudson River Bulkhead and yet underdetermined archaeologically sensitive areas on the eastern portion of the WTC site. As such, FTA and PANYNJ have developed measures to mitigate these potential impacts pursuant to Section 106 of the National Historic Preservation Act.

Comment 39: The DEIS fails to acknowledge that the physical remains of the World Trade Center, including the truncated box beam column that form the perimeter of the tower footprints are archaeological resources. Thus, studies presented in Appendix B are inadequate to make the assumption that the current potential for archaeological resources on the WTC site is the same as prior to September 11, 2001. (Gardner)

Response: The remaining remnants and structures on the WTC site were evaluated as historic resources under Section 106 of the National Historic Preservation Act since these resources are presently unearthed.

Comment 40: The DEIS fails to describe the possibility that remnants of the *Tyjger* may exist in the spaces between the east slurry wall of the WTC "bathtub" and the west wall of the IRT subway tunnel. (Gardner)

Response: According to PANYNJ drawings and a field visit, it appears that the slurry wall abuts the IRT subway wall. Based on documents referenced in PANYNJ"s 2003 Phase 1A reports, the slurry wall was constructed as a solid wall of concrete which replaced the soil once located there.

Comment 41: It cannot be certain that prior utility and subway construction have fully disturbed or removed archaeological resources beneath Church Street and Liberty Plaza. It is recommended that additional research be conducted to substantiate the DEIS finding regarding archaeological resources in the vicinity of Church Street and Liberty Plaza Park. (Suphin)

Response: The Preferred Alternative for the Permanent WTC PATH Terminal would not result in a subgrade concourse beneath Church Street to Liberty Plaza. Therefore, the project would not disturb any potential, remaining archaeological resources beneath the roadway or within the Plaza.

Comment 42: The analysis presented in the DEIS assumes that the Coordinated Determination of Eligibility (March 31, 2004) provides a proper basis for the evaluation of the project's potential effects on historic resources. The Coordinated Determination of Eligibility is faulty in many regards, including its failure to properly define the period of significance, its failure to acknowledge the significance of the site under more than one National Register eligibility criteria, and its improper application of the concepts of integrity. The FTA should request a formal determination from the Keeper of the National Register and that the Determination of Eligibility is revised appropriately. (Gardner)

Response: FTA does not plan on making such a referral. FTA believes that the Coordinated Determination of Eligibility provides a proper basis for the Section 106 review process. FTA and PANYNJ have provided additional information about the WTC site and the potential impacts of the Preferred Alternative through meetings and correspondence with the Section 106 consulting parties throughout the process to develop a Memorandum of Agreement. Therefore, the recommended mitigation measures were not limited by the Coordinated Determination of Eligibility. FTA and PANYNJ believe that the Memorandum of Agreement provides for appropriate measures and treatments with respect to the WTC site.

Comment 43: In discussing the setting of the WTC Site, the DEIS fails to distinguish between the Area of Potential Effect for historic remains and archaeological remains. A discussion of the setting associated with the World Trade Center ruins and remains should be included. Furthermore, the DEIS should include "setting" among the characteristics of the WTC Site that will be diminished. (Gardner et al)

Response: The Areas of Potential Effect for Historic and Archaeological resources are shown in Figure 6-1, and Chapter 6, "Cultural Resources" of the DEIS and this FEIS, and the corresponding text describes them separately.

With respect to the setting of the WTC site, the Draft Finding of Effects, which was presented as Appendix B of the DEIS concluded the following:

The project will introduce a new building and several small structures (such as vents and street access to concourses) into an APE that already contains a wide variety of historic and modern buildings ranging in height from one to 60 stories. Although the construction is new, the terminal, multiple accesses to the street level, and ventilation shafts functionally replace the same uses that existed prior to September 11, 2001. The proportions and architectural styles of the adjacent buildings vary greatly, reflecting the various periods in which they were designed and constructed. Historic masonry-clad buildings stand beside contemporary buildings constructed of glass, concrete, and metal in the APE north, east, and south of the project site; the entirety of Battery Park City on the west dates to the 1970s. The WTC itself initiated the introduction of modern (1960s) skyscrapers to the neighborhood. Redevelopment of the WTC Site, which will be underway independently of the Permanent WTC PATH Terminal, will again bring skyscrapers to the site of the WTC, including the Freedom Tower at the northwest quadrant of the WTC Site, and several somewhat shorter but still prominent office towers on the eastern portion of the site. The proposed Permanent WTC PATH Terminal will also be of contemporary design but of smaller scale than the other buildings proposed for the WTC Site under the Redevelopment Plan. Each of the two vent structures currently proposed to be located in the Route 9A median, west of the WTC Site, would be of long and slender massing and would stand approximately 40 feet tall. It is anticipated that the structures would be clad in reflective material, in keeping with modern material used on buildings in the immediate area.

The urban environment forming the setting of the WTC Site will continue to possess its distinguishing variety. Therefore, the introduction of the new Permanent WTC PATH Terminal and associated vent and access structures will not diminish the integrity of the WTC Site's setting.

Comment 44: The DEIS consistently employs words such as "could" and "may" when discussing effects to specific historically significant elements of the WTC site. Such words suggest uncertainty as to the exactly if and/or how various elements will be affected. Not only is this because of the insufficiently detailed description of the project but also because a complete inventory (with maps) of the historically significant elements at the WTC site was never prepared as part of the Coordinated Determination of Eligibility. A complete inventory of both site features and off-site artifacts should be conducted. In the absence of a

complete inventory, any assessments of effects or proposals for mitigation are premature. (Gardner, Gardner et al)

Response: The Permanent WTC PATH Terminal is currently in its design stage. It is known that the project will impact the approximately 16-acre, National Register-eligible WTC site, but the extent of this impact to specific remaining remnants and structures on the WTC site was uncertain at the time of the publication of the DEIS. Subsequent to publication of the DEIS, FTA and PANYNJ held four meetings with the project's Section 106 consulting parties. At these meetings, FTA and PANYNJ provided additional information regarding the Terminal's design and its potential impacts on remaining remnants and structures within the WTC site. Where specific effects are known, the findings presented in the FEIS have been updated, and mitigation measures have been developed. In cases where effects remain uncertain, the executed Memorandum of Agreement provide for stipulations to address these potential impacts should they occur.

PANYNJ is currently conducting HABS/HAIR Level II documentation of the WTC site pursuant to the stipulations of the executed Memorandum of Agreement. PANYNJ has also conducted a detailed inventory, including a photographic log, of all artifacts located within Hanger 17 of John F. Kennedy Airport.

Comment 45: FTA and PANYNJ should make attempts to preserve and/or incorporate remaining remnants on the WTC site into the project's design. FTA and PANYNJ should immediately prepare specific plans to incorporate the viewing and access of historic elements into the everyday experience of the Permanent WTC PATH Terminal. In cases, where adverse impacts to certain elements are absolutely unavoidable, the FTA and PANYNJ should immediately share plans with the Section 106 Consulting Parties for the mitigation of these impacts. Specifically the elements that should be incorporated into the design include: box beam column remnants marking the tower perimeter; northwest remnant sub-grade structures; passageway to E-train; steel beams in cross form; plaza; and subway entrance to Vesey Street. (Lustbader, Todorovich, Yaro; Sanchis III et al 1, Sanchis III et al 2)

Response: Subsequent to publication of the DEIS, FTA and PANYNJ held four meetings with the project's Section 106 consulting parties. At these meetings, FTA and PANYNJ provided additional information regarding the Terminal's design and its potential impacts on remaining remnants and structures within the WTC site. Based on consulting party comments, FTA and PANYNJ developed alternatives for components of the Terminal to minimize or avoid adverse effects, and alternatives were selected based on consulting party input. Subsequent to this process, FTA and PANYNJ developed a Memorandum of Agreement that contains the design measures developed through the Section 106 consultation

process. The project's consulting parties were given multiple opportunities to comment on a draft Memorandum of Agreement prior to its execution. Thus, FTA and PANYNJ believe that the Section 106 consultation process has provided a sufficient level of investigation to avoid, minimize, or mitigate the Preferred Alternative's adverse impact on the 16-acre WTC site.

Comment 46: PANYNJ should respect the wishes of many family members of the victims of the terrorist attacks and should not construct atop the tower footprints. (Lachman)

Response: Through its Section 106 review process, the FTA and PANYNJ have been working closely with Section 106 Consulting Parties, which include groups representing the victims' families. This process has resulted in a Memorandum of Agreement that specifies measures to minimize and mitigate the adverse effects of the Terminal to the tower footprints.

Comment 47: The discussion of the tower perimeter column bases implies that it is the column bases that constitute the footprints of the Twin Towers. The DEIS never discusses the footprints of the Twin Towers as a holistic entity. The tower perimeter column bases are discussed separately from other features located within the footprints proper. A discussion of how the footprints in their entirety will be affected is essential to properly evaluate the effects to them and to properly evaluate the project with respect to Section 4(f) of the U.S. Department of Transportation Act. (Gardner, Gardner et al, Kornfeld)

Response: The Memorandum of Agreement acknowledges that the column bases delineate the north and south tower footprints. The Memorandum of Agreement also stipulates measures to avoid, minimize, or mitigate the Preferred Alternative's effects to the columns bases and the spaces that they define.

Comment 48: The DEIS implies that physical disturbance of the truncated box beam columns is the only way they will be affected. The statement that the project would impact "some" of the columns is incorrect. They will all be affected in that their associated setting will be altered. The statement that some of the column bases while being made inaccessible could remain in situ is not very meaningful. If they become inaccessible they will be adversely affected. (Gardner et al)

Response: The DEIS describes the direct alteration or removal of remaining structures and elements on the WTC site resulting from the construction and operation of the Permanent WTC PATH Terminal. As described in Chapter 6, "Cultural Resources," collectively, the alteration or removal of these remaining structures and remnants would alter the integrity of feeling of the WTC site, which is noted as an adverse impact.

With regard to setting, the project will introduce a new building and several small structures (such as vents and street access to concourses) into an APE that already contains a wide variety of historic and modern buildings ranging in height from one to 60 stories. Although the construction is new, the terminal, multiple accesses to the street level, and ventilation shafts functionally replace the same uses that existed prior to September 11, 2001. The proportions and architectural styles of the adjacent buildings vary greatly, reflecting the various periods in which they were designed and constructed. Historic masonry-clad buildings stand beside contemporary buildings constructed of glass, concrete, and metal in the APE north, east, and south of the project site; the entirety of Battery Park City on the west dates to the 1970s. The WTC itself initiated the introduction of modern (1960s) skyscrapers to the neighborhood. Redevelopment of the WTC Site, which will be underway independently of the Permanent WTC PATH Terminal, will again bring skyscrapers to the site of the WTC, including the Freedom Tower at the northwest quadrant of the WTC Site, and several somewhat shorter but still prominent office towers on the eastern portion of the site. The proposed Permanent WTC PATH Terminal will also be of contemporary design but of smaller scale than the other buildings proposed for the WTC Site under the Redevelopment Plan. Each of the two vent structures currently proposed to be located in the Route 9A median, west of the WTC Site, would be of long and slender massing and would stand approximately 40 feet tall. It is anticipated that the structures would be clad in reflective material, in keeping with modern material used on buildings in the immediate area.

Comment 49: How many box beam column bases will be "temporarily" covered during construction? For how long? How will they be affected and protected during construction? (Gardner et al)

Response: All of the box beam column bases that are not currently covered and that would remain on-site would be covered during the construction period for their protection. Per the stipulations of the Project's Memorandum of Agreement, PANYNJ will develop a Resource Protection Plan for the WTC site that will include measures to protect the box beam column bases during the construction period.

Comment 50: There is an urgent need to remove the few inches of dirt that obstruct the remains of the footprints so that they can be properly inventoried, identified, documented, and photographed. (Gardner et al)

Response: PANYNJ removed the few inches of dirt that obstruct the remains and have documented and photographed remaining features. Upon completion, this documentation will be circulated to the project's Section 106 Consulting Parties.

Comment 51: The DEIS states that "obscuring the features from public view would not necessarily diminish the site's integrity of feeling." The present setting includes full access to and visibility of the north tower footprint and much of the south tower footprint. The ability to see and possibly touch the remains of the WTC is integral to the feeling associated with the site. The post-Terminal construction site will look very different from today. It will evoke less of a feeling of the effects of the events of September 11, 2001. The covering of portions of the footprints by tracks and portions of air space above the footprints by the Terminal structure will alter the setting of the WTC site. (Gardner et al, Sanchis III et al 1, Sanchis III et al 2)

Response: Refer to the response to Comment 48 above.

Comment 52: The statement that "all of these Tower perimeter columns were removed" is incorrect and contradicts the following phrase which states that the bases of the columns remain. (Gardner et al)

Response: The statement in Chapter 6, "Cultural Resources" of this FEIS was revised for clarification as follows: "During the post-September 11, 2001 emergency recovery operations conducted by the City of New York, all of these Tower perimeter columns were truncated such that only the bases remain."

Comment 53: The fact that construction of various proposed infrastructure elements will not physically destroy any of the truncated box beam columns is not meaningful in itself. The DEIS notes that proposed infrastructure "may somewhat impact visibility and accessibility." Exactly what does this mean? Much more specific information is needed. (Gardner et al)

Response: There would be various site infrastructure elements supporting the Preferred Alternative within the PATH right-of-way. The Preferred Alternative may also include utility lines that cross the footprints of the former North and South Towers at an elevation above the existing floor of the WTC site (Elevation 242 or 58 feet below Sea Level). Under current plans, these utilities would be at Elevation 264 (36 feet below Sea Level). These utility lines would serve the joint infrastructure needs of both the Permanent WTC PATH Terminal and the WTC Memorial and Redevelopment Plan.

The Preferred Alternative platforms and supporting infrastructure may permanently obscure 5 to 7 of the North Tower perimeter column bases and up to 3 of the South Tower perimeter column bases that currently exist outside of the PATH right-of-way. Given safety considerations, these column bases would be inaccessible to the general public. However, as described in the executed Memorandum of Agreement, PANYNJ will provide for architectural treatments within the Terminal such that a minimum of 5 to a maximum of 7 column bases of the east column line of the North Tower would be visible from Platform D.

Comment 54: Exactly what alterations that would be "additive in nature" are being referred to? While they may not "result in diminution of the physical characteristics of features," they still may adversely affect these features in other ways. (Gardner et al)

Response: As described in Chapter 2, "Project Alternatives," a fourth platform, an east-west concourse, a north-south concourse, and an above-ground Terminal Building will be constructed within the WTC site beyond the limits of the temporary WTC PATH station. The analysis indicates that such "additive" alterations will change the existing environment within the site through the introduction of new elements, thereby diminishing the Site's integrity.

Comment 55: The need for an additional track should be qualified and its adverse effects on the historic site should be considered. (Kornfeld)

Response: As described in Appendix C-2 of this FEIS, PATH requires a five-track operation at the WTC Terminal to support daily operations on the Newark-WTC and Hoboken-WTC routes, to allow for overnight train storage, or to provide for failure management.

In order to maintain reliable operations for its customers, PATH must plan for system failures that result in service disruptions. Disruptions can occur for a number of operational and maintenance reasons such as police actions, medical emergencies, equipment failures, routine maintenance and construction; and special operations. In the event of car equipment failure, PATH must have facilities to layover trains if they become fully disabled. Because PATH's WTC facility is a terminal station, trains dwell at the station in order to maintain the scheduled headways. Thus, each of the Hoboken-WTC and Newark-WTC routes require two active tracks such that an incoming train can arrive before an outgoing train departs. However, if a train becomes disabled, an additional track is needed to serve the next or multiple incoming trains.

Because of system-wide limitations and to allow for a more efficient operation during the start of early morning service, PATH uses four of the five tracks at the WTC for overnight storage of 6 Hoboken-WTC trains. The Terminal's fifth track is retained for revenue service on the Newark-WTC Line. Beginning at approximately 5:40 AM each morning, PATH begins revenue service on the Hoboken-WTC Line by bringing the train stored at Journal Square into the WTC Terminal. Trains are then moved from storage at the WTC to revenue service every 10 minutes following the departure of the first train until all 7 consists are operational. This plan allows PATH to more efficiently manage its labor hours and decreases the time that Hoboken-WTC trains are in non-revenue operation. During winter months, the overnight storage of trains at the WTC facility allows PATH to establish AM peak Hoboken-WTC service without first removing snow or ice from the trains and tracks.

During construction of the Preferred Alternative, the existing Tracks 1 through 5 would be taken out of service one at a time to allow for permanent track and platform installation. Thus, a temporary Track 6 is needed during construction to maintain PATH's minimum operating requirements.

As stipulated in the executed Memorandum of Agreement, the temporary PATH track (in addition to the existing 5 tracks) and associated ballast that would be installed on a temporary basis during construction of the Project tracks and platforms would be removed upon completion of the permanent tracks and platforms to re-expose the North Tower perimeter column remnants and portions of the North Tower footprints that may be covered by the temporary track and ballast.

Comment 56: The Memorandum of Agreement should incorporate a specific commitment to loop utilities and other infrastructure outside the tower footprint. (Sanchis III et al 2)

Response: As described in Chapter 6, "Cultural Resources" of this FEIS, the Preferred Alternative may also include utility lines that cross the footprints of the former North and South Towers at an elevation above the existing floor of the WTC site (Elevation 242 or 58 feet below Sea Level). Under current plans, these utilities would be at Elevation 264 (36 feet below Sea Level). These utility lines would serve the joint infrastructure needs of both the Permanent WTC PATH Terminal and the WTC Memorial and Redevelopment Plan..

Comment 57: The DEIS states that "the tower perimeter column bases would be preserved in place to the maximum extent possible." It is unclear what the phrase "to the maximum extent possible" means. FTA and PANYNJ should acknowledge their commitment to preserve 97 percent of the north tower footprint and 50 percent of the south tower footprint. (Gardner)

Response: As described in the executed MOA, the total extent of the North Tower footprint at elevation 242 (58 feet below Sea Level) to be permanently occupied by any portion of the Project would be approximately 1,600 square feet and would not exceed 4 percent of the North Tower footprint area. The total extent of the South Tower footprint at elevation 242 (58 feet below Sea Level) to be permanently occupied by any portion of the Project would be approximately 23,615 square feet (21,615 currently occupied by the temporary WTC PATH station plus 2,000 additional square feet for the Permanent WTC PATH Terminal) and would not exceed a total of 53 percent of the South Tower footprint area..

Comment 58: The discussion of how the remains of the Hudson and Manhattan tubes and terminals will be affected needs to be much more detailed. (Gardner et al)

Response: As stated in Chapter 2, "Project Alternatives," of this FEIS, construction of the Terminal may also require the demolition and excavation of remaining structures within the eastern portion of the WTC site between MTA/NYCT's 1 and 9 line and Church Street, which includes all portions of the former H&M Terminal. This work would also support the future development of the site by others. Per the stipulations of the executed Memorandum of Agreement, PANYNJ would fully document the remains of the former H&M Terminal to HABS/HAER Level II Standards prior to demolition.

Comment 59: The DEIS states that the remaining portions of the former Hudson & Manhattan (H&M) Terminal and the cast-iron tubes leading from the station do not meet criteria for listing on the National Register due to a loss of historic integrity. This statement is inconsistent with other findings, specifically the Coordinated Determination of Eligibility and the LMDC's Programmatic Agreement. (Gardner)

Response: Prior to the Coordinated Determination of Eligibility for the WTC site, SHPO determined that the remaining portions of the former H&M Terminal and the cast-iron tubes leading from the station do not meet the criteria for listing on the National Register as an entity onto itself due to a loss of historic integrity (letter dated October 16, 2003). However, given its location within the 16-acre WTC site, the former H&M Terminal was listed as a remaining remnant and structure in the Coordinated Determination of Eligibility. As such, the Preferred Alternative's effects on the H&M Terminal remnants were reviewed pursuant to Section 106 of the National Historic Preservation Act.

Comment 60: All of the slurry walls should be considered equally significant, and the DEIS must identify whose undertaking is associated with effects to the west slurry wall. Furthermore, FTA must determine whether or not bathtub wall reinforcement is or is not part of their project. If it is not, then presumably it is part of LMDC's project. Yet, the LMDC never discussed it in their Final Generic Environmental Impact Statement or Record of Decision for the WTC Memorial and Redevelopment Plan. (Gardner et al)

Response: As described in Chapter 2, "Project Alternatives," of this FEIS, the Preferred Alternative includes funds for the reinforcement of the basement ("slurry") walls, which form the "bathtub" within the WTC site. This work is necessary to ensure the structural integrity of the walls and to support future redevelopment of the WTC site, including the Permanent WTC PATH Terminal. As part of the Permanent WTC PATH Terminal's construction, PANYNJ could reinforce the entire west bathtub wall except for portions that would remain visible as part of the WTC Memorial. PANYNJ would also reinforce portions of the east bathtub wall abutting NYCT's 1 and 9 line that were not previously reinforced. If other development on the WTC site does not move forward according to current

schedules or plans, it may also be necessary to reinforce portions of the north bathtub wall east of Freedom Tower and portions of the south bathtub wall above the existing PATH substation. It is currently estimated that approximately 30 percent of the required slurry wall repairs would be undertaken as part of the Preferred Alternative.

Comment 61: The removal of the recovery and reconstruction ramp, although necessary and unavoidable, should be acknowledged as an adverse effect. Preservation plans for the ramp should be considered. (Gardner et al)

Response: The support foundation for the ramp would be relocated to allow for construction of a temporary track. The ramp would remain during early construction of the Preferred Alternative and would then be removed. Pursuant to the executed Memorandum of Agreement, the ramp would be documented to HABS/HAER Level II Standards prior to its removal.

Comment 62: The inclusion of a discussion of the "Northwest Remnant Subgrade Structures" as part of the project would seem to contradict numerous statements by PANYNJ that demolition of these structures is not part of the PATH project. (Gardner et al)

Response: Since publication of the DEIS, PANYNJ and the LMDC have pursued the removal of the Northwest Remnant Subgrade Structures under an independent action from the Permanent WTC PATH Terminal project. Therefore, this FEIS considers the Northwest Remnant Subgrade Structures as part of the Future Common to All Alternatives for the Permanent WTC PATH Terminal.

Comment 63: PANYNJ should consult with museum curators and investigate the possibility of salvaging more than three elements from the northwest remnant subgrade structures. Additional elements, along with the recently photographed Tito Dupret images, could provide for a more effective interpretation of the World Trade Center site. (Lustbader, Sanchis III et al 1, Sanchis III et al 2)

Response: Since publication of the DEIS, PANYNJ and the LMDC have pursued the removal of the Northwest Remnant Subgrade Structures under an independent action from the Permanent WTC PATH Terminal project. Thus mitigation measures pursuant to its removal are not part of this project.

Comment 64: The DEIS states that the entrance to the E train would be reconfigured and that certain elements associated with the existing E train passageway may be relocated. No description or drawings of the planned reconfiguration are provided, and no mention is made of which elements "may" be relocated. The passageway to the E train was recently restored and is one of the last surviving elements of the World Trade Center site. PANYNJ should conduct additional

analysis to incorporate the passageway into the Permanent WTC PATH Terminal's design. (Gardner et al, Lustbader; Love, Sanchis III et al 1, Sanchis III et al 2)

Response: As stipulated in the Project's MOA, the new pedestrian connection between the Permanent WTC PATH Terminal and the MTA/NYCT WTC E Subway Station would incorporate the existing E subway entrance, in its current location, in a manner that retains existing materials and features of this entrance, including, but not limited to, the handrails, the travertine flooring, the steps and doors separating the E train from the pedestrian connection, and overhead signage, to the extent possible and in accordance with current building codes and Americans with Disabilities Act requirements. The design would include, at a minimum, a plaque identifying the historic features of the E subway entrance. During construction of the new pedestrian connection between the Permanent WTC PATH Terminal and the E Subway Entrance, doors may need to be carefully removed and stored until they can be reinstalled within the new connection.

Comment 65: The steel beam in cross form should be moved temporarily within the World Trade Center site. If it needs to be moved off-site, proper public notification should be given, and it should be carefully preserved at JFK Hangar 17. (Lustbader, Sanchis III et al 1, Sanchis III et al 2)

Response: As stipulated in the executed MOA, PANYNJ would relocate the steel column and crossbeam mounted on a concrete pedestal and currently situated within the WTC site near Church Street in accordance with Stipulation VI of the MOA (see Appendix B). The object would remain in the custody and control of PANYNJ pending final disposition.

Comment 66: The steel beams in cross form should be removed from the site since it would be inappropriate as a permanent part of the site. The "steel cross" has an association with a particular religion on a site where people of many different religions perished. (Love)

Response: Refer to the response to Comment 65 above.

Comment 67: FTA and PANYNJ should not preserve everything that might be deemed a "ruin" by future generations. While most local residents are sensitive to victims' families and preservationist concerns, the primary focus has to be on the redevelopment of the site and economic revitalization of Lower Manhattan. (Gaull, Love)

Response: Through its Section 106 review process, the FTA and PANYNJ have been working closely with Section 106 Consulting Parties, which include groups representing the victims' families and local residents. This process has resulted

in a Memorandum of Agreement that specifies measures to avoid, minimize, and mitigate the Preferred Alternative's adverse effects to remaining remnants and structures on the WTC site.

Comment 68: The plaza and subway entrance at Vesey Street are the only surviving above ground elements of the World Trade Center site. The removal of these stairs is an avoidable adverse effect. The non-functionality and current instability of the stairs is given as a justification for their removal, which is unacceptable. Their non-functionality does not diminish their historical significance. FTA should identify the feasibility of stabilizing these remains and consider design modifications that would permit their preservation in place so they will not be adversely affected. (Gardner et al, Lustbader, Sanchis III et al 1)

Response: Subsequent to the publication of the DEIS, FTA and PANYNJ have determined that a proposed Permanent WTC PATH Terminal entrance in the location of the plaza and subway entrance to Vesey Street can be moved. As such, the Permanent WTC PATH Terminal would not impact the plaza and subway entrance to Vesey Street.

Comment 69: The decision to remove the structural remnants of the Vesey Street stairway is acceptable given its heavy damage and lack of permanent stability or functionality. (Love)

Response: As noted in the response to Comment 68, the Preferred Alternative would not alter the plaza and subway entrance to Vesey Street.

Comment 70: Avoidance of archaeological resources and data recovery are not the only forms of mitigation available for dealing with archaeological resources. (Gardner)

Response: The executed MOA includes the process to address the Preferred Alternative's impacts on the Hudson River Bulkhead and its potential impacts to as yet determined archaeological resources that may be located within the eastern potion of the WTC site. Because the Hudson River Bulkhead is also located within the APE for the Route 9A Project, PANYNJ would coordinate its treatment plan with NYSDOT. Similarly because the potential archaeological resources within the WTC site are also located within the APE for the WTC Memorial and Redevelopment Plan, PANYNJ would coordinate its treatment plan, if necessary, with LMDC.

In consultation with SHPO, and FHWA and NYSDOT, PANYNJ would develop and implement a plan to locate and identify intact portions of the Hudson River Bulkhead that would be affected by construction of the Permanent WTC PATH Terminal's east-west pedestrian connection. In the event that the intact portions of the Hudson River Bulkhead are identified, PANYNJ would, in consultation with the SHPO and NYSDOT, prepare a

treatment plan for those portions of the Hudson River Bulkhead to be affected by the Project. The plan would be submitted to SHPO and Section 106 consulting parties for their review and comment prior to implementation.

Prior to any Project-related subsurface disturbance at any of the locations that have been determined to be sensitive for historic archaeological resources, PANYNJ will, in consultation with the SHPO, and LMDC as appropriate, identify and evaluate the National Register eligibility of any archaeological resources at these locations in accordance with 36 CFR 800.4.

In the event that FTA, in consultation with SHPO, determines that National Register-eligible archaeological resources will be adversely affected by construction of the Preferred Alternative, PANYNJ would, in consultation with FTA, SHPO, and LMDC as appropriate, and the Section 106 consulting parties, develop and implement a Archaeological Resource Treatment Plan for the Project. The Archaeological Resource Treatment Plan and documentation will adhere to the standards established by the Secretary of the Interior's Standards and Guidelines for Archaeology (48 FR 44716), including the standards therein for professional qualifications. The plan will be submitted to SHPO and Section 106 consulting parties for their review and comment prior to approval.

Comment 71: The proposed photographic documentation of the entire WTC site should be done to HABS/HAER Level 1 Standards and the documentation plan should be subject to the review and approval of the National Park Service. (Gardner)

Response: Per the stipulations of the executed MOA, PANYNJ would document the WTC site and its historic features to Level II standards of the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) prior to the removal or alteration of any historic features from the WTC site. This documentation will consist of large-format, black-and-white photography of the site and its historic features as they currently exist; large-format photographic reproduction of selected existing drawings of current conditions and of pre-September 11, 2001 conditions; and a written history and description of the site and its historic features using information previously generated for the Coordinated DOE for the WTC site as well as the Permanent WTC PATH Terminal's DEIS and FEIS. The completed documentation would be submitted to SHPO and HABS/HAER.

Comment 72: FTA should explore the desirability of inviting LMDC as a signatory to any Programmatic Agreement developed for the Permanent WTC PATH Terminal project given the high interrelationship with between this project and the World Trade Center Memorial and Redevelopment Plan. (Gardner)

Response: The LMDC signed the Permanent WTC PATH Terminal Memorandum of Agreement as a concurring party. (See Appendix B.)

Comment 73: The Hudson River Park Trust would like to be included in future discussions related to any impacts to the Hudson River Bulkhead and consistency with the existing Programmatic Agreement. (Blackman)

Response: As a consulting party to the Section 106 review process for the Permanent WTC PATH Terminal, the Hudson River Park Trust has been notified of all consulting party meetings including those that have outlined the project's Memorandum of Agreement. As a consulting party, the Hudson River Park Trust will be invited to review and comment on the Archaeological Resource Treatment Plan that will be developed for the project's potential impacts on the Hudson River Bulkhead.

Comment 74: The DEIS states that PANYNJ will coordinate with the other Lower Manhattan project sponsors "to minimize disruption in access to cultural and historic sites." The WTC site is considered a historic resource. If the LMDC, through its Programmatic Agreement, will control access to the tower footprints, then how can such coordination be possible? (Gardner)

Response: The above-referenced text refers to an Environmental Performance Commitment, which will be implemented during the construction period. The full text of this EPC states that the Lower Manhattan Recovery Project sponsors will "establish coordination among projects to avoid or minimize interruption in access to cultural and historic sites." The Environmental Performance Commitment pertains to off-site cultural resources including historic sites, community and religious institutions, museums, and other attractions. During the construction period, the WTC site will not be publicly accessible beyond public viewing areas that will be provided by PANYNJ and the LMDC. In the long-term, access will be controlled by LMDC and PANYNJ pursuant to the stipulations of their respective agreements that were developed in accordance with Section 106 of the National Historic Preservation Act.

URBAN DESIGN AND VISUAL RESOURCES

Comment 75: The DEIS assessment of the Terminal building's effects to visual resources is extremely cursory, one-sided, and based on highly dubious assumptions. The proposed Terminal building is an iconic, modernist structure that would have adverse effects on the visual character and heritage of Lower Manhattan. (Hemric)

Response: As described in Chapter 7, "Visual Resources," the Terminal building would be located on a site that contained modern structures prior to September 11, 2001 and modern structures will be constructed on the WTC site as part of the WTC Memorial and Redevelopment Plan. While Chapter 6, "Cultural Resources," identified historic structures in the vicinity of the project site, the area has a mix of both older and modern skyscrapers, including One Liberty Plaza and the

Hilton Millennium Hotel. Thus, a modern terminal building is in keeping with the urban context of this area. Furthermore, Church Street does not have a contiguous street wall in the vicinity of the World Trade Center site since newer structures are set back with exterior plazas. Thus, the shape and position of the Terminal will not adversely effect the urban design of the urea.

The density and patterns of development in New York City has resulted in adjacent iconic structures for some time. For example, Grand Central Terminal and the Chrysler Building are adjacent as is Rockefeller Center and Saint Patrick's Cathedral. The location of an "iconic" Terminal building in Lower Manhattan is in keeping with New York's history and patterns of development.

TRANSPORTATION

Comment 76: The DEIS should have noted how the plans for a Permanent WTC PATH Terminal would have a negative impact on passenger mobility and comfort when compared to the pre-September 11, 2001 PATH Terminal and concourse since the previous concourse was essentially at street level on all sides. (Hemric)

Response: While the Terminal's platforms and tracks would have a similar configuration to the pre-September 11, 2001, vertical and horizontal circulation would be much improved. Two concourses would provide for east-west and north-south access through the WTC site. These corridors would converge within the transportation hall, which would provide access to street-level, the Dey Street concourse of the Fulton Street Transit Center, and the Cortlandt Street (1 and 9), Cortlandt Street (N and R), and World Trade Center (E) subway stations. The concourse would also connect to elements of the WTC Memorial and Redevelopment Plan, including the memorial, cultural centers, offices, and retail on the WTC site. The east-west concourse would extend beneath Route 9A to a new entrance in front of the Wintergraden of the World Financial Center. This new Route 9A connection would allow for east-west travel between the WTC and World Financial Center without a major change in vertical grade, which was the case with the former north bridge of the WTC. The linear design of the concourses would provide for visual access to destinations and wayfinding signage would be provided throughout the complex. The proposed design of the concourses would provide for easier and more direct connections to transit stations and uses on and off the WTC site than was provided prior to September 11, 2001.

Comment 77: The DEIS should examine how the transformation of Lower Manhattan to a more well-rounded, 24-hour district might actually lessen the need for peak hour transit service. (Hemric)

Response: By 2025, employment in Lower Manhattan is projected to total nearly 422,000, which will be less than 1 percent fewer employees than existed prior to September 11, 2001. Although the residential population of Lower Manhattan

will increase by a much greater proportion than its commuter population, there will continue to be a substantial number of jobs in this area. Furthermore, prior to September 11, 2001, new and expanded office development in Jersey City, Newark, and Hoboken result in a rapidly increasing trend toward reverse-commuting by PATH. Currently, several office projects are planned in these areas that will likely result in more reverse-commuters in coming years. Thus, commuters between New Jersey and Lower Manhattan and those between Lower Manhattan and New Jersey will continue to constitute a substantial number of peak hour trips, and it is not anticipated that demand for peak hour transit service will lessen as compared to the pre-September 11, 2001 volumes.

Comment 78: The proposed connections between the Cortlandt Street (R and W) station and the World Trade Center (E) station should be integrated into the design of the Permanent WTC PATH Terminal as should the western end of the Dey Street passageway and the eventual connection to the Cortlandt Street (1 and 9) station. These connections should be designed to allow for fare-free transfers should MTA/NYCT subways and PATH adopt an integrated fare structure in the future. (Lachman)

Response: PANYNJ is coordinating with MTA to provide for a seamless connection between the Permanent WTC PATH Terminal and the Fulton Street Transit Center's Dey Street Concourse, the Cortlandt Street Station (1 and 9), the Cortlandt Street Station (R and W); and the World Trade Center Station (E). While these connections will allow for transfers between PATH and NYCT subways, they will also provide subgrade access between future uses on the WTC site. Therefore, these connections are not being planned as fare-free transfers. However, PANYNJ and MTA continue to work toward an integrated fare system that would allow for transfers between PATH and NYCT using a single fare-card. This system would be implemented for the transit connections within the WTC Transportation Hub when it becomes available.

Comment 79: The sound system for announcements at the WTC facility is absolutely terrible and messages are difficult to understand. (Gorsky)

Response: The Preferred Alternative would include a modern public address system to provide for announcements can be heard by commuters throughout the complex.

Comment 80: Before considering the design of the various subway stations involved, PANYNJ should consider methods of barrier-free fare collection. (Adler)

Response: As described in Chapter 8, Section A, "PATH," PANYNJ and MTA/NYCT are currently coordinating to develop an integrated fare collection system. However, the enhancement of fare collection for subways is a separate undertaking from the Permanent WTC PATH Terminal.

Comment 81: The PANYNJ should continue its work with the LMDC, the City, and the State to bring direct, one-seat access from Long Island and John F. Kennedy Airport to Lower Manhattan. These transportation improvements are critical to maintaining and enhancing Downtown's role as a central business district and a thriving part of the region's economy. (Hensley)

Response: PANYNJ in corporation with LMDC, MTA, and the New York City Economic Development Corporation are currently studying alternatives for a direct, rail connection between John F. Kennedy Airport and Lower Manhattan. However, this undertaking is independent from the Permanent WTC PATH Terminal.

Comment 82: The Permanent WTC PATH Terminal and a direct, high-speed connection to Newark Liberty International Airport presents an opportunity for Lower Manhattan to compete more effectively for job growth and development in the New York City metropolitan area. (McArdle)

Response: As described in Chapter 8, Section A, "PATH," of the DEIS, PANYNJ is studying PATH expansion projects including an extension from Newark Penn Station to Newark Liberty International Airport. However, this project is independent from the Permanent WTC PATH Terminal. The Preferred Alternative would support the future expansion of PATH to Newark Liberty International Airport.

Comment 83: To encourage greater ridership (particularly on nights and weekends) and to lessen use of automobiles, PANYNJ and MTA should agree to a ticket arrangement that would allow the user to pay one price for a combined PATH/MTA ride and should also consider combined unlimited PATH/MTA tickets similar to MTA/NYCT's current unlimited monthly subway pass. (Pasternack)

Response: As described in Chapter 8, Section A, "PATH," PANYNJ, and MTA/NYCT are currently coordinating to develop an integrated fare collection system. Presently, MTA pay-per-ride MetroCards are accepted at the temporary WTC PATH station and similar integration will be implemented at other PATH stations in the near future. In the long-term, the agencies hope to develop systems that allow for compatibility of other types of fare cards. However, the enhancement of fare collection is a separate undertaking from the Permanent WTC PATH Terminal.

Comment 84: The E train at the World Trade Center Station should be linked to the R and W line at Cortland Street, about a 100-foot distance to carry more passengers to the south at Whitehall/Water streets or even further to Brooklyn. (O'Shea)

Response: MTA/NYCT is considering a sub-grade connection between the World Trade Center (E) and Cortlandt Street (R and W) stations as part of the Fulton Street

Transit Center. However, this undertaking is independent from the Permanent WTC PATH Terminal.

Comment 85: The DEIS does not provide a sufficient explanation or appropriate backup for the 2025 ridership estimates. It is impossible for the reviewer to evaluate the legitimacy of the methodology or assumptions used to arrive at these estimates. An accurate estimate is imperative to justify the expansion of the facility beyond its pre-September 11, 2001 and current temporary capacity. (Gardner)

Response: A ridership appendix is included as Appendix C-1 of this FEIS. The appendix incorporates modifications to the ridership forecasts made subsequent to publication of the DEIS. These modifications reflect current ridership trends at the temporary WTC PATH station as well as development proposals and other planning efforts in both Lower Manhattan and New Jersey that may result in changes to future PATH ridership. This appendix was circulated in draft form for review by the project's Section 106 consulting parties in August 2004.

Comment 86: The PANYNJ recently announced that it will procure 246 new PATH cars that will have three doors on each side, which will allow for faster loading and unloading of passengers. The DEIS does not consider the potential of these cars to increase capacity and the degree to which improved loading and unloading will improve platform operations at the Permanent WTC PATH Terminal. (Gardner)

Response: As described in Appendix C-2 of this FEIS, three-door cars will decrease the boarding/alighting times of trains by 50 percent, which will improve dwell times and could reduce the overall travel time on PATH routes. However, the new cars are not expected to improve the station clearance time for passengers since they would not directly affect platform area or vertical circulation elements. Furthermore, since the WTC Terminal is a terminal station, passenger circulation at this facility is not highly influenced by the dwell times of trains.

Comment 87: The discussion of probable impacts associated with the various design options for a Permanent WTC PATH Terminal must include an evaluation of how these alternatives will affect historic resources, especially the WTC site. (Gardner)

Response: Chapter 6, "Cultural Resources," details the impacts of the Preferred Alternative on historic resources, including the WTC site. Additional analysis is provided in the Section 4(f) Evaluation.

Comment 88: As a result of the WTC Memorial, there will be no access to the transportation center, for residents living west of West Street. Reaching the Terminal will be a major obstacle since no one will be able to cross the Memorial. Because

NYSDOT proposes a tunnel under West Street, the PATH Route 9A connection will be deep and will pose a great hardship for those who use it. (Gaull)

Response: As currently planned, street-level access to the Terminal for those west of Route 9A could be achieved via the Route 9A Connection adjacent to the World Financial Center. The entrance to this connection would have vertical circulation including escalators and elevators. The connection below Route 9A will provide for easier movement between the concourse and the PATH mezzanine level than existed prior to September 11, 2001. Alternatively, those accessing the Terminal from west of Route 9A could cross Route 9A at grade and enter the Terminal via Freedom Tower, Greenwich Street, or Liberty Street.

AIR QUALITY

Comment 89: Air quality monitoring should be conducted within the WTC bathtub where PATH riders are walking and standing. (Coangelo)

Response: The National Ambient Air Quality Standards (NAAQS) standards are based on 24-hour and annual averaging periods, but the potential exposure time of PATH patrons within the "bathtub" would be considerably shorter. Thus, monitoring would be ineffective since these sort-term exposures would not have a relative basis for comparison.

Comment 90: Air quality monitoring results should be posted on a Website on a daily basis for residents and workers to obtain. (Coangelo)

Response: The Lower Manhattan Project Sponsors are currently investigating verification procedures and protocols for the Lower Manhattan Recovery Projects. This process will involve input from the New York State Department of Environmental Conservation to determine best practices for necessary data collection and reporting. The resultant, coordinated verification plan, including reporting methods, would be administered through the Lower Manhattan Construction Coordination Group or the Lower Manhattan Construction Command Center.

Comment 91: The EIS identified construction-period exceedance in particulate matter (PM) 2.5, which is the highly respirable kind. Where you have exceedance in $PM_{2.5}$, you can also have exceedance in very ultra-fine particulates, which may be even more dangerous to human health. The DEIS proposes to reduce or mitigate harmful effects to the extent possible, but who will determine what is possible and according to what criteria. (Orkin)

Response: PANYNJ would implement the following mitigation measures to reduce project-generated emissions during the construction period. These measures include those previously identified as EPCs.

- Ultra Low Sulfur Diesel Fuel (ULSD): As described in the EPCs, PANYNJ would require that contractors use ULSD for all non-road vehicles that operate with diesel engines.

- Electrification: PANYNJ or its contractor would develop a plan, in consultation with Con Ed, as appropriate, to disperse grid power throughout the contraction zone for the Preferred Alternative. In its contract documents, PANYNJ would require all contractors and subcontractors to use electrically powered equipment for air compressors, pumps, mixing, desanding and grout plants, welding machines, and any other diesel powered equipment that can be replaced with an electrically powered version. However, this does not apply to the east-west pedestrian concourse beneath Route 9A if the concourse is built by NYSDOT, since NYSDOT has not yet finalized what level of electrification would be possible for its projects. Given current conditions, it is expected that at lest 50 percent of the air compressors, pumps, mixing, desanding and grout plants, welding machines, and other diesel powered equipment that can be replaced with an electrically powered version would operate on electric power sources.

- Tailpipe Reduction Measures: In its contract documents, PANYNJ would require the use of Diesel Particle Filters (DPFs) or other measures with equivalent Particulate Matter (PM) removal efficiency for all nonroad diesel engines of 50 horsepower or greater wherever the implementation of such a device is feasible. However, there may be cases where DPFs would not be feasible for safety considerations, mechanical reasons, or where the technology would not function properly. In such cases, the constructor would submit a request for an exception for review and approval by PANYNJ prior to implementation, and in these cases, Diesel Oxidation Catalysts (DOCs) may be used. Only in cases where, for technical reasons, neither DPFs or DOCs can be used effectively, and where the operation cannot be performed by another engine or other means, would the use of diesel engines greater than 50 horsepower be allowed without tailpipe reduction measures, subject to the above-described approval measures.

- Newer Engines: In its contract documents, PANYNJ would require the use of post-1995 fuel injection engines, which meet the Tier II engine emissions standards, as defined in Title 40, Part 89.112. Exceptions will be made only for specific engines that are not yet commercially available as Tier II, and where the task cannot be reasonably accomplished using alternative engines or means which do comply with these demands. In such cases, the contractor would submit a request for an exception for review and approval by PANYNJ prior to implementation.

- Diesel Emission Mitigation (DEM) Plan: PANYNJ would require contractors to prepare a DEM Plan that shall address the control of emissions from all engines and vehicles including those that are not

equipped with emission control devices. As described in the EPCs, the DEM Plan would limit idling times on diesel powered engines to 3 minutes and would require that contractors locate diesel powered engines away from fresh air intakes.

- Dust Control Plan: As described in the EPCs, PANYNJ would require contractors to submit a Dust Control Plan. Among other things, the plan would contain protocols and procedures for the spraying of dust piles, containment of fugitive dust, and appropriate adjustment measures to accommodate changes in meteorological conditions.
- Verification: The effectiveness of measures to reduce construction period emissions depends on compliance. To that end, verification procedures would be implemented through construction specifications and contract documents. PANYNJ would verify mitigation and would identify opportunities to expand its implementation as part of its ongoing oversight and auditing of the Project's construction. Furthermore, verification procedures would be implemented in accordance with decisions of the Lower Manhattan Construction Command Center, including procedures for reporting updates to the public.
- Other Emissions Reduction Technologies: PANYNJ is and will continue to investigate additional means (e.g., fuel emulsions) to reduce NOx (NO and NO2) emissions, but it is not yet known whether these measures would reduce the effectiveness of the above described mitigation. Therefore, specific means to further reduce NOx have not been identified in the mitigation plan for the Preferred Alternative at this time. If this investigation results in additional means to reduce NOx without jeopardizing the PM reducction measures and if other constraints such as technological availability are resolved, then PANYNJ would implement these additional mitigation techniques, as appropriate.

As described in Chapter 9, "Air Quality,' these measures would reduce the maximum $PM_{2.5}$ increments of the Preferred Alternative by approximately 66 percent, and neighborhood scale increments would be reduced by half to below the threshold level of 0.1 $\mu g/m^3$,

Comment 92: The FTA and PANYNJ should have an objective, third-party for air quality monitoring. Otherwise, it may be a conflict of interest. (Orkin)

Response: Verification procedures would be implemented through construction specifications and contract documents to ensure the use of ULSD, maintenance of reduction technologies, dust suppression programs, and the use of grid power. PANYNJ would verify mitigation and would identify opportunities to expand its implementation as part of its ongoing oversight and auditing of the Project's construction.

Furthermore, as noted in the response to Comment 90 above, the Lower Manhattan Project Sponsors are currently investigating verification procedures and protocols for the Lower Manhattan Recovery Projects. This process will involve input from the New York State Department of Environmental Conservation to determine best practices for necessary data collection and reporting. The resultant, coordinated verification plan would be administered through the Lower Manhattan Construction Coordination Group or the Lower Manhattan Construction Command Center.

Comment 93: If exceedances of $PM_{2.5}$ occur during construction, how will PANYNJ address them? (Orkin)

Response: As described in the Response to Comment 91 above, PANYNJ has committed to mitigation that would reduce PM emissions by 66 percent as compared to the analysis presented in the DEIS. As such, exceedance is predicted only for a very small area immediately adjacent to Route 9A. The occurrence of such high levels would depend on the coincidence of peak background levels above the 98th percentile together with peak construction activity and extreme metrological conditions. At a very conservative maximum, this could occur on up to six days of the peak construction year. Such an occurrence, although possible, is not likely, and it would be a temporary situation, limited to a small area. Furthermore, this exceedance would not be expected to occur outside the peak construction year since activity would be reduced. Construction activity will be monitored in this area to ensure that emissions from construction equipment and extreme meteorological conditions are prevented from occurring concurrently.

Comment 94: The FEIS should provide a breakdown of the on-road and off-road emissions. (Hargrove)

Response: Chapter 9, "Air Quality" of the FEIS includes a distribution of on-road and off-road emissions. Of the total predicted project-generated emissions, 50 to 61 percent of VOC, 77 to 91 percent of NOx, 40 to 61 percent of PM_{10} and 78 to 88 percent of $PM_{2.5}$ would be from on–site sources.

Comment 95: The FEIS should provide a more detailed discussion of the NO_2 emissions and the technical data to support the conclusion that the analysis of NO_2 emissions is conservatively high as well as which other measures can be implemented to further minimize the emissions of $PM_{2.5}$ (Hargrove)

Response: The discussion of NO_2 emissions and their modeling assumptions have been expanded in Chapter 9, "Air Quality" and Chapter 15, "Cumulative Effects" of this FEIS. Since publication of the Draft Environmental Impact Statement, PANYNJ has worked with the Metropolitan Transportation Authority to further expand the Environmental Performance Commitments pursuant to construction-

period emissions. As described in this FEIS, PANYNJ has committed to the use of ultra-low sulfur fuel for all non-road equipment, limitation of unnecessary idling time on diesel powered engines to 3 minutes, Tier II standards for all non-road equipment, tailpipe reduction technologies for non-road engines of 50HP or greater, and the use of grid power, wherever possible, for engines that can operate on electric power such as welders; pumps; air compressors; and slurry, desanding, and grout mixers. Furthermore, PANYNJ is investigating the use of fuel emulsions. As noted in Chapter 9, "Air Quality," these combined measures would result in a substantial reduction in NO_2 emissions.

Comment 96: The mitigation measures identified in the DEIS do not affect the emissions of NO_2. The FEIS should assess a scenario that includes all of the stated mitigation measures from the DEIS as well as other measures that will significantly reduce emissions of particulate matter as well as NO_2 and NOx, in general. (Hargrove)

Response: PANYNJ has committed to the use of Tier II engines and the electrification of the equipment, such as welders; pumps; air compressors; and slurry, desanding, and grout mixers, that can operate on electric power, wherever feasible. These measures will substantially reduce the emission of NO_2. Furthermore, PANYNJ is investigating the use of other means (e.g., fuel emulsions) to reduce NO and NO_2 emissions.

Comment 97: The FEIS should be as definitive as possible on opportunities to reduce the emissions of NO_2 as the DEIS was for $PM_{2.5}$ emissions. This should include a description of the equipment that would be electrified and the degree to which electrification would reduce NO_2 emissions. (Hargrove)

Response: Refer to the above response to Comment 96.

Comment 98: Given that the New York Metropolitan Region is a nonattainment area for ozone, a cumulative inventory of emissions of NOx and VOC, as precursors to ozone formation, would be appropriate. (Hargrove)

Response: No emissions are expected under the Preferred Alternative in either the opening or design years. A mesoscale analysis of both on-road and off-road construction equipment and vehicles was prepared for this FEIS to identify the project's incremental increase in Nitrogen Dioxide (NO_2) and Volatile Organic Compounds (VOCs) during its construction. As compared to the projected regional emissions inventory in the New York ozone SIP for the same years—the on–road portion of the emissions would be less than 0.007 percent and 0.002 percent of the SIP mobile source NOx and VOC emissions, respectively; the on-site portion of the emissions would be 0.06 percent and 0.004 percent of the non-road SIP NOx and VOC emissions or less (depending on the year), respectively. The proposed mitigation for construction emissions, aimed at

reducing impacts in the immediate vicinity of the construction sites would also reduce the total region-wide emissions related to the Preferred Alternative.

NOISE AND VIBRATION

Comment 99: It is absolutely necessary that FTA and PANYNJ prevent and mediate potential construction-period vibration impacts to historic structures near the WTC site. It is recommended that state-of-the-art monitoring and stringent vibration standards be implemented. (Lustbader, Morrow)

Response: The executed Memorandum of Agreement includes protocols to prepare a CPP for historic structures that may be affected by construction-period vibration. Furthermore, the Memorandum of Agreement stipulates that PANYNJ would prepare a Resource Protection Plan for construction of the Project. (Refer to Chapter 6, "Cultural Resources" and Chapter 10, "Noise and Vibration" for more details regarding the components of these plans.)

Comment 100: Noise monitoring should be undertaken during construction. (Coangelo)

Response: PANYNJ would verify its noise mitigation measures and would identify opportunities to expand its implementation as part of its ongoing oversight and auditing of the Project's construction. This would include on-site noise monitoring during construction. Furthermore, verification procedures would be implemented in accordance with decisions of the Lower Manhattan Construction Command Center, including procedures for reporting updates to the public.

INFRASTRUCTURE AND ENERGY

Comment 101: FTA, PANYNJ, and the other Lower Manhattan project sponsors should implement an achievable time frame for the completion of infrastructure construction related to these projects. (Ayer)

Response: Supporting infrastructure for the Preferred Alternative would be constructed in phases. Most major infrastructure work associated with the Terminal would be complete in 2009.

Comment 102: FTA and PANYNJ should avoid any permanent impairment of utility infrastructure along the Route 9A pathway. (Ayer)

Response: The Preferred Alternative's concourse would traverse Route 9A below existing utility conduits. If these utilities are not relocated by NYSDOT as part of the Route 9A Project, PANYNJ would stabilize utility conduits as necessary to ensure that they would not be impacted during or after the concourse's construction.

Comment 103: FTA and PANYNJ should avoid any unnecessary additional costs to carriers associated with any infrastructure relocation or construction, to the extent carriers may be responsible for such costs. This would include avoiding multiple relocations, identifying any new routes as quickly as possible, providing adequate notice to all affected utilities, enlisting cooperation from building owners, and minimizing any disruption of telecom services to businesses and residential consumers. (Ayer)

Response: The construction of the Preferred Alternative would involve limited utility relocation within the WTC site and potentially along the west side of Church Street. PANYNJ would assume the cost for any utility relocation required to construct the Preferred Alternative. PANYNJ would coordinate with utility carriers prior to any necessary relocation.

Comment 104: FTA and PANYNJ must treat all carriers with infrastructure in the project areas in a non-discriminatory manner. This would include (but not be limited to) extending to these carriers any benefits Verizon receives with regard to easements, access to facilities, and recovery of restoration costs resulting from reconstruction projects under the Partial Action Plan for Utility Restoration and Infrastructure Rebuilding. (Ayer)

Response: PANYNJ would assume the cost for any utility relocation required to construct the Preferred Alternative. Operators will be properly informed of necessary utility work throughout the construction of the Permanent WTC PATH Terminal.

Comment 105: The DEIS described, as a benefit, the energy savings generated by a glass pavilion with natural illumination. However, the DEIS should have also examined the energy demanded by a subgrade pedestrian concourse, including a connection below Route 9A since the pre-September 11, 2001 concourse was not below-grade and since the former North Bridge was naturally illuminated. (Hemric)

Response: The pre-September 11, 2001 concourse was mostly enclosed with only a few access points directly to the street. Thus, the concourse itself did not benefit from natural illumination in most areas. The design of the Permanent WTC PATH Terminal will incorporate natural light from street-level through to the platform-level, which will reduce the need for artificial illumination as compared to the pre-September 11, 2001 facility.

While a pedestrian bridge over Route 9A would require less illumination than would a subgrade concourse during daytime hours, a major reduction in energy demand would not be realized. A bridge would be subject to natural heating during summer months and natural cooling during winter months, whereas, a subgrade concourse would have less variation in temperature throughout the

year. Thus, a bridge would require more energy for climate-control than would a subgrade concourse.

Comment 106: Telecommunications service, including emergency services, to Lower Manhattan may be disrupted or degraded, unless: PANYNJ ensures that the proposed underground pedestrian concourse does not disrupt or prevent Verizon's use of Route 9A or Church Street as a utility pathway. The proposed underground concourse has the potential to permanently impair Verizon's use of the Route 9A utility pathway. (Bachmore)

Response: The Preferred Alternative would not result in the relocation of utilities under Route 9A. There may be limited utility relocation along the west side of Church Street, but alternative pathways would be provided.

Comment 107: Since the various alternatives for the Lower Manhattan recovery projects each require a different relocation plan, it is imperative that the alternatives be narrowed and that any decisions regarding the relocation of the utilities be made be final and permanent. (Bachmore)

Response: Construction of the Preferred Alternative may require limited utility relocation along the eastern portion of the WTC site at the proposed location of the Terminal's connection with FSTC's Dey Street Concourse. PANYNJ would coordinate this relocation with efforts being undertaken by LMDC and MTA/NYCT to minimize any disruption to local utility operators.

Comment 108: The EIS does not disclose the adverse effects such as timing delays, service disruptions, disruptions to vehicular and pedestrian traffic, inconvenience to Lower Manhattan community, and wasted cost, if the utility relocation measures proposed by Verizon are not implemented. (Bachmore)

Response: The Preferred Alternative would not result in the relocation of Verizon's utility pathways beneath Route 9A. There may be limited utility relocation along the west side of Church Street. If Verizon utilities would be relocated, PANYNJ would coordinate relocation plans with the utility operator prior to their implementation.

CONTAMINATED MATERIALS

Comment 109: I am concerned that the DEIS finding that little hazardous materials remain in the project site is based on EPA data. (Orkin)

Response: USEPA data was not used to substantiate the finding presented in the DEIS. PANYNJ and LMDC have conducted Phase I and Phase II hazardous materials testing throughout the WTC site. NYSDOT has also conducted testing along Route 9A, in the vicinity of the proposed east-west connection for the

Permanent WTC PATH Terminal. All of these tests were conducted by licensed consultants under contact with the respective project sponsors.

NATURAL AND WATER RESOURCES

Comment 110: The PANYNJ should contact the National Oceanographic and Atmospheric Administration/Fisheries for information on Essential Fish Habitats and Federally-listed species and the New York State Department of Environmental Conservation for information on State-listed species. (Stilwell)

Response: Federal and state oversight agencies were contacted during the scoping process for the Permanent WTC PATH Terminal and the resultant correspondence is shown in Appendix G, "Natural and Water Resources." The reinstatement of the river water cooling system at the WTC site would be undertaken by LMDC and PANYNJ as part of the WTC Memorial and Redevelopment Plan. LMDC prepared an Essential Fish Habitat (EFH) Assessment of the Lower Hudson River estuary as part of its Final Generic Environmental Impact Statement (April 2004). (As noted in Chapter 13, "Natural and Water Resources," the EFH is available at LMDC's website, www.renewnyc.com). Subsequently, PANYNJ has filed a renewal application for the river water cooling system with the New York State Department of Environmental Conservation under a separate undertaking.

Comment 111: Given the importance of the Lower Hudson River estuary for aquatic species resources, it is recommended that a closed cooling system or one of the dry-cool technologies be used in the Permanent WTC PATH Terminal. If river water cooling is used, best management practices should be implemented to avoid impacts associated with impingement/entrainment and thermal discharge. (Stilwell)

Response: The river water cooling system includes two intakes located on the eastern shore of the Hudson River near the World Financial Center. River water cooling was used prior to September 11, 2001 and would be reestablished as part of the current redevelopment of the WTC site. The New York State Department of Environmental Conservation is currently reviewing PANYNJ's application to renew their State Pollutant Discharge Elimination System (SPDES) permit for the river water cooling system. As part of this application, PANYNJ has prepared a Best Technologies Available (BTA) study that specifies measures to protect fish eggs and larve from entrainment and entrapment associated with the systems intake grates. These measures include: 1) Using 3 gallons per minute (gpm)/ton chillers; 2) Variable speed pumps; and 3) Modifying the intake structure with 2 millimeter (mm) wedgewire screens to reduce the approach velocity to 0.5 feet per second (fps) with a corresponding river water flow of 120,000 gallons per minute (gpm).

While some level of impact to aquatic organisms due to entrainment of fish eggs (and much smaller numbers of larvae) is unavoidable utilizing the selected design, overall aquatic impacts are materially reduced from pre-September 11, 2001 conditions. The proposed system would eliminate the potential for impingement and would reduce entrainment of yolk-sac and post-yolk sac ichthyoplankton from pre-September 11, 2001 levels by an estimated 93 percent and 97 percent respectively. In fact, virtually all (approximately 98 percent) of the entrained organisms are eggs, which are subject to high rates of natural mortality and fecundity. By excluding life stages of entrainable organisms with higher natural survival rates, the selected design minimizes the adverse environmental impact of the cooling water intake structures.

The river water cooling system would be closed-circuit such that water extracted from the Hudson River would not be mixed with potable water or stormwater as it travels through the system. Therefore, the system would not alter the composition of Hudson River water.

Regulations set forth at 6 NYCRR Part 704 establish water quality standards governing thermal discharges to the waters of the state that requires. They require that "all thermal discharges to the waters of the State shall assure the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife in and on the body of water" [6 NYCRR §704.1(a)]. Part 704 also sets forth specific criteria for discharges that, if met, would assure compliance with the standard. The criteria for estuarine discharges include a maximum surface temperature of 90°F, a limit on the lateral extent of a 4°F temperature rise to two-thirds of the width of the receiving river, and a limit on the cross-sectional area with a 4°F temperature rise to one-half of the river cross section. Because of Hudson River hydrodynamics, the maximum surface temperature of 90°F is the critical criterion to be met.

The BTA study specifies that the maximum designed change in temperature (ΔT) of the proposed river water cooling system is 10°F. Therefore, cooling water flow discharges would not result in temperatures in excess of the 90°F criterion, since the maximum ambient surface water temperature is 80°F.

Comment 112: It is recommended that measures be implemented to avoid or reduce the likelihood of impacts to migratory birds. Examples of these measures that would be applicable to this project include 1) minimizing window lighting and using strobes on aerial towers/antenne for aircraft beacons and orientating reflective window surfaces by using etched glass or adhesive films. (Stillwell)

Response: As described in the FEIS, PANYNJ will incorporate architectural and landscaping features into the project's design that will reduce the potential for both daytime and nighttime bird strikes. The measures identified above have been included in the proposed mitigation plan.

COASTAL ZONE MANAGEMENT

Comment 113: The evaluation of the project's consistency with Policy 10 of New York City's Waterfront Revitalization Program is inaccurate. The DEIS should discuss the adverse impact of the project on the WTC site and the project's failure to "retain and preserve designated historic resources." (Gardner)

Response: The full Policy 10 of the New York City Waterfront Revitalization Program states that a project should "protect, preserve, and enhance resources significant to the historical, archaeological, and cultural legacy of the New York City coastal area." Furthermore, Policy 10.1 states that the project should "retain and preserve designated historic resources and enhance resources significant to the coastal culture of New York City." The WTC site was not been determined historically significant for its role in the "coastal culture of New York City." Therefore, the finding presented in the DEIS is considered appropriate as it pertains to the Local Waterfront Revitalization Program.

Comment 114: The statement that the project "would not have an adverse impact on coastal resources" is incorrect and inconsistent with the finding that historic properties would be adversely impacted by the project. (Gardner)

Response: Refer to the above response to Comment 113.

CUMULATIVE EFFECTS

Comment 115: It would be advisable to produce a composite drawing to help the public understand the complete vision for the area and to keep them informed on a daily basis during construction. (Carey)

Response: In an April 2003 speech to the Alliance for Downtown New York, Inc., Governor Pataki laid out the vision for the redevelopment of Lower Manhattan. The vision was the Libeskind plan for the WTC site, which resulted in the programming of spaces for the World Trade Center Memorial and Redevelopment Plan, the Fulton Street Transit Center, the Route 9A Project, and the Permanent WTC PATH Terminal. Subsequently, PANYNJ has been coordinating with NYSDOT, LMDC, and MTA/NYCT to program spaces as specific project plans evolve. These plans have been made available to the public through the news media, public exhibitions, and the internet.

In accordance with Governor Pataki's November 22, 2004 Executive Order, the Lower Manhattan Construction Command Center will communicate with residents, businesses, and the general public through a communications director working with each agency's communications and public outreach personnel; providing a central focus on issues critical to the local community and the

construction industry, by coordinating initiatives, public outreach, and information.

Comment 116: The DEIS fails to adequately account for the cumulative effects of other planned and on-going projects on the WTC site. Of special concern is the relationship between the Permanent WTC PATH Terminal and the WTC Memorial and Redevelopment Plan. The LMDC's Programmatic Agreement is legally bound to provide "reasonable and appropriate access" to the tower footprints, but FTA and PANYNJ are not signatories. The final design of the Permanent WTC PATH Terminal will be a major factor in determining the extent and quality of access to the footprints. Thus, actions taken by the FTA and PANYNJ under the Memorandum of Agreement to minimize disturbance to the tower footprints, enhance the amount and quality of access, and/or avoid or minimize "use" of the footprints may be rendered moot by actions taken by the LMDC pursuant to their Programmatic Agreement. (Gardner, Gardner et al, Sanchis III et al 1, Sanchis III et al 2)

Response: The executed Memorandum of Agreement provides for stipulations to address potential cumulative effects on the WTC site. As described in the Memorandum of Agreement, PANYNJ would request that all agencies constructing projects within the WTC site submit preliminary and pre-final documents to PANYNJ. PANYNJ and its designated historic preservation consultant would consult with SHPO and the Lower Manhattan Emergency Preservation Fund to asses whether there would be the potential for a cumulative adverse effect from the Permanent WTC PATH Terminal and other WTC site projects based on the preliminary and pre-final plans. If SHPO and PANYNJ, agree that Project plans or completed activities have resulted in or are likely to result in cumulative adverse effects on the WC site, then PANYNJ shall consider measures with respect to the Permanent WTC PATH Terminal to mitigate or minimize these effects, including technical or financial measures for its protection, stabilization, or repair and Project design modifications. PANYNJ would make its documentation of potential cumulative effects and accompanying mitigation plans available for review by the National Park Service, the Advisory Council on Historic Preservation, the Lower Manhattan project sponsors, and the Section 106 consulting parties. PANYNJ's plans to minimize or mitigate adverse cumulative effects would also consider the stipulations within the Programmatic Agreements for the WTC Memorial and Redevelopment Plan, the Route 9A Project, and the Fulton Street Transit Center.

Comment 117: FTA, the Federal Highway Administration, and the LMDC should request a formal determination of National Register eligibility for the WTC site from the Keeper of the National Register of Historic Places. The existing determination is a "lowest common denominator" document that is badly flawed by the

reluctance of at least one of the agency/authors to even acknowledge that the WTC site is historic in any way. (Gardner)

Response: See the above response to Comment 42.

Comment 118: The statement that LMDC identified no adverse effects with respect to the WTC site is incorrect. Although LMDC did not make such a determination, it was effectively superseded when they entered a Programmatic Agreement with the SHPO and the Advisory Council on Historic Preservation, the purpose of which was to address "adverse effects on historic properties." (Gardner)

Response: Chapter 15, "Cumulative Effects," of this FEIS reflects LMDC's determination as follows: "LMDC identified potential adverse effects with respect to the WTC site and prepared and executed Programmatic Agreements that will guide the design and construction of their project with respect to potential impacts."

Comment 119: FTA and PANYNJ have attempted to minimize encroachment over the perimeter column bases which outline the footprints of towers one and two of the World Trade Center, but the cumulative impact of additional construction activities could minimize access to these bases. The FTA and PANYNJ should adhere to the design and construction goals outlined in the DEIS. (Lustbader, Sanchis III et al 1, Sanchis III et al 2)

Response: The Memorandum of Agreement for the Permanent WTC PATH Terminal provides for specific measures to minimize the short- and long-term effects of the Terminal on the perimeter column bases. These commitments consider the provisions set forth in the Programmatic Agreement among LMDC, the Advisory Council on Historic Preservation, and SHPO for the WTC Memorial and Redevelopment Plan.

Comment 120: Chapter 6, "Cultural Resources" and Chapter 10, "Noise and Vibration" state that the construction protection plan will be based on the requirements laid out in the New York City Department of Buildings Technical Policy and Procedure Notice #10/88. The Notice deals with procedures for avoiding damage to adjacent structures resulting from adjacent construction of a single project. It does not include procedures, vibration standards, and monitoring programs for cumulative construction projects. (Sanchis III et al 2)

Response: Pursuant to the stipulations of the Project's executed Memorandum of Agreement, PANYNJ would coordinate its Construction Protection Plan for the Barclay-Vesey Building with LMDC. It would coordinate its construction Protection Plan for St. Paul's Chapel and Graveyard and the Former East River Savings Bank with MTA/NYCT and LMDC. PANYNJ's Construction Protection Plans for the Beard Building and 114-118 Liberty Street would be coordinated with LMDC.

Comment 121: It is recommended that the Terminal's construction be coordinated through a single entity charged with overseeing all of the Lower Manhattan construction to reduce the potential cumulative impacts on surrounding historic properties. (Lustbader, Sanchis III et al 2)

Response: On November 22, 2004, New York State Governor George E. Pataki signed an Executive Order creating the Lower Manhattan Construction Command Center. The Command Center will administer the construction of project's within Lower Manhattan that either 1) have a construction value of more than $25 million; 2) require governmental actions or permits or; 3) require work within in a City or State street or highway.

The Command Center will coordinate community information, construction logistics, utility coordination, environmental compliance and safety, and diversity and equal opportunities in employment. The Command Center will be managed by an Executive Director to be appointed by the Governor and the Mayor of the City of New York. The Mayor will also appoint a Director of City Operations to act as a liaison between the Command Center and City officials. An Executive Committee, to be chaired by the Executive Director, will be appointed to facilitate communications between the Command Center, the Lower Manhattan Project Sponsors, and other key city and state departments and agencies.

As stated in the Executive Order, the functions of the Command Center will be:

- "Coordinating the work of the participants in the rebuilding process and ensuring that the construction in Lower Manhattan proceeds as scheduled by mediating conflicts in schedules and street and site access between construction projects, agencies, and the Lower Manhattan Community;"
- "Coordinating protocols, contract requirements and activities outside of individual project limits through planning on a daily basis throughout construction for government agencies, developers, construction managers, general contractors, and contractors;"
- "Coordinating construction projects to minimize inconvenience for residents, workers, pedestrians, vehicles, and commuters;"
- "Ensuring that the Lower Manhattan area remains neat, clean and orderly throughout construction;"
- "Communicating with residents, businesses, and the general public through a communications director working with each agency's communications and public outreach personnel; providing a central focus on issues critical to the local community and the construction industry, by coordinating initiatives, public outreach, and information;" and
- "Utilizing technology to facilitate coordination of projects."

Furthermore, pursuant to the stipulations of the executed Memorandum of Agreement for the Permanent WTC PATH Terminal, PANYNJ is committed to

coordinating with the appropriate Lower Manhattan Project Sponsors for potential cumulative effects on the WTC site, the Hudson River Bulkhead, the Barclay-Vesey Building, St. Paul's Chapel and Graveyard, the Former East River Savings Bank, the Beard Building, and 114-118 Liberty Street.

COMMITMENT OF RESOURCES

Comment 122: The DEIS should identify that the project's use of the WTC site constitutes a permanent, irretrievable and irreversible commitment of a historic resource. (Gardner)

Response: Chapter 16, "Commitment of Resources" of the DEIS identified the short-term use of historic and archaeological resources during the construction period. This FEIS also notes the Project's long-term use of the WTC site, which is a National Register-eligible historic resource. The FEIS also references the Memorandum of Agreement and its stipulations to avoid, minimize, or mitigate both the short- and long-term use of historic resources.

DRAFT SECTION 4(F) EVALUATION

Comment 123: The Draft Section 4(f) Evaluation describes 4 (five if one counts a variation) avoidance alternatives. Three of these (no action, relocation of PATH projections, and locate terminal off-site) are clearly not serious alternatives. Real alternatives include the Location 1 alternative described in Chapter 2 and a variety of alternatives involving design variations to the latter must be discussed. All of these alternatives would result in a reduction in the "use" of the WTC site. (Gardner, Sanchis III et al 2)

Response: As noted in the Final Section 4(f) Evaluation, which is included in this FEIS, the U.S. Department of Interior has agreed that there are no reasonable and prudent alternatives to the use of the historic property, which is defined as the 16-acre WTC site, to meet the transportation purpose and need of the project. Therefore, FTA and PANYNJ have developed measures to minimize harm through the project's Section 106 consultation process.

Comment 124: The Draft Section 4(f) Evaluation should clearly state that the project "would" rather than "may" use historic properties. (Gardner)

Response: The findings presented in the Section 4(f) Evaluation reflect specific impacts to cultural resources where known and includes the stipulations of the Project's Memorandum of Agreement that minimize harm to these resource. For yet determined impacts, the Final Section 4(f) Evaluation describes the potential impact and appropriate measures to minimize harm should impacts occur.

Comment 125: The description of the project's effects on historic resources and potential mitigation are identical to text presented in Chapter 6, "Cultural Resources." The Section 4(f) Evaluation should incorporate comments made on Chapter 6. (Gardner)

Response: The Final Section 4(f) Evaluation is updated to reflect changes made to Chapter 6, "Cultural Resources," in response to public comments on the DEIS.

Comment 126: The Section 4(f) Evaluation identifies physical remnants from the site that were listed in the Coordinated Determination of Eligibility. However, the list is incomplete. Furthermore, this list should be expanded to compensate for deficiencies in the Coordinated Determination of Eligibility that resulted from the incorrect application of the integrity standard and the failure to include the area within the tower footprints. (Gardner)

Response: The list of effects presented in the Draft Section 4(f) Evaluation reflects the findings presented in the Draft Finding of Effects pursuant to Section 106 of the National Historic Preservation Act. The Project's Section 106 Consulting Parties were invited to comment on the Draft Finding of Effects and changes were made in the FEIS pursuant to these comments. The FEIS discloses the Preferred Alternative's effects on the WTC site, including the footprint areas of the former North and South Towers.

Comment 127: The Draft Section 4(f) Evaluation states that the No Action Alternative still has the potential to remove or alter contributing elements of the WTC site. However, this is the case only because it is assumed that the World Trade Center Memorial and Redevelopment Plan would result in the need for additional egress and access locations and ventilation structures. If FTA and PANYNJ are coordinating with the LMDC as claimed, then it should be possible to develop a "no action" alternative that would not require the "use" of the historically significant WTC site features and still accommodate a Memorial. (Gardner)

Response: The No Action Aclternative for the Permanent WTC PATH Terminal has been clarified, and this alternative would not physically alter or remove historic structures or remnants on the WTC site. However, other changes in the WTC site could potentially occur as a result of the No Action Alternative, but the impacts of these changes are speculative at this time.

Comment 128: Figure 4(f)-2 should be modified to clearly show that the tower footprints in their entirety, not just the perimeter box beam columns, are the contributing elements to the significance of the WTC site, and a second figure should be provided that shows remnant structures within the footprints should be included. (Gardner)

Response: Figure 4(f)-2 identifies some of the remaining remnants and structures listed in the Coordinated Determination of Eligibility. Other column remnants and infrastructure on the WTC site are identified in the Determination of Eligibility. Furthermore, the revised finding of effects in the Final Section 4(f) Evaluation discloses the Preferred Alternative's effects on the footprints.

Comment 129: Avoidance alternatives 4A and 4B are incorrectly labeled in Figure 4(f)-3. (Gardner)

Response: Figure 4(f)-3 of the Final Section 4(f) Evaluation reflects the correct labeling of Alternative 4A, "Church Street" and Alternative 4B, "Vesey Street."

APPENDIX B: DRAFT FINDING OF EFFECTS

The following comments were submitted by Section 106 Consulting Parties pursuant to the Draft Finding of Effects document that was included as part of the DEIS. The Draft Finding of Effects document was incorporated into analysis presented in Chapter 6, "Cultural Resources," Chapter 15, "Cumulative Effects," and the Draft Section 4(f) Evaluation of the DEIS. Therefore, many of the comments made on the Finding of Effects have been noted above under the appropriate technical chapter. The comments below, however, are specific to the document that appears in Appendix B of the DEIS. This document was not updated as part of the preparation of the FEIS; however, applicable text and graphics in Chapter 6, "Cultural Resources," and the Final Section 4(f) Evaluation reflect these comments, as appropriate.

Comment 130: The description of the undertaking is not detailed enough to permit an independent evaluation of how, and to what degree, the historic resources within the project's Area of Potential Effect will be affected. While the figures in the Draft Finding provide some information, it is not possible to relate how what is being proposed will affect individual resources that contribute to the significance of the WTC Site. Much more detailed descriptions are necessary. For example, in referring to the E-Train passageway, the Draft Finding only says that the station will be reconfigured and that certain elements may be relocated. No description or drawings of the planned reconfiguration are provided, and no mention is made of which elements "may" be relocated. The fact that the FTA and the PANYNJ cannot state with certainty which elements are proposed for relocation suggests that any finding of effect is premature. (Gardner et al, Gardner)

Response: The Permanent WTC PATH Terminal is currently in its design stage. It is known that the project will impact the approximately 16-acre, National Register-eligible WTC site, but the extent of this impact to specific remaining remnants and structures on the WTC site was uncertain at the time of the publication of the DEIS. Subsequent to publication of the DEIS, FTA and PANYNJ held four meetings with the project's Section 106 consulting parties. At these meetings, FTA and PANYNJ provided additional information regarding the Terminal's design and its potential impacts on remaining remnants

and structures within the WTC site. Where specific effects are known, the findings presented in the FEIS have been updated, and mitigation measures have been developed. In cases where effects remain uncertain, the executed Memorandum of Agreement provide for stipulations to address these potential impacts should they occur.

Comment 131: It is unclear where the ventilation which may be constructed "adjacent to Route 9A" would be located. A graphic showing the location would be helpful, as would a description of the ventilation structure. (Gardner et al)

Response: As reflected in Chapter 2, "Project Alternatives" of this FEIS, the ventilation structures would be located within the median of Route 9A atop Tunnels E and F of the PATH system.

Comment 132: There is no discussion of what mitigative measures the FTA is proposing to avoid or minimize adverse effects to the WTC Site. Mitigative measures that have been considered and discarded, if any, should be identified. (Gardner et al)

Response: A discussion of preliminary mitigation measures was provided in Chapter 6, "Cultural Resources" of the DEIS. Since publication of the DEIS, FTA and PANYNJ have executed a Memorandum of Agreement with specific commitments to avoid, minimize, and/or mitigate adverse impacts to the WTC site. The full text of the MOA is presented in Appendix B of this FEIS, and Chapter 6, "Cultural Resources," summarizes the commitments.

Comment 133: It is unclear exactly what this Figure 2 is attempting to show. (Gardner et al)

Response: Figure 2 reflects the programming of spaces within and immediately adjacent to the WTC site at street-level.

Comment 134: Figure 4 should clearly identify the entire area occupied by the footprints of the Twin Towers as a historic resource. (Gardner et al)

Response: Figure 4 identifies the remaining remnants and structures listed in the Coordinated Determination of Eligibility. Although the Coordinated Determination of Eligibility did not specifically reference the footprints as a remaining remnant or structure on the WTC site, the revised finding of effects presented in Chapter 6, "Cultural Resources," of this FEIS discloses the Preferred Alternative's effects on the footprints. ✳

A. INTRODUCTION AND METHODOLOGY

Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966 (49 USC §303) prohibits the Secretary of Transportation from approving any program or project that requires the "use" of 1) any publicly owned land in a public park, recreation area, or wildlife and waterfowl refuge of national state, or local significance, or 2) any land from a historic site of national, state, or local significance (collectively "Section 4(f) resources"), unless there is no feasible and prudent alternative to the use of such land and the project includes all possible planning to minimize harm to the resource.

With respect to the term "use", the USDOT, Federal Transit Administration (FTA) considers three possible ways in which a project could involve a "use" of a resource:

- When land is permanently incorporated into a transportation facility;
- When there is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose; or,
- When there is a constructive use of land.

Constructive use occurs when the project does not directly incorporate land from a Section 4(f) resource, but the project's impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired. Substantial impairment occurs only when the protected activities, features, or attributes of the resource are substantially diminished.

With respect to historic sites, no constructive use would occur when:

- Compliance with the requirements of Section 106 of the National Historic Preservation Act (NHPA; 16 USC §470) results in an agreement with the State Historic Preservation Officer (SHPO) of "no effect" or "no adverse effect";
- The projected noise and vibration levels of the proposed transit project do not exceed the relevant noise and vibration impact criteria; or
- The projected noise levels exceed the thresholds because of existing noise, but the increase in noise due to the project is barely perceptible.

This Section 4(f) evaluation has been prepared pursuant to the finding that the Preferred Alternative for the Permanent WTC PATH Terminal would have an adverse effect on the National Register-eligible WTC site and the Hudson River Bulkhead. The Project may also have temporary vibration impacts to nearby historic structures during its construction and may disturb as yet unverified archaeological resources that could remain on the WTC site.

The sections below describe:

- The applicability of Section 4(f) to the Project;
- The Section 4(f) properties;
- The probable use of the Section 4(f) properties by the Project Alternatives;
- Avoidance alternatives to the use of Section 4(f) properties; and
- Planning efforts to minimize harm to the Section 4(f) properties where avoidance is not feasible or is not prudent.

B. APPLICABILITY OF SECTION 4(f) TO THE PROJECT

As described above, a Section 4(f) evaluation is prepared when a transportation project proposes using land from a publicly owned park, recreation area, wildlife or waterfowl refuge, or from a historic site of national, state, or local significance. Since this Project would not use publicly owned parkland, recreational areas, or wildlife or waterfowl refuges, Section 4(f) does not apply for these types of potential resources. However, the Section 4(f) properties described below may be used during construction and/or operation of the Permanent WTC PATH Terminal.

- The Preferred Alternative would be constructed within the boundaries of the approximately 16-acre WTC site (National Register-eligible) and would therefore use this historic resource;
- The Preferred Alternative would require the use of the Hudson River Bulkhead (State and National Register-eligible);
- The Preferred Alternative may require alteration or removal of as yet determined archaeological resources within the eastern portion of the WTC site.
- The Preferred Alternative's construction may result in vibration impacts to known or potential historic buildings within 90 feet of the Project's construction zone.

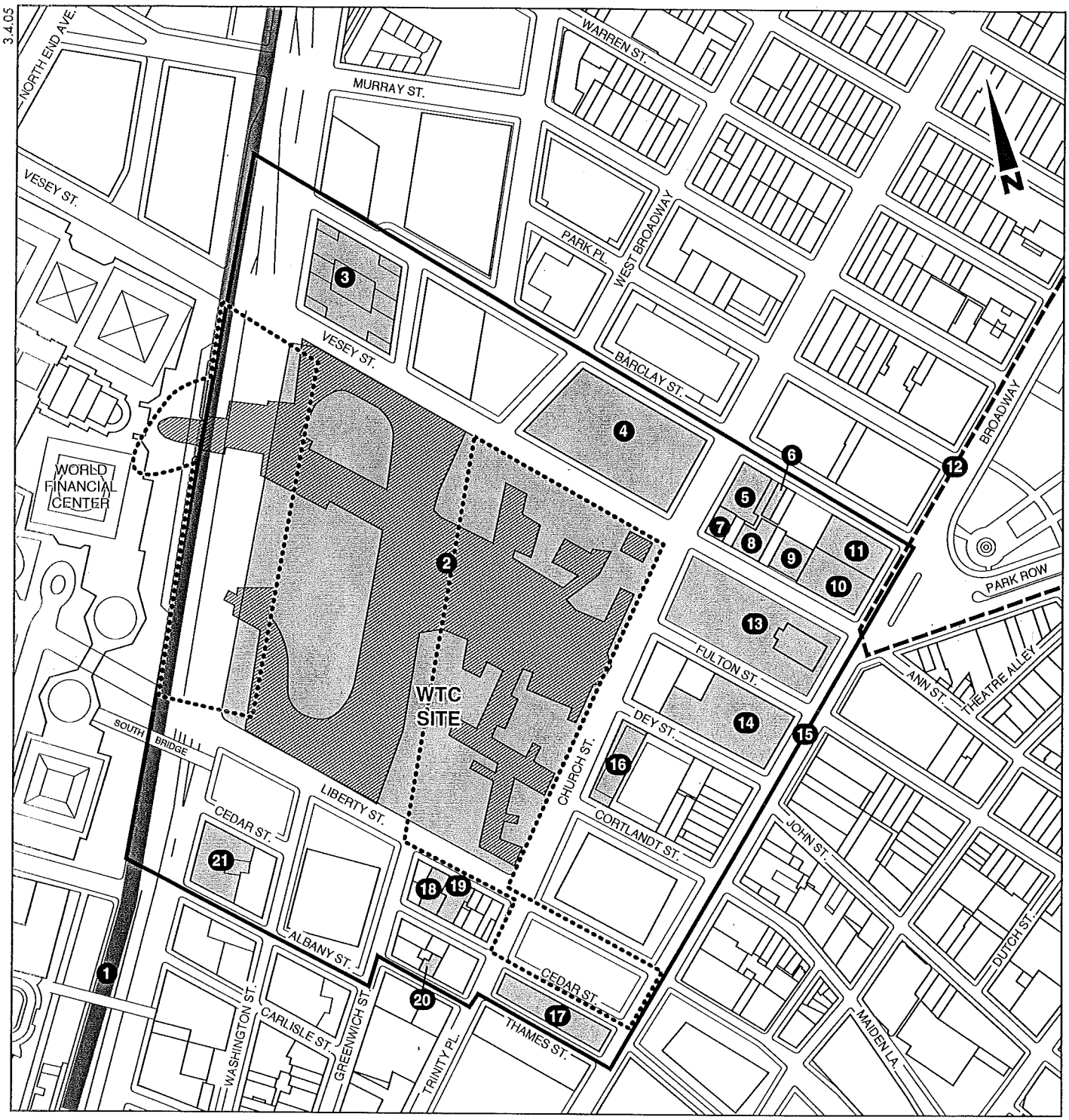
These resources are shown in Figure 4(f)-1

WTC SITE

DESCRIPTION OF THE SECTION 4(f) PROPERTY

The WTC site meets National Register criteria for its association with the September 11, 2001 terrorist attacks on the WTC's two 110-story towers, which on a national level constitute "historic events that have made a significant contribution to the broad patterns of our history." As stated in the Coordinated Determination of Eligibility (DOE) for the WTC site, "the significance of the WTC site is reflected by its integrity of location, setting, feeling, association, and materials" (see Appendix B). The Coordinated DOE also states that some physical remnants on the WTC site possess integrity of materials, including the bathtub, basement walls, and the surviving bases of steel structural columns.

The boundaries of the eligible property are Route 9A, Vesey Street, Church Street, and Liberty Street. Within these boundaries, the site retains various remnants of the former WTC complex and temporary structures introduced as part of the rescue and recovery operations that followed the attacks. As described in the Coordinated DOE, these physical features of the site contribute to its significance. These items include:



Permanent WTC PATH Terminal

Area of Potential Effect for Archaeological Resources

Area of Potential Effect for Historic Resources

Known Historic Resource

Known Historic District

0 200 500 FEET

SCALE

Refer to Table 4(f)-1 for Site Numbers

PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 4(f)-1
Area of Potential Effect

- Tower Perimeter Column Bases (constructed pre-September 11, 2001);
- Bathtub Slurry Walls (constructed pre-September 11, 2001) and Tiebacks (constructed post-September 11, 2001/temporary);
- Northwest Remnant Subgrade Structures (constructed pre-September 11, 2001);
- Recovery and Construction Ramp (constructed post-September 11, 2001/temporary);
- North and South Tunnel Projections from West Wall (constructed pre-September 11, 2001);
- H&M (Hudson & Manhattan) Remnants (constructed pre-September 11, 2001);
- Other Vehicular Ramps (constructed pre-September 11, 2001);
- PATH Tracks and Substation (reconstructed post-September 11, 2001);
- Existing WTC PATH Main Entrance and Concourse, Sidewalks, Fencing, Existing PATH Platforms/Mezzanine (constructed post-September 11, 2001/temporary);
- Passageway to the NYCT WTC Subway Station (E-Train) (constructed pre-September 11, 2001);
- Steel Beams in Cross Form (constructed post-September 11, 2001);
- Plaza and Subway Access from Vesey Street (constructed pre-September 11, 2001); and
- Cooling Water Pipes (constructed pre-September 11, 2001).

PROBABLE USE OF THE SECTION 4(f) PROPERTY

No Action Alternative

Under the No Action alternative, the temporary PATH station would remain in service until either 1) elements of the WTC Memorial and Redevelopment Plan would preclude operations, 2) the station would not safely accommodate passenger demand, or 3) the major elements of the station would exceed their useful service life. In each case, it is assumed that as redevelopment efforts occur in and around the WTC site, modifications to the physical characteristics and operation of the station would be required to maintain temporary PATH service to the extent possible. These modifications may include additional access and egress locations and the construction of ventilation structures should the tracks and platforms be enclosed by the above-construction of the WTC Memorial and Redevelopment Plan.

Preferred Alternative

The Preferred Alternative for a Permanent WTC PATH Terminal would consist of five levels—track and platform, mezzanine, concourse (main), concourse (balcony), and street-level. Elements of the Terminal would be located throughout the WTC site. The proposed tracks and platforms would be in essentially the same location as the temporary WTC PATH station but would be expanded and configured to accommodate a fourth platform and 10-car trains. A mezzanine would be constructed immediately above the tracks and platforms. The concourse would extend in an east-west direction through the site from Route 9A to Church Street with intermediate connections to the Freedom Tower and other elements of the WTC Memorial and Redevelopment Plan. It would also extend in the north-south direction east of the 1 and 9 subway line from the northeast quadrant of the site to Liberty Street. The concourse would provide connections to the Cortlandt Street (R and W), Cortland Street (1 and 9), and World Trade Center (E) subway stations. A street-level terminal building would be constructed west of Church Street between Fulton and Dey Streets.

The Preferred Alternative is being planned to support PATH's system-wide improvements, PATH's operating requirements, and future ridership demand. Each of these factors results in specific requirements for the design of the Terminal's platforms and tracks, and as such, it has been determined that a 5-track, 4-platform station is needed. Further details on the selection of 5-track, 4-platform configuration as well as alternative track and platform schemes evaluated in conjunction with project planning are provided in Appendix C of the FEIS.

The DEIS noted that the removal of portions of the northwest remnant sub-grade structures on the WTC site may be undertaken as part of the Terminal's construction. However, subsequent to the publication of the DEIS, the removal of the northwest remnant sub-grade structures have been undertaken as an independent action pursuant to the stipulations of the Programmatic Agreement prepared for the WTC Memorial and Redevelopment Plan.

The construction of the Preferred Alternative would not alter the location or setting of the WTC site. However, because it may result in the removal or alteration of remaining remnants and structures on the site, it could diminish the site's integrity of feeling, association, and materials (see Appendix B). The following describes the specific impacts of the Preferred Alternative on the various elements of this Section 4(f) resource. The location of these remaining remnants and structures is shown in Figure 4(f)-2.

- ***Tower Perimeter Column Bases with Other Column Bases and Infrastructure*** (constructed pre-September 11, 2001): There were 84 perimeter columns extending into the bedrock that would outline the North Tower façade, and 73 perimeter columns extending into bedrock that would outline the South Tower façade. The original subgrade column grid in the WTC bathtub was configured to span above the former Hudson & Manhattan tunnels traversing the bathtub, as well as the new PATH tracks (there were 84 perimeter columns for the South Tower appearing above grade). In addition, approximately 34 of the South Tower columns were within the existing PATH right-of-way area (interspersed with tracks, electrical equipment, and other infrastructure), and 39 were outside the PATH right-of-way area. During the post-September 11, 2001 emergency recovery operations conducted by the City of New York, all of these Tower perimeter columns were truncated such that only the bases remain. During subsequent construction of the temporary WTC PATH station, all of the column bases within the PATH right-of-way were either obscured to some extent or removed for installation of the temporary WTC PATH station's track sheds, utilities, duct banks, conduits, and other PATH infrastructure.

  As described in the project's Memorandum of Agreement (MOA), PANYNJ shall, to the maximum extent feasible, preserve in place 84 column base remnants in the North Tower and 39 column base remnants in the South Tower at the existing floor at elevation 242 (58 feet below Sea Level) that outline the footprints of the former Twin Towers at the WTC site and are not located in the PATH right-of-way. However, up to 16 column bases in the North Tower and 3 column bases in the South Tower would be temporarily or permanently removed.

  There would be various site infrastructure elements supporting the Preferred Alternative within the PATH right-of-way, including utility lines traversing the outline of the Tower perimeter column bases, and utility rooms and structures located within the area outlined by the perimeter column bases. Although these would not disturb the perimeter column bases themselves, these elements may somewhat impact visibility and accessibility to the Tower perimeter column bases. The Preferred Alternative may also include utility lines that cross the footprints of the former North and South Towers at an elevation above the existing floor

5.21.04

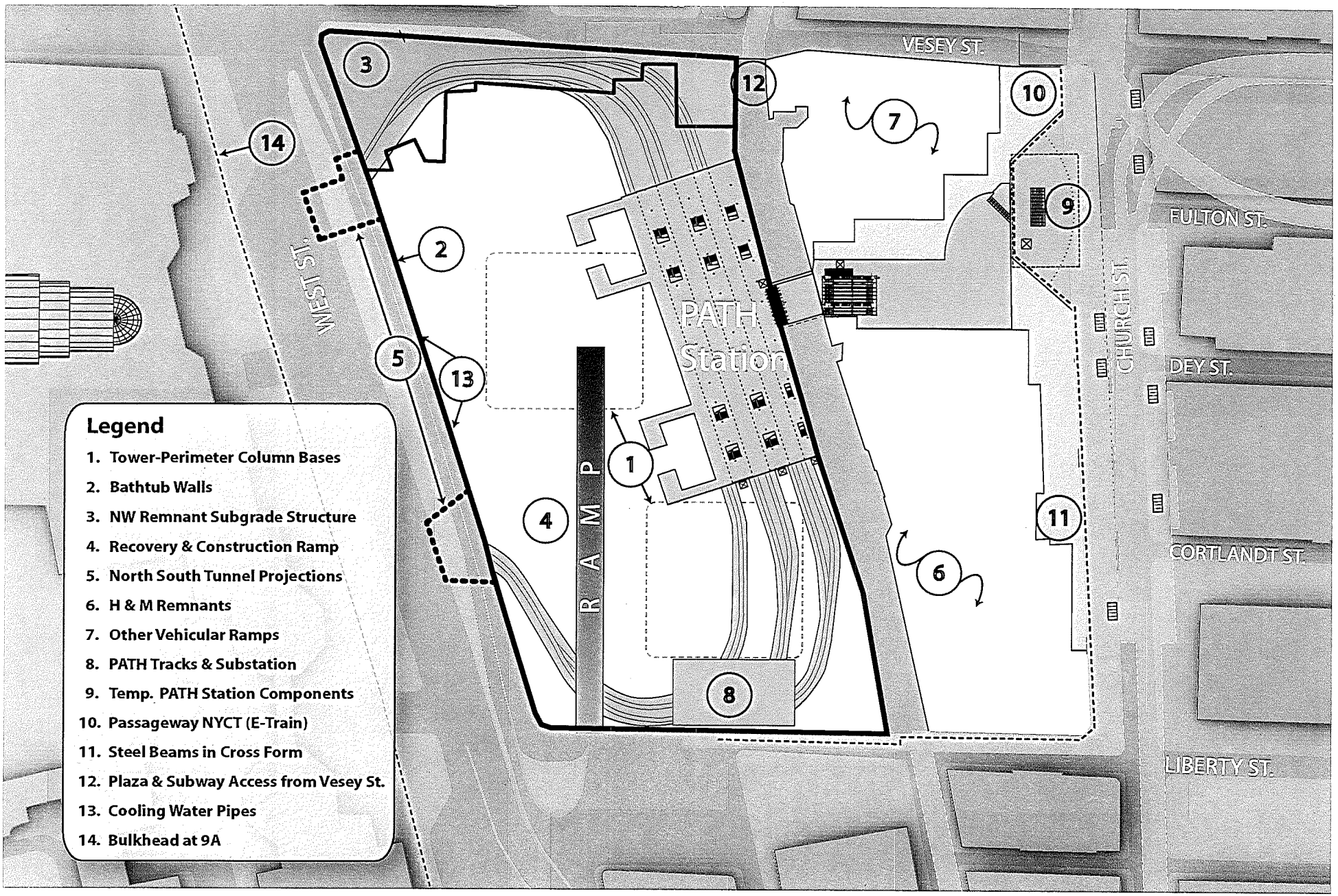


Figure 4(f)-2

Remaining Remnants and Structures on the WTC Site

of the WTC site (Elevation 242 or 58 feet below Sea Level). Under current plans, these utilities would be at Elevation 264 (36 feet below Sea Level). These utility lines would serve the joint infrastructure needs of both the Permanent WTC PATH Terminal and the WTC Memorial and Redevelopment Plan.

The total extent of the North Tower footprint at the lowest level, at approximately elevation 242 (58 feet below sea level) to be permanently occupied by any portion of the Project will be approximately 1,600 square feet and will not exceed 4 percent of the North Tower footprint area. The total extent of the South Tower footprint at the lowest level, at approximately elevation 242 (58 feet below sea level) to be permanently occupied by any portion of the Project will be approximately 21,615 square feet currently occupied by the WTC PATH facility, plus an additional 2,000 square feet required by the Project, and will not exceed 53 percent of the South Tower footprint area.

During the construction of the Preferred Alternative, PANYNJ would install a temporary track west of the existing Track 5. This temporary track would be used to maintain PATH operations while rehabilitation work is undertaken on other PATH tracks. The temporary track would cover column bases and footprint area outside the existing PATH right-of-way during the construction period, but the track would be removed upon completion of the permanent tracks.

- ***Bathtub Walls*** (constructed pre-September 11, 2001) and Tiebacks (constructed post-September 11, 2001/temporary): All four of the slurry walls forming the "bathtub" would require some modification in order to ensure their continued structural function, which is to secure the "basement" of this portion of the WTC site from the high water table resulting from the site's proximity to the Hudson River.

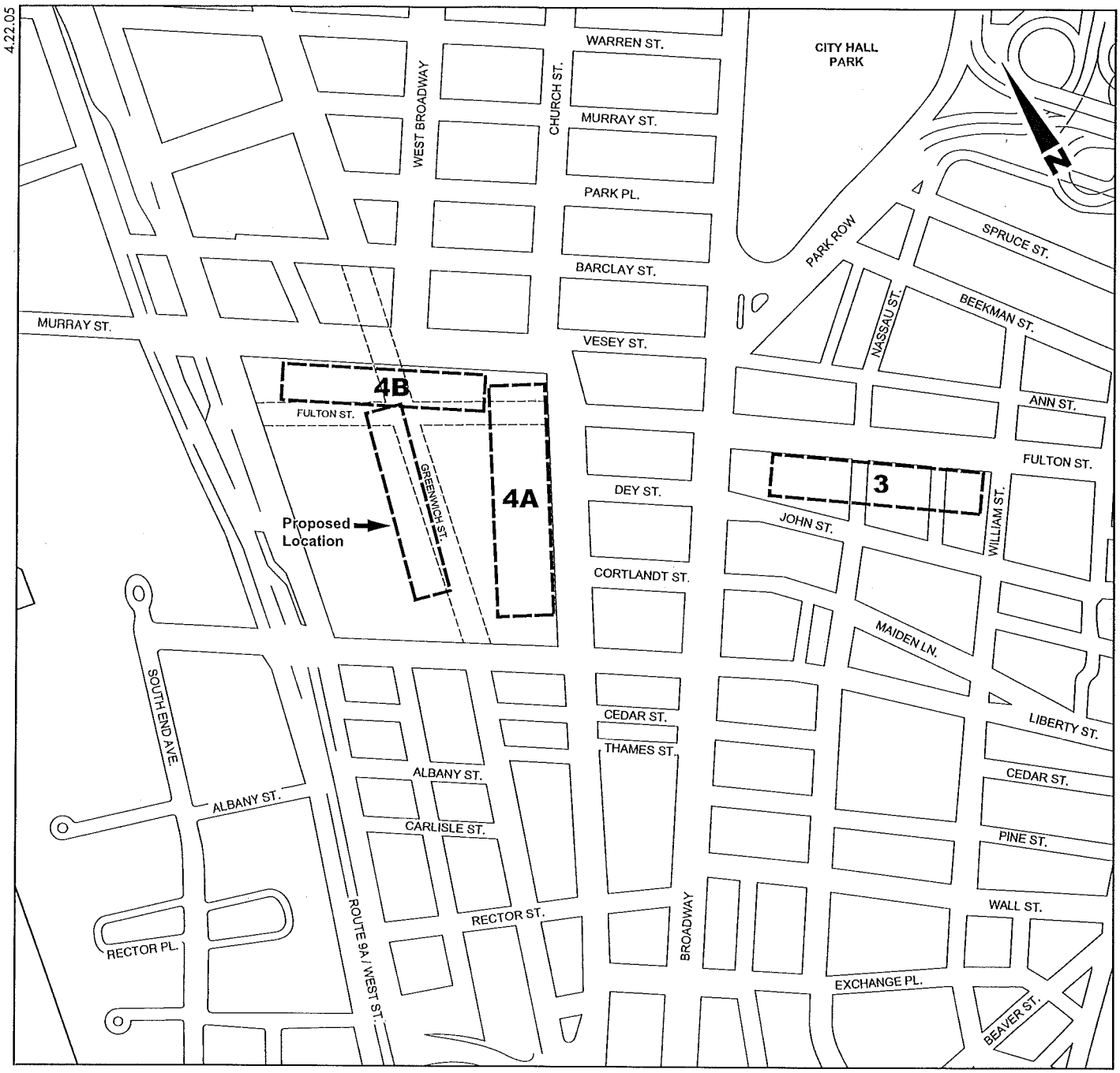
  The Preferred Alternative includes the reinforcement of portions of the basement walls to ensure their structural integrity and to support future redevelopment of the WTC site, including the Permanent WTC PATH Terminal. A portion of the approximately 70 foot high west slurry wall, with tieback caps exposed, is proposed to remain visible and accessible to the public (a separate undertaking), and another portion of the west wall would be pierced (in a location away from the proposed exposed section) for the east-west pedestrian concourse below Route 9A. The remainder of the west wall would be protectively lined as part of the Preferred Alternative. PANYNJ would also reinforce portions of the east bathtub wall abutting NYCT's 1 and 9 line that were not previously reinforced. If other development on the WTC site does not move forward according to current schedules or plans, it may also be necessary to reinforce portions of the north bathtub wall east of Freedom Tower and portions of the south bathtub wall above the existing PATH substation. Where liners are installed, existing tieback caps would remain although their projections would be subsumed within the concrete of the liners.

- ***Recovery and Construction Ramp*** (constructed post-September 11, 2001/temporary): The support foundation for the ramp would be relocated to allow for temporary relocation of an existing track. The ramp would remain during early construction of the Preferred Alternative and would then be removed.

- ***North and South Tunnel Projections from West Wall*** (constructed pre-September 11, 2001): Structural modifications would be made to the projections to accommodate the temporary Track 6.

- ***H&M Remnants*** (constructed pre-September 11, 2001): The cast-iron ring tubes in the east slurry wall of the bathtub would be removed for construction of the Preferred Alternative. On the eastern portion of the WTC site, all or portions of the remnants of the former H&M Terminal building and its powerhouse would be removed to construct a north-south concourse for the Preferred Alternative. Other remnants of these tubes (under the Hudson River) would still remain in service.
- ***Other Vehicular Ramps*** (constructed pre-September 11, 2001): Several of these ramps would be removed or sealed off, as they would have no function under the Preferred Alternative. This would also accommodate construction of new pedestrian concourses.
- ***PATH Tracks and Substation*** (reconstructed post-September 11, 2001): The PATH tracks that are part of the temporary WTC PATH station, would remain but would be further modified for permanent operation and to install a switch to the temporary Track 6. The wiring at the existing substation, also installed as part of the temporary PATH facility, would be modified for the permanent operation.
- ***Existing WTC PATH Station Main Entrance and Concourse, Sidewalks, Fencing, Existing PATH Platforms/Mezzanine*** (constructed post-September 11, 2001/temporary): Portions of these elements would be removed for construction of a permanent entry facility, main transit hall, concourses, PATH mezzanine, and platform levels.
- ***Passageway to the NYCT WTC Subway Station (E-Train)*** (constructed pre-September 11): The passageway between the Terminal and the MTA/NYCT E Subway would be designed to incorporate the existing E Subway entrance in its current location. Certain elements and materials of this passageway, which were retained as part of the construction of the temporary station, would be preserved as part of the Preferred Alternative. However, it may be necessary to remove the doors during construction for their protection. They would be stored until they could be returned to the reconstructed passageway.
- ***Steel Beams in Cross Form*** (post-September 11, 2001): The "steel cross" was moved from the area of 6 WTC to its current location in the eastern portion of the WTC site near the intersection of Church and Cortlandt Streets for public viewing. The cross structure would be removed from this location to accommodate the new north-south pedestrian concourse construction at-grade. The steel beam in cross form would remain in the custody of PANYNJ pending its disposition in accordance with the right of its respective owners.
- ***Plaza and Subway Access from Vesey Street*** (constructed pre-September 11, 2001): The structural remnants of this access from Vesey Street are not permanently stable or functional. However, construction of the Preferred Alternative would not directly impact these elements. Furthermore, as described in the Project's Memorandum of Agreement, PANYNJ would prepare a Resource Protection Plan for the WTC site. This plan would include measures to avoid potential indirect effects on this structure during the Terminal's construction.
- ***Cooling Water Pipes*** (constructed pre-September 11, 2001): The Preferred Alternative would have no impact on the cooling water pipes. However, sections of the existing cooling water pipes may be reconstructed and/or rerouted under a separate undertaking.

These effects to the WTC site would constitute a use of a Section 4(f) resource.



1 Location and Reference Number

Proposed New Street (To be Constructed by Others)

1 No PATH Service to Lower Manhattan (Not Shown)

2 Relocate PATH Projections (Not Shown)

3 Relocate Terminal Off-Site

4A Church Street Location

4B Vesey Street Location

Figure 4(f)-3
Avoidance Alternatives

AVOIDANCE ALTERNATIVES

Four alternatives were considered to avoid the potential adverse effect to the use of the WTC site that would result from the construction of the Preferred Alternative, as shown in Figure 4(f)-3 and as described below:

- Avoidance Alternative 1, No PATH Service to Lower Manhattan;
- Avoidance Alternative 2, Relocate PATH Projections;
- Avoidance Alternative 3, Relocate Terminal Off-site; and
- Avoidance Alternative 4, Relocate Terminal On-site.

As described below, two alternatives that would fully avoid the resource would be feasible but not prudent. The other alternatives may reduce the potential adverse effect to certain contributing elements of the resource, but they would not wholly avoid the use of the Section 4(f) resource. No feasible and prudent alternative could avoid the use of the Section 4(f) resource. Thus, measures to minimize harm were considered.

Avoidance Alternative 1, No PATH Service to Lower Manhattan

The suspension of PATH service to Lower Manhattan would avoid the use of the Section 4(f) property. Under this alternative, PATH would no longer operate between New Jersey and Lower Manhattan but all associated PATH infrastructure would be retained in its current state and service on PATH's Uptown line would be maintained. It is assumed that PATH would operate similar to the six months before the opening of the temporary WTC PATH station with service to Exchange Place. Materials remaining on the WTC site would not be physically altered or removed as a direct result of this alternative.

As was described for the No Action Alternative in this EIS, the full suspension of PATH service to Lower Manhattan would not meet the goals and objectives of this Project as follows:

- *Effectively restore long-term PATH service between New Jersey and Lower Manhattan:* This goal would not be achieved under this avoidance alternative. This alternative would not enhance Lower Manhattan's transportation infrastructure nor would it benefit PATH operations.
- *Establish an intermodal transportation facility in Lower Manhattan:* Because this alternative would not result in construction of a Permanent Terminal for PATH, intermodal connections in Lower Manhattan would not be enhanced as part of this Project. Therefore, this avoidance alternative fails to meet this goal and its objectives.
- *Plan and construct a terminal that would support the redevelopment of Lower Manhattan:* Since this avoidance alternative would not result in a Permanent PATH Terminal in Lower Manhattan, this Project would not directly support the redevelopment of Lower Manhattan. Although other independent actions (e.g., WTC Memorial and Redevelopment Plan; Route 9A Project; Fulton Street Transit Center, etc.) may be pursued as planned, the long-term success of these projects may be jeopardized by the absence of PATH and the transit connections that are part of the Terminal Alternatives. Without a convenient, cost effective transit connection between New Jersey and Lower Manhattan, Lower Manhattan's commercial recovery may never be fully realized.
- *Minimize adverse impacts to the environment:* Although this avoidance alternative would not result in short-term, construction period impacts, it would have long-term adverse effects to the environment as follows:

- The elimination of PATH service to Lower Manhattan and the failure to construct a Permanent Terminal is inconsistent with current, publicly-supported plans and policies for redevelopment of the WTC site and Lower Manhattan as a whole.
- The economic recovery of Lower Manhattan is dependent on the provision of reliable, convenient, and cost effective transit service. The absence of PATH service may reduce the desirability and marketability of Lower Manhattan and could result in the relocation of existing businesses. Thus, this avoidance alternative may have a lasting, negative effect on the economy of Lower Manhattan.
- Assuming that the economic recovery of Lower Manhattan is achieved as planned, the absence of PATH service would result in substantial increases in vehicular traffic and diversions to other modes of transit. As described in Chapter 8, "Transportation," full disruption of PATH service to Lower Manhattan would generate: approximately 1,200 new vehicles (autos, buses, and commuter vans); 6,200 new bus passengers; 8,400 new ferry passengers; 3,600 new passengers on Uptown PATH service; and 9,350 new subway passengers in the AM peak hour. The diversion of passengers from PATH to these other modes would constrain the major roadways and vehicular access points to, from, and within Lower Manhattan and would increase peak hour congestion on commuter buses, commuter rail, uptown PATH service, and city subways.
- The new vehicle trips that would be generated by this alternative would also adversely affect air quality in the New York and New Jersey metropolitan area. In 2025, this avoidance alternative would generate an estimated additional 15.7, 18.0, 1.5, and 236.0 tons per year of volatile organic compounds (VOC), nitrous oxides (NO_x), fine particulates ($PM_{2.5}$), and carbon monoxide (CO), respectively.

Although this alternative is feasible and would avoid the Section 4(f) resources, it is not prudent because it would fail to meet any of goals of this Project.

Avoidance Alternative 2, Relocate PATH Projections

New tunnel projections at a location south of Liberty Street or north of Vesey Street would allow for the construction of PATH tracks and a terminal that would avoid the use of the Section 4(f) resource. To achieve this alternative, new structures would be constructed within the Hudson River between New Jersey and New York. Within New Jersey, new track and tunnels would be necessary to link the new Hudson River tunnels with the remainder of the PATH system. It is assumed that the PATH infrastructure on the WTC site would be retained in its current state and that the other remaining materials would not be physically altered or removed.

The construction of new tunnels under the Hudson River and upland infrastructure in both New York and New Jersey would be very costly (approximately $3 billion) and would take three to four years longer to plan and construct than any of the Terminal Alternatives. Furthermore, this avoidance alternative would not meet some of the goals of this Project as described below:

- *Effectively restore long-term PATH service between New Jersey and Lower Manhattan:* Generally, this goal may be achieved by this avoidance alternative. However, depending upon the selected location for new tunnels and the infrastructure needed to support new track connections, not all of its objectives may be met. Waterfront sites in Lower Manhattan and New Jersey are mostly developed, which limits the location and construction of new PATH infrastructure. Furthermore, since new track connections would be required within New

Jersey, it is assumed that temporary PATH service would have to be disrupted for a period during construction.

- *Establish an intermodal transportation facility in Lower Manhattan:* Although extensive planning would be needed to locate new tracks and a terminal within Lower Manhattan, it may be possible to provide for some intermodal connections. However, it is expected that this alternative would not achieve all of the connections that are proposed as part of the Preferred Alternative.
- *Plan and construct a terminal that would support the redevelopment of Lower Manhattan:* This alternative would allow for the redevelopment of the WTC site, but it may not provide for direct connections to future uses on the site. Furthermore, because Lower Manhattan is fully developed, construction activities outside the WTC site may impact existing structures or may inhibit plans for other sites. Thus, this avoidance alternative may not allow for the redevelopment of Lower Manhattan as currently planned.
- *Minimize adverse impacts to the environment:* This avoidance alternative would result in both short- and long-term adverse impacts to the environment. Depending on the location of the new tunnels and new PATH infrastructure in New Jersey and Lower Manhattan, this alternative has the potential environmental impacts:
  - As described above, the waterfront areas of Jersey City and most of Lower Manhattan are fully developed. Therefore, construction of new Hudson River tunnels and upland connections, including a Terminal building, would temporary disrupt or permanently alter existing land uses.
  - New right-of-way would be required to construct and operate new Hudson River tunnels and their supporting upland infrastructure. This may require the displacement of existing businesses and residents. Furthermore, new tunnels would take much longer to construct than the Preferred Alternative. Thus, this avoidance alternative has a greater likelihood for short-term disruption to businesses in Lower Manhattan as well as Jersey City during the construction period.
  - The construction of PATH infrastructure on new right-of-way has the potential to disturb known or potential historic and archaeological resources in both Lower Manhattan and New Jersey.
  - Because this alternative would physically alter the alignment of PATH, it has the potential to constrain operations both during construction and over the long-term.
  - A new alignment for PATH also has the potential to result in noise and vibration impacts from long-term train operations.
  - The construction of new tunnels within the Hudson River would disturb aquatic species in the Hudson River estuary and has the potential to adversely affect water quality.
  - The excavation of new tunnels for PATH may disturb contaminated soils present in both Jersey City and Lower Manhattan.

Although this alternative is feasible and would avoid the Section 4(f) resource, it is not considered prudent since it would have costs and other impacts of extraordinary magnitude such as a lengthy period of construction, and many adverse effects to the environment.

Avoidance Alternative 3, Relocate Terminal Off-site

Construction of a terminal within Lower Manhattan but outside the limits of the WTC site would reduce the amount of PATH infrastructure on the WTC site, but it would not avoid the use of the Section 4(f) resource. As described in Chapter 2, "Project Alternatives," the Port Authority of New York and New Jersey (PANYNJ) previously explored a terminal location near the intersection of Broadway, Dey Street, and John Street. Under this alternative, PATH tracks and certain supporting infrastructure would be constructed within the WTC site to allow trains to travel between the existing Hudson River tunnel projections and the terminal at Broadway. Given the land and infrastructure constraints east of Church Street, this off-site alternative would require that a stub-end terminal be constructed.

Although this alternative could reduce or eliminate the use of certain portions of the WTC site, it would not wholly avoid the Section 4(f) resource. Furthermore, it would not meet some of the goals of this Project as follows:

- *Effectively restore long-term PATH service between New Jersey and Lower Manhattan:* The stub-end configuration of this terminal would allow for a maximum operating capacity of 20 trains per hour, which would reduce the maximum throughput of the PATH system. Because the tracks leading to the terminal would cross those of the temporary station, the temporary tracks would need to be removed, resulting in the full disruption of PATH service for several months. Thus, this avoidance alternative would result in both short-term and long-term operational constraints for the PATH system.
- *Establish an intermodal transportation facility in Lower Manhattan:* Because this avoidance alternative could result in a new terminal in close proximity to the proposed Fulton Street Transit Center, it would provide for certain intermodal connections in Lower Manhattan. However, since it would be further from the WTC site, the World Financial Center, and trans-Hudson ferry terminals than the Terminal Alternatives, it would not provide for all of the proposed intermodal connections.
- *Plan and construct a terminal that would support the redevelopment of Lower Manhattan:* This alternative would allow for the redevelopment of the WTC site, but it may not provide for direct connections to future uses on the site. Furthermore, because Lower Manhattan is fully developed except at the WTC site, construction activities outside the WTC site may impact existing structures or may inhibit plans for other sites. Thus, this avoidance alternative may not allow for the redevelopment of Lower Manhattan as currently planned.
- *Minimize adverse impacts to the environment:* This avoidance alternative would result in both short- and long-term adverse impacts to the environment as follows:
  - The construction of an above-grade terminal building and below-grade infrastructure for this avoidance alternative would likely require building demolition. Thus, there may be adverse impacts to existing and proposed land uses.
  - PANYNJ would need to acquire new right-of-way and property to construct and operate this alternative. This would likely require the displacement of existing business and possibly residents in order to provide permanent structures for the terminal. Furthermore, temporary displacement and or disruption of businesses would likely be necessary during construction to support staging and other activities.
  - Several historic structures such as the former East River Savings Bank Building, the former American Telephone & Telegraph (AT&T) Building, and the Corbin Building

are located east of the WTC site in the vicinity of the proposed location of this avoidance alternative. Furthermore, the area east of Broadway along John Street is part of the John Street-Maiden Lane Historic District. It is possible that one or more of these structures may be physically altered by construction of a PATH terminal under this alternative. Thus, although this alternative may reduce the effects to the WTC site, it may have impacts on other Section 4(f) resources.

- Construction activities and staging would require temporary street, sidewalk, and lane closures in the vicinity of Dey Street, John Street, and Broadway. This would disrupt vehicular and pedestrian access to businesses and existing transit services and may result in increased congestion at other nearby locations.
- The construction of a terminal in the vicinity of Dey Street and Broadway has the potential to disrupt New York City Transit subway service on the R and W; 4 and 5; J, M and Z; and possibly the 2 and 3 lines when underpinning of subway structures is required. Although this work would be carried out according to New York City Transit guidelines, it may cause off-peak and weekend service disruptions throughout the construction process.
- Because the terminal would be located in any area having many older buildings, there is potential for both short- and long-term adverse noise and vibration impacts. These impacts may result both from the terminal's construction and from train operations.

Thus, while this alternative is considered feasible, it is not prudent. Not only would this alternative not avoid the use of the Section 4(f) resources, but it would also not meet the goals of this Project.

The selection of an off-site location to the north or south of the WTC site would have similar environmental impacts and operational constraints as the Broadway location. Furthermore, because any off-site alternative would require some PATH infrastructure within the WTC site, it would not avoid the use of Section 4(f) resource.

Avoidance Alternative 4, Relocate Terminal On-site

Construction of a terminal at an alternative location on the WTC site would not avoid the use of the Section 4(f) resource. As described in Chapter 2, "Project Alternatives," PANYNJ previously explored two alternative terminal locations within the WTC site—Church Street and Vesey Street.

Avoidance Alternative 4A, Church Street Location

The Church Street location would result in a new terminal on the eastern portion of the WTC site in the approximate location of the former H&M Terminal. The terminal itself would occupy much of the sub-grade levels between Church, Fulton, and Cortlandt Streets, and the 1 and 9 subway line, which are currently programmed for elements of the WTC Memorial and Redevelopment Plan. The track connections between the terminal and the Hudson River tunnels as well as certain ancillary facilities would be located on the western portion of the WTC site.

Not only would this alternative fail to avoid the use of the Section 4(f) resource, it would not meet some of the goals of this Project as follows:

- *Effectively restore long-term PATH service between New Jersey and Lower Manhattan:* This alternative would meet the long-term operational goals of PATH and would allow for temporary service during construction.

- *Establish an intermodal transportation facility in Lower Manhattan:* This avoidance alternative would provide for the intermodal connections to NYCT subways and the Fulton Street Transit Center in the same manner as the Preferred Alternative. However, it would locate PATH further from the World Financial Center and trans-Hudson ferries than would the Preferred Alternative. Furthermore, the vertical circulation within the Church Street option would require a less convenient ascent to street level than the Preferred Alternative since passengers would need to double back several times. Thus, the Church Street option may increase the travel time and level of congestion within the Terminal as compared to the Preferred Alternative.

- *Plan and construct a terminal that would support the redevelopment of Lower Manhattan:* The Church Street location would require the use of sub-grade spaces that are programmed for elements of the WTC Memorial and Redevelopment Plan. As was described in Chapter 2, "Project Alternatives," the use of these spaces may not only reduce the quantity of offices and retail that could be developed on the WTC site, but it would also locate certain building functions such as security and loading at street level. This would be inconsistent with the planning goals for the redevelopment of the site, which seek to centralize building services and security in order to reduce the potential for future incidents on the WTC site. Furthermore, the location of truck docks and other building services at street level would increase noise at the memorial site.

- *Minimize adverse impacts to the environment:* This avoidance alternative would result in nearly the same environmental impacts as the Preferred Alternative.

Although this alternative is considered feasible, it is not prudent. This alternative would not avoid the use of the Section 4(f) resource. Furthermore, it would constrain future development of the WTC site, would have adverse noise and visual impacts on the planned WTC Memorial, and it would degrade the level of customer convenience as compared to the Preferred Alternative. Therefore, this alternative is inconsistent with the goals of this Project.

Avoidance Alternative 4B, Vesey Street Location

The Vesey Street location would result in a new terminal along the north periphery of the WTC site. The terminal itself would extend east-west beneath the 1 and 9 subway line and would occupy much of the sub-grade levels in the northern portion of the site between Vesey and Fulton Streets. The tracks connections to the Hudson River tunnels, certain ancillary facilities, and portions of the terminal would be within the bathtub. The remaining portions of the terminal and its tracks would be located east of the 1 and 9 subway line.

Similar to the Church Street location, this alternative would fail to avoid the use of the Section 4(f) resource. It would also not meet some of the goals of this Project as follows:

- *Effectively restore long-term PATH service between New Jersey and Lower Manhattan:* This alternative would meet the long-term operational goals of PATH, but it would require the full disruption of temporary service during construction. As a result, those commuting between New Jersey and Lower Manhattan would need to pursue alternative modes of travel for several months.

- *Establish an intermodal transportation facility in Lower Manhattan:* This avoidance alternative would provide for the intermodal connections to NYCT subways, the Fulton Street Transit Center, the World Financial Center, and trans-Hudson ferries in a similar manner as the Preferred Alternative.

- *Plan and construct a terminal that would support the redevelopment of Lower Manhattan:* The Vesey Street location would require the use of sub-grade spaces that are programmed for elements of the WTC Memorial and Redevelopment Plan. This may result in the location of building serving and security to street level. Similar to the Church Street location, the location of truck docks and other building services at street level would increase noise at the memorial site and would have adverse visual impacts.
- *Minimize adverse impacts to the environment:* This avoidance alternative would result in nearly the same environmental impacts as the Preferred Alternative.

Although this alternative is considered feasible, it is not prudent. This alternative would not avoid the use of the Section 4(f) resource. Furthermore, it would fully suspend temporary PATH service during construction and would have long-term adverse noise and visual impacts on the planned WTC Memorial. Therefore, this alternative is inconsistent with the goals of this Project.

MEASURES TO MINIMIZE HARM

Absent an avoidance alternative, FTA and PANYNJ would implement measures to minimize harm to this Section 4(f) resource.

Subsequent to the publication of the DEIS, FTA, PANYNJ, SHPO, the Advisory Council on Historic Preservation (ACHP), and the Project's Section 106 consulting parties consulted to develop the Project's Memorandum of Agreement (MOA), which provides for specific commitments to minimize harm to remaining remnants and structures on the WTC site.

The MOA also details the process for documenting all remaining features on the WTC site as well as any artifacts that would be moved from the site during construction of the Permanent WTC PATH Terminal.

Concurrent with the development of the MOA, FTA and PANYNJ have considered alternatives and design modifications for the Preferred Alternative's track and platform level. The intent of this process was to reduce the physical area of the WTC tower footprints that would be obscured by the Preferred Alternative. FTA and PANYNJ have concluded that 5 tracks and 4 platforms are needed within the Terminal to meet the project's goals and objectives, but that a portion of one of the 4 platforms (Platform D) could be narrowed.

The following describes these measures to minimize harm to the Section 4(f) property. The full text of the executed MOA and other supporting materials appear in Appendix B of the FEIS. The process for developing these measures and the MOA itself is described in Section C, "Coordination," of this Final Section 4(f) Evaluation.

WTC Site Documentation

As stated in the MOA, PANYNJ would document the WTC site and its historic features to Level II standards of the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) prior to the removal or alteration of any historic features from the WTC site in connection with the undertaking of the Permanent WTC PATH Terminal. This documentation would consist of large-format, black-and-white photography of the site and its historic features as they currently exist; large-format photographic reproduction of selected existing drawings of current conditions and of pre-September 11, 2001 conditions; and a written history and description of the site and its historic features using information previously generated for the

Coordinated DOE for the WTC site as well as the Permanent WTC PATH Terminal's DEIS and FEIS.

PANYNJ would consult with SHPO and HABS/HAER to determine whether particular features warrant measured drawings, and any such drawings would be prepared by an individual with demonstrated experience in the preparation of measured drawings to HABS/HAER standards.

The completed documentation would be submitted to SHPO and HABS/HAER for consideration. The large-format photographs prepared to HABS/HAER standards would consist of the views itemized in Exhibit H, "Schedule of Photographs" of the Project's MOA (see Appendix B of the FEIS).

Tower Perimeter Column Base Remnants

Up to a total of 5 column bases in the North Tower and up to a total of 3 column bases in the South Tower may be temporarily or permanently removed to construct PATH Platform D. Where Platform D would intersect the northeast corner of the North Tower footprint, the platform would be clear of vertical obstructions and architectural treatments would be used to symbolically represent the location of the footprint. A minimum of 5 to a maximum of 7 column bases of the east column line of the North Tower would be visible from Platform D. The viewing area would consist of a glass wall tilted inward from the platform combined with a mirrored wall to the west to provide a view of the column bases from this area of the platform. Appropriate signage, graphics, and lighting would complete the viewing area.

The locations of column remnants of the South Tower that may be permanently obscured by PATH platforms would be symbolically represented on these platforms through architectural treatments that define and differentiate the portions of the infrastructure that are within the Tower footprint areas. These treatments may include color differentiation, texture differentiation, symbolic representation of Tower perimeter column remnants, and/or an emblematic marker designating the location of the historic resource.

In addition to the column bases described above, up to 4 column bases in the North Tower could be temporarily removed by work to install other Project structures and infrastructure. Of the 4 column bases that could be affected by the Project foundation, those column bases that remain in situ undisturbed or are temporarily removed and returned to their original locations would be accessible following the completion of these foundations.

Removing column bases, on either a temporary or permanent basis, would be considered only after practical engineering design options pursuant to Stipulations I.B., 2a, and 2b, to preserve column bases in place have been exhausted. Column bases that are removed would be returned to their original locations if practical engineering design permits. Permanent removal of column bases would only take place as a last resort, and these column bases would be removed and stored in accordance with the stipulations of the MOA.

The east-west pedestrian concourse to the World Financial Center would be designed and built in a manner that avoids the column remnants projecting above the concrete slab that outline the north perimeter of the North Tower and places this corridor at least five (5) feet outside the North Tower footprint as measured from the center line of each projecting column base to the face of the nearest structural support wall.

The temporary PATH track (in addition to the existing 5 tracks) and associated ballast that would be installed on a temporary basis during construction of the Project tracks and platforms and would be removed upon completion of the permanent tracks and platforms to re-expose the

North and South Tower perimeter column remnants and portions of the North and South Tower footprints that may be covered by the temporary track and ballast.

The construction fill currently on the footprints has been temporarily removed for the purposes of documentation of the footprints pursuant to Stipulation I.A. of the MOA, and would be replaced with clean rounded gravel as required after the documentation in order to protect the footprints and column remnants from ongoing construction. Further treatments may be specified in the Project's Resource Protection Plan.

Passageway to the NYCT Subway Station (E Train)

The new pedestrian connection between the Permanent WTC PATH Terminal and the MTA/NYCT WTC E Subway Station would incorporate the existing E subway entrance, in its current location, in a manner that retains existing materials and features of this entrance, including, but not limited to, the handrails, the travertine flooring, the steps and doors separating the E train from the pedestrian connection, and overhead signage, to the extent possible and in accordance with current building codes and Americans with Disabilities Act requirements. The design would include, at a minimum, a plaque identifying the historic features of the E subway entrance. During construction of the new pedestrian connection between the Permanent WTC PATH Terminal and the E Subway Entrance, doors may need to be carefully removed and stored until they can be reinstalled within the new connection.

East and West Slurry Walls

The design for the Project would provide visibility from within the Terminal to a portion of the east or west slurry wall if the following criteria are met: the condition of the slurry wall evokes the image now understood to represent the historic nature of the wall (e.g. tiebacks are part of the area to be exposed, tiebacks project beyond the re-stabilized slurry wall); the exposure which is provided would enable a view of the slurry wall which is clear, recognizable, and respectful of the slurry wall; and the exposure would not pose a safety hazard to the public from exposed finishes of the wall or its components. The design for the east-west pedestrian concourse shall include a location from which the members of the public may view a plaque and photograph of the west slurry wall.

Steel Beams in Cross Form

PANYNJ would relocate the steel column and crossbeam mounted on a concrete pedestal and currently situated within the WTC site near Church Street in accordance with Stipulation VI of the MOA (see Appendix B). The object would remain in the custody and control of PANYNJ, pending final disposition of these artifacts in accordance with the rights of the respective owners.

Resource Protection Plan for the WTC Site

PANYNJ, in consultation with SHPO and in coordination with LMDC and MTA/NYCT, as appropriate, shall develop a WTC Resource Protection Plan for the Permanent WTC PATH Terminal. The plan would be prepared to protect elements of the WTC site that are to remain in situ from inadvertent damage during the Terminal's construction. It would detail the Project's construction procedures and other construction plans for the site. It would provide for an inspection and reporting of the existing condition of elements, establish protection procedures, establish a monitoring program, and establish methods and materials to be used for any repairs. A historic architect who meets the Secretary of the Interior's professional qualifications standards (48 FR 44716) in historic preservation would be part of the design/construction team

and would have the opportunity to review design drawings and specifications prior to construction. The plan would empower the Project's historic architect in consultation with the Chief Engineer of PANYNJ to issue "stop work" orders to prevent any unanticipated damage to historic properties. Recommencement of work would only be permitted once the Chief Engineer of PANYNJ and the historic architect are assured that appropriate modifications have been made to construction techniques to assure that no further damage would occur.

PANYNJ will furnish copies of the Plan to SHPO, ACHP, the National Park Service, and the Section 106 consulting parties for review and comment prior to its implementation.

HUDSON RIVER BULKHEAD

DESCRIPTION OF THE SECTION 4(f) PROPERTY

There is one known archaeological resource in the area where the Preferred Alternative's pedestrian concourse to the World Financial Center would be located—the Hudson River Bulkhead (S/NR-eligible). The bulkhead and its associated structural systems were built between 1871 and 1936 by the New York City Department of Docks. The majority of the construction consisted of masonry walls on a variety of foundation systems, with quarry-faced ashlar granite block forming the visible face along most of the armored frontage. Design of the bulkhead was the responsibility of George B. McClellan, a Civil War general, who became the first Engineer-in-Chief of the Department of Docks. McClellan's plans contemplated the creation of a 250-foot-wide marginal street, from which 60- to 100-foot-wide piers with cargo sheds would project 400 to 500 feet around 150- to 200-foot-wide slips. Initiated to respond to the deteriorated, congested, and silt-filled condition of the waterfront, the carefully built granite walls created a consistent monumental surface to the waterfront that reinforced an image of New York City's commercial prominence. As property was acquired and as commerce warranted, the city built the bulkheads, built or rebuilt pier substructures, and leased redeveloped areas to private companies, which were usually responsible for piershed and headhouse construction. The bulkhead runs from the Battery to West 59th Street. The portion of the bulkhead located within the study area is below-grade along the western edge of Route 9A (see Figure 4(f)-1).

PROBABLE USE OF THE SECTION 4(f) PROPERTY

No Action Alternative

The No Action Alternative may involve minor construction activities to extend the service life of the temporary WTC PATH station, to the extent possible. Most of these activities would be undertaken within the limits of the WTC site and there would be no disturbance to the Hudson River Bulkhead.

Preferred Alternative

Tunneling for a pedestrian concourse under Route 9A would require piercing the Hudson River Bulkhead, which is buried below ground along the western edge of Route 9A. This would constitute a use of this Section 4(f) resource.

AVOIDANCE ALTERNATIVES

Since a pedestrian concourse below Route 9A would not avoid adverse effects to the Hudson River Bulkhead, alternatives were considered to eliminate this potential adverse impact.

Avoidance Alternative 1: At-grade Crossing

Since subsurface construction would not be required for an at-grade crossing, this alternative would not result in adverse impacts to the Hudson River Bulkhead. However, an at-grade crossing would not meet the goals of this Project as follows:

- *Effectively restore long-term PATH service between New Jersey and Lower Manhattan:* The absence of a grade separated crossing at Route 9A would not restore the facilities that existed prior to September 11, 2001. Previously, two pedestrian bridges crossed Route 9A, providing access between the World Financial Center, the World Trade Center, and PATH. Thus, the at-grade crossing would be inconsistent with this goal for the Project.
- *Establish an intermodal transportation facility in Lower Manhattan:* Because the at-grade crossing would not provide for a convenient connection between the World Financial Center and its ferry terminal, which is west of Route 9A, and the multiple transit facilities, including PATH that would be east of Route 9A. This alternative would not be consistent with this goal for the Project.
- *Plan and construct a terminal that would support the redevelopment of Lower Manhattan:* This alternative would allow for the redevelopment of the WTC site, but it may not provide for a convenient connection between the WTC site and PATH and the World Financial Center and Battery Park City. Although the at-grade alternative is not fully inconsistent with this goal, it does not provide for the enhanced pedestrian connections that would be achieved with a pedestrian concourse under or bridge over Route 9A.
- *Minimize adverse impacts to the environment:* This avoidance alternative would result in long-term adverse impacts to the environment as follows:
  - Since all pedestrians traveling between the WTC site and the World Financial Center would cross at grade, this alternative would likely result in adverse impacts to vehicle traffic on Route 9A as well as to pedestrian levels-of-service. Furthermore, the substantial number of trips that would cross at grade would increase the potential for vehicle/pedestrian conflicts, which would degrade the safety of both vehicular and pedestrian travel in Lower Manhattan.

Thus, while this alternative is considered feasible, it is not prudent. Although an at-grade crossing would avoid the use of the Section 4(f) resources, it would not meet the goals of this Project.

Avoidance Alternative 2: Pedestrian Bridge

The DEIS identified a design option that would result in a pedestrian bridge over Route 9A rather than a sub-grade concourse. Subsequent to publication of the DEIS, the pedestrian bridge was removed as a design option for the Preferred Alternative, but it is considered as part of this Final Section 4(f) Evaluation to avoid the use of the Section 4(f) property.

Subsequent to publication of the DEIS, it was determined that a pedestrian bridge would fail to meet some of the project's goals and objectives as follows:

- *Effectively restore long-term PATH service between New Jersey and Lower Manhattan:* This alternative would provide for the same type of connection that was provided between the WTC site and the World Financial Center as existed prior to September 11, 2001. However, a pedestrian bridge does not provide for the same level of service or convenience as a sub-grade concourse. Under the bridge option, pedestrians wishing to travel between the

Permanent WTC PATH Terminal and Battery Park City would need to ascend from the track/platform level to the second level of Freedom Tower, then cross Route 9A via the bridge and descend to street level through the World Financial Center. This results in two additional sets of stairs/escalators as compared to the subgrade concourse, which increases travel time. Furthermore, the bridge necessitates security measures within the Freedom Tower and the Winter Garden that would not be needed for a subgrade concourse since the bridge diverts greater volumes of pedestrian traffic through these facilities than would the subgrade concourse.

- *Establish an intermodal transportation facility in Lower Manhattan:* Although it may be less convenient for some customers than would be a sub-grade concourse, the pedestrian bridge would provide for connections between the World Financial Center and its ferry terminal, which is west of Route 9A, and the multiple transit facilities, including PATH that would be east of Route 9A. Thus, this alternative would be consistent with this goal for the Project.
- *Plan and construct a terminal that would support the redevelopment of Lower Manhattan:* This alternative would allow for the redevelopment of the WTC site, but it may provide a less convenient connection between the WTC site and PATH and the World Financial Center and Battery Park City than would a sub-grade concourse. Although the pedestrian bridge is not fully inconsistent with this goal, it does not provide for the enhanced pedestrian connections that would be achieved with a pedestrian concourse under Route 9A.
- *Minimize adverse impacts to the environment:* This avoidance alternative would result in long-term adverse impacts to the environment as follows:
  - The construction of the bridge's foundations could result in the disturbance or removal of portions of the Hudson River Bulkhead. The bridge's construction could also affect historic resources located within 90 feet of construction limits, which may result in adverse impacts to other structures within the APE for the Permanent WTC PATH Terminal.

Thus, while this alternative is considered feasible, it is not prudent since it results in reduced levels of service for pedestrians and may necessitate additional security measures for Freedom Tower and the Winter Garden.

MEASURES TO MINIMIZE HARM

Absent an avoidance alternative, FTA and PANYNJ would implement measures to minimize harm to this Section 4(f) resource. The project's executed MOA (see Appendix B) details a process to follow to identify and mitigate any adverse impacts on the Hudson River Bulkhead. Because the Hudson River Bulkhead is also located within the APE for the Route 9A Project, PANYNJ would coordinate its treatment plan with NYSDOT. In consultation with SHPO, and as appropriate, NYSDOT, PANYNJ would develop and implement a plan to locate and identify intact portions of the Hudson River Bulkhead that would be affected by construction of the Permanent WTC PATH Terminal's east-west pedestrian connection. In the event that the intact portions of the Hudson River Bulkhead are identified, PANYNJ would, in consultation with the SHPO and NYSDOT, prepare a treatment plan for those portions of the Hudson River Bulkhead to be affected by the Project. The plan would be submitted to SHPO and Section 106 consulting parties for their review and comment prior to implementation.

WTC SITE ARCHAEOLOGY

A Phase IA Archaeological Assessment and a subsequent Topic Intensive Study for the WTC site found former Block 85 (Lots 8-17) at the northeast corner of the site and former Block 60 (Lots 5, 6, and 10) near the southeast corner of the site to be sensitive and to warrant further consideration (see Figure 4[f]-4.) These areas are located outside the former WTC construction footprint and have the potential to contain shaft features (such as privies, cisterns, wells, and cesspools) predating the 1850s that may have survived under former basements. Lots with basements 20 feet or more below grade have a lesser likelihood of shaft feature preservation.

PROBABLE USE OF THE SECTION 4(f) PROPERTY

No Action Alternative

The No Action Alternative may involve minor construction activities to extend the service life of the temporary WTC PATH station, to the extent possible. Most of these activities would be undertaken within the limits of the temporary WTC PATH station. Therefore, this alternative would not disturb or alter the potential archaeological resources within the northeast and southeast portion of the WTC site.

Preferred Alternative

Construction of the Preferred Alternative would impact portions of the WTC site, which has been identified as potentially sensitive for archaeological resources. If National Register-eligible archaeological resources were found to exist, activities that damaged or destroyed those resources would constitute a use of this historic resource.

The regulations specify that Section 4(f) is not applicable for archaeological resources if it is determined that such resources are important because of what can be learned through data recovery rather than through preservation in place. However, the project's MOA provides for stipulations to address potential impacts to these archaeologically sensitive areas pursuant to the project's compliance with Section 106 of the NHPA.

Prior to any Project-related subsurface disturbance at any of the locations that have been determined to be sensitive for historic archaeological resources, PANYNJ will, in consultation with the SHPO, and LMDC as appropriate identify and evaluate the National Register eligibility of any archaeological resources at these locations in accordance with 36 CFR 800.4.

In the event that FTA, in consultation with SHPO, determines that National Register-eligible archaeological resources will be adversely affected by construction of the Preferred Alternative, PANYNJ would, in consultation with FTA, SHPO, and LMDC as appropriate, and the Section 106 consulting parties, develop and implement an Archaeological Resource Treatment Plan for the Project. The Archaeological Resources Treatment Plan and documentation will adhere to the standards established by the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716), including the standards therein for professional qualifications The plan will be submitted to SHPO and Section 106 consulting parties for their review and comment prior to implementation.

At this time, it is not anticipated that the archaeological resources that could be disturbed with the construction of the Preferred Alternative are important for preservation in place. Therefore, Section 4(f) would not apply to these archaeological resources. However, should it be

determined that these resources should be retained in place, PANYNJ and FTA would prepare a separate Section 4(f) evaluation.

OFF-SITE HISTORIC STRUCTURES

DESCRIPTION OF THE SECTION 4(F) PROPERTIES

An area of Potential Effect (APE) for the Permanent WTC PATH Terminal was established to consider the potential short- and long-term impacts to historic structures. This APE was approved by SHPO in March 2004, and includes 21 known historic or archaeological resources as shown in Table 4(f)-1 and Figure 4(f)-1.

The potential effects of the Preferred Alternative on the WTC site and the Hudson River Bulkhead were described above. This section focuses on the other structures within the Permanent WTC PATH Terminal's APE.

PROBABLE USE OF THE SECTION 4(f) PROPERTIES

No Action Alternative

The No Action Alternative is not expected to result in a direct or constructive use of off-site historic resources.

Preferred Alternative

The long-term operation of the Preferred Alternative is not anticipated to result in any use of off-site historic structures. However, the Terminal's construction may result in vibrations that may impact historic structures in close proximity to construction activities.

Per the guidance of the New York City Department of Buildings, historic structures within 90 feet of the Permanent WTC PATH Terminal's project limits were considered to be potentially impacted by construction activities. Based on these guidelines, the Terminal's construction has the potential to adversely impact 5 Section 4(f) properties within its APE as follows:

- Former East River Savings Bank, 26 Cortlandt Street;
- Barcley-Vesey Building, 140 West Street;
- Beard Building, 125 Cedar Street;
- 114-118 Liberty Street; and
- St. Paul's Chapel and Cemetery.

The other off-site structures listed in Table 4(f)-1 are beyond the 90-foot threshold for construction impacts and would not be subject to use of any sort under Section 4(f).

The executed MOA for the Permanent WTC PATH Terminal provides the following stipulations pursuant to potential impacts to the Barclay-Vesey Building, Former East River Savings Bank, Beard Building, St. Paul's Chapel and Graveyard, and 114-118 Liberty Street.

PANYNJ, in consultation with SHPO and Section 106 consulting parties, and in coordination with LMDC and MTA/NYCT, where appropriate, shall develop a Construction Protection Plan (CPP) for the Project. The CPP would set forth measures for the protection and avoidance of structural and architectural damage to these historic properties that may result from construction vibration. The CPP would be based on requirements in the "New York City Department of

PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure 4(f)-4
Areas of Potential Archaeological Sensitivity

Table 4(f)-1
Known Historic and Archaeological Resources in the Area of Potential Effect

Ref. No.	Name	Address	NHL	S/NR	S/NR-eligible	NYCL	NYCL-eligible
1	Hudson River Bulkhead	Battery to West 59th Street			X		
2	WTC Site	Bounded by Vesey, Church and Liberty Streets, and Route 9A			X		
3	Barclay-Vesey Building	140 West Street			X	X	
4	Federal Office Building/ U.S. Post Office	90 Church Street		X			
5	St. Peter's Roman Catholic Church	22 Barclay Street		X		X	
6	Former St. Peter's School	16 Barclay Street			X		
7	30 Vesey Street	30 Vesey Street			X		
8	Old New York Evening Post Building	20 Vesey Street		X		X	
9	New York County Lawyer's Association	14 Vesey Street		X		X	
10	Astor Building	217 Broadway			X		
11	Transportation Building	225 Broadway			X		
12	African Burial Ground and the Commons Historic District	Bounded by Duane Street, Park Row, Broadway and Centre Street	X	X		X	
13	St. Paul's Chapel and Graveyard	Broadway and Fulton Street	X	X		X	
14	Former American Telephone & Telegraph (AT&T) Company Building	195 Broadway			X		X
15	Fulton Street IRT Station	Fulton Street and Broadway			X	X	
16	Former East River Savings Bank	26 Cortlandt Street			X		X
17	United States Realty Building*	115 Broadway		X	X	X	
18	Beard Building	125 Cedar Street			X		X
19	114-118 Liberty Street	114-118 Liberty Street			X		
20	21-23 Thames Street	21-23 Thames Street			X		
21	90 West Street	90 West Street			X	X	

Notes: Corresponds to Figure 4(f)-1.
NHL: National Historic Landmark.
SR: New York State Register of Historic Places.
NR: National Register of Historic Places.
S/NR-eligible: Site has been found eligible for listing on the New York State and National Registers of Historic Places.
NYCL: New York City Landmark.
NYCL-eligible: LPC has determined that the site appears eligible for NYCL designation.
* The United States Realty Building is listed on the SR only. It is eligible for listing on the NR.

Buildings Technical Policy and Procedure Notice (PPN) #10/88" regarding procedures for the avoidance of damage to historic structures resulting from adjacent construction. The PPN defines adjacent historic structures as being contiguous or within a lateral disturbance of 90 feet from a lot under development or alteration.

The CPP would describe in detail the construction procedures of the Project, as well as the construction procedures associated with other projects under construction in the vicinity of each of these historic properties. It would also provide for the inspecting and reporting of existing conditions at these properties, establish protection procedures, establish a monitoring program to measure vertical and lateral movement and vibration, establish and monitor construction methods to limit vibration; and establish methods and materials to be used for any repairs. The plan shall also specify the implementation of special vibration protection measures to protect

these historic properties from increased vibration levels associated with construction activities. The CPP would provide for a historical architect meeting the Secretary of Interior Standards to supervise implementation of the CPP.

The CPP would empower the historical architect, in consultation with the Chief Engineer of PANYNJ ("The Engineer") to issue "stop work" orders to prevent any damage to historic properties, and any recommencement of work shall only be permitted at such time that the Chief Engineer and historical architect have assurance that the appropriate modifications have been made to the construction technique to assure that no damage would occur to historic properties.

Since measures to avoid substantial impairment of the historic quality of off-site structures protected by Section 4(f) have been incorporated into the Project, this alternative would not require either a direct or constructive use of these structures. The potential impacts to these off-site historic structures under this alternative would be temporary, minor, and repairable.

C. COORDINATION

The FTA is serving as the federal lead agency for this Project under the National Environmental Policy Act (NEPA). PANYNJ a municipal corporate instrumentality and political subdivision of the States of New York and New Jersey, is acting as the Project sponsor.

The NHPA Section 106 review process for the Permanent WTC PATH Terminal began concurrent with its public scoping under NEPA in September 2003. In order to streamline the process for three of the Lower Manhattan Recovery Projects, FTA entered into a coordinated Section 106 review process with the USDOT, Federal Highway Administration (FHWA), lead agency for the Route 9A Project, and the Lower Manhattan Development Corporation (LMDC), lead agency under the U.S. Department of Housing and Urban Development for WTC Memorial and Redevelopment Plan, in December 2003. The three lead agencies jointly notified the SHPO and Advisory Council on Historic Preservation (ACHP) concerning these three Lower Manhattan undertakings and identified potential consulting parties to the Section 106 process. In January and February 2004, FTA, FHWA and LMDC hosted two meetings with consulting parties to discuss the projects and in particular the evaluation of the WTC site for eligibility for inclusion in the National Register of Historic Places. Consulting parties were also offered opportunities to comment on draft versions of the Coordinated DOE for the WTC site, which was issued in final form on March 31, 2004. Upon completion of the Coordinated Determination of Eligibility, the agencies proceeded with their respective projects' Section 106 responsibilities separately.

Subsequently, the FTA determined that the Permanent WTC PATH Terminal would have an adverse effect on the National Register-eligible WTC site and the National and State Register-eligible Hudson River Bulkhead. The FTA also determined that the Permanent WTC PATH Terminal may have adverse effects to off-site historic resources during its construction. As such, PANYNJ and FTA prepared a draft Permanent WTC PATH Terminal Finding of Effects pursuant to Section 106 of the National Historic Preservation Act, which was published as part of the Permanent WTC PATH Terminal's DEIS.

Consulting parties and the general public had the opportunity to comment on this draft Finding of Effects concurrent with the public comment period for this DEIS. FTA and PANYNJ hosted two Section 106 consulting parties meetings, one on June 14, 2004, and one on July 20, 2004. FTA and PANYNJ provided information at these meetings to further clarify the project's effects

on historic resources. The consulting parties commented on the Finding of Effects and provided discussion on measures to avoid, minimize or mitigate these effects.

Following the close of the public comment period on the DEIS, FTA and PANYNJ continued coordination with the Advisory Council on Historic Preservation (ACHP), SHPO, and the other Section 106 consulting parties to develop measures to avoid, minimize, or mitigate adverse effects on the resources identified in the Finding of Effects. One consulting party meeting was held on August 19, 2004, one on November 4, 2004, and one on November 15, 2004 to solicit comments on the draft Memorandum of Agreement (MOA). Another draft version of the MOA was distributed to the consulting parties on December 16, 2004, and the consulting parties were invited to comment in writing.

The consulting parties provided input on the Draft MOA both at the meetings and in writing. The full transcripts of the meetings and the written comment letters appear in Appendix H of the FEIS. The following is a summary of the major issues raised by the consulting parties and how they are addressed in the executed MOA.

- ***Perimeter Column Remnants Outlining North Tower and South Tower Footprints and the Tower Footprint Areas:*** The treatment and accessibility of the perimeter column remnants and footprint areas in the context of the Permanent WTC PATH Terminal was raised at each of the meetings. In response, the MOA contains a set of stipulations regarding FTA and PANYNJ's commitment that, to the maximum extent feasible given project implementation requirements, the design of the Terminal will preserve in place 84 column base remnants in the North Tower and 39 column base remnants in the South Tower at the existing floor at elevation 242 (58' below Sea Level) that outline the footprints of the former Twin Towers at the WTC site and are not located in the PATH right-of-way. The MOA also sets forth the total, not-to-exceed, extent of each of the tower footprints that will be permanently occupied by any portion of the project, and specifies that the east-west pedestrian corridor will be constructed outside the North Tower footprint. The tower perimeter column bases that would remain in place but may be covered by the platform will have symbolic representation, through architectural treatments, of column remnants that may be obscured or permanently removed by the Terminal's platforms.

- ***Cumulative Effects:*** Consulting parties expressed concern about the cumulative effects of multiple undertakings in this area of Lower Manhattan on the WTC site and on other historic properties in the vicinity. Initial drafts of the MOA, as well as the DEIS and FEIS, specified that Construction Protection Plans (CPPs) would be prepared in advance of construction to ensure that buildings adjacent to areas of construction for the Permanent WTC PATH Terminal would not be inadvertently harmed by a variety of factors, including ground-borne vibration. The final MOA takes into account the need to coordinate development and implementation of the CPPs with LMDC, MTA/NYCT and NYSDOT. It also specifically provides for development and implementation of a plan for protection of historic elements of the WTC site during construction activities within the Site, including construction associated with the WTC Memorial and Redevelopment Plan and, as necessary, with the Fulton Street Transit Center and Route 9A. The MOA also sets forth a detailed process for PANYNJ to address cumulative effects on the WTC site during design, and through the first six months of the Terminal's operation.

- ***WTC Site Artifacts:*** A number of consulting parties were concerned about "off-site" artifacts from the WTC site, many of which are in the interim care and custody of PANYNJ at Hangar 17 at JFK International Airport. The inventory and treatment of these off-site

artifacts is not a part of the Permanent WTC PATH station, and their possible use in the WTC Memorial will be coordinated by LMDC. However, the MOA for the WTC PATH station provides a process to be followed in the event that elements now on the WTC site must be removed during construction of the Permanent WTC PATH Terminal.

- ***E-Train Subway Entrance:*** Responding to a number of comments regarding the E-train subway entrance, the MOA specifies that the remains of the pre-September 11, 2001 entrance to the E subway line from the WTC site will be incorporated, to the greatest extent possible consistent with current building codes and Americans with Disabilities Act requirements, into the new pedestrian connection between the Terminal and the subway.
- ***Recordation of the WTC site:*** Consulting parties were very interested in a comprehensive documentation of current conditions on the WTC site prior to construction, As such, recordation of the WTC site is a stipulation of the Permanent WTC PATH Terminal MOA.
- ***Continued Participation of Consulting Parties:*** Consulting parties raised concerns regarding their continued involvement following the execution of the MOA. Consistent with the regulations implementing Section 106 of NHPA, the MOA explicitly provides for continued participation of consulting parties throughout the design process and treatment plans development following the execution of the MOA.

The MOA among the FTA, ACHP, SHPO, PANYNJ, and concurring consulting parties was executed in April 2005.

FTA solicited U.S. Department of the Interior (DOI) review of the Draft Section 4(f) Evaluation, which was published concurrent with the DEIS. In a letter dated, July 30, 2004, DOI agreed with the findings that there are no feasible and prudent alternatives to the proposed project, if project objectives are to be met (see Appendix H). However, DOI could not agree that all planning for measures to minimize harm had been undertaken. DOI recognized that the Project's Section 106 review process was ongoing and that a MOA would be executed prior to publication of the FEIS. DOI has and will continue to have involvement in the Project's Section 106 review process, including the measures developed pursuant to the MOA in order to minimize harm to the Section 4(f) resources.

The executed MOA provides for ongoing coordination with ACHP, SHPO, and the Project's Section 106 Consulting Parties during the design and construction of the Preferred Alternative. This includes review of a Resource Protection Plan, Construction Protection Plans, and HABS/HAER documentation. Design review for the treatment of the Terminal's platforms, the E subway entrance, and the east and west slurry walls will involve SHPO, ACHP, and the Project's Section 106 Consulting Parties. Furthermore, the MOA provides for a process to communicate project information with the Section 106 Consulting Parties as the design moves forward. ✳

A. BIBLIOGRAPHY

Able, K.W., J.P. Manderson, and A.L. Studholme. *Habitat Quality in the New York/New Jersey Harbor Estuary: An Evaluation of Pier Effects on Fishes.* Final Report. Hudson River Foundation. New York, NY. 1995.

_____. *The Distribution of Shallow Water Juvenile Fishes in an Urban Estuary: The effects of Manmade Structures in the Lower Hudson River.* Estuaries 21(48):731-744. 1998.

_____. *Habitat quality for shallow water fishes in an urban estuary: the effects of man-mad structures on growth.* Marine Ecology Progress Series 187:227-235. 1999.

Adams, D.A., O'Connor, J.S. and Weisberg, S.B. *Final Report; Sediment Quality of the NY/NJ Harbor System. An Investigation under the Regional Environmental Monitoring and Assessment Program (R-EMAP).* EPA/902-R-98-001. 1998.

Alliance for Downtown New York, Inc. *Downtown Alliance Survey of Lower Manhattan Retail Establishments.* 2001.

_____. *Transportation Priorities for Lower Manhattan: Executive and Users Groups Survey on Transportation and Infrastructure.* April, 2003.

_____. *The Downtown Report.* Winter 2003.

ASA Analysis and Communication, Inc.. *2000 Year Class Report for the Hudson River Estuary Monitoring Program.* Prepared for and jointly funded by Central Hudson Gas and Electric Corporation. Consolidated Edison Company of New York, Inc. 2003.

Avery, M.L., P.F. Springer, and J.F. Cassel. *The effects of a Tall Tower on Nocturnal Bird Migration—a Portable Ceilometer Study.* Auk 93:281-291. 1976.

Bakerville, Charlie. *Bedrock Map of Manhattan.* 1994

Battery Park City Authority, *Battery Park City 5th Supplemental Environmental Impact Statement.* July 2000.

Beebe, C.A., and Savidge, I.R. "Historical Perspective on Fish Species Composition and Distribution in the Hudson River Estuary." *American Fisheries Society Monograph* 4:25-36. 1988.

Beranek, L.L. *Noise and Vibration Control.* New York: McGraw-Hill. 1971.

Berger, E.H. and co-editors. *The Noise Manual.* Fairfax, American Industrial Hygiene Association Press. 2000.

Brennan, Joseph, *Abandoned Stations.* 2001.

Brosnan, T.M., and O'Shea, M.L. "New York City Department of Environmental Protection, Marine Sciences Section, New York Harbor Water Quality Survey: 1994." Wards Island, NY. 1995.

Busby, M.W. and Darmer, K.I. "A Look at the Hudson Estuary." *Water Resources Bulletin* 6: 802 812. 1970.

Coastal Environmental Services. "Television City Project: Characterization of the Aquatic Ecology of the Site and Assessment of Potential Impacts of the Project on the Aquatic Biota." Prepared for Berle, Cass, and Case, New York, New York; McKeown and Franz, Inc., New York, NY; and The Trump Organization. New York, NY. 1987.

Council on Environmental Quality, U.S. Department of Housing and Urban Development, and the U.S. Environmental Protection Agency. .*The Costs of Urban Sprawl.* 1974.

Council on Environmental Quality. *Environmental Justice: Guidance Under the National Environmental Policy Act.* December 1997.

Cushman & Wakefield. Downtown New York Office Market Data, 2001 and 2003.

_____. *Manhattan Marketbeat Series.* 1998-2002.

Duffy-Anderson, J.T., and K.W. Able. 1999. Effects of municipal piers on the growth of juvenile fishes in the Hudson River estuary: a study across a pier edge. Marine Biology 133:409-418.

Dynegy Roseton LLC, Entergy Indian Point 3 LLC, Mirant Bowline LLC, New York Power Authority, and Niagara Mohawk Power Corporation. Prepared by ASA Analysis and Communication. New Hampton, NY.

EEA, Inc. *Report on Aquatic Studies: Hudson River Center Site.* Prepared for the New York City Public Development Corporation, New York, NY. Prepared by EEA, Inc. Garden City, NY. 1988.

Environment Canada, NESCAUM. "Manufacturer of Emission Controls Association, The Impact Of Retrofit Exhaust Control Technologies On Emissions From Heavy-Duty Diesel Construction Equipment," SAE 199-01-0110.

Federal Emergency Management Agency, Federal Transit Administration, Federal Highway Administration, U.S. Department of Housing and Urban Development, New York State Urban Development Corporation, U.S. Coast Guard, U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, National Marine Maritime Fisheries Service. "Memorandum of Understanding" (MOU). June 2002.

Gabriel Productions, Inc. *Gabriels Apartment Rental Guide: New York City.* 2003 ed.

Harris, Cyril M. *Handbook of Acoustical Measurements and Noise Control.* New York: McGraw-Hill. 1991.

Harris, David A. *Noise Control Manual for Residential Buildings.* McGraw-Hill. 1997.

Hatch Mott MacDonald. *Community Right-to-Know Survey.* 2000.

Hazen and Sawyer. *Newtown Creek Water Pollution Control Plant. Revised Application for Modification of the Requirements of Secondary Treatment Under Section 301(h), PL 97-117.* Prepared for the City of New York, Department of Environmental Protection. 1983.

Houle, C. 2003. Letter from Charlene Houle (New York Natural Heritage Program, Albany, NY) to Sandra Collins (AKRF) concerning the WTC Memorial and Redevelopment Plan project. September 30, 2003.

Hurley, L.M. *Field Guide to the Submerged Aquatic Vegetation of Chesapeake Bay. U.S. Fish and Wildlife Service*, Chesapeake Bay Estuary Program, Annapolis, MD. 1990.

Klem, D., Jr. *Bird-window collisions*. Wilson Bulletin 101(4):606-620. 1989.

_____. *Bird Injuries, Cause of Death, and Recuperation from Collisions with Windows*. Journal of field Ornithology 61(1):115-119. 1990a.

_____. *Collisions Between Birds and Windows: Mortality and Prevention*. Journal of field Ornithology 61(1):120-128. 1990b.

_____. *Glass and Bird Kills: an Overview and Suggested Planning and Design Methods of Preventing a Fatal Hazard*. In: Wildlife conservation in metropolitan environments. NIUW Symposium Series 2, L.W. Adams and D.L. Leedy, eds. Published by the National Institute for Urban Wildlife, MD. USA, pp. 99-104. 1991.

Lauer, G. *Preliminary Studies Concerning Effects of Cooling System Transport Upon Planktonic Organisms at the Astoria Power Station, Queens, NY.* Report prepared for Consolidated Edison Company of New York, Inc. 1971.

Lawler, Matusky & Skelly Engineers (LMS). *New York and New Jersey Harbor Navigation Project, Aquatic Biological Survey Report 2002-2003, Draft Report*. Prepared for U.S. Army Corps of Engineers, New York District, Environmental Review Section, Jacob K. Javits Federal Building, 26 Federal Plaza, New York, NY. 2003.

Limburg, M.A. Moran, and McDowell, W.H. In *The Hudson River Ecosystem*. K.E. Springer Verlag, New York, NY. 1986.

Lonsdale, D.J., and Cosper, E.M. *Phytoplankton Productivity and Zooplankton Feeding and Productivity in the Lower Hudson River Estuary.* Marine Sciences Research Center, SUNY, Stony Brook, NY. Final report to the Hudson River Foundation, New York, NY. 1994

Lower Manhattan Development Corporation. *Fulton Corridor: Creating a Vision for Enhanced Retail+Arts+Cultural Activities in Lower Manhattan.* Volume 1, Strategic Plan. June 12, 2003.

Lower Manhattan Development Corporation and Port Authority of New York and New Jersey, *Lower Manhattan and the World Trade Center Site: Urban Planning and Transportation Study*, September 2002.

Lower Manhattan Emergency Preservation Fund. *Map: Corridors of Concern.* 2003.

Lyon, R.H. *Transportation Noise*. Grozier Publishing. 1973.

Martin, G.R. *The Visual Problems of Nocturnal Migration*. In: Bird Migration. E. Gwinner (ed.). Springer-Verlag Berlin Heidelberg. pp. 185-197. 1990.

Mayor Michael Bloomberg. *Vision for a 21st Century Lower Manhattan.* December 2002.

Meixler, M., Gallagher, A., Eckerlin, G., and Bain, M. (Cornell University). *Biological Status of the Hudson River Park Sanctuary Waters, Progress Report,* September 2003. Prepared for the Hudson River Park Trust. http://environment.cornell.edu/hudson/HRPTWeb.htm.

Moore, F.R. *Sunset and Orientation Behavior of Migrating Birds*. Biological Review 62:65-86. 1987.

Moran, M.A. and Limburg, K.E. "The Hudson River Ecosystem." In *The Hudson River Ecosystem,* Limburg, K.E., M.A. Moran, and W.H. McDowell. Springer Verlag, New York, NY. 1986.

Moran, Procter, Mueser & Rutledger and Eggers and Higgins. *Geologic Sections Along Pierhead and Bulkhead Lines; Battery Place to Cortlandt Street*. Erasco Services Inc. 1942.

_____. *Geologic Sections Along Pierhead and Bulkhead Lines; Cortlandt Street to Harrison Street*. Erasco Services Inc. 1942.

Morreale, S.J. and E.A. Standora. *Cumulative Evidence of Southward Migration of Juvenile Sea Turtles from Temperate Northeastern Waters*. Proceedings of the Twelfth Annual Workshop on Sea Turtle Biology and Conservation. pp. 85-86. NOAA Technical Memorandum NMFS-SEFSC-361. 1995.

Nelson, J.T., and H.J. Saurenman. *State-of-the-Art Review: Prediction and Control of Noise and Vibration from Rail Transit Trains*, DOT-TSC-UMTA-83-3.

Nelson, P.M. *Transportation Noise Reference Book.* Butterworths, London. 1987.

NESCAUM. "Memorandum—Diesel Emissions Resulting from Ground Zero Activity." April 8, 2002.

New York and New Jersey Harbor Estuary Program. *New York-New Jersey Harbor Estuary Program, Including the Bight Restoration Plan: Final Comprehensive Conservation and Management Plan.* 1996.

_____. Factsheet No. 3: Pollution in the Harbor Estuary. Undated.

New York City Audubon Society. *Reported Collisions Listed By Location, Refine Location Report*. http://www.birdbash.org/NYCASBirdWatch/ReportLocTotals.asp. 2004.

New York City Department of Buildings. Technical Policy and Procedure Notice #10/88, "Procedures for the Avoidance of Damage to Historic Structures." June 1988.

New York City Department of City Planning. *New York City Coastal Zone Boundary Map.* 1982.

_____. *The New Waterfront Revitalization Program, A Propsoed 197a Plan.* September 1999.

_____. *New York City Zoning Resolution*, December 2003.

New York City Department of Environmental Protection. *1997 Harbor Water Quality Survey Summary*. New York, NY. 1998.

2000 Harbor Water Quality Survey Summary. New York, NY. 2001.

_____. *2001 Harbor Water Quality Survey Summary.* New York, NY. 2002.

New York City Department of Health. *A Community Needs Assessment of Lower Manhattan Following the World Trade Center Attack*, Community HealthWorks. December 2001.

New York City Mayor's Office of Environmental Coordination. *City Environmental Quality Review (CEQR) Technical Manual.* December 2001.

New York City Public Development Corporation with EA Engineering, Science, and Technology. *Phase I Feasibility Study of the Aquatic Ecology Along the Hudson River in Manhattan.* 1990.

New York Metropolitan Transportation Council. *2000 Hub Bound Travel Report, Transportation to the Manhattan Central Business District.* May 2003.

_____. *Demographic and Socioeconomic Forecasting Post September 11th Impacts.* Technical Memorandum Prepared by Urbanomics.

_____. Employment forecasts, 2000-2025.

New York State Department of Environmental Conservation. 2003. Peregrine Falcon Fact Sheet, www.dec.state.ny.us/website/dfwmr/wildlife/endspec/pefafs.html

_____. *Phase II Alternative Attainment Demonstration for Ozone.* November 1988.

New York State Department of Labor. *Covered Employment and Wages (ES-202) Program.* 2000-2002.

New York State Urban Development Corporation d/b/a Empire State Development Corporation. *New York Stock Exchange New Facility Final Environmental Impact Statement.* December 2000.

_____. *7 World Trade Center Reconstruction Project SEQRA Environmental Assessment Form and Supporting Analysis.* May 2002.

NRDC. *The Environmental Impacts of World Trade Center Attacks—A Preliminary Assessment.* February 2002.

Ogden, L.J. *Collision Course: The Hazards of Lighted Structures and Windows to Migrating Birds*. Published by World Wildlife Fund Canada and Fatal Light Awareness Program, 46 pp. 1996.

PBS&J. "The Hudson River Park. Natural Resources Appendix to Final Environmental Impact Statement." Prepared for the Empire State Development Corporation and the Hudson River Park Conservancy. 1998.

Perlmutter, A. *Ecological Studies Related to the Proposed Increase in Generating Capacity at the Astoria Power Station of Consolidated Edison*. Report prepared for the Consolidated Edison Company of New York, Inc. 1971.

Pinsker, Lisa M. *Applying Geology at the World Trade Center Site.* November 2001.

Rago, P.J. *Production Forgone: An Alternative Method for Assessing the Consequences of Fish Entrainment and Impingement Losses at Power Plants and Other Water Intakes.* Ecological Modelling 24:79-111. 1984.

Real Estate Board of New York. *Retail Report.* Spring, 2003.

Ricker, W. E. "Computation and interpretation of biological statistics of fish populations." Fish. Res. Board Can. Bull. 191. 1975.

Rohmann, S.O., and Lilienthal, N. *Tracing a River's Toxic Pollution: A Case Study of the Hudson, Phase II. Inform, Inc.* New York, NY. 1987.

Rusanowsky, D. Letter from Diane Rusanowsky (National Marine Fisheries Service) to Sandra Collins (AKRF). August, 26, 2003.

Schmidt-Koenig, K. Avian Orientation and Navigation. Academic Press. London. 1979.

Schuberth, Christopher J. *The Geology of New York City and Environs*. 1968.

Scott, F.R., and D.A. Culter. *The Fall Migration: Middle Atlantic Coast Region*. American Birds 25(1): 36–40. 1971.

Standora, E.A., S.J. Morreale, R.D. Thompson, and V.J. Burke. *Telemetric Monitoring of Diving Behavior and Movements of Kemp's Ridleys*. Proceedings of the Tenth Annual Workshop on Sea Turtle Biology and Conservation. Page 133. NOAA Technical Memorandum NMFS-SEFC-278. 1990.

Steinberg, N., Way, J., and Suszkowski, D.J. *Harbor Health/Human Health: an Analysis of Environmental Indicators for the NY/NJ Harbor Estuary.* Prepared for the New York/New Jersey Harbor Estuary Program by the Hudson River Foundation for Science and Environmental Research. Produced under a cooperative agreement between the Hudson River Foundation and US EPA Region II. 2002.

Stepien, J.C., Malone, T.C. and Chervin, M.B. "Copepod communities in the estuary and coastal plume of the Hudson River." *Estuarine, Coastal and Shelf Science* 13:185-194. 1981.

Tamaro, George J. *World Trade Center "Bathtub": From Genesis to Armageddon.* November 2002.

Transportation Research Board. *Highway Capacity Manual. 2000.*

_____.. *Highway Capacity Manual Special Report 209.* 1994.

U.S. Army Corps of Engineers. *New York and New Jersey Harbor Navigation Study. Draft Environmental Impact Statement.* 1999.

U.S. Department of Commerce, Bureau of the Census, *Decennial Census of Population and Housing,* 1990 and 2000.

U.S. Department of Housing and Urban Development and Lower Manhattan Development Corporation, *World Trade Center Memorial and Redevelopment Plan, Draft Generic Environmental Impact Statement.* January 2004.

_____. *World Trade Center Memorial and Redevelopment Plan, Final Generic Environmental Impact Statement.* April 2004.

_____. *World Trade Center Memorial and Redevelopment Plan, Record of Decision and Lead Agency Findings Statement.* June 2004.

_____.. *World Trade Center Memorial and Redevelopment Plan Environment Assessment for Proposed Refinements.* April 2005.

U.S. Department of Transportation Federal Highway Administration. *Section 4(f) Policy Paper.* June 1989.

U.S. Department of Transportation Federal Highway Administration and New York State Department of Transportation, *Route 9A Reconstruction Project Final Environmental Impact Statement.* May 1994.

_____.. *Appendix B: Cultural Resources to the Route 9A Reconstruction Project Final Environmental Impact Statement.* May 1994.

_____.. *Route 9A Reconstruction Project Cultural Resources Summary Report.* April 1996.

_____.. *Route 9A Project, Supplemental Draft Environmental Impact Statement,* May 2004.

_____.. *Route 9A Project, Supplemental Final Environmental Impact Statement,* Unpublished.

U.S. Department of Transportation Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, April 1995.

U.S. Department of Transportation Federal Transit Administaration Lower Manhattan Recovery Office. *Approach to Cumulative Effects Analysis for the Lower Manhattan Recovery Effort.* July 2003.

U.S. Department of Transportation Federal Transit Administration, Metropolitan Transportation Authority, and MTA New York City Transit. *Fulton Street Transit Center, Draft Environmental Impact Statement.* May 2004.

_____.. *Fulton Street Transit Center, Final Environmental Impact Statement.* October 2004.

_____.. *Fulton Street Transit Center, Record of Decision.* November 2004.

_____.. *South Ferry Terminal, Environmental Assessment.* May 2004.

_____.. *South Ferry Terminal, Findings of No Significant Impact.* August 2004.

U.S. Environmental Protection Agency. Enforcement and Compliance History Online (ECHO). USEPA Office of Enforcement and Compliance. 2003. http://www.epa.gov/echo/index.html.

_____.. *Compilation of Air Pollutant Emission Factors* AP-42, Fifth Edition, Volume I: *Stationary Point and Area Sources*, www.epa.gov/ttn/chief/ap42. NC. January 1995. (Updates and draft sections through 2003.)

_____. "A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections." *User's Guide to CAL3QHC.* Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. September 1995.

_____.. *Compilation of Air Pollutant Emission Factors AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources*, Draft Ch. 13.2.1, NC, http://www.epa.gov/ttn/chief/ap42/. August 2003.

_____. *EPA's Newest Draft Nonroad Emission Inventory Model,* www.epa.gov/otaq/nonrdmdl.htm. April 2003.

_____. *EPA's Response to the World Trade Center Collapse: Challenges, Successes, and Areas for Improvement*, Report No. 2003-P-00012, Office of Inspector General. August 21 2003.

_____. *External Review Draft—Exposure and Human Health Evaluation of Airborne Pollution from the World Trade Center Disaster*, NCEA. October 2002.

_____. *User's Guide for the EPA Nonroad Emissions Model Draft NONROAD 2002*, EPA420-P-02-013. December 2002.

_____..*User's Guide to MOBILE6.1 and MOBILE6.2: Mobile Source Emission Factor Model*, EPA420-R-02-028. October 2002.

U.S. Green Building Council. *Leadership in Energy and Environmental Design, Green Building Rating System for New Construction and Major Renovations* Version 2.1. November 2002.

Wall Street Rising. *Downtown Retail Attraction Program.* March 2003.

Woodhead, P.M.J. *The Fish Community of New York Harbor: Spatial and Temporal Distribution of Major Species.* Report to the New York New Jersey Harbor Estuary Program, New York, NY. 1990.

Woodhead, P.M.J., F.J. Rohlf, and M.A. O'Hare, *The Structure of the Fish Community and Distribution of Major Species in the Lower Hudson Estuary and New York Harbor.* Final report to: Hudson River Foundation, New York, NY. 1992.

B. LAWS, RULES, AND REGULATIONS

FEDERAL

Americans with Disabilities Act of 1990 as amended (ADA; 24 USC §§12101 et seq.).

Clean Air Act of 1970 as amended (CAA; 42 USC §§7401 et seq.).

Clean Water Act of 1977 as amended (33 USC §§1251 et seq.).

Coastal Zone Management Act of 1972 as amended (16 USC §§1451 to 1465).

Endangered Species Act of 1973 as amended (7 USC §136; 16 USC §§460 et seq.)

Executive Order 11988, "Floodplain Management." President James E. Carter, Jr. 24 May 1977.

Executive Order 11900, "Protection of Wetlands." President James E. Carter, Jr. 24 May 1977.

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." President William J. Clinton. 11 February 1994

Executive Order 13274, "Environmental Stewardship and Transportation Infrastructure Project Reviews." President George W. Bush. 18 September 2002.

Magnuson-Stevens Fishery Conservation and Management Act of 1976 as amended (16 USC §§1801 to 1883).

Migratory Bird Treaty Act of 1918 as amended (16 USC §§703 to 712).

National Environmental Policy Act of 1969 as amended (NEPA, 42 USC §§4321 et seq.).

National Historic Preservation Act of 1966 as amended (NHPA; 16 USC §§470 et seq.).

Noise Control Act of 1972 (49 USC §§4901 et. seq.)

Resource Conservation and Recovery Act of 1976 as amended (42 USC §§6901 et seq.).

Section 4(f) of the U.S. Department of Transportation Act of 1966 as amended (49 USC §303).

STATE AND LOCAL

Air Pollution Control Act (ECL §§19-0101 et seq.).

New York State Historic Preservation Act of 1980 (Recreation and Historic Preservation Law §§14.01 et seq.).

State Environmental Quality Review Act of 1975 as ameneded (ECL §§8-0101 et seq.).

State Pollution Discharge Elimination System Act of 1975 as amended (ECL §§17-0801 et seq.).

Governor George E. Pataki State of New YOrk Executive Order 133, "Establishing the Lower Manhattan Construction Center." November 22, 2004.

Waterfront Revitalization of Coastal Areas and Inland Waterways Act of 1982 (Executive Laws §§42-0910 et seq.).

Mayor Abraham D. Beame, New York City Executive Order No. 91 as amended, "City Environmental Quality Review," 1977 as amended.

New York City Landmarks Preservation Code, (Administrative Code of the City of New York §25-301 et seq.).

New York City Noise Control Code (Administrative Code of the City of New York §24-201 et seq.)

C. SUPPORTING DOCUMENTATION

Lower Manhattan Development Corporation, Metropolitan Transportation Authority, New York State Department of Transportation, and Port Authority of New York and New Jersey. "Environmental Analysis Framework for Transportation Recovery Projects in Lower Manhattan." September 2003.

_____. "Lower Manhattan Transportation Recovery Projects Common Environmental Performance Commitments." September 2003.

U.S. Department of Transportation Federal Transit Administration and Port Authority of New York and New Jersey. "Draft Scope: Permanent World Trade Center PATH Terminal Environmental Impact Statement." September 2003.

_____. "Locations Feasibility Analysis." February 2004.

_____. *"Memorandum of Agreement Among the Federal Transit Administration, the New York State Historic Preservation Office, the Advisory Council on Historic Preservation, and the Port Authority of New York and New Jersey Regarding the World Trade Center Transportation Hub (WTC PATH Terminal and Pedestrian Connections) in New York, New York."* April 2005. ✳

This Final Environmental Impact Statement (FEIS) has been widely distributed and is available for review at libraries, community boards, and other locations. Compact disc and/or bound hard copies of the document were distributed to the federal agencies, New York and New Jersey state agencies, New York City agencies, elected officials, and Section 106 consulting parties listed below. A notice of the document's availability was mailed to the major institutions, community groups, interest groups, local businesses, property owners, property managers, and utility companies listed below.

A. LIST OF NOTIFIED PARTIES

FEDERAL AGENCIES

Advisory Council on Historic Preservation (ACHP)*
U.S. Army Corps of Engineers (ACE)
U.S. Department of Commerce, National Marine Fisheries Service (NMFS)
U.S. Department of Homeland Security, Coast Guard (USCG)
U.S. Department of Housing and Urban Development (HUD)**
U.S. Department of Homeland Security, Federal Emergency Management Agency (FEMA)
U.S. Department of the Interior
U.S. Department of Transportation, Federal Railroad Administration (FRA)
U.S. Department of Transportation, Federal Highway Administration (FHWA)**
U.S. Environmental Protection Agency (EPA)
U.S. General Services Administration, Northeast Division (GSA)**

NATIVE AMERICAN TRIBES

Cayuga Nation
Delaware Nation
Oneida Indian Nation
Onondaga Indian Nation
Poospatuck Nation Tribal Council
Shinnecock Nation Cultural Center and Museum**
Stockbridge-Munsee Band of Mohicans
St. Regis Band of Mohawk Indians
Tonawanda band of Seneca
Tuscarora Nation

---

* Indicates a signatory party for the Memorandum of Agreement.

** Identifies a Section 106 consulting party.

NEW YORK STATE AGENCIES

Battery Park City Authority (BPCA)**
Empire State Development Corporation (ESDC)
Hudson River Park Trust (HRPT)**
Lower Manhattan Development Corporation (LMDC)**
Metropolitan Transportation Authority (MTA)
MTA, New York City Transit (NYCT)**
New York Metropolitan Transportation Council (NYMTC)
New York State Department of Environmental Conservation (NYSDEC)
New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP)*
New York State Office of General Services (NYSOGS)
New York State Department of State (NYSDOS)
New York State Department of Transportation (NYSDOT)**

NEW JERSEY STATE AGENCIES

New Jersey Department of Transportation (NJDOT)
New Jersey Transit (NJ Transit)
North Jersey Transportation Planning Authority (NJTPA)

NEW YORK CITY AGENCIES

New York City Art Commission**
New York City Department of City Planning (NYCDCP)**
New York City Department of Design and Construction (NYCDDC)
New York City Fire Department (FDNY)**
New York City Department of Environmental Protection (NYCDEP)
New York City Department of Parks and Recreation (NYCDPR)
New York City Department of Sanitation (NYCDOS)
New York City Department of Transportation (NYCDOT)**
New York City Economic Development Corporation (NYCEDC)
New York City Fire Department (FDNY)
New York City Landmarks Preservation Commission (LPC)**
New York City Mayor's Office of Environmental Coordination
Mew York City Office of Emergency Management (OEM)
New York City Office of Management and Budget (OMB)
New York City Planning Commission (CPC)
New York City Police Department (NYPD)

ELECTED OFFICIALS

CONNECTICUT

U.S. Representative Christopher Shays, District 4**

NEW JERSEY

U.S. Senator Jon Corzine**
U.S. Senator Frank Lautenberg
U.S. Representative Michael Ferguson, District 7

U.S. Representative Rodney Frelinghuysen, District 11
U.S. Representative Robert Menendez, District 13
U.S. Representative William Pascrell, District 8
U.S. Representative Donald A. Payne, District 10
U.S. Representative Steven Rothman, District 9

New Jersey State Governor, Richard J. Codey (Acting)

New Jersey State Assemblymember Donald Kofi Tucker, District 28
New Jersey State Assemblymember Wilfredo Caraballo, District 29
New Jersey State Assemblymember Anthony Chappone, District 31
New Jersey State Assemblymember Mims Hackett, District 27
New Jersey State Assemblymember Vincent Prieto, District 32
New Jersey State Assemblymember Louis Manzo, District 31
New Jersey State Assemblymember John F. McKeon, District 27
New Jersey State Assemblymember William D. Payne, District 29
New Jersey State Assemblymember Joan M. Quigley, District 32
New Jersey State Assemblymember Craig A. Stanley, District 28
New Jersey State Assemblymember Albio Sires, District 33
New Jersey State Assemblymember Brian P. Stack, District 33
New Jersey State Senator Richard J. Codey, District 27
New Jersey State Senator Joseph V. Doria, Jr., District 31
New Jersey State Senator Sharpe James, District 29
New Jersey State Senator Bernard F. Kenny, District 33
New Jersey State Senator Ronald L. Rice, District 28
New Jersey State Senator Nicholas J. Sacco, District 32

Mayor Jerramiah Healy, City of Jersey City
Mayor Joseph V. Doria, Jr., City of Bayonne
Mayor Sharpe James, City of Newark
Mayor Raymond J. McDonough, City of Harrison
Mayor David Roberts, City of Hoboken

NEW YORK

U.S. Senator Hillary Rodham Clinton
U.S. Senator Charles Schumer
U.S. Representative Carolyn Maloney, District 14**
U.S. Representative Jerrold Nadler, District 8**
U.S. Representative Nydia M. Velazquez, District 12
U.S. Representative Susan W. Kelly, District 19
U.S. Representative Brian Higgins, District 27

New York State Governor, George E. Pataki**
New York State Comptroller, Alan G. Hevesi
New York State Attorney General Eliot Spitzer
New York State Senator Diane J. Savino, District 23
New York State Senator Martin Connor, District 25**
New York State Senator Thomas Duane, District 29
New York State Assemblymember Deborah J. Glick, District 66
New York State Assemblymember Sheldon Silver, District 64**

Mayor Michael R. Bloomberg, City of New York, New York**
New York City Comptroller, William Thompson, Jr.
New York City Public Advocate, Betsy Gotbaum
Manhattan Borough President, C. Virginia Fields**
New York City Councilmember Alan J. Gerson, District 1**
New York City Councilmember A. Gifford Miller, District 5
New York City Councilmember Margarita Lopez, District 2
New York City Councilmember Christine Quinn, District 3

SECTION 106 CONSULTING PARTIES

The following reflects groups and organizations involved in the Section 106 process for the Permanent WTC PATH Terminal in addition to the agencies and elected officials identified above by an asterisk (*). The Section 106 Consulting Parties have been notified of the project's NEPA documentation. Certain consulting parties also serve as community interest groups, public interest groups, and local utility owners. However, these groups are listed within this section rather than under subsequent sections of this chapter.

Alliance for Downtown New York, Inc.
American Institute of Architects, New York Chapter
American Planning Association, New York Metro Chapter
Architectural League of New York
Association for a Better New York
BCRE-90 West Street Corp.
BPC United
Cantor Fitzgerald Relief Fund
Community Board 1-Landmarks Committee
Community Board 1-WTC Redevelopment Committee
Coalition of 9/11 Families
Coalition to Save West Street
Consolidated Edison
Families of September 11th
Give Your Voice
Greek Orthodox in America
Historic Districts Council
Imagine New York
Lower Manhattan Cultural Council
Lower Manhattan Emergency Preservation Fund
Municipal Art Society
National Trust for Historic Preservation
New York Historical Society
New York Landmarks Conservancy
New York New Visions
Pace University – Center for Downtown New York
Partnership for New York City
Preservation League of New York State
Rebuild Downtown Our Town (R.dot)
Regional Plan Association/Civic Alliance
September's Mission

Silverstein Properties, Inc.
Skyscraper Safety Campaign
St. Paul's Church
Team Twin Towers
Tribeca Organization
Tribeca Partnership
Van Alen Institute
Verizon Communications
Voices of September 11th
Wall Street Rising
World Monuments Fund
WTC Families for a Proper Burial
WTC Residents Coalition
WTC Survivors' Network

MAJOR INSTITUTIONS, COMMUNITY GROUPS, AND INTEREST GROUPS

Access to the Region's Core Study
AFL-CIO
Alliance for the Arts
American Institute of Certified Public Accountants
American Institute of Graphic Arts
American Society of Civil Engineers, Metropolitan Section
American Society of Landscape Architects, New York Chapter
American Stock Exchange
Andrew Glover Youth Program
Arcane School
Asian American Business Development Center
Asian American Federation of New York
Asian American Legal Defense and Education Fund
Asian Americans for Equality
Auto Free New York/IRUM, Inc.
Automobile Club of New York
Barrier Free Living
Battery Conservancy
Battery Park City Owners Association
Borough of Manhattan Community College
Bowling Green Association
Brooklyn College Graduate Center
Building & Construction Trades Council of Greater NY
Building Trades Employers Association
Cases Center Alternative
Center for Justice & Democracy
Center for Social & Economic
Center for Urban Community Service
Chambers-Canal Civic Association
Chatham Square Congregation
Cheung on Kan Tin DOA
Chinatown Chinese Congregation

Chinatown LDC
Chinese American Planning Council
Chinese Conservative Baptist Church
Chinese Consolidated Benevolent Association New York
Chinese Evangel Mission Church
Chinese Missionary Baptist Church
Chinese United Methodist Church
Church of Jesus Christ of Latter Day Saints
Citizens Budget Commission
Citizens Housing & Planning Council
Citizen's Union Foundation
CityKids Foundation
Civic Alliance-Regional Plan Association
Civitella Ranieri Center
Clean Air Campaign
Collegiate Reformed Dutch Church
Committee for Better Transit
Community Food Resource Center
Community Training Center
Council on the Environment of NYC
Disabled in Action
District Council 37 AFSCME – Health Center
Downtown Business Network
Downtown Athletic Club
Downtown Community TV Center
Downtown Lower Manhattan Association Inc.
Downtown NYC!
El Mesias
Electric Railroaders Association
Empire State Transportation Alliance
Environmental Defense
Episcopal Church of Our Saviour
Family Association of Tribeca East
First Chinese Baptist Church
First Chinese Presbyterian Church
First Street Block Association
Friends of Hudson River Park
Garden State News
General Contractors Association of New York
Global Institute of Finance
Heavenly Grace Buddhist Temple
High School for Leadership & Public Service
High School of Economics & Finance
House Church in New York
Independence Plaza Tenants Association
Institute for Civil Infrastructure Systems
Institute for Rational Urban Mobility
International Brotherhood of Teamsters, Local 282

International Union of Operating Engineers
IS 289
IS/JHS 707
Jersey City Economic Development Corporation
Jersey City Redevelopment Agency
Jewish Heritage Museum
Joint Council 16, Teamsters
Ling Jiou Mountain Buddhist
Local 100 – Transport Workers of America AFL-CIO
Louise LoPresti
Lower Manhattan Residents Relief Coalition
Lower Manhattan Tenants Coalition
Lutheran Community Service
Mahayana Temple Buddhist Association
Manhattan Academy of Technology
Manhattan Chamber of Commerce
Manhattan School of Computer Technology
Manhattan Youth Recreation
Mariners' Temple Baptist Church
Murry Bergtraum High School for Business Careers
National Museum of the American Indian
Natural Resources Defense Council
New Life of New York City, Inc.
New Urban Transportation Systems
New Jersey Association of Railroad Passengers
New York Alfred E. Smith Rec
New York Association of Consulting Engineers
New York Building Congress, Inc.
New York Career Institute
New York Chinese Community Center
New York City Central Labor Council AFL-CIO
New York City Coalition Against Hunger
New York City Partnership
New York City Transit Museum
New York City Transit Riders Council
New York Downtown Beekman Hospital
New York Law School
New York Lawyers for the Public Interest
New York League of Conservation Voters
New York Mercantile Exchange, Inc.
New York Public Library: Manhattan Branch
NOW Legal Defense and Education Fund
Nursing Home Community
NY Chinese Baptist Church
Nyack College Graduate Center
Nyack College Undergraduate Center
NYC & Company - Convention and Visitors Bureau
Our Lady of Victory Church

PATH Patron Advisory Board
Permanent Citizens Advisory Committee to the MTA
Pratt Institute Center for Community and Environmental Development
Professional Business Institute
PS 124 – Yung Wing School
PS 126 – Jacob Riis School
PS 150 – Tribeca Learning Center
PS 1 – Alfred E. Smith
PS 2
PS 234 – Independence School
PS 89
Real Estate Board of New York
Riis Upper School
Rudin Center for Transportation Policy and Management
Seamens Church Institute of NY & NJ
South Street Seaport
South Street Seaport Museum
St. Andrews Roman Catholic Church
St. Barbara Greek Orthodox Church
St. Elizabeth Ann Seton Shrine
St. James Church
St. Johns United Methodist Church
St. Joseph's Church
St. Peter's Church
St. Teresa's Church
Straphangers Campaign
Structural Engineers Association of New York
Stuyvesant High School
Supporters of World Trade Center Preservation
Tischman Construction
Transconfiguration Catholic Church
Transportation Alternatives
Transworld Buddhist Association
Trinity Church
Tri-State Transportation Campaign
True Buddha Diamond Temple
True Light Lutheran Church
Trust in God Baptist Church
U.S. Green Building Council, New York Chapter
Union of Orthodox Jewish
UNITE – Union of Needletrades
Vision of September 11th
West Harlem Environmental Action
WKTU-FM Radio
Women's City Club
World Trade Center Restoration Movement
WTC United Family Groups
Youth Organizers United

LOCAL BUSINESSES, PROPERTY OWNERS, AND PROPERTY MANAGERS

111 Cedar Street, LLC
112 Liberty Street Residence
114 Liberty Street, LLC
119 Cedar Street
120 Greenwich Development Associates, LLC
120 Liberty Street, LLC
140 Liberty Street Association
ABN AMRO Incorporated
Aegis Insurance Services, Inc.
Alba Wheels UP International, Inc.
American Eagle Tankers
Apple Bank
B&P International, Ltd.
Bankers Trust Company
Barclay Street Realty
Barclay Vesey LLC
Bell Atlantic
Blue Millennium Realty
Brack Capital Real Estate
Brookfield Financial Properties
Castega-20 Vesey Street
CDL (New York)
Cedar Management Corp
Century 21, Inc.
Chase Manhattan Bank
Chemical Residential Mtg.
Cigna Healthcare
Citibank
Cushman & Wakefield
David M Baldwin Realty
Deutsche Bank Trust Company NJ, Ltd.
Dow Jones & Company, Inc.
Emigrant Mortgage Company
EquiServe, Inc.
Estee Lauder Services, Inc.
Federal Farm Credit Banks Funding
Federal Home Loan Bank of New York
Fidelity Investments
Financial Information, Inc.
Financial Sciences Corporation
Fleet Bank, N.A.
Fred Alger & Company, Inc.
From the Ground Up
Fundtech, Ltd.
Garban Intercapital Services, LLC
Goldman, Sachs & Co.
Greater Blouse, Skirt & Undergarment Association

Greystone Properties Vesey, LLC
Hellenic Orthodox Church of St. Nicolas
Hellman & Friedman
Independence Savings Bank
J&R Music and Computer World
JPMorgan Chase Bank, Inc.
K P Realty LLC
KS Engineering
Leafstone Staffing Services
Lehman Brothers Holdings, Inc.
Lewco Securities Corporation, Inc.
Liberty Street Association
M & T Bank
Mack-Cali Realty Corporation
Mayore Estates LLC
Merrill Lynch & Company, Inc.
Metropolitan Life Insurance Company
Millenium Hilton
Morgan Stanley Dean Witter Trust FSB
Narwest Mtg Inc
Nationsbanc Mortgage Corporation
New York County Lawyers Association
New York Marriott Financial Center
New York Mercantile Exchange, Inc.
New York Stock Exchange
New York Telephone Company
New York University
Newport Office Properties Corp., Inc.
Nick Spyreas Enterprises
North Fork Bank
PNC Bank, N.A.
PR Newswire Association, Inc.
PricewaterhouseCoopers, L.L.P.
Prudential Securities, Inc.
Sakele Brothers, LLC
Sargents LLC
Schwab Capital Markets, LP
Tara Realty Company LLC
Westfield Corporation Inc.
Y.S.G.F. Realty LLC

UTILITY COMPANIES

New York Power Company
Public Service Energy and Gas (PSE&G)

B. PUBLIC VIEWING LOCATIONS

WEBSITE

www.panynj.gov/pathrestoration

GOVERNMENT OFFICES

Federal Transit Administration, Lower Manhattan Recovery Office
One Bowling Green, Room 436
New York, NY 10004

Port Authority of New York and New Jersey
115 Broadway, 10th Floor
New York, NY 10006

Manhattan Borough President's Office
Municipal Building, 19th Floor
One Centre Street
New York, NY 10007

COMMUNITY BOARD OFFICES

Manhattan, Community Board #1
51 Chambers Street, Room 716
New York, NY 10007

LIBRARIES

NEW JERSEY

Free Public Library and Cultural Center of Bayonne
697 Avenue C
Bayonne, NJ 07002

Harrison Public Library
415 Harrison Avenue
Harrison, NJ 07029

Hoboken Public Library
500 Park Avenue
Hoboken, NJ 07030

Jersey City Public Library
472 Jersey Avenue
Jersey City, NJ 07302

Newark Public Library
5 Washington Street
Newark, NJ 07101

NEW YORK

New York Public Library – Chatham Square Regional Branch
33 East Broadway
New York, NY 10002

New York Public Library – New Amsterdam Branch
9 Murray Street
New York, NY 10007 ✳

This document was prepared by the Port Authority of New York and New Jersey (PANYNJ), a bi-state public benefit corporation of the States of New York and New Jersey, under the direction of and with active involvement from the U.S. Department of Transportation, Federal Transit Administration (FTA). Key individuals and firms involved in the preparation of this Environmental Impact Statement are indicated below.

A. U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA)

Carol Braegelmann, AICP
Bernard Cohen
Paul LeBrun

B. PORT AUTHORITY OF NEW YORK AND NEW JERSEY (PANYNJ)

PRIORITY CAPITAL PROGRAMS

Anthony Cracchiolo
Louis J. Menno, P.E.
Peter L. Rinaldi, P.E.
William S. Wong
Shawn T. Lenahan, AIA
Carla J. Bonacci, AIA
Paul Demeo

ENGINEERING

Jerrold M. Dinkels, P.E.
Bernard P. McNeilly, P.E.
Craig LaCaruba, RLS
Tarek N. Baghat, P.E.
Michael E. Kraft
Michelle Jubran
Robert P. Pruno, P.E.
Anthony York
Steven Weiner, P.E.
David W. Caruth, P.E.
Jei Zhang
Raymond E. Sandiford, P.E.
James Palmer, P.E.
Bernice R. Malione

GOVERNMENT AFFAIRS

Glenn P. Guzi

LEGAL

Timothy Stickelman
Harry Barr
Lynda Calore
Sydney D. Lipstein

PATH

Joann M. Breslin
Harrold D. Levitt
Richard E. Rowan
Sam Sharma, P.E.

POLICY AND PLANNING

Christopher R. Zeppie
Louis P. Venech

PUBLIC AFFAIRS

Kevin Kirchman

C. ENVIRONMENTAL IMPACT STATEMENT CONSULTANT TEAM

AKRF, INC.

Robert F. Conway, P.E., Project Manager
Christopher M. Calvert, AICP, Deputy Project Manager
Suzanne M. Cunningham, Senior Editor
Debra C. Allee, AICP, Commitment of Resources
Tuhina Banik, Air Quality
Sandra L. Collins, Natural and Water Resources
Hillel Hammer, Air Quality
Fred Jacobs, Ph.D., Natural and Water Resources
Mei Mei Lee, Agency Coordination, Process, and Public Participation
Michael P. Lee, Air Quality
Anne M. Locke, AIA, Cultural Resources; Urban Design and Visual Resources
Britt Page, Socioeconomic Conditions
George Penesis, P.E., AICP, Noise and Vibration
Jessica L. Pristera, Noise and Vibration
Jerry G. Rice, Socioeconomic Conditions
Stephen S. Rosen, Ph.D., Noise and Vibration
Allison Ruddock, Coastal Zone Management
Esther Siskind, Executive Summary
Jennifer M. Wallin, Natural and Water Resources
Weixiong Wu, Ph.D., Noise and Vibration

ENG-WONG, TAUB & ASSOCIATES

Martin Taub, P.E., Transportation (Vehicular Traffic and Parking)
Paul Eng-Wong, P.E., Transportation
Donald A. Aridas, Transportation (PATH and Transit)
Matthew Carmody, P.E., Transportation (Pedestrians)
Babu Veeregowda, P.E., Transportation (Vehicular Traffic and Parking)

HATCH MOTT MACDONALD, INC.

Kevin E. Koch, P.E., Infrastructure and Energy; Contaminated Materials
Jennifer M. Kohlsaat, Infrastructure and Energy; Contaminated Materials
Ellen Moore, Infrastructure and Energy; Contaminated Materials

HISTORICAL PERSPECTIVES, INC.

Cece Saunders, RPA, Archaeologist
Christine Flaherty, RPA, Archaeologist
Betsy Kearns, RPA, Archaeologist
Julie Abell Horn, RPA, Archaeologist

HOWARD STEIN HUDSON ASSOCIATES

Arnold J. Bloch, Community and Public Relations
Christopher Ryan, Community and Public Relations
Maura Fitzpatrick, Community and Public Relations
Veronica Bailey-Simmons, Community and Public Relations

THE LOUIS BERGER GROUP, INC.

John A Hotopp, Ph.D., Cultural Resources
Marty Bowers, Cultural Resources
Zachary Davis, Cultural Resources
Carol Halitsky, Cultural Resources

Glossary of Abbreviations

ACHP	Advisory Council on Historic Preservation (U.S.).
ACE	U.S. Army Corps of Engineers.
ADA	Americans with Disabilities Act of 1990 (42 USC §§12101 et seq).
APE	Area of Potential Effect.
AQI	Air Quality Index.
AQNMP	Air Quality and Noise Management Plan.
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers.
AST	Above-ground storage tank.
BBT	Brooklyn-Battery Tunnel.
BID	Business Improvement District.
BMCC	Borough of Manhattan Community College.
BPC	Battery Park City.
BPCA	Battery Park City Authority.
BUD	Beneficial Use Determination.
CAAA	Clean Air Act Amendments of 1990.
CBD	Central Business District.
CDC	Centers for Disease Control and Prevention.
CEPP	Construction Environmental Protection Program (see below).
CEQ	Council on Environmental Quality.
CEQR	City Environmental Quality Review, (Executive Order No. 91 of 1977)
CFR	Code of Federal Regulations.
CMP	Construction Management Plan.
CO	Carbon monoxide.
Con Edison	Consolidated Edison of New York, Inc.
CPC	New York City Planning Commission.
CSO	Combined sewer outfall.
CZMA	Federal Coastal Zone Management Act of 1972 (16 USC §1456).

dB	Decibel, a unit of sound level.
dBA	A weighted decibel. A sound pressure level that incorporates the human ear's sensitivity to pitch.
Decibel (dB)	The unit for measuring noise, which is 10 times the logarithm of the ratio of the sound pressure squared to a standard reference pressure squared.
DEIS	Draft Environmental Impact Statement.
DOHMH	New York City Department of Health and Mental Hygiene.
DOC	Diesel Oxidation Catalyst.
DOE	Determination of Eligibility
DPF	Diesel Particulate Filter.
Downtown Alliance	Alliance for Downtown New York, Inc.
DU	Dwelling unit.
EFH	Essential Fish Habitat.
EDR	Environmental Data Resources.
EIS	Environmental Impact Statement.
EPA	U.S. Environmental Protection Agency.
EPC	Environmental Performance Commitment.
ESDC	Empire State Development Corporation.
FAR	Floor area ratio, the ratio of a building's floor area to its lot size.
FDNY	New York City Fire Department.
FDR	Franklin D. Roosevelt (refers to FDR Drive, the elevated expressway along the East River waterfront of Manhattan).
FEIS	Final Environmental Impact Statement.
FEMA	U.S. Department of Homeland Security, Federal Emergency Management Agency.
FEMP	Federal Energy Management Program.
FHWA	U.S. Department of Transportation, Federal Highway Administration.
FIRE	Finance, Insurance, and Real Estate.
FRA	U.S. Department of Transportation, Federal Railroad Administration.
FSTC	Fulton Street Transit Center.
FTA	U.S. Department of Transportation, Federal Transit Administration.
GAFO	General merchandise, apparel and accessories, furniture and home furnishings, and other comparison goods.
GEIS	Generic Environmental Impact Statement.

gpd	Gallons per day.
GSA	U.S. General Services Administration.
H&M	Hudson and Manhattan (refers to the railroad that operated the Hudson Tubes between New Jersey and New York).
HASP	Health and Safety Plan.
HCM	Highway Capacity Manual.
HDC	New York City Housing Development Corporation.
HEP	Harbor Estuary Program.
HP	Horsepower.
HRPT	Hudson River Park Trust.
HUD	U.S. Department of Housing and Urban Development.
HVAC	Heating, ventilation, and air conditioning.
ICG	Interagency Consultation Group.
IRT	Interagency Review Team.
L_{dn}	An average sound level over the entire day where the nighttime hours are weighted more than those during the daytime.
L_{eq}	Equivalent sound level, or an energy average sound level, usually specified over a period of time. This is the constant sound level that, in a given period, conveys the same sound energy as the actual time-varying sound.
JFK	John F. Kennedy (refers to John F. Kennedy Airport).
LEED	U.S. Green Building Council, Leadership in Energy Efficiency.
LM	Lower Manhattan (refers to Special New York City Zoning District).
LMDC	Lower Manhattan Development Corporation.
LMEPF	Lower Manhattan Emergency Preservation Fund.
LOS	Level of service (see above).
LPC	New York City Landmarks Preservation Commission.
LRTPs	Long-range transportation plans.
LWRP	Local Waterfront Revitalization Program.
mgd	Million gallons per day.
MOA	Memorandum of Agreement.
MOBILE6.2	The latest emissions model developed by the Environmental Protection Agency to compute vehicular exhaust emission factors.
MOU	Memorandum of Understanding.
MPO	Metropolitan Planning Organization.

MPT	Maintenance and Protection of Traffic.
msf	Million square feet.
MSHA	U.S. Department of Labor, Mining Safety and Health Administration.
MTA	Metropolitan Transportation Authority.
NAAQS	National Ambient Air Quality Standards (see below).
NCWPCP	Newtown Creek Water Pollution Control Plant.
NEPA	National Environmental Policy Act of 1969 (42 USC §§4231 et seq).
NJDEP	New Jersey Department of Environmental Protection.
NJ Transit	New Jersey Transit.
NFPA	National Fire Protection Association.
NHL	National Historic Landmark.
NHPA	National Historic Preservation Act of 1966 (16 USC §470).
NJDOT	New Jersey Department of Transportation.
NJTPA	North Jersey Transportation Planning Authority.
NMFS	U.S. Department of Commerce, National Marine Fisheries Service.
NO_2	Nitrogen dioxide; an air pollutant and precursor to ozone.
NO_X	Nitrogen oxides.
NPS	U.S. Department of the Interior, National Park Service.
NR	National Register of Historic Places.
NRDC	National Resources Defense Council.
NYC	New York City.
NYCAS	New York City Audubon Society.
NYCDCP	New York City Department of Planning.
NYCDDC	New York City Department of Design and Construction.
NYCDEP	New York City Department of Environmental Protection.
NYCDOS	New York City Department of Sanitation.
NYCDOT	New York City Department of Transportation.
NYCDPR	New York City Department of Parks and Recreation.
NYCEDC	New York City Economic Development Corporation.
NYCHPD	New York City Department of Housing Preservation and Development.
NYCL	New York City Landmarks and Historic Districts.
NYCRR	New York Codes, Rules and Regulations.
NYCT	Metropolitan Transportation Authority, New York City Transit.

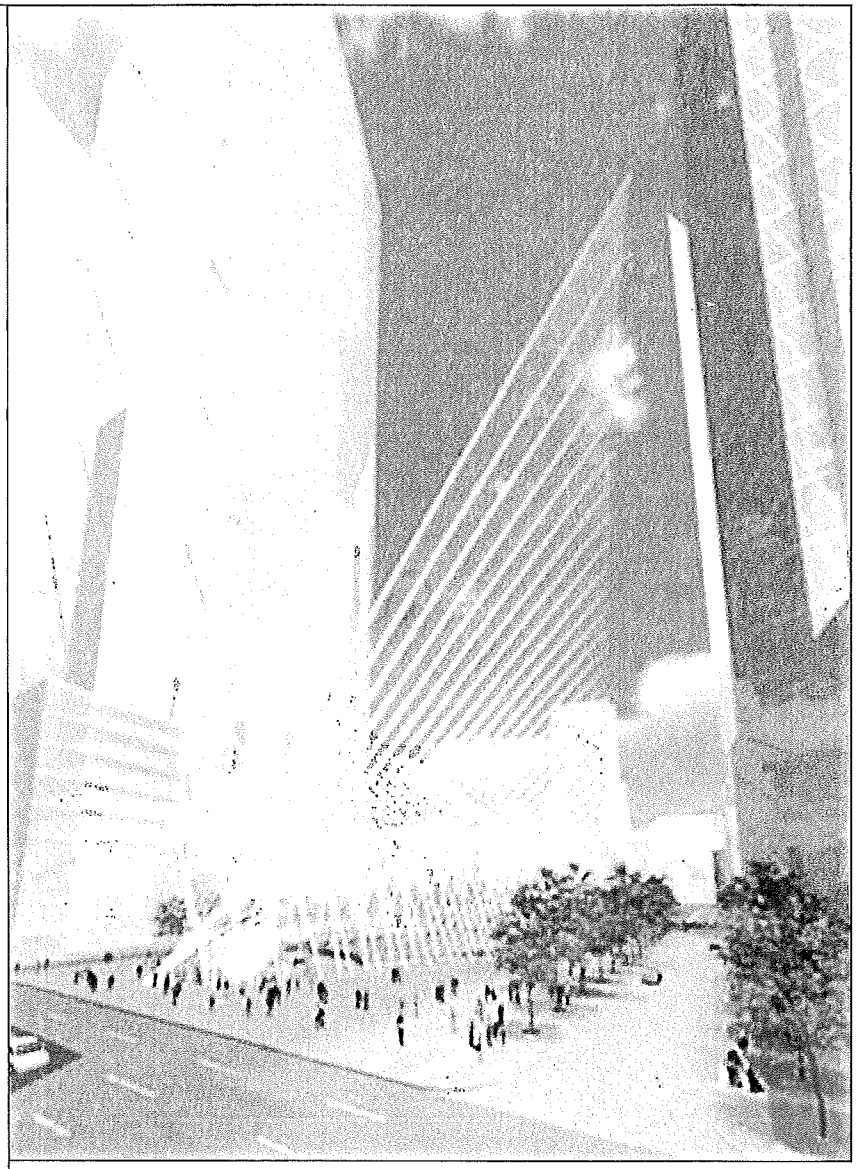
NYDOH	New York City Department of Health.
NYMA	New York Metropolitan Area.
NYMTC	New York Metropolitan Transportation Council.
NYPD	New York Police Department.
NYS	New York State.
NYSDEC	New York State Department of Environmental Conservation.
NYSDOL	New York State Department of Labor.
NYSDOS	New York State Department of State.
NYSDOT	New York State Department of Transportation.
NYSE	New York Stock Exchange.
NYSOGS	New York State Office of General Services.
NYSOPRHP	New York State Office of Parks, Recreation and Historic Preservation.
NYNHP	New York State Natural Heritage Program.
NYU	New York University.
OEM	New York City Office of Emergency Management.
OMB	New York City Office of Management and Budget.
OIG	Office of Inspector General.
OSHA	U.S. Department of Labor, Occupational Safety and Health Administration.
PABT	Port Authority Bus Terminal.
PAC	Public Advisory Committee.
PAHs	Polycyclic aromatic hydrocarbons.
PANYNJ	Port Authority of New York and New Jersey.
PATH	Port Authority Trans-Hudson.
PCBs	Polychlorinated biphenyls.
PM_{10}	Particulate matter of 10 microns or less.
$PM_{2.5}$	Particulate matter of 2.5 microns or less.
PPE	Personal protection equipment.
P.S.	New York City Primary School.
PSE&G	Public Service Energy & Gas.
psf	Per square foot.
REBNY	Real Estate Board of New York.

Route 9A	New York State Highway 9A (refers to the roadway that runs along the western periphery of the World Trade Center site. Route 9A is also referred to as West Street. West Street is used for building addresses along Route 9A in the vicinity of the World Trade Center Site).
RIMS II	Regional Input-Output Modeling System.
RTK	Right-To-Know.
SAV	Submerged aquatic vegetation.
SBA	U.S. Small Business Administration.
SDEIS	Supplemental Draft Environmental Impact Statement.
Section 4(f)	Section 4(f) of the Department of Transportation Act of 1966 (49 USC §303).
Section 106	Section 106 of the National Historic Preservation Act of 1966 (16 USC §470(a)).
SEQRA	New York State Environmental Quality Review Act.
SFP	Square feet per Pedestrian
SHPA	New York State Historic Preservation Act of 1980.
SHPO	State Historic Preservation Officer, a division of the New York State Office of Parks, Recreation, and Historic Preservation.
SIC	Standard Industrial Code.
SIP	State Implementation Plan.
SLM	Sound Level Meter.
S/NR	State and National Registers of Historic Places.
SO_2	Sulfur dioxide; an air pollutant mainly associated with the combustion of sulfur-containing fuels such as diesel and fuel oil.
SPDES	New York State Pollutant Discharge Elimination System (Article 17, Title 8, of the New York State Environmental Conservation Law).
SR	New York State Register of Historic Places.
SWPPP	Stormwater Pollution Prevention Plan.
TAC	Technical Advisory Committee.
TIP	Transportation Improvement Program.
TMP	Traffic Management Plan.
TMU	Tribeca Mixed-Use.
UDC	New York State Urban Development Corporation.
USC	U.S. Code.
USCG	U.S. Department of Homeland Security, Coast Guard.

USDOT	U.S. Department of Transportation.
USGBC	U.S. Green Building Council.
USGS	U.S. Geological Survey.
USFWS	U.S. Department of the Interior, Fish and Wildlife Service.
UST	Underground storage tank.
ULSD	Ultra low-sulfur diesel.
v/c	Volume-to-capacity ratio.
VdB	A unit of measure of vibration in decibels, which are distinct from noise decibels.
VOC	Volatile organic compound.
vph	Vehicles per hour.
WFC	World Financial Center.
WRP	Waterfront Revitalization Program.
WSURA	Washington Street Urban Renewal Area.
WTC	World Trade Center.

PERMANENT WTC PATH TERMINAL

FINAL ENVIRONMENTAL IMPACT STATEMENT



VOLUME II

APPENDICES

Part 1 of 2
Appendices A through F

United States Department of Transportation
Federal Transit Administration

THE PORT AUTHORITY OF NY & NJ

PATH

MAY 2005

PATH Appendices Table of Contents

Appendix A: Land Use, Neighborhood Character, and Public Policy **A-1**

Appendix B: Cultural Resources **B-1**

B-1: Coordinated Determination of National Register Eligibility—World Trade Center Site, New York City, New York.

B-2: Permanent WTC PATH Terminal Memorandum of Agreement

B-3: Phase 1A Archaelological Assessment: World Trade Center Property

B-4: Topic Intensive Archaeological Study: World Trade Center Property

B-5: Route 9A Reconstruction Project: Cultural Resources Summary Report

B-6: Programmatic Agreement among the United States Army Corps of Engineers, the New York State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Development of the Hudson River Park Along Manhattan's West Side in New York City, New York

B-7: Correspondence

Appendix C: Transportation **C-1**

C-1: PATH Ridership Estimates

C-2: Platform and Truck Planning Requirements

C-3: Vehicular Traffic and Parking

C-4: Pedestrians

C-5: Cumulative Construction Traffic

Appendix D: Air Quality **D-1**

Appendix E: Noise and Vibration **E-1**

Appendix F: Contaminated Materials **F-1**

Appendix G: Natural and Water Resources **G-1**

Appendix H: Process, Agency Coordination, and Public Participation **H-1**

H-1: Response to Comments on Draft Scope

H-2: DEIS Public Hearing Transcripts

H-3: Written Comments on the DEIS

H-4: Section 106 Review Meeting Transcripts

H-5: Written Comments from Section 106 Consulting Parties

Appendix I: Construction Analysis and Management Framework **I-1**

I-1: Environmental Analysis Framework and Environmental Performance Commitments

I-2: Executive Order Establishing the Lower Manhattan Construction Command Center

Appendix A

Land Use, Neighborhood Character, and Public Policy

Appendix A: Land Use, Neighborhood Character, and Public Policy

Table A-1
2006 Construction Period Future Common to All Alternatives: Lower Manhattan Projects Planned for Completion*

Map No.**	Name	Address	Status	Use
WTC Redevelopment Sites—Under Construction				
North of WTC Site				
1	Barclay-Vesey (Verizon) Building	140 West Street	2004	Restoration: 1,171,540 sf office
2		125 Church Street	2004	50 residential units
7	Woolworth Building	233 Broadway	2004	150 residential units
3	7 World Trade Center	Vesey and Greenwich Streets	2005	1,685,000 sf office + 2 electrical substations
4	Federal Office Building/U.S. Post Office	90 Church Street	2005	500,000 sf (Post Office) & 626,260 sf (Office)
5		10 Barclay Street	2005	375 residential units, 19,341 sf community facility, 90 parking spaces
6	WSURA Site 5C	Route 9A and Chambers Street	2006	456 residential units, 14,000 sf retail, 18,000 sf community facility, 102-space parking garage
Broadway Corridor—NONE				
Greenwich South Corridor				
8		90 West Street	2005	410 residential units, 11,400 sf retail, 69 accessory parking spaces
Battery Park City				
9	Teardrop Park	22 River Terrace	2004	Recreation/open space
10	Museum of Jewish Heritage	Site 14C, BPC S	2004	Institutional(museum expansion)
12		Site 18B, BPC	2005	268 residential units, 14,000 sf retail
13		Site 19B, BPC	2005	264 residential units
14		Pier A	2005	7,000 sf retail
17		Site 3, BPC S	2006	420 residential units, 45,000 sf institutional (BPC Parks Conservancy)
18	Route 9A—Promenade South	Between West Thames Street and Battery Place; Battery Place between Route 9A and Washington Street	2006	Transportation
49		Site 16/17, BPC N	2006	530 residential units, 12,000 sf NY Public Library Branch, 4,000 sf World Hunger, 10,000 sf cultural not-for-profit, 100 sf BPC Parks Conservancy, 1,400 seat café, 14,682 sf open space
Tribeca				
19		161 Hudson Street	2004	Residential conversion
20		200 Church Street	2004	20 residential units
21		3-9 Hubert Street	2004	34 residential units
22		416 Washington Street	2004	87 residential units
23	NY Law School	Church Street between Leonard and Worth Streets	2005	Educational (expansion)
24		448 Greenwich Street	2006	120 residential units
Chinatown below Canal Street—NONE				
Brooklyn Bridge to Battery Park				
25		10 Liberty Street/William Street	2004	284 residential units, 3,000 sf retail
26		2 Gold Street	2004	605 residential units, 24,500 sf retail
27	Whitehall Ferry Terminal	Whitehall Street	2004	Transportation, 10,000 sf retail
28	Hampton Inn	320 Pearl Street	2004	80 hotel rooms
29		63 Wall Street	2005	475 residential units
30		85 South Street	2005	50 residential units
67	Block 97	Front Street, Beekman Street, Peck Slip	2005	100 residential units
64		15 William Street	2006	348 residential units, 68,000 sf office, 5,500 sf retail, 91 accessory parking spaces
68	NYU Downtown Hospital	Between Spruce and Beekman Streets	2006	800 residential units, 40,000 sf ambulatory care center, 400 parking spaces
Civic Center Area—NONE				

Notes: * Residential conversions of 20 units or less have not been included.
** See Figure A-1 for corresponding No Build map.

Sources: AKRF, Inc., New York City Department of City Planning, Lower Manhattan Development Corporation, New York State Department of Transportation, Alliance for Downtown New York, Manhattan Community Board One, Battery Park City Authority.

Table A-2
2009 Opening Year Future Common to All Alternatives: Lower Manhattan Projects Planned for Completion*

Map No.**	Name	Address	Status	Use
WTC Redevelopment Sites				
31	Memorial	WTC Site, Southwest Quadrant	2009	212,200 sf Memorial
31	Memorial Center	WTC Site, Southwest Quadrant	2009	50,000 sf museum space dedicated to September 11 and related events
31	Cultural	WTC Site, Southwest Quadrant	2009	200,000-240,000 sf (includes Memorial Center and other cultural uses)
31	Freedom Tower	WTC Site, Northwest Quadrant	2009	2.6 million sf office, 60,000 sf garden, space for café (600 seats) and restaurant (400 seats), 6,000 sf viewing deck (400-person capacity)
31	Performing Arts	WTC Site, Northwest Quadrant	2009	Performing Arts center, 2,200 seats
31	Tower 2 Base	WTC Site, Northwest Quadrant	2009	57,000 sf retail
31	Tower 3 Base	WTC Site, Northwest Quadrant	2009	126,000 sf retail
31	Tower 4 Base	WTC Site, Northwest Quadrant	2009	127,500 sf retail
31		WTC Concourse Levels	2009	Additional retail area, bringing total up to 1 million square feet; parking for automobiles and loading facilities to accommodate 80 trucks; utilities and possible bus garage
31	September 11 Place	WTC Site, Southwest Quadrant	2009	12,562 sf open space
31	PATH Plaza	WTC Site, Southeast Quadrant	2009	30,545 sf open space
31	Wedge of Light (north of Fulton)	WTC Site, Northeast Quadrant	2009	21,602 sf open space
31	Wedge of Light (south of Fulton)	WTC Site, Southeast Quadrant	2009	25,174 sf open space
31	Liberty Park	South of Liberty Street	2009	29,766 sf open space
31	Bus Parking Facility	Below grade South of Liberty Street or the WTC Site	2009	Below-grade bus parking facility (100 buses)
North of WTC Site				
32	WSURA Site 5B	270 Greenwich Street	2008	730 residential units, 240,000 sf retail
41	Fiterman Hall	30 West Broadway	By 2009	360,000 sf institutional
Broadway Corridor				
33	Fulton Street Transit Center	Fulton Street and Broadway	2008-09	Transportation
Greenwich South Corridor				
72	Castle Clinton	Castle Clinton National Monument, Battery Park	2007	Cultural
Battery Park City				
15		Site 23, BPC N	2007	246 residential units, 20,000 sf institutional (BPC Parks Conservancy)
16		Site 24, BPC N	2007	345 residential units, 40,000 sf community recreation center
34	Route 9A—Reconstruction	Between Chambers and West Thames Streets	2007	Transportation
11		Site 2, BPC S	By 2009	282 residential units, 125,000 sf Women's Museum
35		Site 26, BPC N	2009	2.3 million sf office (1.275 million sf office, 450,000 sf trading floors, 200,000 sf building amenity space, 345,000 sf mechanical space), up to 30,000 sf retail, up to 300 accessory parking spaces
54	Ponte Sites	Leonard Street and West Broadway	By 2009	380 residential units
Tribeca				
36		258 West Street	By 2009	68 residential units
37	Hudson River Park, Segment 3	Chambers Street to north of Canal Street	By 2009	Public open space
Chinatown below Canal Street				
59	New York Post	Catherine Slip on Water Street	2007	650 residential units, mini-storage use (existing)
Brooklyn Bridge to Battery Park				
38		23 Wall Street / 15 Broad Street	2007	428 residential units, 850,000 sf institutional and/or hotel and/or retail
39	South Ferry Subway Terminal	South Ferry	2007	Transportation
66		250 Water St, Peck Slip-Beekman Street	2007	300 residential units, 175,000 sf institutional
63		Rockrose/ 201 Pearl Street	2008	315 residential units, 30,000 sf retail
73		20 Exchange Place	By 2009	Residential conversion (720 units)
74	Wall Street Regent Hotel	55 Wall Street	By 2009	Residential conversion (200 units)
Civic Center Area—NONE				

Notes: * Residential conversions of 20 units or less have not been included.
** See Figure A-1 for corresponding No Build map.

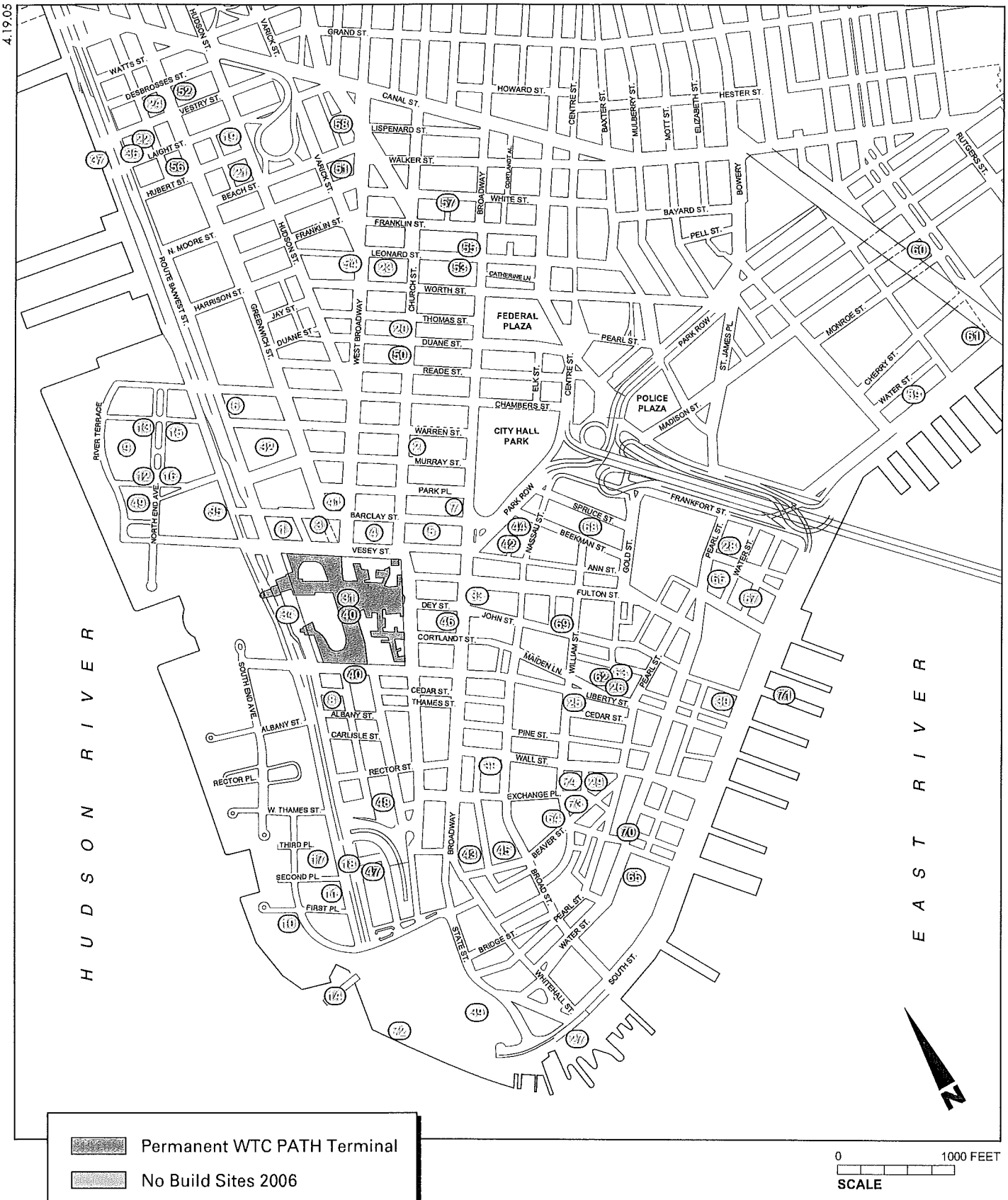
Sources: AKRF, Inc., New York City Department of City Planning, Lower Manhattan Development Corporation, New York State Department of Transportation, Alliance for Downtown New York, Manhattan Community Board One, Battery Park City Authority.

Table A-3
2025 Design Year Future Common to All Alternatives:
Lower Manhattan Projects Planned for Completion**

Map No.**	Name	Address	Status	Use
WTC Redevelopment Sites				
40	Tower 2	WTC Site, Northeast Quadrant	2015	2.2 million sf office
40	Tower 3	WTC Site, Southeast Quadrant	2015	1.9 million sf office
40	Tower 4	WTC Site, Southeast Quadrant	2015	1,7 million sf office
40	Tower 5	South of Liberty Street	2015	1.6 million sf office, 17,300 sf retail
40	Hotel	WTC Site, Northeast Quadrant	2015	600,000 sf hotel (800+ rooms), 150,000 sf function space
North of WTC Site				
Broadway Corridor				
42		115 Nassau Street	Proposed	Residential conversion
43		10 Broadway	Proposed	Residential conversion
44		5 Beekman Street	Proposed	Residential conversion
45		60 Broad Street	Potential	200 residential units, 800,000 sf office
46		West side of Broadway between Cortlandt and Dey Streets	Potential	unknown
Greenwich South Corridor				
47	Former Downtown Athletic Club	16-20 West Street	Potential	Residential or hotel
48	Battery Garage/ Greenwich Square	Greenwich / West Streets	Potential	600 residential units, open space
Battery Park City				
Tribeca				
50		130 Duane at Church	Proposed	45 hotel rooms
51		24 Varick Street / 240 West Broadway	Proposed	32 residential units
52		443 Greenwich Street	Proposed	256 residential units
53		90 Leonard Street	Proposed	275,838 sf (either res. or retail)
55		353-59 Broadway	Potential	
56		408 Greenwich Street	Potential	44,000 sf office with residential
57		55 White St	Potential	20 residential units
58		6 York St / West Broadway (at Sixth Avenue)	Proposed	150 hotel rooms
Chinatown below Canal Street				
60		150 Madison St	Potential	73,000 sf manufacturing
61		Two Bridges Site – north of Manhattan Bridge	Potential	
Brooklyn Bridge to Battery Park				
62		79 Maiden Lane	Proposed	400 residential units
65		55 Water Street	Proposed	518,050 sf office
69		59 John Street	Proposed	residential conversion
70	Second Avenue Subway	From 125th Street to Water Street at Hanover Square	Proposed	Transportation—new 8.5-mile subway line
71	East River Waterfront Park/ Developments	From Battery Maritime Building in Battery Park to South Street Seaport	Potential	Potential for active and passive open spaces, housing and cultural institutions
	Airport Access	Direct links from Lower Manhattan to JFK and Newark International Airports	Potential	Transportation
Civic Center Area—NONE				

Notes: * Residential conversions of 20 units or less have not been included.
** See Figure A-1 for corresponding No Build map.

Sources: AKRF, Inc., New York City Department of City Planning, Lower Manhattan Development Corporation, New York State Department of Transportation, Alliance for Downtown New York, Manhattan Community Board One, Battery Park City Authority.



PERMANENT WTC PATH TERMINAL
Final Environmental Impact Statement

Figure A-1
No Build Projects

Appendix B

Cultural Resources

Appendix B-1: **Coordinated Determination of National Register Eligibility—World Trade Center Site, New York City, New York**

U.S. Department
of Transportation

Federal Transit Administration
Lower Manhattan Recovery Office
One Bowling Green, Suite 436
New York, NY 10004
212-668-2500
212-668-2505 (fax)

Federal Highway Administration
New York Division
Leo W. O'Brien Federal Building, 7th Floor
Albany, NY 12207
518-431-4125
518-431-4121 (fax)

LMDC
Remember Rebuild Renew

Lower Manhattan Development Corporation
One Liberty Plaza, 20th Floor
New York, NY 10006
212-962-2300
212-962-2431 (fax)

March 31, 2004

To: Section 106 Consulting Parties (see attached list)

Re: *Coordinated Determination of National Register Eligibility—World Trade Center Site*

Dear Consulting Party:

Following review of comments on the February 6, 2004 coordinated determination of eligibility, Lower Manhattan Development Corporation, Federal Highway Administration, and Federal Transit Administration have prepared a revised Coordinated Determination of National Register Eligibility, dated March 31, 2004. A copy of that document is enclosed.

We thank you for your participation in the Section 106 process thus far and the coordinated determination of eligibility. We look forward to continuing consultation in the next steps of the Section 106 process as our respective projects proceed.

Sincerely,

Kevin M. Rampe
Lower Manhattan Development Corporation
President

Bernard Cohen
Federal Transit Administration
Director, Lower Manhattan Recovery Office

for Robert Arnold
Federal Highway Administration
New York Division Administrator

cc: Bernadette Castro, NY SHPO
New York State Office of Parks, Recreation and Historic Preservation

Richard Schmalz
New York State Department of Transportation

Joseph Seymour
The Port Authority of New York and New Jersey

Jan C. Opper
U.S. Department of Housing and Urban Development

List of Consulting Parties and Potential Consulting Parties

Charlene	Vaughn	Advisory Council on Historic Preservation
Klima	Don	Advisory Council on Historic Preservation
Anna	Melman	Alliance for Downtown New York, Inc.
Frederic	Bell	American Institute of Architects – NY Chapter
Michael	Levine	American Planning Association – NY Metro Chapter
Rosalie	Genevro	Architectural League of New York
Michelle	Adams	Association for a Better New York
Stephanie	Gelb	Battery Park City Authority
Helene	Seeman	BPC United
Edie	Lutnick	Cantor Fitzgerald Relief Fund
Richard	Kennedy	CB 1 WTC Redevelopment Committee
Bruce	Ehrmann	CB 1 Landmarks Committee
Anthony	Gardner	Coalition of 9/11 Families
Jack	Lynch	Coalition of 9/11 Families
Lee	Ielpi	Coalition of 9/11 Families
Phyllis	Wahahrockah-Tasi	Delaware Nation
Tom	Roger	Families of September 11th
Nikki	Stern	Families of September 11th
George	Schira	Greek Orthodox in America (St. Nicholas)
Robert	Kornfeld	Historic Districts Council
Laura	Blackman	Hudson River Park Trust

Kate	Daly	Landmarks Preservation Commission
Tricia	Mire	Lower Manhattan Cultural Council
Ninfa	Segarra	WTC Residents Coalition
David	Stanke	WTC Residents Coalition
Hon. C Virginia Fields		Manhattan Borough President
Frank	Sanchis	Municipal Art Society
Vicki	Weiner	Municipal Art Society
Marilyn	Fenollosa	National Trust for Historic Preservation
Elizabeth	Merritt	National Trust for Historic Preservation
Deborah	Bershad	New York City Art Commission
Robin	Forst	Office of Council member Gerson
Amanda	Burden	New York City Department of City Planning
Michael	Samuelian	New York City Department of City Planning
Kenneth T.	Jackson	New York Historical Society
Peg	Breen	New York Landmarks Conservancy
Bruce	Fowle	New York New Visions
Debra	Lester	Speak Silver's Office
Matt	Viggiano	Senator Connor's Office
Paul	Laudato	NYS Office of Parks, Recreation, and Historic Preservation Field Services Bureau
Robert	Kuhn	NYS Office of Parks, Recreation, and Historic Preservation Field Services Bureau
Kathy	Wylde	Partnership for New York City
Patty	Nonnan	Partnership for New York City

Daniel	Slippen	Pace University – Ctr for Downtown NY Poospatuck Nation Tribal Council
Scott	Heyl	Preservation League of New York State
Ken	Lustbader	Preservation League of New York State Consultant
Jesi	Pezzuoli	R.dot (Rebuild Downtown Our Town)
Petra	Todorovich	Regional Plan Association/Civic Alliance
Monica	Iken	September's Mission
Winonah	Warren	Shinnecock Nation Cultural Center and Museum
Michael	Gerrard	Silverstein Properties
Daniel	Matthews	St. Paul's Church
Kevin	Madigan	St. Peter's Church
Paul	Thompson	St. Regis Band of Mohawk Indians
Sherry	White	Stockbridge-Munsee Band of Mohicans
Jonathan	Hakala	Team Twin Towers
Hon. Michael Bloomberg		The City of New York
Keith	Martin	New York State DOT
Sharon-Frances	Moore	Tribeca Organization
Philip	Craft	Congresswoman Maloney's Office
Linda	Rosenthal	Congressman Nadler's Office
Christopher	Shays	United States Congress
		US General Services Administration
Raymond	Gastil	Van Alen Institute
Sherida	Paulsen	Van Alen Institute
Megan	Cook	Verizon

Noah	Pfefferblit	Wall Street Rising
Bonnie	Burnham	World Monuments Fund
Diane	Homing	WTC Families for a Proper Burial
Sally	Regenhard	Skyscraper Safety Campaign
Mary	Fetechel	Voices of September 11
Louise	Lopresti	
Hon. George	Pataki	Governor of New York State
Peter	Miller	WTC Survivors' Network
Tim	Carey	Battery Park City

COORDINATED DETERMINATION OF NATIONAL REGISTER ELIGIBILITY—WORLD TRADE CENTER SITE NEW YORK CITY, NEW YORK, MARCH 31, 2004

I. INTRODUCTION

This document has been prepared pursuant to Section 106 of the National Historic Preservation Act in association with proposed reconstruction and redevelopment in the area of the approximately 16-acre World Trade Center superblock (WTC Site), bounded generally by Vesey Street on the north, Liberty Street on the south, Route 9A/West Street on the west and Church Street on the east.

The Federal Transit Administration (FTA), Federal Highway Administration (FHWA), and Lower Manhattan Development Corporation (LMDC), as a recipient of funds from U.S. Department of Housing and Urban Development (HUD), are coordinating the Section 106 processes for several proposed undertakings on or adjacent to the WTC Site: Permanent World Trade Center PATH Terminal (FTA with the Port Authority of New York and New Jersey [Port Authority]), World Trade Center Memorial and Redevelopment Plan (LMDC with HUD funding), and Route 9A Reconstruction (FHWA with New York State Department of Transportation [NYSDOT]). The substance of this document will be incorporated by each of the agencies into their respective environmental review documents.

Section 106 requires federal agencies to identify historic properties (e.g. buildings, structures, sites, objects and districts listed in or eligible for inclusion in the National Register of Historic Places) that may be affected by a proposed undertaking. This document focuses on the WTC Site.

Each of these undertakings is subject to environmental review under the National Environmental Policy Act (NEPA) and to review under Section 106. Environmental impact statements are being prepared for each of these independent undertakings. Because each of the undertakings is different and may have different effects, different Areas of Potential Effect (APEs) have been or will be defined for each undertaking. Identification of historic properties elsewhere in the various projects' APEs and the analysis of potential effects on those properties are being conducted separately.

This document includes information gathered in the NEPA scoping processes for the projects and in meetings with the consulting parties held in the offices of the LMDC at One Liberty Plaza, New York, New York, on January 6, 2004, and on February 2, 2004, as well as written comments received by the coordinating agencies through March 8, 2004.

This document is not intended to be an exhaustive history of the development of Lower Manhattan, the WTC, the events that lead up to September 11, 2001, the horrific events of September 11, or the rescue and recovery operations in the wake of those events. There is substantial and ongoing documentation of those events elsewhere in the numerous articles, books, films, and television reports and productions. This document is intended to express why the coordinating agencies have made a determination that the WTC Site is eligible for listing on the National Register of Historic Places. Each agency's environmental review document will include information relating to its specific project site and additional historical information relating to each project.

The coordinating agencies recognize however, that the WTC Site has been substantially altered since the attacks and collapses on September 11 and include an Appendix relating to artifacts removed from the WTC Site and a discussion regarding the current state of the WTC Site.

II. HISTORICAL INFORMATION

A. BACKGROUND

Prior to European contact in the early 17th century, Native Americans speaking a Munsee dialect of the Eastern Algonquin language inhabited Manhattan Island. Native Americans referred to the island of Manhattan as "Minna-atn" which meant "Island of Hills." The first contacts between Native Americans and Europeans occurred when early explorers began to trade with the native population. Dutch trading expeditions had been visiting the Hudson River for many years prior to the founding of New Amsterdam at the southern tip of Manhattan in 1626. These groups made contact with the native population; Robert Juet, who traveled with Henry Hudson on his 1609 voyage, provides in his journal a description of the native population and their trading practices. Dutch colonization in Manhattan began in earnest in 1625 when an expedition of farmers from the Dutch West India Company arrived at the southern tip of Manhattan with the purpose of building a fort and laying out nine Company farms.

Wall Street was once the northern line of land fortification for the settlement and Pearl Street, to the east of the WTC Site, formed the eastern edge of the island. The Hudson River waterfront ran along the approximate location of Greenwich Street today. Because it was a high bluff, shipping and piers were located along the East River. Blocks were largely formed in an irregular pattern as former farms were developed, giving the area its characteristically winding and narrow system of streets. By the end of the 18th century, the island's shoreline had been extended with new land created on fill. The city's waterfront, particularly around the southern portion of the island, was its important trade and business area. Residential areas, concentrated both inland and farther north including Tribeca, were located away from the commercial and industrial uses.

Tribeca is a neighborhood in Lower Manhattan, generally bounded by Canal Street to the north, Broadway to the east, Barclay Street to the south and the Hudson River to the west. The area's name was adopted by real-estate developers in the mid-1970s and stands for "triangle below Canal." Originally farmland, Tribeca was transformed into a residential neighborhood in the early 1800s, including an enclave of stately brick residences surrounding St. John's Park (subsequently redeveloped with a freight depot and now the site of St. John's Rotary and the exit of the Holland Tunnel) on Hudson Street. Bear Market, a fruit and produce market (which became known as Washington Market), opened at the western end of the neighborhood in 1813, and became one of the city's key food suppliers. It came to occupy a full block along Washington Street between Fulton, Vesey, and West Streets, now part of the WTC Site. However, the neighborhood remained primarily residential until the 1840s, when shipping and commerce in Lower Manhattan intensified, attracting business and making the area a major point of transfer. By the 1860s, the area had become a commercial district as the city's commercial core stretched north. The western portion, containing the Washington Market district, became New York's wholesale food center, covering roughly the western half of what is Tribeca today. In 1872, the New York Mercantile Exchange, known first as the Butter and Cheese Exchange of New York, was founded by dairy merchants seeking to standardize the wholesale business. Booming business necessitated the construction of a new structure for the Exchange at the corner of Hudson and Harrison Streets in 1882; the Exchange occupied this location until its move to a larger space in the WTC in 1977 and then again to Battery Park City (BPC). During the 1880s, new warehouses were built to house mercantile exchanges dealing in butter, cheese, and eggs. At the time of construction of the 1884 Washington Market building, a time capsule containing business cards and a note in remembrance of the construction of the market signed by 32 businessmen was buried; this was discovered at the excavation for the WTC. The eastern portion of Tribeca became a central transfer point for textiles and dry goods by the middle of the century, with new stores, factories, and storage houses built to house those uses.

The development of Lower Manhattan as a shipping and mercantile district continued through the late 19th century. At the same time, banks, investment companies, and brokerage firms built corporate offices in Lower Manhattan to be near the trading activity of the New York Stock Exchange (NYSE) and other

financial and trading institutions, creating what is known to this day as New York City's Financial District. Construction of the Brooklyn Bridge was completed in 1883 to link the cities of Brooklyn and New York and to serve a growing Brooklyn population which until then could only travel to Manhattan by ferry. In addition, the bridge opened up trade routes to Brooklyn, Queens, and the remainder of Long Island, which were primarily farmland. At the turn of the century, tall towers began to appear on the Lower Manhattan skyline. In 1898, 15 Park Row became the world's tallest office tower. Subsequently, other large buildings were erected during the first half of the 20th century—among them the Equitable Building, the Woolworth Building, 70 Pine Street, and 40 Wall Street.

During the first half of the 20th century, Tribeca, including the Washington Market, remained a vital commercial district. However, in the 1950s and 1960s, the Tribeca area underwent yet another transformation. Shifts in market and economic trends resulted in the moving away and/or closure of wholesale business, leaving the many warehouses in the area empty. In the 1960s, the city established the Washington Street Urban Renewal Area (WSURA), which transformed Tribeca and adjacent neighborhoods from failing wholesale and industrial uses to new residential and office uses with schools to serve the new community. Artists were the first to make use of the available spacious and lit buildings, with many factories and warehouses converted to residential lofts. Today Tribeca is a fashionable residential district that includes art galleries, upscale shops, and restaurants.

B. THE WORLD TRADE CENTER

The WTC was originally conceived in the early 1960s by the Downtown-Lower Manhattan Development Association. Chase Manhattan Bank chairman David Rockefeller, founder of the development association, and his brother, New York governor Nelson Rockefeller, pushed hard for the project, insisting it would benefit the entire city. In 1962, the States of New York and New Jersey authorized and directed the Port of New York Authority, now known as the Port Authority of New York and New Jersey (the Port Authority), to acquire the Hudson & Manhattan (H&M) Railroad, an interstate public transit system (now known as PATH). That same year, the Port Authority began plans to build the WTC, and selected architect Minoru Yamasaki to design the project, architects Emery Roth & Sons to handle production work, and, at the request of Yamasaki, the firm of Skilling, Helle, Christiansen and Robertson to serve as engineers. The Port Authority envisioned a project with a total of 10 million square feet of office space. To achieve this, Yamasaki considered more than a hundred different building configurations before settling on the concept of twin towers and three lower-rise structures.

A 12-block area was cleared to create the WTC Site. Five city streets were closed, buildings on the site were demolished, and the site was extensively excavated, especially the area west of the No. 1/9 IRT subway line where the "bathtub" that became the base for the Twin Towers was created. The WTC Site, including the Twin Towers, was built around the Hudson Tubes of the H&M Railroad, which traversed the bathtub, without any interruption of train service. A new PATH Terminal and tracks were constructed at a lower level in the bathtub, replacing the Hudson Terminal of the H&M Railroad on Church Street.

STRUCTURAL AND BUILDING FEATURES

Several structural and building features made the construction of the WTC possible. These features are described below and involved the foundations, elevators and structural system.

Foundations

Much of the ground on which the WTC would be located lay on landfill, which had extended the west side of Lower Manhattan into the Hudson River. Roughly half of the WTC would be located where the Hudson River once flowed. As over a million cubic yards of fill would need to be excavated to set the WTC on bedrock, at issue was how to keep the waters of the Hudson River out. John M. Kyle Jr., chief engineer at the Port Authority, is credited with developing a solution by suggesting the use of the slurry trench method. With this method, excavating machines dug a three-foot-wide trench down to bedrock,

roughly 70 feet below street level. These trenches were dug in 22-foot-wide sections. As fill was removed from each section, a slurry of water and bentonite (an expansive clay) was pumped in. The clay naturally plugged any holes in the sides of the dirt walls. A giant reinforcing steel cage was then lowered into the trench with attachment points for reinforcing tiebacks that were later anchored to bedrock outside the wall. Then, concrete was poured into the trench which forced out the temporary slurry as it rose from the bottom up. These three-foot-thick wall sections became known as the bathtub, although it was meant to keep water out, not in. Once the wall was complete, earth from within the bathtub was removed, and was used as fill on which BPC was later built. When the infrastructure inside the bathtub was complete, the tiebacks were severed.

Elevators

A second feature associated with the Twin Towers was the design of express and local elevators. Although the invention of elevators made skyscrapers possible, elevators were thought to limit how high skyscrapers could go—the higher the building, the more people in the building and, therefore, a greater number of elevators would be needed. Additional elevators would occupy more floor space, thus leaving less floor space available to rent. This dilemma was a limiting factor in the development of skyscrapers and is why most skyscrapers seldom climbed beyond 80 stories. In order to maximize floor space and provide enough elevators to support all the office workers, the Twin Towers were divided into three zones for vertical transportation needs. Local elevators for each of these zones were stacked vertically in the core of the building serving the floors within the zone. Large express elevators traveled up to "skylobbies" on the 44th and 78th floors. At these floors passengers would exit the elevators on the side opposite from where they had entered and would cross the lobby to utilize local elevators. Each tower also had two express elevators that went all the way to the top from street level, and a freight elevator that went all the way to the top from the bottom subgrade level. This skylobby system, by separating express and local elevators, maximized efficiency of transport and economy of space.

Structural System

Tube-style construction was used for the Twin Towers whereby structural steel columns were located only along the exterior wall and around the central core of elevator shafts, stairwells and bathrooms. Thus, the exterior walls would carry the vertical loads as well as resisting all lateral winds. This construction method was made possible by the use of high-strength steels that had not been available previously. The vertical load bearing columns were closely spaced and also served as frames for the narrow floor-to-ceiling windows.

The perimeter columns of the Twin Towers extended vertically into the concrete floor of the bathtub, although in certain areas the perimeter column loads were transferred to span over bottom level infrastructure, including the PATH tracks. Therefore, not all of the perimeter columns in the concrete floor of the bathtub were aligned with the actual façade perimeters of the Twin Towers that were visible at grade.

COMPLETION OF WTC

The WTC represented major urban renewal planning of the 1960s. It comprised six buildings, including the 110-story Twin Towers (1 and 2 WTC). These buildings rose over 1,350 feet and were the two tallest buildings in the world when completed in December 1970 and April 1972. The roof of 1 WTC also had a 351.5-foot mast supporting television and FM radio antennae for major public and private broadcasters in New York City. Occupancy of the Twin Towers began in December 1970 at 1 WTC and in April 1972 at 2 WTC.

The WTC also included Four and Five World Trade Center (4 and 5 WTC), both of which were nine-story buildings; the eight-story United States Customs House (6 WTC); and a 22-story hotel (3 WTC), all of which surrounded the Austin J. Tobin Plaza (the Plaza). Directly below the Plaza was the Concourse,

which consisted of a retail mall and transportation hub that provided pedestrian connections to the PATH trains to New Jersey and several subway lines operated by MTA/NYCT. There were six below-grade floors in the bathtub and three below-grade levels on the east side of the WTC Site, providing parking for approximately 2,000 cars, a system of freight servicing and loading, and significant infrastructure and utilities supporting the operation of the WTC's buildings and transportation facilities, including PATH. The six below-grade floor slabs also provided critical lateral stability for the slurry wall of the bathtub. This subgrade area in the bathtub contained various central plant and services and a grid of columns (30-foot by 30-foot in most areas) to support these subgrade slabs and buildings. Certain structural columns, particularly those adjacent to the north and south slurry walls, were placed in accordance with the contours of the bathtub, the PATH tracks, and other infrastructure components. Thus, there were notable exceptions and an irregular pattern in the areas of the PATH tracks at the north and south ends of the WTC bathtub.

Historically, Lower Manhattan's skyline was developed with the most technologically advanced buildings of the time. As skyscraper technology allowed taller buildings to be built, many pioneering buildings were erected in Lower Manhattan, several of which were intended to be—and were—the tallest building in the world, such as the Woolworth Building. These modern skyscrapers were often constructed alongside older low buildings. By the mid 20th-century, the Lower Manhattan skyline was a mix of historic and modern, low and hi-rise structures, demonstrating the evolution of building technology, as well as New York City's changing and growing streetscapes. Although many skyscrapers were located in the immediate vicinity, the new WTC introduced structures of a much larger scale. When completed, the Twin Towers were the most prominent features of the new WTC and Lower Manhattan's skyline

The large volume of soil excavated for the WTC became fill that began the creation of BPC. BPC was originally conceived around the construction of a seven-story megastructure containing urban functions and amenities, including shops, restaurants, schools, parks, rapid transit, utilities, and public and recreational facilities. A partly glassed-in, partly open service spine was designed to run through the length of BPC connecting all the buildings. The BPC area of 23.5 acres was deeded to New York City.

POST WTC COMPLETION

Shortly after the WTC opened, the recession of the mid-1970s began, the local real estate market collapsed, and plans for BPC were halted. However, a movement to reuse old industrial and commercial buildings was well underway to the north in the newly named SoHo neighborhood, a trend which moved to other industrial and commercial districts, including Tribeca. Attracted by spacious floors, large windows, and low rents—and aided by tax abatement—artists led what became a strong trend of converting former industrial space to residential use.

In the late 1970s, the financial industry rebounded. As the real estate market recovered, space, so plentiful a few years earlier, became scarce. A new wave of office construction began. This activity was accompanied by a new Master Plan for BPC in 1979 that would create a mixed commercial and residential development. The 1979 plan introduced sidewalks and extended the street grid toward the Hudson River. The commercial center was moved from the southern end of the WTC Site up to the middle, tying it to the WTC, with residential developments planned to the north and south.

Pursuant to an agreement between the Port Authority and New York State's Battery Park City Authority (BPCA), a climate-controlled pedestrian bridge was built connecting the northern part of the WTC Site with the commercial core of BPC constructed by the BPCA west of the WTC. North of the 16-acre WTC Site proper was Seven World Trade Center (7 WTC), a 47-story office building completed in 1987 over two electrical substations occupied by Consolidated Edison Company of New York, Inc. (Con Edison). 7 WTC was connected to the WTC Site by a pedestrian bridge over Vesey Street.

South of the WTC Site the two blocks fronting Liberty Street between Greenwich Street and Route 9A were occupied by a 39-story office building at 130 Liberty Street, the Church of St. Nicholas at 155 Cedar Street and a parking lot surrounding the church.

On February 26, 1993, at 12:18 pm, a terrorist truck bomb was set off in the public parking garage underneath the WTC killing six individuals, including a pregnant woman, and causing extensive damage to subgrade infrastructure and the hotel (3 WTC). Following the bombing, public parking was eliminated and a security improvements (capital upgrade) program, as well as certain operational security measures were implemented. In 1995, the Port Authority erected a public "World Trade Center Memorial" on the plaza level of the WTC above the blast site and a private memorial area was established in a subgrade level.

By the turn of the 20th century, the WTC was more than 95 percent occupied and a major economic driver in Lower Manhattan and the Twin Towers were symbols of commercial vitality, representing the strength of the Financial District and New York City as a world leader in trade and finance. The WTC also was a symbol of the rebirth of the downtown. The Twin Towers were the most prominent buildings at the WTC and had become cultural icons and important symbols of the nation's global economic power. The sheer height and scale of the towers was a bold architectural statement. The Twin Towers were also one of the country's most widely recognized architectural symbols. Located at the heart of the nation's third-largest business district, the WTC employed over 42,000 workers, and contained approximately 12 million square feet of commercial office space within the Twin Towers and four adjacent office buildings, as well as hotel and conference facilities, open space, and one of the most successful enclosed specialty retail centers in the country.

C. SEPTEMBER 11, 2001

THE ATTACKS

On September 11, 2001, terrorists hijacked three commercial jetliners (two of which departed from Logan International Airport and one of which departed from Washington Dulles International Airport) and used them to destroy the WTC and damage the Pentagon, respectively. An additional commercial jetliner (which departed from Newark Liberty International Airport) was hijacked and subsequently crashed in Pennsylvania.

At 8:46 am, American Airlines Flight 11 carrying 92 people struck the north tower (1 WTC) between floors 94 and 98, with the impact roughly centered on the north face. Almost immediately, national and international media coverage began. At 9:03 am, United Airlines Flight 175 carrying 65 people struck the south tower (2 WTC) between floors 78 and 84 toward the east side of the south face. Each plane banked steeply as it was flown into a tower, causing damage across multiple floors. As the aircraft impacted the buildings, fireballs erupted and jet fuel spread across the impact floors and down interior shaftways, igniting fires.

As the resulting fires raged throughout the upper floors of the two towers, thousands attempted to evacuate the buildings. Anecdotes taken from survivors indicate heroic behavior was commonly displayed. Some mobility-impaired occupants were carried down many flights of stairs by other occupants. There were numerous reports of people frequently stepping aside and temporarily stopping their evacuation to let burned and badly injured occupants pass by. As the occupants evacuated down and out of the buildings, firefighters and first responders were working their way up the stairways toward the fires.

THE COLLAPSES, DESTRUCTION, AND LOSS OF LIFE

At 9:59 am, 56 minutes after it was struck, the south tower collapsed. The north tower continued to stand until 10:29 am when it, too, collapsed.

The collapses of the towers caused destruction of or extensive damage to all the other buildings on the WTC Site as well as several adjacent buildings. Portions of the south tower (2 WTC) fell on the hotel (3 WTC) at the corner of Liberty Street and Route 9A, on the building at the corner of Liberty and Church Streets (4 WTC), on the central plaza and on the surrounding streets and the area south of Liberty Street, including the building and plaza at 130 Liberty Street just to the south of the WTC. When the north tower (1 WTC) collapsed portions fell on 6 WTC, on 5 WTC, on the plaza, and on the surrounding streets and structures west of Route 9A and north of Vesey Street. All mass transit stations and facilities at the WTC Site were destroyed, and service on several lines was shut down until new connections could be established. The aftermath left victims, human remains, building materials and burning debris covering the entire WTC Site (see Photo 1).

Images of these events were broadcast and were recorded by the media as well as by eyewitnesses. These images were seared in the minds of those who survived the events as well as those who witnessed them in person or on television.

North of the WTC Site, damage to 7 WTC resulted in its collapse later that day. South of the WTC Site, the Church of St. Nicholas was destroyed; 130 Liberty Street was severely damaged, and its two-level plaza along Liberty Street was destroyed. Other buildings surrounding the WTC Site, including the Hilton Hotel, Century 21 Department Store and the Federal Office Building/U.S. Post Office on Church Street, Fiterman Hall on Barclay Street, 90 West Street and the Barclay-Vesey (Verizon) Building on Route 9A, and the Winter Garden, the World Financial Center, and Gateway Plaza in BPC were also severely damaged. Material covered a larger area, with the bulk in the immediate area extending north to Chambers Street, east to Nassau/Broad Streets, south to the Battery, and west to the Hudson River waterfront.

While an estimated 15,000 people were evacuated from the WTC Site, approximately 2,749 people in and around the WTC lost their lives including workers, commuters, residents, visitors, those on the hijacked airliners, and rescue personnel. This death toll number includes 343 New York City fire fighters, 23 New York City police officers, 37 members of the Port Authority Police Department, 92 passengers on American Airlines Flight 11 and 65 passengers on United Airlines Flight 175. Tens of thousands of others were evacuated from the immediate area. There was no loss of life in the PATH system, as PATH trains were directed to not offload passengers at the WTC, and service to the WTC was suspended.

THE AFTERMATH, RESCUE AND RECOVERY OPERATIONS

Shortly after the two attacks on the WTC, all flights in the United States were grounded by the order of the Federal Aviation Administration (FAA). The Port Authority of New York and New Jersey Police Department (PAPD) and other Port Authority employees, the New York City Police Department (NYPD), the Fire Department of the City of New York (FDNY), other emergency response personnel, and concerned citizens rushed to respond to these attacks.

In recognition of the disastrous impact of the terrorist attacks, President George W. Bush declared Lower Manhattan a national disaster area and $21 billion in aid was approved by the United States Congress for the repair, restoration, and recovery efforts. These funds were allocated to the Federal Emergency Management Agency (FEMA), FTA, and HUD for specific objectives and grants, to be separately administered by each of the agencies and local project sponsors.

In November 2001, the New York State Urban Development Corporation d/b/a Empire State Development Corporation (ESDC) established the LMDC, to oversee the revitalization and rebuilding of Lower Manhattan. Eight of the 16 members of the Board of Directors of LMDC are nominated by the Governor of the State of New York and eight are nominated by the Mayor of the City of New York. LMDC's activities, including the currently proposed WTC Memorial and Redevelopment Plan, are being funded through grants from HUD made possible under a $2.783 billion appropriation from the United States Congress for the purpose.

The effects of the terrorist attacks were felt throughout the region and the country, leading to an outpouring of support from local, national, and international levels for the physical, financial, and emotional recovery efforts that continue to this day. Roughly 1,600 FEMA workers were dispatched to Lower Manhattan to assist in the recovery effort. Thousands of volunteers came to the area to assist. In the aftermath, the image of the Twin Towers became a symbol of antiterrorist resolve and the collective determination of the city, the state, and the nation called for rebuilding to restore the iconic center of the Financial District and to honor those who died there on September 11, 2001 and on February 26, 1993.

Much of Lower Manhattan south of Houston Street became a restricted area and was cordoned off in the weeks following the attacks for security and recovery reasons. Large streets and parks, including Route 9A, Battery Park, and the Hudson River Park below Houston Street, were taken over by safety installations, emergency vehicles, recovery equipment, and rescue and recovery facilities for extended periods of time. Some streets remain closed or occupied by safety installations and construction equipment. Many of the businesses and residents in the surrounding area were temporarily displaced, and some have not returned. The building at 130 Liberty Street remains standing, damaged and vacant.

The WTC Site as it existed as of noon on September 11 was transformed yet again by the rescue and recovery operations that began immediately after the attacks under the direction of the FEMA and the New York City Department of Design and Construction (DDC). Work continued 24 hours a day, seven days a week. Initial efforts were tremendous and focused on human rescue operations; only eighteen people were rescued from the ruins of the WTC, two of them were injured police officers discovered in the underground retail concourse. The remaining sixteen were all found among the ruins of 1 WTC. Fourteen of them, twelve firefighters, one police officer and one civilian office worker, were found largely unscathed in an intact stairwell section between the second and fourth floors, sandwiched between collapses. The remaining two rescued were two Port Authority employees recovered in the rubble of the north Tower. The second of these two was rescued approximately 27 hours after the collapse and was the last person to emerge alive from the ruins. As the days passed, the likelihood of successful rescue diminished. As of January 2004, the New York City Office of the Chief Medical Examiner (OCME) confirmed the deaths of 2,749 individuals. Nearly 20,000 human remains have been recovered to date, some of which have not been identified. The unidentified remains have been preserved by the OCME. There are more than 1,200 victims for whom no remains have been identified.

Following September 11, 2001, the City of New York maintained primary responsibility for the recovery efforts and coordinated its efforts with other private and governmental entities until June 30, 2002, when recovery efforts concluded and DDC returned the WTC Site to Port Authority control. Approximately 1.8 million tons of damaged structures and materials were removed through the fall, winter, and spring of 2001-2002. Damaged portions of the lower facades of the Twin Towers that were still intact in the aftermath were cut and removed to allow the recovery of human remains. On the east side of the WTC Site, the standing portions of 4 WTC and 5 WTC were demolished with wrecking balls and removed. Removal of the material from building structures above and below ground exposed the 70 foot deep bathtub within the western portion of the WTC Site which had contained the bases of the Twin Towers, the hotel (3 WTC) and the U.S. Customs House (6 WTC) as well as the PATH Terminal and supporting facilities including the parking garage where the explosives were detonated in the 1993 terrorist attack on the WTC.

As material was removed from areas near the WTC and the near-term stability of standing structures was verified, workers and residents were generally allowed to return to the surrounding area. By the beginning of 2002, the restricted area was pushed back west of Broadway and south of Barclay Street and a public viewing platform was constructed on Fulton Street just east of Church Street. The platform remained in place until Church Street was opened and a wide sidewalk/viewing area on the west side of the street (on the eastern edge of the WTC Site) was created. While Liberty, Vesey, and Barclay Streets surrounding the WTC Site remain closed to vehicular traffic, pedestrian paths have been created across Vesey and Liberty Streets from Church Street to Route 9A. Route 9A was re-opened on March 29, 2002, after construction

of an interim roadway allowing the re-opening of the Brooklyn Battery Tunnel. However, some buildings to both the south and the north of the WTC Site remain unoccupied. Most are being repaired or reconstructed. The fate of Fiterman Hall, a building on the north side of Barclay Street being renovated for use by the Borough of Manhattan Community College before September 11, is uncertain.

In order to stabilize and conserve what remained of the WTC Site as well as to protect the health and safety of rescue workers, necessary infrastructure repairs were undertaken concurrently with the recovery efforts, including the temporary stabilization of the slurry wall with over a thousand steel cable tiebacks and flood-proofing portions of the WTC Site primarily along the south, east and west portions of the WTC bathtub. Structural slabs in the northern portion of the bathtub (underneath 6 WTC) were left for interim stabilization of the northern slurry wall. Recovery efforts concluded as of June 30, 2002 when the WTC Site was returned to Port Authority control. MTA/NYCT completed reconstruction of the No. 1/9 subway tunnel in September 2002 and service resumed on that subway line to Lower Manhattan. The Cortlandt Street station within the WTC Site remains closed.

In order to restore service to a major regional transit hub, construction of a temporary WTC PATH station by the Port Authority began in July 2002 upon conclusion of the recovery operations. The station opened for service in November 2003. The temporary WTC PATH station was constructed in substantially the same configuration that existed on the morning of September 11, except that the tracks and platforms are not fully enclosed, and were built to an eight-car length (and not the original 10-car length), and the station is not heated or air-conditioned, has fewer pedestrian and transit connections, and has only one entrance/exit located on Church Street near Vesey Street.

South of the WTC Site, 130 Liberty Street remains vacant and shrouded in black netting. Its plaza and the supporting structure for the plaza were removed, leaving a deep hole in the ground. To the west, the block formerly occupied by St. Nicholas Church and the parking lot was repaved and has been used for site access and construction staging.

Most of the structural steel from the WTC was removed and distributed for recycling under recovery contracts let by DDC. Major pieces of steel from the towers and 7 WTC were taken to the National Institute of Standards and Technology in Gaithersburg, Maryland for analysis. In addition, selected building remnants (structural steel, building materials, and building components including portions of the structural tridents at the lobby level of the North Tower) and artifacts (including crushed emergency and private vehicles, trackage from the PATH and No. 1/9 lines, and a bicycle rack,) were salvaged for possible memorial and museum use and stored by the Port Authority in Hangar 17 at John F. Kennedy International Airport. In October 2002, the Port Authority Board formally acted to approve a program and funding to protect, catalog and store these artifacts. Other artifacts were salvaged by the New York State Museum and are stored at their facility in Albany. The New York State Museum also gave salvaged artifacts to other museums and institutions in New York and New Jersey. (Appendix A discusses artifacts that were removed from the WTC Site, including those stored at the New York State Museum in Albany, NY and at Hangar 17.)

On March 11, 2002, six months after the attacks on WTC, LMDC, the Port Authority, and the City of New York, established an Interim Memorial in Battery Park. The centerpiece of the memorial is the damaged *Sphere*, a bronze sculpture that had stood in the center of the WTC plaza and made available as a result of a donation by the AXA Art Insurance Corporation. Also on March 11, 2002, Governor Pataki and Mayor Bloomberg dedicated the *Tribute in Light*, two banks of 44 spotlights which projected light almost one mile into the night sky near the location of the Twin Towers. The *Tribute in Light* was the result of collaboration between civic organizations and artists from a broad range of disciplines, and could be seen from up to 25 miles around Lower Manhattan. The lighting of the *Tribute in Light* was one of many ceremonies held across the United States that day and continued to illuminate the night sky for 32 days.

Government programs aimed at providing assistance to individuals affected by the events of September 11 were also established in the months following. The Victim Compensation Fund provides economic compensation to families and dependents of victims in lieu of pursuing a civil court case for damages; the Small Business Administration offered low-interest loans to eligible individuals to repair or replace damaged property and personal belongings not covered by insurance; FEMA's Disaster Housing Program made funds and services available to individuals whose homes were uninhabitable, while FEMA and New York State also provided cash grants to those who did not qualify for the Small Business Administration loans; Department of Labor also made funds available for extension of unemployment assistance. Financial assistance provided by individuals and nonprofit organizations such as the American Red Cross, September 11th Fund, Twin Towers Fund, and New York State World Trade Center Relief Fund also proved invaluable in the recovery efforts.

Following July 1, 2002, the Port Authority continued site stabilization measures including necessary slurry wall repairs, structural shoring, de-watering systems, and other work and structural monitoring. The Port Authority also constructed perimeter walkways and a perimeter fence with information panels describing the history of the WTC Site and the area for the thousands of daily visitors to the WTC Site.

In August 2002, Congress appropriated $4.55 billion in federal funding to be provided through FEMA and the FTA for transportation projects in Lower Manhattan. FTA, the lead federal agency, continues to work with the governor of New York and state and local agencies to identify and develop projects using this federal aid.

III. RESOURCE DESCRIPTION

The WTC Site is located on the west side of Lower Manhattan. Occupying approximately 16 acres, the WTC Site is bounded by Vesey Street on the north, Liberty Street on the south, Route 9A/West Street on the west and Church Street on the east. The IRT No. 1/9 subway divides the WTC Site into two parts—a western portion and an eastern portion (see Photo 2). The west portion of the WTC Site contains approximately 11 acres. It is delineated by reinforced concrete walls approximately three feet thick and approximately 70 feet high. Within these walls, the ground was excavated to bedrock for construction of this portion of the WTC and the below-ground PATH Terminal. This foundation structure was early on named the bathtub, the concrete walls serving to seal the basement of this part of the WTC against water seeping from the nearby Hudson River. With removal of the ruined structures and debris following the attacks, the bathtub has been exposed to nearly full view for the first time since it was constructed (see Photos 3 and 4). The slurry walls constructed around the bathtub area are visible in this portion of the WTC Site except where a portion of the substructure of 6 WTC has been left in place to support those walls. The east portion of the WTC Site was not so deeply excavated (and it has a typical basement structure). Along Church Street the east portion is at grade with three below-grade levels.

The following inventory is divided as the WTC Site is divided into west and east portions. Surviving elements of the WTC observed during site visits in November 2003 are listed below. Elements constructed or installed in association with the recovery and stabilization efforts following September 11, as well as elements associated with the temporary PATH station, are also included to provide a complete picture of the WTC Site today.

West Portion of the WTC Site—Bathtub

After the removal of approximately 1.8 million tons of material from the site, the only standing and remaining structure in this portion of the WTC Site was a remnant of the below-grade (basement) levels of 6 WTC, located along Route 9A and Vesey Street. The most visible remnants of the WTC are the slurry walls which surrounded the bathtub.

1. West wall (constructed pre-September 11): This wall was under the roadbed of Route 9A and adjacent to Tower One, the hotel (3 WTC) and 6 WTC. The north end of the wall is partially covered and obscured from view by remnants of the below-grade structure of 6 WTC (see Photo

5). Damage to the wall from September 11 is apparent as is the new concrete used to repair the damage and increase the height of the wall to prevent flooding. Water damage is also apparent on the wall and sections of reinforcement have been exposed. A number of features are visible, including:

a. Vehicular entrance ramps (constructed pre-September 11): Two sets of rectangular openings are located in the west wall. They were the vehicular entrances/exits for the WTC parking garage from ramps formerly in the median of Route 9A—now beneath the northbound lanes of the temporary roadway. They were located at the B2 basement level and are approximately 42 feet above the bathtub floor. The north pair is located just south of the surviving sections of 6 WTC (see Photo 5). The south pair flanks the southern set of cooling water pipes (see Photos 6 and 7). The north ramp of this southern pair (to the right in Photos 6 and 7) was used by the terrorists to drive the vehicle with explosives into the garage in the 1993 attack on the WTC.

b. Cooling Water Pipes (constructed pre-September 11): Openings for two pairs of cooling water intake and outflow pipes are located in the west wall. The pipes painted green are the 60-inch pipes installed with the original construction (see Photos 6 and 7). These two pipelines ran under West Street between the WTC Site and a subterranean Hudson River Water Pump House facility in BPC. Pipes painted blue are the 66-inch pipes installed in the 1990s. These pipes were routed underneath subgrade entrance ramps under West Street/Route 9A and entered the WTC Site underneath Tower One.

c. Tiebacks (installed post-September 11/temporary): Nearly 1,000 temporary tiebacks were installed during the recovery to hold the wall in place when the debris and damaged below-grade structures were removed. Some tiebacks extend as much as 40 feet long and are anchored to bedrock around the bathtub area. All the tiebacks visible on this wall have been capped to protect them.

d. Southern Projection (constructed pre-September 11): This is the largest apparent opening in the wall that is visible (see Photo 8). It is near the southern end of the wall. The structure was used for emergency PATH tunnel egress and ventilation, and also as part of the venting system for the garage, as well as emergency diesel generators, and connected to vent structures that were located in the median of Route 9A. Note there is also a similar projection behind the remnants of the 6 WTC substructure.

e. PATH tunnel access (constructed pre-September 11): This is located in the southern projection for the southern tunnel (see Photo 8). The restored tracks, covered and partially walled, emerge from the southern projection at the bottom of the bathtub. Note the second PATH tunnel is in the northern projection and not visible due to the remnants of the 6 WTC substructure.

f. Egress stairs (constructed post-September 11/temporary): Steel egress stairs for the emergency egress from the PATH Tunnels "E" and "F" are located in the bathtub in the middle of the wall with a emergency walkway access from each tunnel to grade level along Route 9A.

2. South wall (constructed pre-September 11): The south wall was located under the middle of Liberty Street (see Photo 9). It was adjacent to Tower Two. Damage to this wall is also apparent, as are the new concrete repairs and the vertical extension of the wall to prevent flooding.

   a. PATH tracks (constructed post-September 11): The PATH tracks are adjacent to the base of this wall in the same location that they ran prior to September 11, 2001.

   b. PATH substation (constructed post-September 11): This is the new blank-walled structure above the PATH tracks providing the traction power for train operations.

c. Recovery and Construction ramp (constructed post-September 11/temporary): This ramp provides temporary primary construction access for pedestrians and vehicles from street level to the floor of the bathtub, installed in March 2002 during the recovery effort. This is also among the emergency egress routes for the temporary WTC PATH station.

d. Tiebacks (constructed post-September 11/temporary): Tiebacks were installed during the recovery to hold the wall in place when the debris and damaged below-grade structures were removed.

3. East wall (constructed pre-September 11): This wall is visible above the temporary PATH tracks and on either side of the portion of the temporary WTC PATH station in the bathtub (see Photos 9 and 10). September 11 damage as well as new concrete in repaired sections of the wall are distinguishable.

   a. Hudson Tubes (constructed pre-September 11): Two cast-iron ring tubes are located in the east wall. Only the south tube is visible (see Photo 11).

   b. Vehicular access ramp (constructed pre-September 11): A former vehicular ramp into the below-grade service areas on the WTC Site is just west of the east wall (see Photo 12). Inside the WTC Site (at approximately Fulton Street) the ramp connects to and runs through a portion of the one of the original Hudson Tubes. It connected to the outside world on Barclay Street under 7 WTC where trucks entered and exited the WTC.

   c. Temporary WTC PATH station (constructed post-September 11/temporary): The new structure of the temporary WTC PATH station is visible, and is adjacent to the eastern wall of the bathtub (see Photos 13 and 14). The structures are at the same location and elevations as the pre-September 11 station facility. PATH trains enter and exit the station on the track/platform level. Above that is the mezzanine level (also within the bathtub) where the turnstiles are located. Along the west wall of the mezzanine and overlooking the bathtub, the open structure has screen panels that are translucent; they allow light into the mezzanine level but do not obscure most views out to the WTC Site. Printed panels are also located along the walls and have quotes of famous New Yorkers. Four temporary emergency exit staircases lead from the PATH mezzanine to the floor of the bathtub.

4. North wall (constructed pre-September 11): This wall is largely obscured by the remnants of the substructure of 6 WTC.

   a. 6 WTC (constructed pre-September 11): Remnants of the grade level slab, an egress staircase, and six below-grade floors of 6 WTC (Levels B1-B6) are remaining at the north end of the bathtub (see Photo 15). Smoke scars from the September 11 terrorist attacks are visible at levels B1-B5 from the exterior. These areas were used as below-grade parking (see Photos 16 and 17) and have been temporarily stabilized and shored as part of the site recovery following September 11, 2001.

   b. Tiebacks (constructed post-September 11/temporary): Some tiebacks have been installed where slabs have been demolished (see Photo 18). A few tiebacks near the truck access ramp have cables that have not been cut back and capped.

   c. Vehicular access ramp (constructed pre-September 11): This heavily damaged ramp once connected the WTC Site to Barclay Street (under 7 WTC) and is visible in this area.

5. Area within Bathtub: This is the area that was generally excavated to the concrete floor of the bathtub. It is within the slurry walls (see Photos 2-4). Tower One, Tower Two, 3 WTC (the hotel) and 6 WTC all stood above the bathtub. The concrete floor of the bathtub lies over a layer of gravel which varies in thickness depending upon the geology of a particular location within the bathtub. In addition to the portions of 6 WTC and the temporary WTC PATH station, and

operations and maintenance facilities and its elements identified above, other features or structures now present in the bathtub include:

a. Tower perimeter column bases (constructed pre-September 11): The original subgrade column grid for the Twin Towers was configured in the bathtub to span above the former H&M tunnels traversing the bathtub as well as the new PATH tracks. During the recovery and site clean-up, the perimeter column bases that outline the space where the Twin Towers stood (sometimes referred to as footprints) were cut off just at or above the concrete floor of the bathtub, but remnants remain (see Photos 19 and 20). The perimeter outlines of the north tower and south tower are delineated by column bases forming squares. Prior to September 11, 2001, the PATH facility occupied approximately the east half of the south tower's footprint. There were 84 perimeter columns extending into the concrete floor of the bathtub that would outline the north tower and, due to the configuration and crossing of PATH tracks, 73 perimeter columns extending into the concrete floor of the bathtub that outline the south tower. Of the 73 perimeter columns outlining the south tower, 34 of them were in the PATH facility.

b. Other column bases (constructed pre-September 11): These column bases supported other structures or infrastructure that once existed in the bathtub. They include column bases inside the perimeter of the Twin Towers. Most of the columns were arranged in a 30-foot by 30-foot grid pattern, with notable exceptions and an irregular grid pattern occurring in the areas of the PATH tracks at the north and south ends of the WTC bathtub.

c. Other infrastructure (constructed pre-September 11): Other infrastructure including elevator pits, sump pumps, ejector pumps and drainage lines are located within the bathtub area.

East Portion of the WTC Site

This is the portion of the WTC Site outside of the bathtub area. This area is located east of the alignment of Greenwich Street and the restored No. 1/9 subway line which permits service to the Rector and South Ferry Stations. The new temporary WTC PATH station concourse level and street entrance is located in the north half of this area. There are no surviving remnants of buildings 4 WTC and 5 WTC in this area. Features identified in the eastern portion of the WTC Site include the following:

1. Temporary WTC PATH station main entrance (constructed post-September 11): This new structure is entered from Church Street at Fulton Street. The station has a sculptural form, with two wings rising from a central truss supported on two vertical trusses.

2. Temporary WTC PATH station concourse (constructed post-September 11): This is located one level below-grade (see Photo 21). It connects to the pre-existing downtown platform of the NYCT N/R/W line running under Church Street and at the northeast corner of the WTC Site to the NYCT E line.

3. WTC PATH Terminal underpass (constructed pre-September 11): This is a pedestrian underpass connecting the mezzanine level to the concourse level, located under the No. 1/9 subway line, just as it did in the former WTC. This underpass structure itself remained intact despite the destruction and damage of September 11. New escalators were installed post-September 11.

4. Restored NYCT No. 1/9 subway line (constructed post-September 11): A concrete box enclosing the subway tracks, as well as portions of the former Cortlandt Street station, runs north-south across the WTC Site, just east of the slurry wall. The tracks and enclosure were completely rebuilt after September 11.

5. Plaza and subway access from Vesey Street (constructed pre-September 11): The heavily damaged stair and escalator structure on Vesey Street lead up to the WTC plaza and the bridge to 7 WTC (see Photo 22). It also provided access to the No. 1/9 Cortlandt Street subway station which was under the WTC.

6. Remnants of the Hudson Terminal and the H&M Railroad (constructed pre-September 11): These are found below grade in the middle of the WTC Site along Church Street between Fulton and Cortlandt Streets. When the new WTC PATH Terminal opened in 1971, unused portions of the Hudson Tubes were converted to truck ramps. Sections of these unused portions of the cast-iron tubes exist on site. Below-grade portions of the former terminal that were used for truck loading, parking, and commercial storage also exist on site. All components of the former H&M Terminal substation have been removed (during construction of the WTC), and only large openings in the ground where these features were located survive.
7. Sidewalks and fencing (constructed post-September 11): These sidewalks and fencing are located around the perimeter of the WTC Site.
8. Passageway to the NYCT WTC subway station (constructed pre-September 11): Remnants of the WTC passageway to the E subway line are located below-grade and include steps, a ramp, doors and flooring (see Photos 23 and 24). This passageway has been reopened and connects with the temporary WTC PATH station.
9. Steel cross (erected post-September 11): A section of two connected beams forming a steel cross was found near 6 WTC and erected by recovery workers on the WTC Site.

IV. NATIONAL REGISTER ELIGIBILITY EVALUATION

The WTC Site meets National Register Criterion A for its association with the September 11, 2001 attacks on the two 110-story towers of the WTC which on local, state and national levels constitute "historic events that have made a significant contribution to the broad patterns of our history." In connection with the events of September 11, the WTC Site is significant in the areas of political and government issues, social history and economic history. The WTC Site is exceptionally significant in the history of the United States as the location of events that immediately and profoundly influenced the lives of millions of American citizens and for its role in symbolizing and commemorating those events for survivors, families of victims, New Yorkers, Americans and visitors from all over the world. The WTC Site is defined as the approximately 16-acre property bounded by Route 9A (West Street), and Vesey, Liberty, and Church Streets.

Although the events of September 11 occurred just over two years ago, the WTC Site meets the requirement of National Register Criteria Consideration G that a property achieving significance within the last 50 years must be of exceptional importance. The flying of two large commercial jetliners into the WTC's Twin Towers were the acts that precipitated numerous events of great magnitude, among them the deaths of an unprecedented number of individuals in a single location resulting from foreign attacks on American soil, and also actions, still unfolding, taken by the United States both at home and abroad in response to the attacks themselves and to the issues of global terrorism of which they were a part. The ultimate historical importance of the various events and actions resulting from the attacks has yet to be fully determined, since they are still underway and additional actions are likely to be initiated in the foreseeable future. However, there exists more than sufficient information at this time to document the exceptional importance of the attacks on the WTC to the history of the United States in the 21st century.

The attacks on the Twin Towers on September 11 caused the death of what is currently estimated to have been nearly 2,800 people and when taken together with the attack on the Pentagon and the crash of hijacked Flight 93 in Shanksville, PA, the total rises to more than 3,000. An immediate result of the attacks was a profound transformation in both local and national security. Shortly after the attacks, the FAA grounded all flights then within United States airspace and turned back all flights then coming into the country—something that it had never done before and that continued for several days after September 11. The United States Office of Homeland Security (which later became the Department of Homeland Security) was established on October 8, 2001. In early October 2001, the United States and other members of the international community attacked and then invaded Afghanistan, where the governing

Taliban regime harbored terrorist leaders and training camps. The comprehensive federal response to the events of September 11 also included Congressional enactment of major legislation such as the Aviation and Transportation Security Act, National Construction Safety Team Act, Air Transportation Safety and System Stabilization Act, the United States Patriot Act, and the Terrorism Risk Insurance Act of 2002, as well as major changes in foreign policy.

The significance of the WTC Site is enhanced by the fact that the collapses of the Twin Towers was captured on film, witnessed on television by millions of people as it occurred, and has been replayed countless times all over the world. As such, the image has been indelibly burned into our collective memory, and the WTC Site is a compelling reminder of the tragic events of that terrible day.

In addition to its direct association with the events of September 11, the WTC Site has already acquired significance as the primary place for commemorating the events that transpired there. Almost from the day of the attacks, crowds of people from all over the world, representing diverse cultures, nationalities, and classes, have journeyed to the WTC Site to pay their respects to the victims and bear witness to the significance of the events. It has been the location of countless memorials, ceremonial events, and private pilgrimages by the families of the victims, survivors, rescue workers, government officials, world leaders, and citizens of New York, the nation, and the world. On each of the two subsequent anniversaries of the attacks, the name of each of the victims has been read aloud at the WTC Site, thus publicly proclaiming the collective grief of a nation.

The period of significance begins on September 11, 2001, the day on which the attacks occurred, and continues to June 30, 2002, the date on which DDC concluded the recovery efforts and returned the WTC Site to Port Authority control. Absent the events of September 11, the Twin Towers would not have collapsed, thousands of people would not have lost their lives, the WTC and several adjacent buildings would not have been destroyed or extensively damaged, the massive search, rescue and recovery efforts would not have taken place, the PATH system and the No. 1/9 subway line and station below the towers would have remained in operation, and the numerous actions taken by the United States at home and abroad in the name of national security and war on terrorism would not have taken place (or, with regard to the latter, not in the manner they have to date).

The WTC Site was the locus of the events of September 11 and the significance of those events and their aftermath to American history makes the WTC Site eligible for National Register listing, even at this early date. Although the existing elements on the site do not fully express the scale or catastrophic nature of the events of the day, various remnants of the WTC's Twin Towers and other structures help convey in different ways the events of September 11 and their aftermath and, therefore contribute to the WTC Site's historic significance.

Foremost among these items are the truncated box-beam column bases that help define the perimeter or "footprints" of the former Twin Towers and the slurry walls that form the sides of the underground bathtub for the Twin Towers. The truncated box-beam column bases serve to poignantly delineate the areas where so many lives were lost that day. As revealed by the recovery efforts, the west wall in particular helps to convey the scale of both the bathtub and the destruction wrought on September 11.

Other items also contribute to the understanding of the events in a different way. The remnants of the parking garage contain slabs and interior columns charred with smoke from the fires that burned for months. The beams forming a cross erected by recovery workers reflect the faith and dedication of thousands of rescue and recovery workers both on September 11 and in the months following.

Other remnants, such as the portion of the concrete steps and escalator ramp from Vesey Street to the subway and the remaining portion of the passageway to the E subway line, serve as reminders that the WTC Site was not limited to the Twin Towers and included both pedestrian and transit connections to the surrounding communities.

The significance of the WTC Site is reflected by its integrity of location, setting, feeling, association, and materials. Physical remnants on the WTC Site possess integrity of materials that convey the catastrophic

events of September 11. The WTC Site retains integrity of location, as it is the location of the now-destroyed complex where the September 11 attacks occurred. It also retains integrity of setting. Although buildings and infrastructure within the WTC were destroyed and their ruins removed, the physical environment surrounding the WTC Site remains essentially as it was on September 11, for example its relationship to other buildings in the neighborhood and its location near the Hudson River in Lower Manhattan (a location that necessitated the construction of the slurry walls and bathtub visible today). The WTC Site retains integrity of feeling—the surviving physical features at the site, including the large bathtub, slurry walls, and the bases of steel columns, as they have been revealed by the rescue and recovery efforts, convey the destruction that took place on September 11. The WTC Site also retains integrity of association, which is the direct link between an important historic event and a historic property. The Twin Towers were the targets of these September 11 attacks, and physical features surviving on this site that have material integrity retain their quality of association with the profound events of that day, as well as the post September 11 recovery effort.

The WTC Site is significant due to the extraordinary and catastrophic events of September 11, 2001. These events are important at the local, state and national levels due to the people who died and who gave their lives trying to help others, the physical destruction of the WTC and the unprecedented recovery effort. During the recovery, surviving elements of the WTC were disassembled and removed as part of the search and rescue operations; these actions also contribute to the site's significance. Some of these artifacts (as described in Appendix A) could also contribute to the site's significance if returned to the WTC Site to convey aspects of the events that give rise to the site's eligibility. The individual project sponsors will consider the reuse and interpretative value of artifacts as they further develop their undertakings.

BOUNDARY DESCRIPTION AND JUSTIFICATION FOR THE NATIONAL REGISTER-ELIGIBLE WTC SITE

The boundaries of the eligible property are contiguous with the boundaries of the WTC Site. The WTC Site was the immediate setting in terms of historical development, design and function for the 110-story Twin Towers, which were the specific objectives of the terrorist attacks, and is the primary area onto which they collapsed on September 11. The targets of the attacks, the area that suffered the most catastrophic loss of lives and buildings, and the location most widely recognized for its association with the attacks, is the 16 acres once occupied by the WTC. This area most directly and outstandingly represents the events of September 11. The WTC Site is also associated with the extensive recovery effort that continued on the WTC Site until June 30, 2002.

V. BIBLIOGRAPHY

Allen, Oliver E. Tales of Old Tribeca, an Illustrated History of New York's Triangle Below Canal. New York: Tribeca Trib, Inc. 1999.

Anonymous. 9/11 Memorial to Store Unidentified Remains. Los Angeles Times. August 26, 2003.

Anonymous. Report: Final WTC Death Toll Drops by Three; Could Stand at 2,749. Posted 1/23/2004 2:38 PM, Updated 1/23/2004. 3:49 PM. USA Today. USA Today website as of February 4, 2004. http://www.usatoday.com/news/sept11/2004-01-23-wtc-toll_x.htm

Borakove, Ellen, Director of Public Affairs for New York City Medical Examiner's Office. Phone Interview February 4, 2004.

Darton, Eric. Divided We Stand: A Biography of New York's World Trade Center. New York: Basic Books. 1999.

Dewan, Sheila K. New York Times. Public Lives: An Interpreter of Messages Left by the Dead. June 6, 2003.

Federal Emergency Management Agency. World Trade Center Building Performance Study, FEMA 403, Appendix D: WTC Steel Data Collection. May 2002. FEMA website as of February 4, 2004. http://www.fema.gov/pdf/Library/Fema403_apd.pdf

Gillespie, Angus Kress. Twin Towers: The Life of New York City's World Trade Center. New Brunswick, N.J.: Rutgers University Press. 1999.

Glanz, James and Eric Lipton. City in the Sky: The Rise and Fall of the World Trade Center. New York: Times Books, Henry Holt and Company. 2003.

Hartgen Archaeological Associates. Route 9A Reconstruction Project, Draft Archaeological Assessment Report, Battery Place to Harrison Street. March 1990.

Jackson, Kenneth T., ed. The Encyclopedia of New York City. New Haven, CT: Yale University Press. 1995.

Langewiesche, William. American Ground: Unbuilding the World Trade Center. New York: North Point Press. 2002.

Lipton, Eric. Left Mostly Out of Memorial Designs, Trade Center Steel Sits Rusting in a Hangar. New York Times. December 19, 2003.

National Institute of Standards and Technology. Documentary Information Received by NIST, August 2003. NIST website as of February 4, 2004. http://wtc.nist.gov/media/docs_info_received.html

National Institute of Standards and Technology. Federal Building and Fire Safety Investigation of the World Trade Center Disaster, Project #3: Analysis of Structural Steel, Update, December 2, 2003. NIST website as of February 4, 2004. http://wtc.nist.gov/media/Analysis of_Structural_Steel.pdf

National Park Service, National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation.

National Park Service, National Register Bulletin 16A: How to Complete the National Register Registration Form.

New York State Museum. Press Release. August 2003. NYSM website as of February 4, 2004. http://www.nysm.nysed.gov/press/2003/wtcresponse.html

New York State Museum. The World Trade Center: Rescue Recovery Response. August 2003. NYSM website as of February 4, 2004. http://www.nysm.nysed.gov/wtc/

Tyson, Peter. Towers of Innovation. Included in a companion web site to Public Broadcasting Service. Why the Towers Fell. Originally broadcast February 2, 2002. PBS website as of February 5, 2004. http://www.pbs.org/wgbh/nova/wtc/innovation.html

Voice of America News. Unidentified Remains of World Trade Center Victims to be Preserved in Permanent Memorial. Aug 25, 2003, 17:42 UTC. VOA website as of February 5, 2004. http://www.voanews.com.

VI. LIST OF PREPARERS

AKRF, Inc.

- Anne M. Locke, Assoc. AIA
  Senior Vice President
- Andrea Burk, M.S.
  Architectural Historian
- Claudia Cooney, M.S.
  Technical Director

The Louis Berger Group, Inc.

- John A. Hotopp, Ph.D., RPA
  Senior Vice President
- Martha H. Bowers, M.A.
  Principal Architectural Historian

VII. COMMENTS

Comments on the January 21, 2004 and February 6, 2004 drafts of this Coordinated Determination of National Register Eligibility were received from:

- Coalition of 9/11 Families, Anthony Gardner, Executive Board member
- Coalition to Save West Street, Marilyn Gaull Howard
- Families of September 11, Nikki Stern, Director
- Greek Orthodox Archdiocese and St. Nicholas Church, George Schira
- Historic Districts Council, Robert Kornfeld, Director
- Historic Districts Council, Robert Kornfeld, Director; Metro New York Chapter, American Planning Association, Ethel Sheffer, President; Coalition of 9/11 Families (Coalition), Anthony Gardner, Executive Board member; Voices of September 11th, Mary Fetchet, President
- Louise LoPresti
- Lower Manhattan Emergency Preservation Fund (composed of Municipal Art Society, Frank E. Sanchis, III, Executive Director; National Trust for Historic Preservation, Elizabeth S. Merritt, Deputy General Counsel, Marilyn Fenollosa, Senior Program Officer & Regional Attorney; New York Landmarks Conservancy, Peg Breen, President; Preservation League of New York State, Scott Heyl, President; World Monuments Fund, Bonnie Burnham, President; Ken Lustbader, Preservation Consultant)
- Municipal Art Society, Vicki Weiner, Director of Historic Preservation

- National Trust for Historic Preservation, Elizabeth S. Merritt, Deputy General Counsel, Marilyn Fenollosa, Senior Program Officer & Regional Attorney
- New York City Landmarks Preservation Commission, Robert Tierney
- New York Landmarks Conservancy, Alex Herrera, Director of Preservation
- Preservation League of New York State, Ken Lustbader, Consultant
- Shinnecock Nation Cultural Center and Museum, Winonah Warren
- Voices of September 11th, Mary Fetchet, President

APPENDIX A—ARTIFACTS

During the rescue and recovery operations, a number of artifacts were removed from the WTC Site. Artifacts are the materials that were identified, secured, and preserved. This section deals with those artifacts that were taken from the WTC Site during the recovery efforts. A structure or pieces of a structure or a site removed from their historic location would not usually be considered for National Register eligibility because they have lost their integrity of location. However, based on consultation between the State Historic Preservation Office and the National Park Service, it has been determined that if artifacts are returned to the WTC Site, then they could be considered to contribute to the historic significance of the property.

Of the artifacts removed from the WTC Site one of the most famous is the Sphere, an artwork by Fritz Koenig originally located on the fountain at the center of the Tobin Plaza. The Sphere was damaged in the September 11 attacks and was donated by AXA Insurance Company to the Interim Memorial created on March 11, 2002, in Battery Park by LMDC, the Port Authority, and the City of New York. The Interim Memorial is dedicated "to all whose lives were taken, and the many who gave their lives trying to save them at the World Trade Center in the attacks of September 11, 2001." On the first anniversary of the attacks, Mayor Michael Bloomberg dedicated an eternal flame at the Interim Memorial.

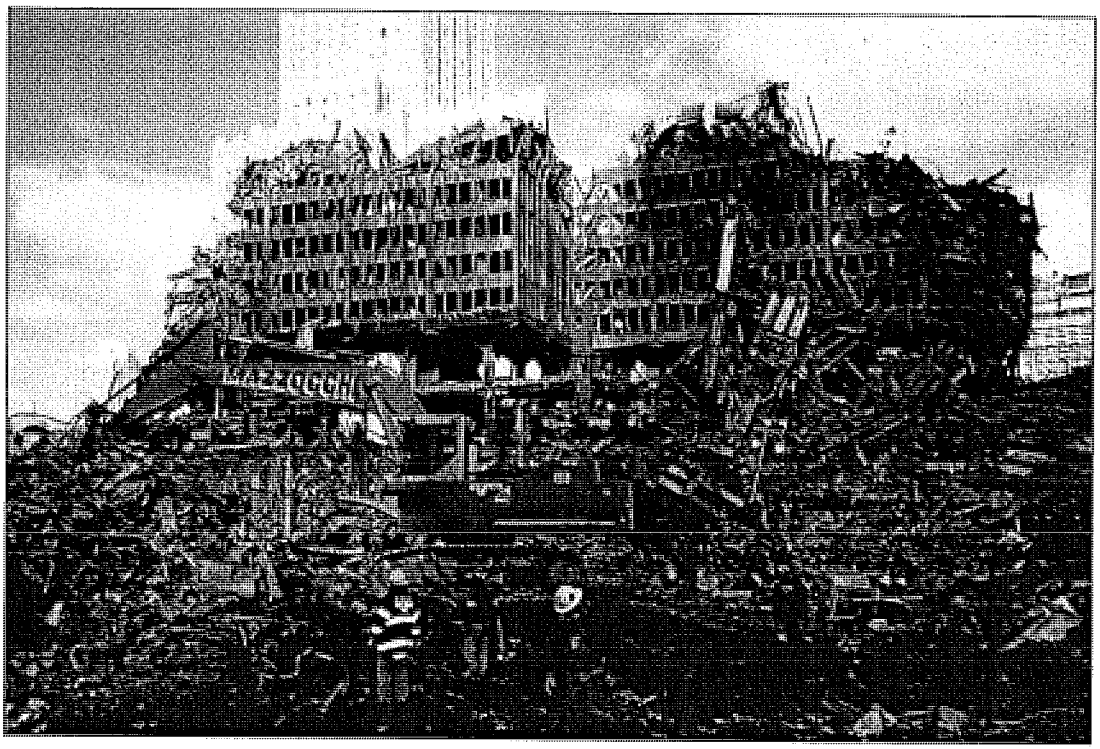
During the rescue and recovery period when New York City's Department of Design and Construction controlled the WTC Site, the materials were taken to Fresh Kills landfill and steel was taken to a steel recycling plant in New Jersey. The National Institute of Standards and Technology selected certain pieces of steel for testing to study factors leading to the collapse of the Towers.

A note on the cover of the Steel Data Collection Spreadsheet attached to FEMA's World Trade Center Building Performance Study indicates that: "As of May 2002, of the 156 steel pieces listed in the spread sheet, 41 are at the National Institute of Standards [and Technology], 19 were discarded after [samples] were taken, 45 are at the salvage yards, and the rest either were discarded after they were documented or were accidentally processed in the salvage operation before or after being documented."

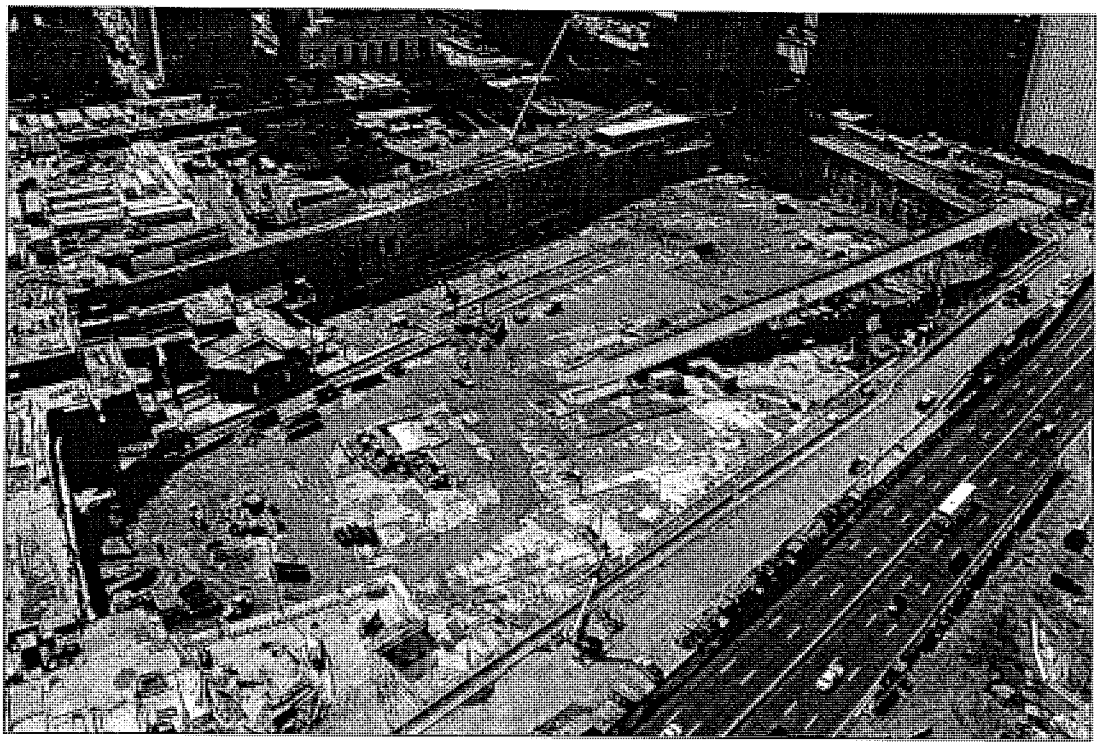
During the recovery efforts numerous requests were made by museums and other organizations for materials from the WTC Site. These requests were directed to the New York City Office of Emergency Management (OEM) and OEM allowed some organizations to take some materials. It has been reported that artifacts are in the possession of the Smithsonian Institution, the Federal Bureau of Investigation (FBI), the New York City Police Department (NYPD), the Fire Department of New York (FDNY), the Museum of the City of New York, the New York City Police Museum, the New York City Fire Museum, the Staten Island Historical Society, the New York Historical Society and the New Jersey Historical Society. One round planter containing a living yew tree was salvaged from the WTC Site and is now located at the Governor's mansion in a nursery behind the house. A 60-ton piece of steel was given to the United States Navy and was melted down for the SS New York. At one point the Mayor's office was giving away two-foot sections of steel and some of this steel is at Mt. Manresa—a retreat house in Staten Island that housed out-of-town workers involved in the recovery efforts at Fresh Kills. In addition, a traveling exhibition from the NYSM titled "Recovery: The World Trade Center Recovery Operation at Fresh Kills" has about 50 rare photographs and 40 objects and is touring the country.

The New York State Museum in Albany has a number of artifacts from the WTC Site including the heavily damaged Engine 6 pumper, recovered NYPD and FDNY objects, architectural remains, several battered flags, a large steel column from floors 7-9 of Tower Two, a damaged 20-foot high, 10-ton steel column from floors 71-73 of Tower One, the steering wheel from a car, observation deck souvenirs, melted floppy discs, keys, a crushed payphone, a large collection of firearms from the U.S. Customs House (Six World Trade Center), destroyed street lampposts, fire hydrants, a destroyed elevator door, pieces of the airplanes that crashed into the Twin Towers including a portion of the wheel assembly from one of the planes, a piece of fuselage, and a steel beam with an embedded airplane piece.

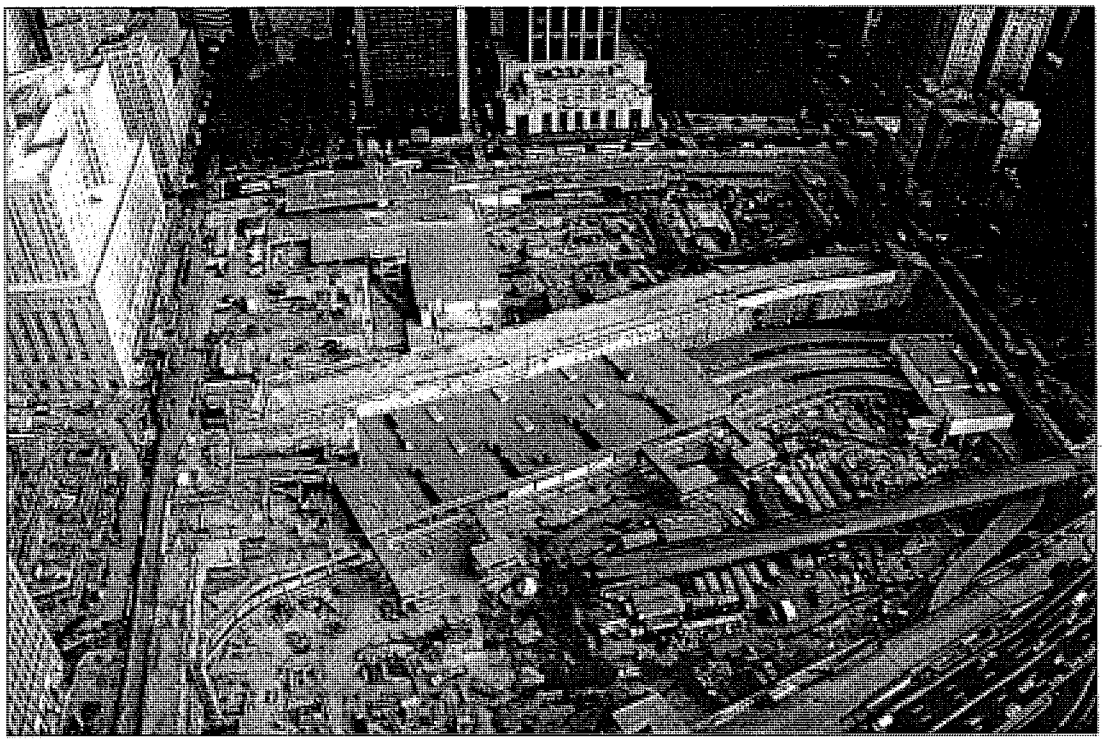
The Port Authority has a large number of artifacts catalogued and stored in Hangar 17 at John F. Kennedy (JFK) Airport. They were retrieved from Fresh Kills landfill and the steel recycling yard in New Jersey, as well as the WTC Site. One of the objects is a 36-foot-by-4-foot steel column that was the last large piece of steel carried off the WTC Site. It was removed in the ceremony on May 30, 2002, marking the day following the recovery of the last human remains at the site. Hangar 17 also contains pieces of a 100-foot-tall by 100-foot-wide section of the lower facade of Tower One with its Gothic arches. The collection also includes a portion of the Tower One antenna, a turnstile from the WTC PATH Terminal, a motor from one of the Twin Towers giant elevators, a bicycle rack with seven abandoned bikes and a silver and blue helmet, and six crushed ladder trucks and fire engines.



View of WTC Site as it appeared in December 2001 (Port Authority) 1

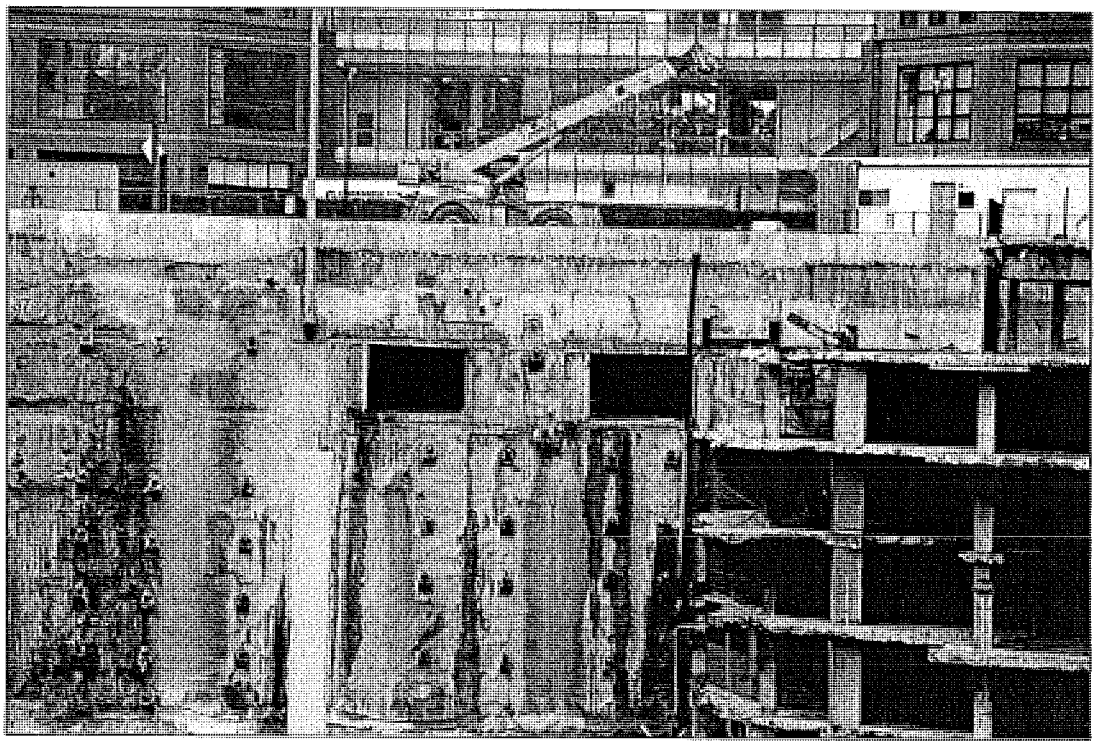


View of WTC Site as it appeared in June 2002 (Port Authority) 2

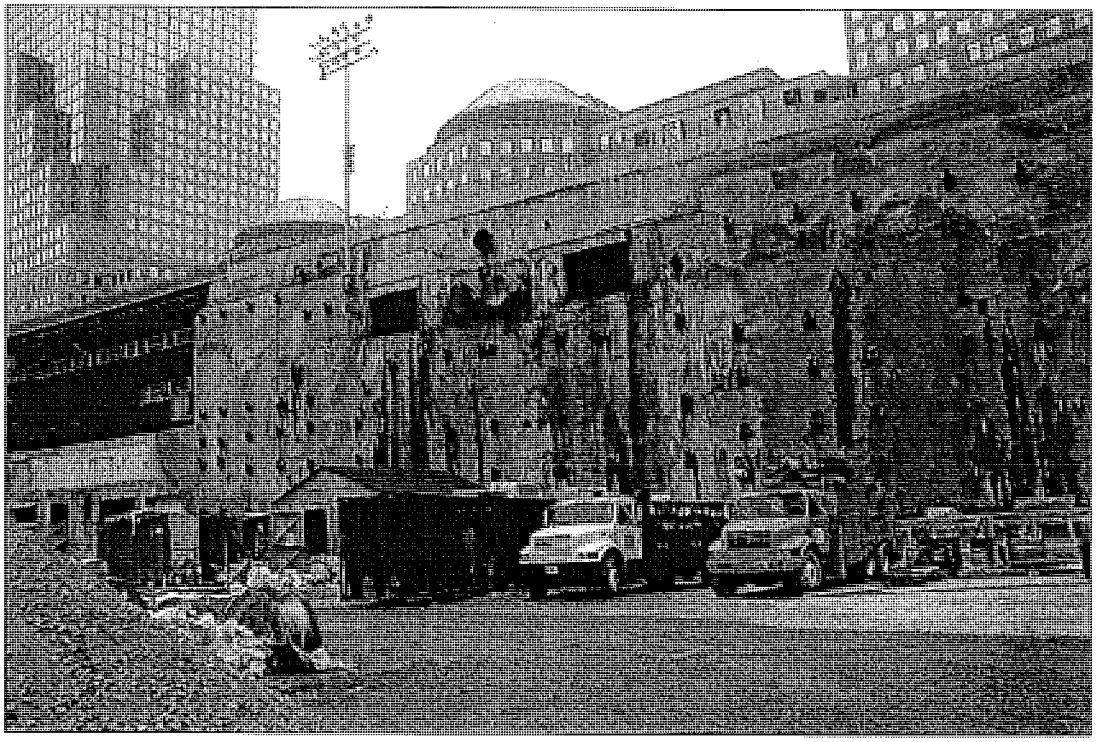


Aerial view of WTC Site (Port Authority) **3**

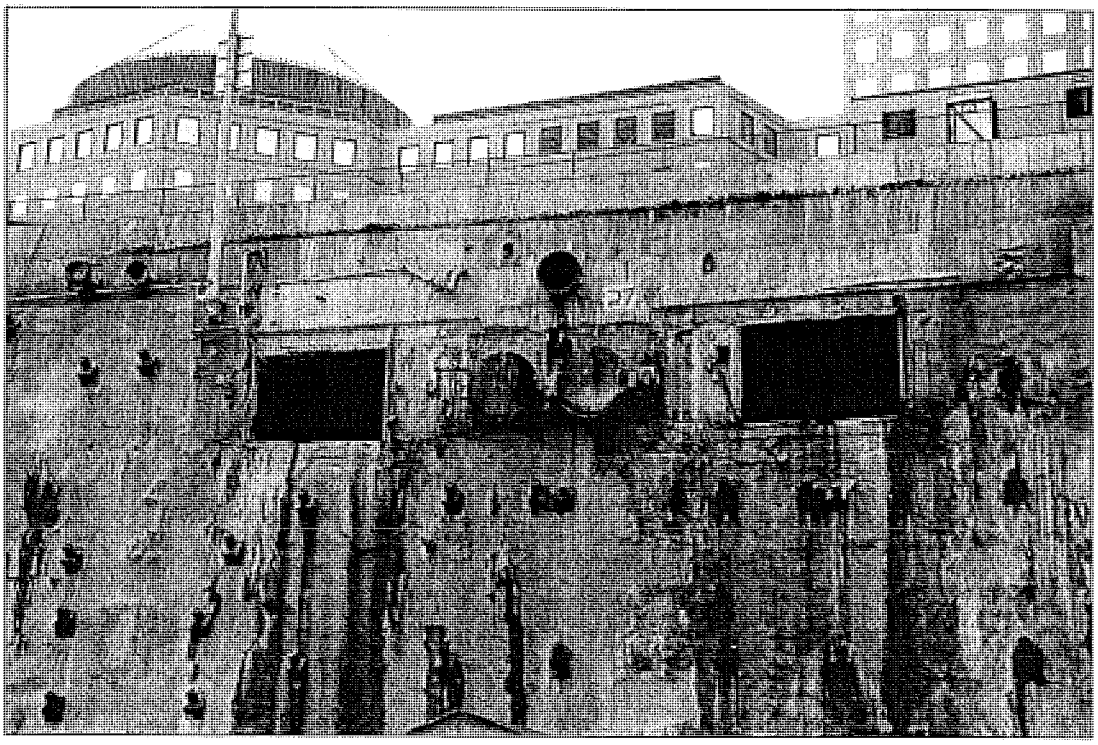
View of bathtub, looking south from northern edge of WTC Site **4**



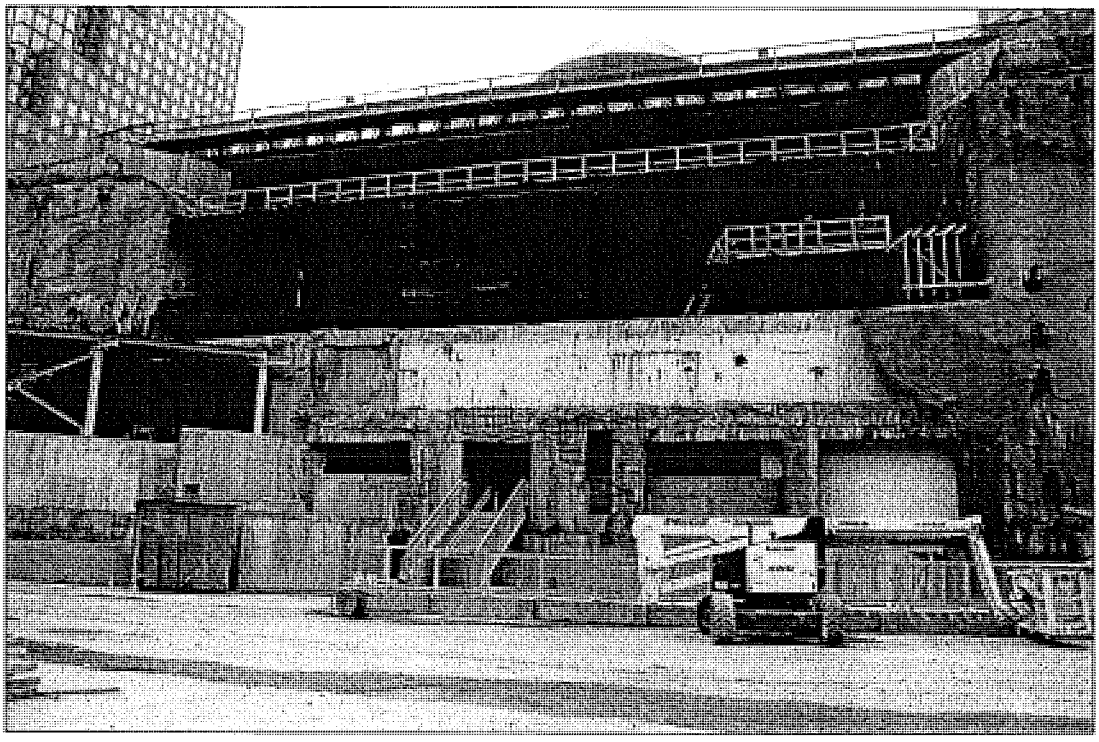
West slurry wall, north end **5**



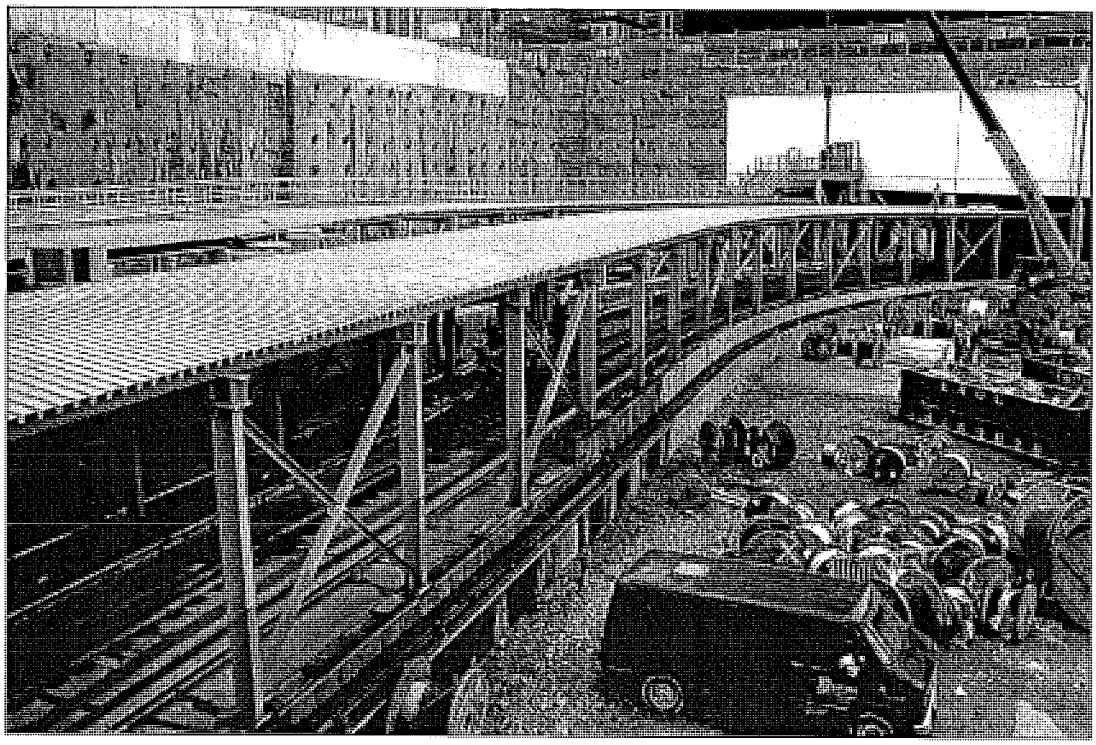
West slurry wall, view of vehicular entrance ramps and southern projection **6**



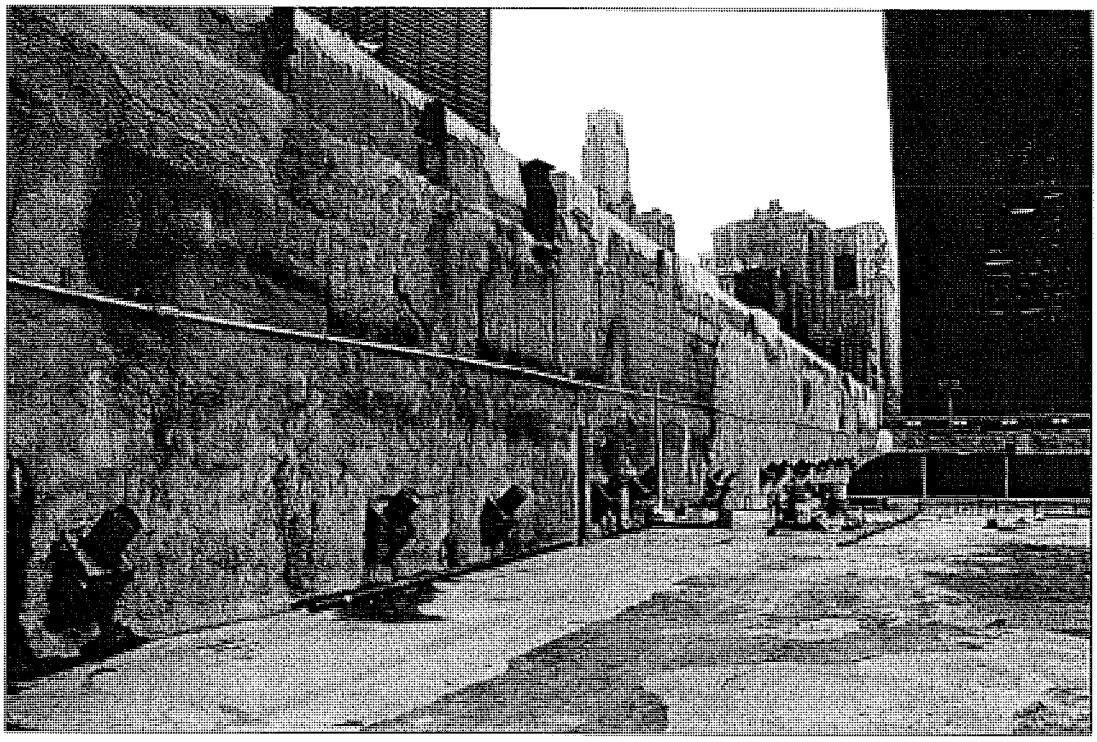
West slurry wall, detail view of vehicular entrance ramps and cooling water pipes **7**



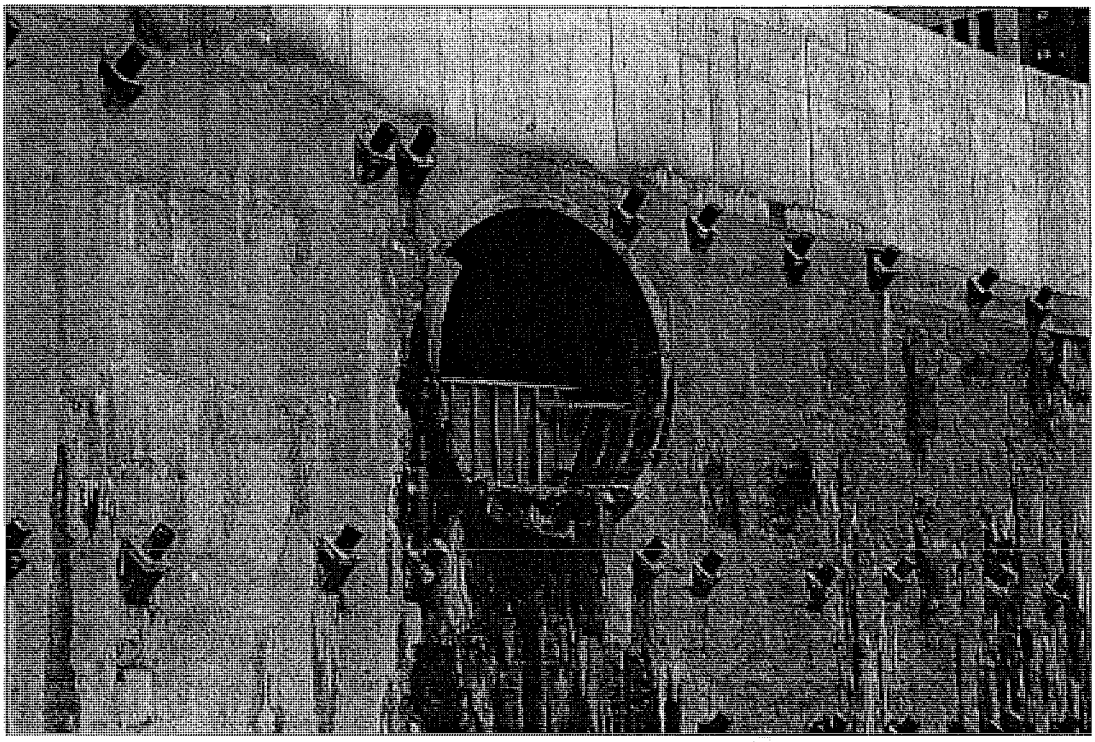
West slurry wall, view of southern projection and PATH tunnel access **8**



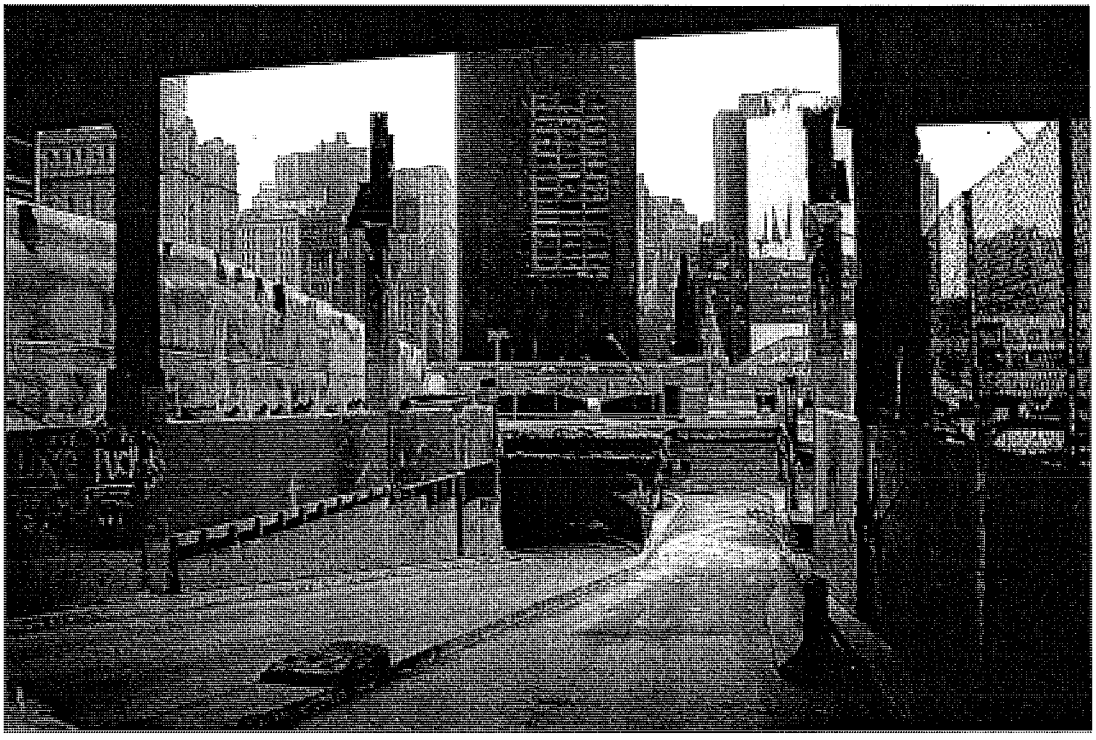
South and east slurry walls, view of new PATH tracks **9**



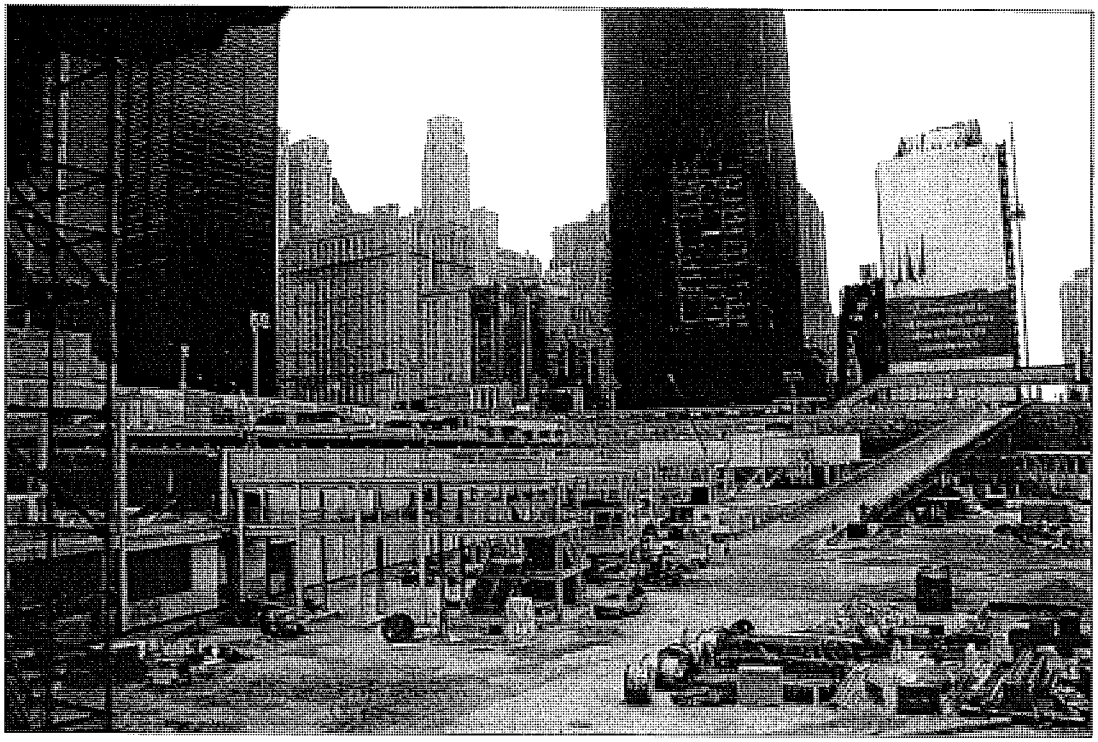
East slurry wall **10**



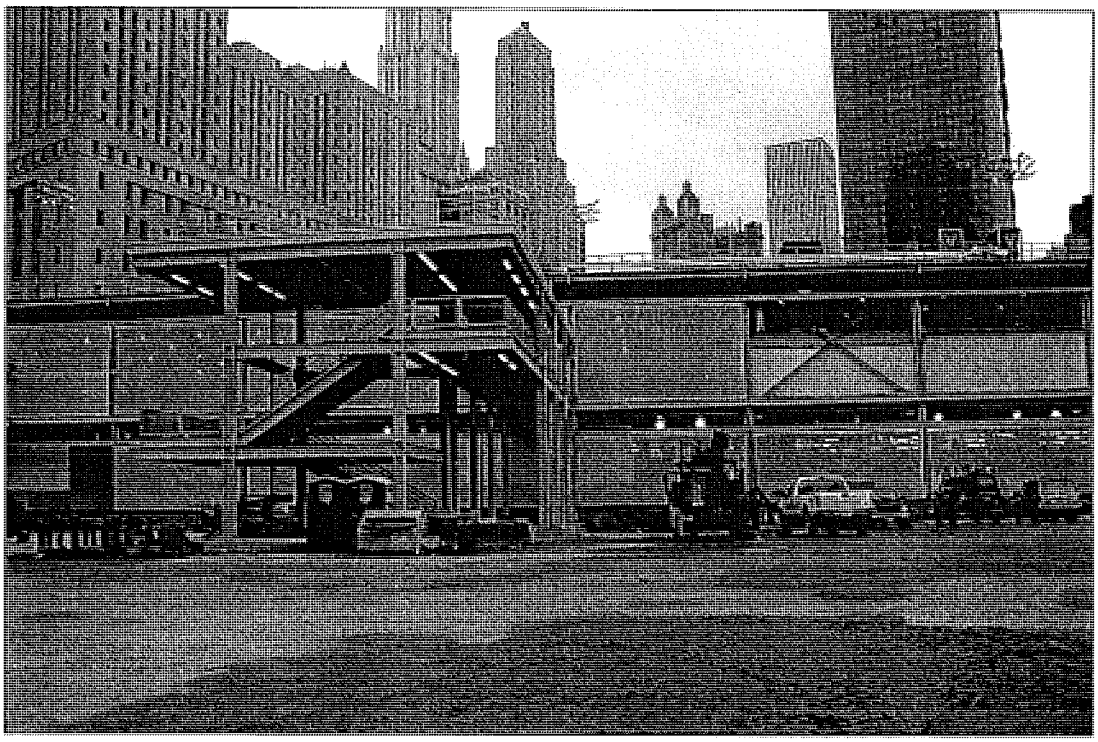
East slurry wall, view of Hudson Tube **11**



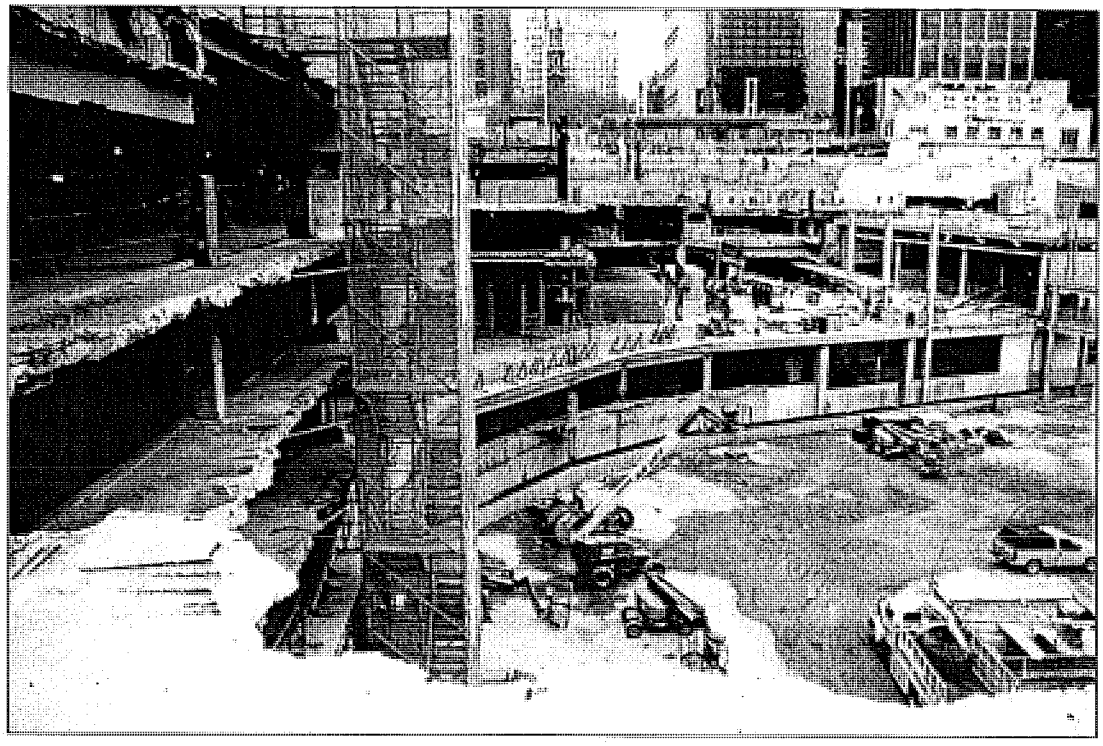
East slurry wall, view of vehicular access ramp **12**



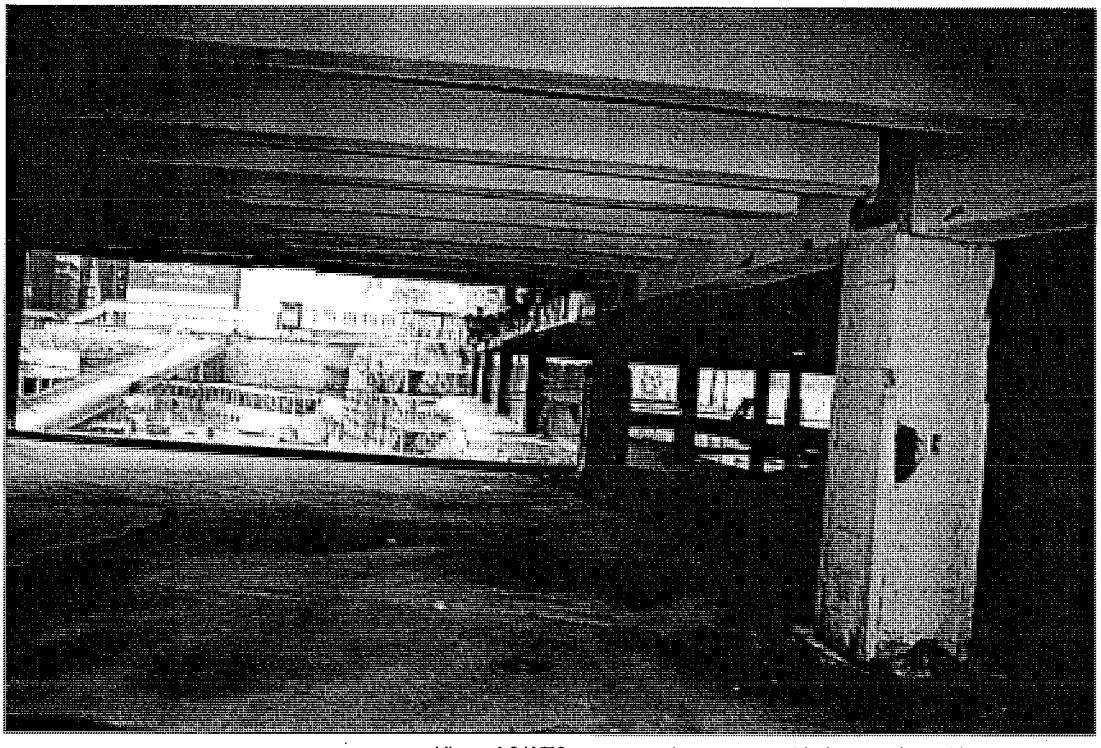
View of temporary WTC PATH station, adjacent to east slurry wall **13**



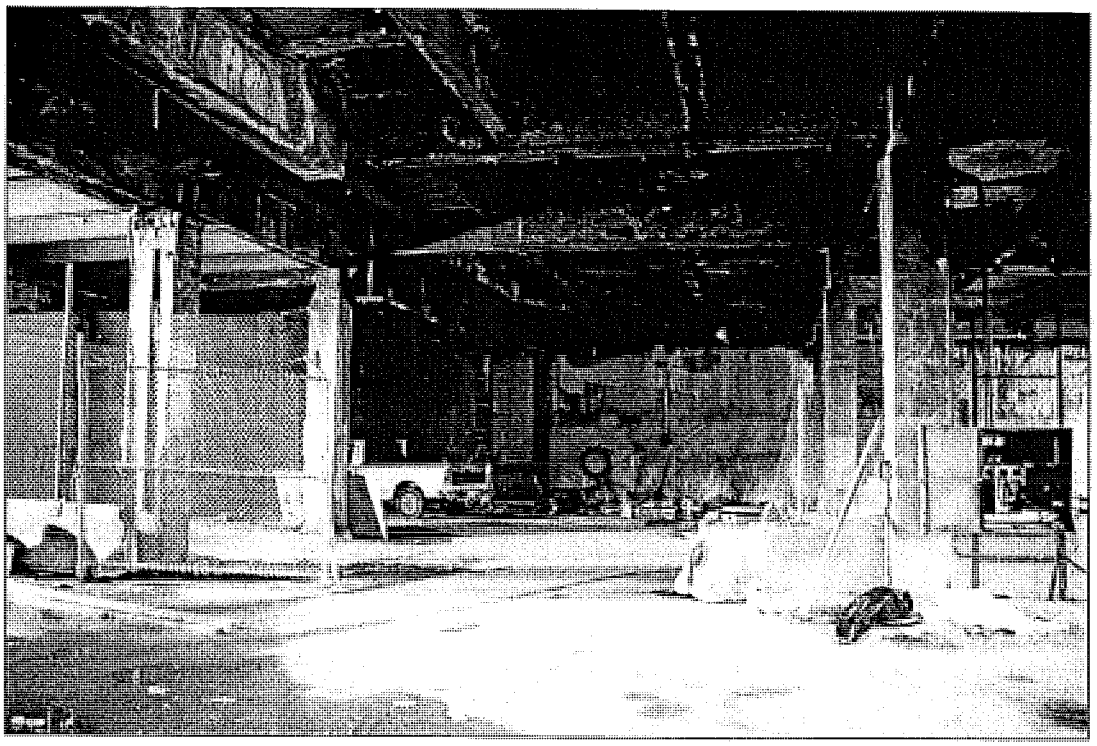
View of temporary WTC PATH station **14**



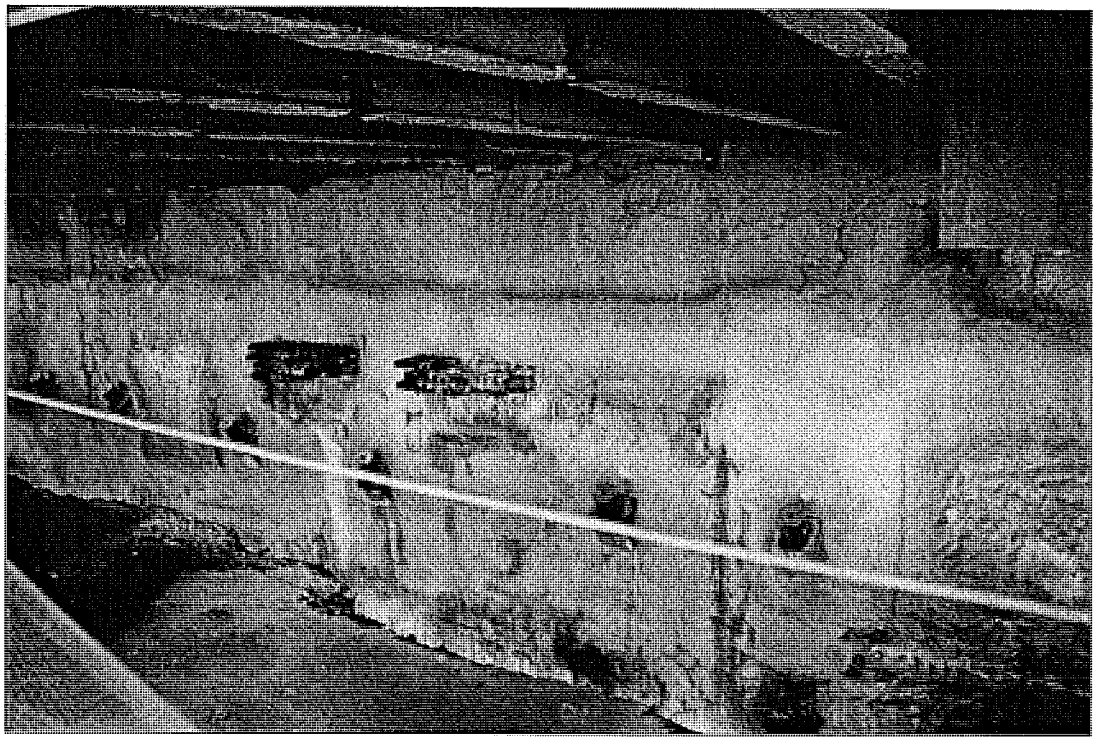
North slurry wall, view of remnants of 6 WTC **15**



View of 6 WTC remnants, former area of below-grade parking **16**

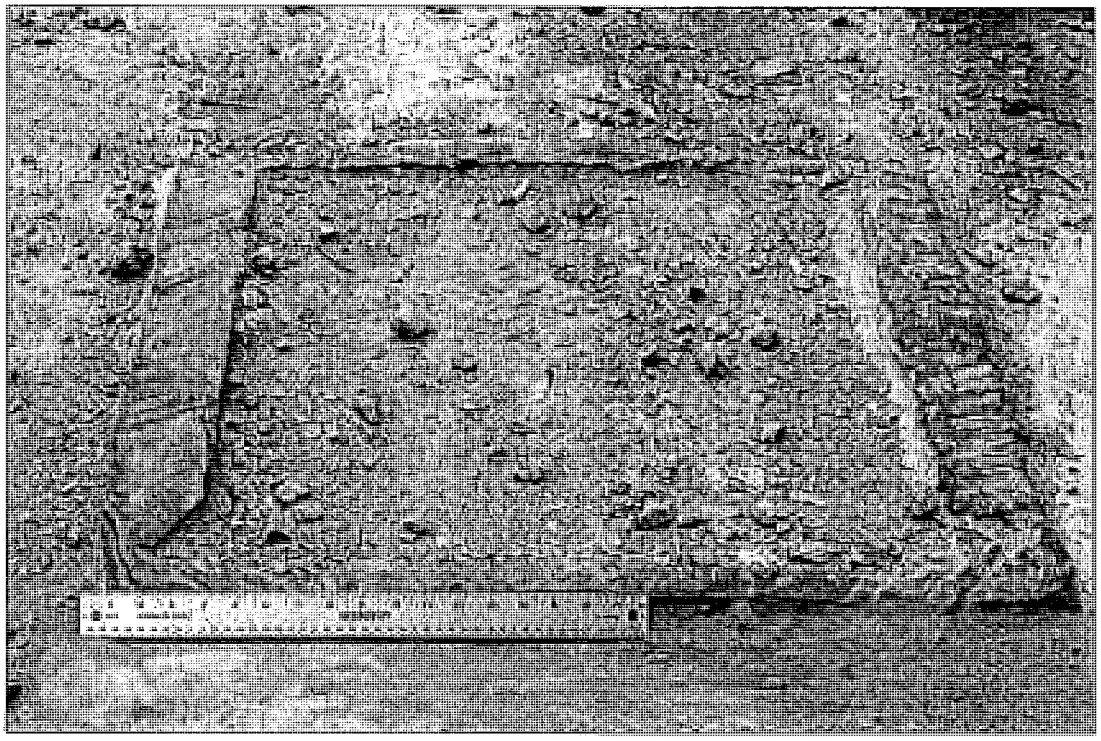


View of 6 WTC remnants, former area of below-grade parking **17**

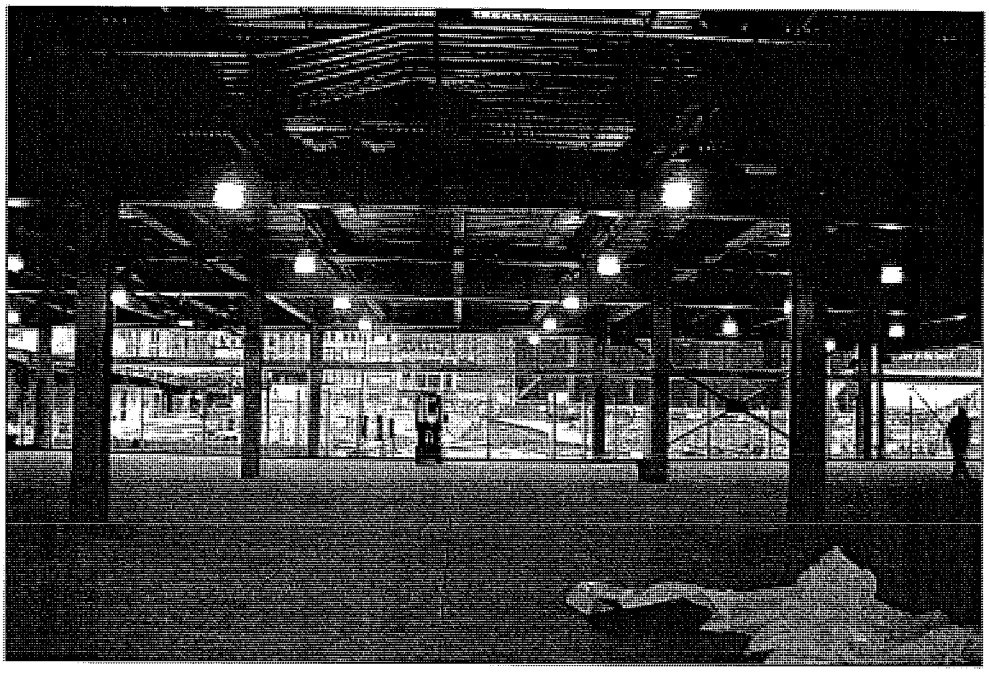


North slurry wall, view of temporary tieback caps **18**

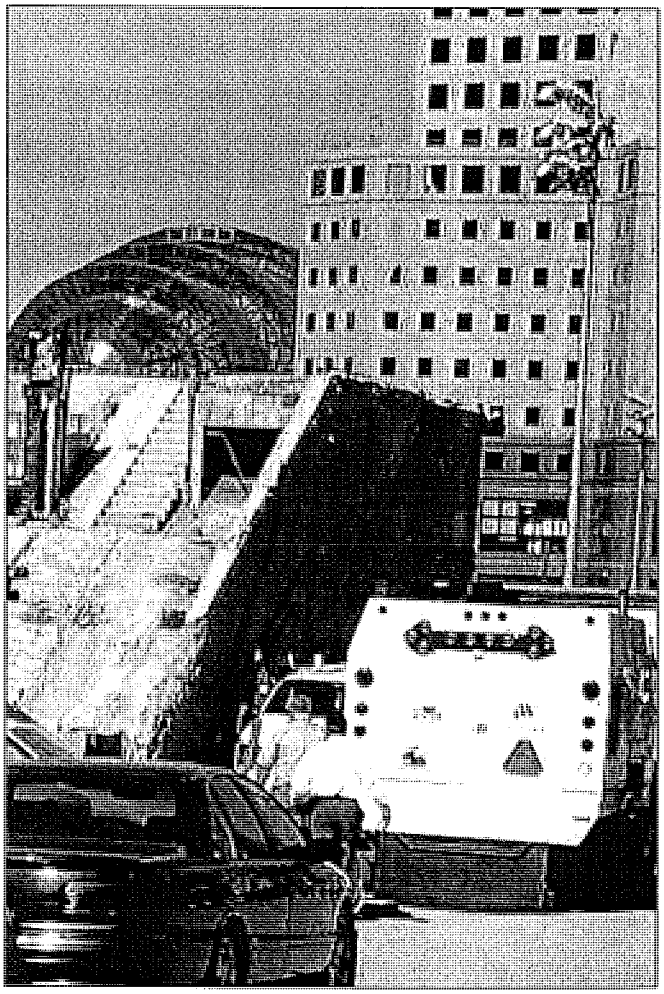
Bathtub area, truncated box beam column bases **19**



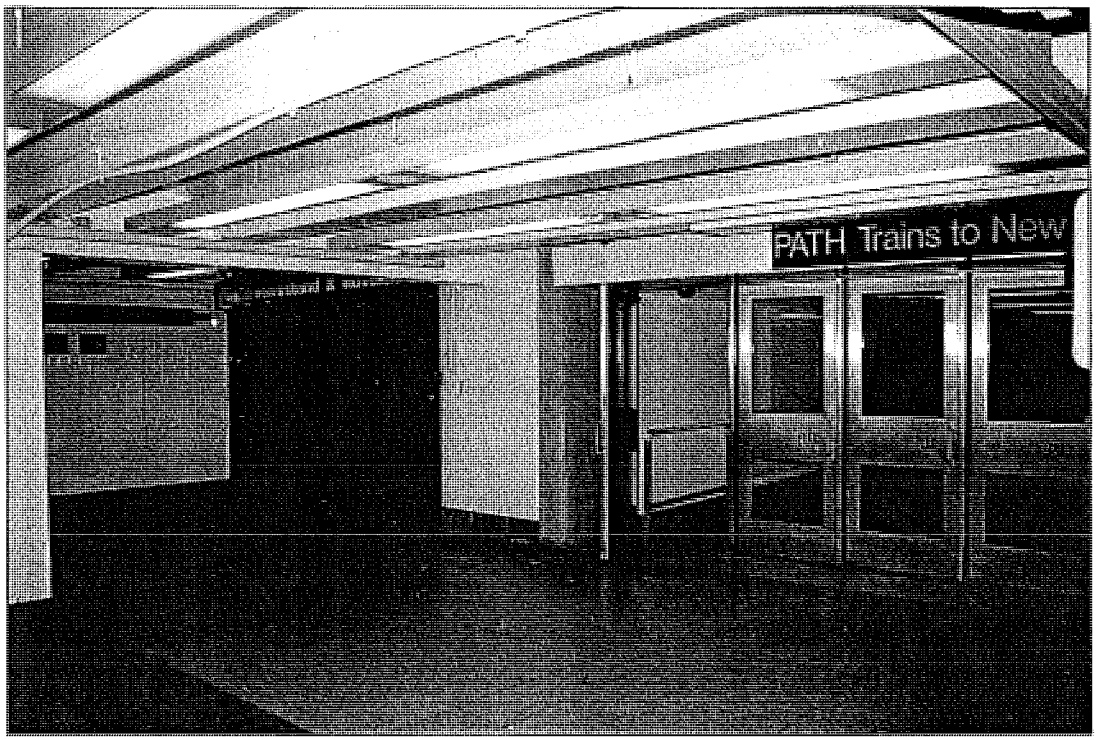
Bathtub area, detail view of truncated box beam column base **20**



View of new temporary WTC PATH station concourse **21**



View of damaged stair and escalator structure on Vesey Street **22**



Remnants of the WTC passageway to the E subway line **23**

Remnants of the WTC passageway to the E subway line **24**

MEMORANDUM OF AGREEMENT
AMONG
THE FEDERAL TRANSIT ADMINISTRATION
THE NEW YORK STATE HISTORIC PRESERVATION OFFICE
ADVISORY COUNCIL ON HISTORIC PRESERVATION
AND
THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
REGARDING THE
WORLD TRADE CENTER TRANSPORTATION HUB
(WTC PATH TERMINAL AND PEDESTRIAN CONNECTIONS)
IN NEW YORK CITY, NEW YORK

WHEREAS, the Port Authority of New York and New Jersey ("PANYNJ") proposes to construct a World Trade Center Transportation Hub, consisting of a permanent WTC PATH Terminal and pedestrian connections ("the Project") at the World Trade Center ("WTC") Site, currently bounded by Church, Liberty, West, and Vesey Streets in Manhattan; and

WHEREAS, the previous WTC PATH Terminal facility was destroyed as the result of the terrorist attacks on September 11, 2001, and re-establishment and enhancement of the WTC PATH transportation facility is critical to the long term economic revitalization and growth of Lower Manhattan; and

WHEREAS, a temporary WTC PATH station was constructed by PANYNJ and has been operating since November 23, 2003; and

WHEREAS, PANYNJ is proposing to use funding assistance from the Federal Transit Administration ("FTA") to implement the Project, assistance that renders the Project a Federal undertaking subject to Section 106 of the National Historic Preservation Act ("Section 106"), 16 USC § 470; and

WHEREAS, FTA, as lead agency, in cooperation with PANYNJ, has prepared an Environmental Impact Statement ("EIS") in accordance with the National Environmental Policy Act ("NEPA") to evaluate the Project's potential environmental impacts and consider various project alternatives; and

WHEREAS, FTA has consulted with the New York State Historic Preservation Office ("SHPO") and the Advisory Council on Historic Preservation ("ACHP") about the Project in accordance with the Section 106 regulations (codified at 36 CFR Part 800); and

WHEREAS, FTA, in consultation with SHPO, has determined the Area of Potential Effect ("APE") for the Project as defined in 36 CFR 800.16(d), to be as depicted on the map presented as Exhibit A hereto, and have identified the properties listed in or eligible for inclusion in the National Register of Historic Places ("Historic Properties" and/or "Historic Resources") within that APE (pursuant to 36 CFR 800.4[b]-[d]), and has determined the effects of the Project on the identified Historic Properties in accordance with 36 CFR 800.5; and

WHEREAS, FTA has applied the Criteria of Adverse Effect (36 CFR 800.5[a][1]), in consultation with SHPO, and has determined that implementation of the Project will have an adverse effect on the following Historic Properties within the APE:

a. WTC Site (Tower Perimeter Column Remnants outlining the footprints of the North Tower and the South Tower and the footprints with Other Column Bases and Infrastructure, E Subway Entrance, East and West Slurry Walls, Steel Beams in Cross Form and Remnants of the Hudson Terminal and the H&M Railroad); and
b. Hudson River Bulkhead; and

WHEREAS, FTA has applied the Criteria of Adverse Effect (36 CFR 800.5[a][1]), in consultation with SHPO, and has determined that implementation of the Project may have an adverse effect on the following Historic Properties within the APE:

a. WTC Site: Vehicular Entrance Ramps, Cooling Water Pipes, Southern Projection, Tiebacks, PATH Tunnel Access, South Slurry Wall, Recovery and Construction Ramp, Hudson Tubes, Vehicular Access Ramp (connecting Barclay Street with 7 WTC), North Slurry Wall, 6 WTC, Vehicular Access Ramp to Barclay Street (under 7 WTC), and Restored NYCT No. 1/9 Subway Line;
b. Barclay-Vesey Building, 140 West Street;
c. Former East River Savings Bank, 26 Cortlandt Street;
d. Beard Building, 125 Cedar Street;
e. 114-118 Liberty Street; and
f. St. Paul's Chapel and Graveyard, Broadway and Fulton Street; and

WHEREAS, FTA finds, in consultation with SHPO and PANYNJ, that the Project may have adverse effects on archaeological resources yet to be identified within the APE in areas depicted in Exhibit B attached hereto; and

WHEREAS, FTA has applied the Criteria of Adverse Effect (36 CFR 800.5[a][1]), in consultation with SHPO, and has determined that implementation of the Project will result in no adverse effect on the following Historic Properties within the APE:

a. WTC Site (any elements not included in the foregoing two Whereas clauses);
b. Federal Office Building/U.S. Post Office, 90 Church Street;
c. St. Peter's Roman Catholic Church, 22 Barclay Street;
d. Former St. Peter's School;
e. 30 Vesey Street;
f. Old New York Evening Post Building, 20 Vesey Street;
g. New York County Lawyers' Association, 14 Vesey Street;
h. Astor Building, 217 Broadway;
i. Transportation Building, 225 Broadway;
j. African Burial Ground and the Commons Historic District, bounded by Duane Street, Park Row, Broadway and Center Street;

k. Former AT&T Company Building, 195 Broadway;
l. 21-23 Thames Street;
m. 90 West Street;
n. Fulton Street IRT Station;
o. Plaza and subway access from Vesey Street; and
p. United States Realty Building, 115 Broadway; and

WHEREAS, since early 2002, PANYNJ and the Lower Manhattan Development Corporation ("LMDC") have coordinated with New York State Department of Transportation ("NYSDOT"), FTA, the U.S. Department of Housing and Urban Development ("HUD"), and the Federal Highway Administration ("FHWA") with respect to historic and environmental analyses including Environmental Performance Commitments ("EPC's") (attached hereto as Exhibit C), coordinated Section 106 meetings prior to the execution of a Coordinated Determination of Eligibility ("DOE"), and the execution of a Coordinated DOE itself; and

WHEREAS, PANYNJ, LMDC, NYSDOT and New York Metropolitan Transportation Authority ("MTA") concurred to adhere to certain common commitments set forth in the EPC's, as part of the Environmental Analysis Framework ("EAF") (attached hereto as Exhibit D), that commit to the coordinated analysis of cumulative environmental impacts including Air Quality, Noise and Vibration, Cultural and Historic Resources, Access and Circulation, and Economic Effects; and

WHEREAS, coordinated Section 106 meetings occurred among PANYNJ, LMDC, NYSDOT, FTA, HUD, FHWA and SHPO, which, in addition to soliciting input from the Project's Consulting Parties, developed the framework for a Coordinated DOE; and

WHEREAS, a Coordinated DOE, in consultation with the Project's Consulting Parties, was finalized on March 31, 2004, and concluded that the WTC Site is eligible for inclusion in the National Register of Historic Places; and

WHEREAS, the Coordinated DOE of the WTC Site for the National Register identified elements that contribute to the WTC Site's historic significance; and

WHEREAS, based on the findings in the Coordinated DOE, the federal agencies proceeded with the planning and development of their separate projects under their jurisdiction. Where the Permanent WTC PATH Terminal Project and another project (the WTC Memorial and Redevelopment Plan, Fulton Street Transit Center, or the Route 9A Project) affect a particular element as identified in the DOE, PANYNJ and the appropriate sponsoring agency(s) will coordinate their respective projects such that the effects of the Project on these elements are fully addressed in consultation with SHPO and the Project's Consulting Parties; and

WHEREAS, PANYNJ, during project design, construction, system testing, and the first six months of full operation of the Project, will review and consider all construction plans for redevelopment of the WTC Site that may result in long-term or unanticipated adverse effects on the WTC Historic Property in order to avoid, minimize, or mitigate such effects on historic

properties that may result from multiple projects and their incremental cumulative impacts on the WTC Site as defined in 40 CFR 1508.7; and

WHEREAS, the United States Department of Transportation ("DOT") is evaluating project alternatives for the reconstruction of a half-mile section of Route 9A (West Street) along the west side of the WTC Site through FHWA; and is proposing construction of the Fulton Street Transit Center, which will have pedestrian connections to the Project through FTA; and has executed a Section 106 Amendment to the 1994 Programmatic Agreement dated October 13, 2004 and attached hereto in Exhibit E; and executed a Section 106 Programmatic Agreement dated September 24, 2004, respectively; and

WHEREAS, LMDC, as a recipient of community development block grant assistance from HUD, is responsible for the planning and execution of the WTC Memorial and Redevelopment Plan, that is the subject of a Programmatic Agreement among LMDC, SHPO and ACHP executed on April 22, 2004 and attached hereto as Exhibit F hereto; and

WHEREAS, these other projects associated with the WTC Site are subject to certain executed Section 106 Agreement documents(s) referenced above and this Memorandum of Agreement ("Agreement") is not intended to amend, modify and/or create additional requirements for those projects under their respective executed Section 106 Agreement document(s); and

WHEREAS, pursuant to that certain Programmatic Agreement, LMDC, in cooperation with PANYNJ, has prepared documentation ("Proposed Removal of Remnants from the Northwest Corner of the World Trade Center Site") of the Northwest Slab remnants located in the WTC Site and has identified the following resources to be removed from the WTC Site to Hangar 17 at John F. Kennedy International Airport ("Hangar 17"):

a. smoke-scarred column;
b. column with blistered paint;
c. wall section from Level B2 with locational sign;
d. day-glow handrails; and

WHEREAS, SHPO, on May 24, 2004, has concurred with the "Proposed Removal of Remnants from the Northwest Corner of the World Trade Center Site"; and

WHEREAS, LMDC and PANYNJ, recognized that certain other items were relevant to the WTC Site and shall preserve the wall section with heart and cross graffiti and two steel beams with the name "Levinson" stamped on them, from the Northwest Slab remnants from the WTC Site; and

WHEREAS, PANYNJ is the interim custodian of certain structural materials and other items (hereafter referred to as "off-site artifacts") removed from the WTC Site and the immediately surrounding area during the post-September 11, 2001 recovery effort and now located in Hangar 17 and other PANYNJ locations; and

WHEREAS, the Project's key goals and objectives include the following: Create a World-Class, Transportation Facility; Support the Redevelopment of Lower Manhattan; Provide for Improved

Pedestrian Connections; Provide for Advanced Security; Enhance Pre-September 11, 2001 PATH Operations; Support 10-Car PATH Trains in Order to Support Ridership Growth; Minimize Impacts to Temporary PATH Service during Construction; Minimize Impacts to the Local Environment during Construction; and Minimize Construction Cost and Duration; and

WHEREAS, of the different alternatives further evaluated and identified in the EIS, FTA and PANYNJ determined that one alternative is the optimal configuration; and

WHEREAS, FTA and PANYNJ evaluated three alternatives to be carried forward for further study in the Draft EIS, identified as a No Action Alternative, and two alternatives of the optimal configuration: a Terminal with Liberty Plaza Connection Alternative and a Terminal without Liberty Plaza Connection Alternative; and determined that the selected alternative for transit service between New Jersey and Lower Manhattan is the Terminal without Liberty Plaza Connection; and

WHEREAS, this Agreement was developed with appropriate public involvement (pursuant to 36 CFR 800.2[d] and 800.6[a]) both coordinated with the scoping, public review and public hearings conducted to comply with NEPA and its implementing regulations and through public meetings specifically conducted to comply with NHPA and its implementing regulations; and in consultation with the SHPO, ACHP and (pursuant to 36 CFR 800.2[d] and 800.6[a]) more than 70 invited Consulting Parties (identified in Exhibit G hereto); and

WHEREAS, National Park Service ("NPS") may have an ongoing interest in the WTC Site and will be recognized as a Consulting Party in the implementation of this Agreement, and will be provided appropriate documentation to assist in any subsequent evaluation of the WTC Site; and

WHEREAS, the public was provided the opportunity to comment on the Project and the following Project documents, and the public will hereafter be provided with further opportunities to comment on the Project as stipulated further in this Agreement:

1. Scoping document for the preparation of an EIS for the Project pursuant to NEPA and its implementing regulations;
2. Draft EIS for the Project, dated May 2004, prepared pursuant to NEPA;
3. Draft Finding of Effects, distributed June 3, 2004, prepared pursuant to NHPA; and

WHEREAS, on June 4, 2004, by copy of the Draft EIS, the following Native American Tribes have been invited, through the NEPA process, to comment on the Project: the Shinnecock Nation; the Cayuga Nation; the Tuscarora Nation; the Saint Regis Band of Mohawk Indians; the Delaware Nation; the Poospatuck Nation; the Onondaga Indian Nation; the Oneida Indian Nation; the Tonawanda Band of Seneca; and the Stockbridge-Munsee Band of Mohicans. To date, FTA and PANYNJ have received comment from the Shinnecock Nation. An opportunity for further comment will continue as per provisions stated in Stipulation X; and

WHEREAS, the following Native American Tribes have been invited to participate in the Section 106 review: Cayuga Nation, Delaware Nation, Shinnecock Nation Cultural Center and Museum, St. Regis Band of Mohawk Indians, Stockbridge-Munsee Band of Mohicans. To date,

FTA and PANYNJ have received comments from the Shinnecock Nation. An opportunity for further comment will continue as per provisions stated in Stipulation X; and

WHEREAS, in response to Executive Order 133 for the State of New York signed on November 22, 2004, the Lower Manhattan Construction Command Center ("LMCCC") was established to ensure that adverse effects at Lower Manhattan Recovery Projects are minimized, coordinate the work of the participants, institute and implement construction coordination protocols and requirements, and mediate conflicts in schedules.

NOW, THEREFORE, FTA, SHPO, ACHP and PANYNJ, as the signatory parties to this agreement, agree that the Project will be implemented in accordance with the following stipulations to ensure that the effects of the Project on Historic Properties are taken into account.

STIPULATIONS

FTA, as the Federal lead agency, remains responsible for the implementation of the terms of this Agreement and will require, as a condition of any approval of Federal funding for the Project, adherence to the stipulations set forth herein. PANYNJ, the project sponsor, will have the lead in the implementation of each stipulation unless otherwise noted in the stipulation.

I. WORLD TRADE CENTER SITE

Because the WTC Site is located in the APE of the WTC Memorial and Redevelopment Plan as well as in the APE for the Project, PANYNJ shall coordinate treatment of the WTC Site with LMDC.

A. DOCUMENTATION

1. As a measure to address adverse effects to the WTC Site, PANYNJ, prior to removal or alteration of any historic features of the WTC Site in connection with this Project, shall ensure that the WTC Site and its historic features are documented to Level II standards of the Historic American Buildings Survey/Historic American Engineering Record ("HABS/HAER"). This documentation shall consist of large format black-and-white photographs of the Site and historic features, as they currently exist.

   The construction fill on the footprints was temporarily removed for the purposes of documentation stipulated by this Agreement, and will be replaced with clean rounded gravel after the documentation in order to protect the footprints and column remnants from ongoing construction. Large-format photographic reproduction of selected drawings of current conditions and of pre-9/11 conditions, and a written history will be prepared and a description of the Site and historic features utilizing information previously generated for the Coordinated DOE for the WTC Site and the Project's EIS. HABS/HAER documentation generated by PANYNJ will be presented as a single submission to SHPO.

2. PANYNJ shall consult with SHPO and HABS/HAER to determine whether particular features warrant measured drawings; any such drawings shall be prepared by an individual

with demonstrated expertise in the preparation of measured drawings to HABS/HAER standards.

3. PANYNJ shall deposit the completed documentation in the following repositories unless otherwise determined by SHPO: (a) New York Historical Society; (b) New York City Public Library; (c) HABS/HAER; and (d) two copies to SHPO with one set to be forwarded to the New York State Archives. The large-format photographs prepared to HABS/HAER standards shall consist of the views itemized on the Schedule of Photographs appended hereto as Exhibit H. One set of the completed documentation will be presented to the WTC Memorial Center.

B. PERIMETER COLUMN REMNANTS OUTLINING NORTH TOWER AND SOUTH TOWER FOOTPRINTS AND THE TOWER FOOTPRINT AREAS AFFECTED

1. In the design and construction of the Project, PANYNJ shall to the maximum extent feasible, preserve in place 84 column base remnants in the North Tower and 39 column base remnants in the South Tower at the existing floor at elevation 242 (58 feet below Sea Level) that outline the footprints of the former Twin Towers at the WTC Site and are not located in the PATH right-of-way.

2. While striving to preserve in place the 84 column base remnants in the North Tower and the 39 column base remnants in the South Tower, up to a total of 16 column bases in the North Tower and up to a total of 3 column bases in the South Tower have the potential to be temporarily or permanently removed. If they are to be removed, they are to be removed as follows:

   a. *Platform D.* Every effort will be made to avoid removing any column bases, however, up to 5 column bases in the North Tower and up to 3 column bases in the South Tower could be temporarily or permanently removed to construct Platform D. The design of Platform D in the northeast corner area of the North Tower has been modified to move the vertical circulation element to the north and west on the Platform allowing the corner of the North Tower to be symbolically represented in the finish materials on the Platform. A minimum of 5 to a maximum of 7 column bases of the east column line of the North Tower will be visible from Platform D. The viewing area will consist of a glass wall tilted inward from the Platform combined with a mirrored wall along the west wall enabling viewing of the column bases from this area of the Platform. Appropriate signage, graphics, and lighting will complete the viewing area.

   b. *Platforms B, C, and D.* The locations of column remnants of the South Tower that may be removed or permanently obscured by the Project platforms shall be symbolically represented on these platforms through architectural treatments that will define and differentiate the portions of the infrastructure that are within the Tower footprint areas. These treatments may include color differentiation, texture differentiation, symbolic representation of Tower perimeter column remnants and/or an emblematic marker designating the location of the Historic Resource.

c. *Project Foundation.* Up to 4 column bases in the North Tower could be temporarily removed by work to install other Project structures and infrastructure. Of the 4 column bases that could be affected by the Project foundation, those column bases that remain in situ undisturbed or are temporarily removed and returned to their original locations will be accessible following the completion of these foundations.

3. Removing column bases, on either a temporary or permanent basis, will be considered only after practical engineering design options pursuant to Stipulations I. B. 2a and 2b, to preserve column bases in place have been exhausted. Column bases that are removed will be returned to their original locations if practical engineering design permits. Permanent removal of column bases will only take place as a last resort, and these column bases will be removed to Hangar 17 pursuant to Stipulation I. H.

4. The proposed east-west pedestrian corridor shall be designed and built in a manner that avoids the column remnants projecting above the concrete slab that outline the north perimeter of the North Tower and place this corridor at least 5 feet outside the North Tower footprint as measured from the center line of each projecting column base to the face of the nearest structural support wall.

5. The temporary PATH track (in addition to the existing 5 tracks) and associated ballast that will be installed on a temporary basis during construction of the Project tracks and platforms shall be removed upon completion of the permanent tracks and platforms to re-expose the North Tower and South Tower perimeter column remnants and portions of the North Tower and South Tower footprints that may be covered by the temporary track and ballast.

6. The total extent of the North Tower footprint at the lowest level, at approximately elevation 242 (58 feet below Sea Level) to be permanently occupied by any portion of the Project will be approximately 1,600 square feet and will not exceed 4% of the North Tower footprint area. The total extent of the South Tower footprint at the lowest level, at approximately elevation 242 (58 feet below Sea Level) to be permanently occupied by any portion of the Project will be approximately 21,615 square feet currently occupied by the WTC PATH facility, plus an additional 2,000 square feet required by the Project, and will not exceed 53% of the South Tower footprint area.

7. The construction fill on the footprints has been temporarily removed for the purposes of documentation of the footprints pursuant to Stipulation I.A. of this Agreement, and will be replaced with clean rounded gravel as required after the documentation in order to protect the footprints and column remnants from ongoing construction. Further treatments may be specified in the Resource Protection Plan.

8. Where treatments are set forth in this Stipulation under I. B. 2, PANYNJ shall follow this process:

   a. Design plans for the treatments will be developed in consultation with the SHPO and submitted at the preliminary (35%) and pre-final (75%) completion stages for SHPO comment. NPS and Consulting Parties will be given the opportunity to comment on the treatment design plans.

b. Design plans will be made available, subject to Stipulation IX.D., to the Consulting Parties and the public via the PANYNJ website at www.PANYNJ.gov/pathrestoration (Project website). The Consulting Parties will be informed of the availability of the plans by electronic notification as the plans are posted on the Project website and the Consulting Parties shall have 21 calendar days to comment on the plans. PANYNJ will provide paper copies of such plans to Consulting Parties upon request.

c. The review of the plans shall focus on the architectural treatments defining and differentiating the portions of the Project within the Tower footprint areas.

d. If SHPO makes substantive comments during the pre-final design review, SHPO may request the opportunity to concur on the final design.

e. SHPO will respond within 30 calendar days or earlier to the design plans at each stage of completion as described above.

f. Prior to approval of submitted plans and specifications, PANYNJ will consider and respond to all comments received from SHPO and Consulting Parties within the specified comments period. If SHPO does not respond within the comment period, PANYNJ may assume that SHPO concurs with the submitted plans and specifications.

C. E SUBWAY ENTRANCE

1. The new pedestrian connection between the Terminal and the MTA/NYCT E Subway shall be designed to incorporate the existing E Subway entrance, in its current location, in a manner that retains existing materials and features of this entrance, including, but not limited to, the handrails, travertine flooring, including the existing steps and doors separating the E train from the pedestrian connection, and overhead signage, to the extent possible and consistent with current building codes and Americans with Disabilities Act requirements. This design will include, at a minimum, a plaque identifying the historic features of the E subway entrance.

a. Design plans for treatments will be developed in consultation with the SHPO and submitted at the preliminary (35%) and pre-final (75%) completion stages for SHPO comment. NPS and Consulting Parties will be given the opportunity to comment on the treatment design plans.

b. Design plans will be made available to the Consulting Parties and the public via the Project website. The Consulting Parties will be informed of the availability of the plans by electronic notification as the plans are posted on the Project website and the Consulting Parties shall have 21 calendar days to comment on the plans. PANYNJ will provide paper copies of such design plans to Consulting Parties upon request.

c. The review of the plans shall focus on the treatment of the existing E Subway entrance.

d. If SHPO makes substantive comments during the pre-final design review, SHPO may request the opportunity to concur on the final design.

e. SHPO will respond within 30 calendar days or earlier to the design plans at each stage of completion as described above.

f. Prior to approval of submitted plans and specifications, PANYNJ will consider and respond to all comments received from SHPO and Consulting Parties within the specified comments period. If SHPO does not respond within the comment period, PANYNJ may assume that SHPO concurs with the submitted plans and specifications.

2. If during construction of the new pedestrian connection between the Terminal and the E Subway, it is determined that the existing E Subway entrance doors need to be removed, then they will be removed in accordance with Stipulation VI below.

D. PENETRATION OF EAST AND WEST SLURRY WALLS FOR THE PROJECT

1. The design for the Project shall provide visibility from within the Terminal to a portion of the East or West Slurry Wall if the following criteria are met: the condition of the slurry wall evokes the image now understood to represent the historic nature of the wall (e.g. Tiebacks are part of the area to be exposed, Tiebacks project beyond the re-stabilized slurry wall); the exposure provided would enable a view of the slurry wall which is clear, recognizable, and respectful of the slurry wall; and the exposure would not pose a safety hazard to the public from exposed finishes of the wall or its components. The design for the East-West Pedestrian Connector shall include a location from which the members of the public using the Connector may, at a minimum, view a plaque and photograph of the West Slurry Wall.

a. Design plans for treatments will be developed in consultation with the SHPO and submitted at the preliminary (35%) and pre-final (75%) completion stages for SHPO comment. NPS and Consulting Parties will be given the opportunity to comment on the treatment design plans.

b. Design plans will be made available to the Consulting Parties and public via the Project website. The Consulting Parties will be informed of the availability of the plans by electronic notification as the plans are posted on the Project website and the Consulting Parties shall have 21 calendar days to comment on the plans. PANYNJ will provide paper copies of such design plans to Consulting Parties upon request.

c. The review of the plans shall focus on the slurry wall mitigation.

d. If SHPO makes substantive comments during the pre-final design review, SHPO may request the opportunity to concur on the final design.

e. SHPO will respond within 30 calendar days or earlier to the design plans at each stage of completion as described above.

f. Prior to approval of submitted plans and specifications, PANYNJ will consider and respond to all comments received from SHPO and Consulting Parties within the specified comments period. If SHPO does not respond within the comment period, PANYNJ may assume that SHPO concurs with the submitted plans and specifications.

E. STEEL BEAMS IN CROSS FORM

PANYNJ shall relocate the steel column and crossbeam mounted on a concrete pedestal and currently situated within the WTC Site near Church Street to Hangar 17 or an alternate location in accordance with Stipulation VI below, where the object will remain in the custody and control of PANYNJ as are other off-site artifacts in Hangar 17 from the WTC Site, pending final disposition of these artifacts in accordance with the rights of the respective owners thereof.

F. RESOURCE PROTECTION PLAN FOR CONSTRUCTION AT WTC SITE

1. To protect historic elements of the WTC Site that are to remain in situ from inadvertent damage during construction activities of this Project within the WTC Site, PANYNJ, in consultation with SHPO and in coordination with LMDC and with (as appropriate) those with certain property interests in the WTC Site, shall develop a WTC Resource Protection Plan ("WTCRPP") for the Project after the Record of Decision for the Project.

2. The WTCRPP will describe in detail the construction procedures of the Project related to Historic Properties and the construction procedures associated with other projects under construction in the vicinity of those Historic Properties. It will also provide, with respect to the Project, for the inspecting and reporting of existing conditions at these historic elements; establish protection procedures; establish a monitoring program; establish and monitor construction methods; and establish methods and materials to be used for any repairs. A historic architect who meets the Secretary of the Interior's professional qualifications standards (48 F.R. 44716) in historic preservation will be part of the design/construction team for the Project and will have the opportunity to review design drawings and specifications for the Project prior to construction in order to prevent damage to Historic Resources.

3. The WTCRPP will empower the historic architect, in consultation with the Chief Engineer of PANYNJ ("Engineer") or the Engineer's designee, to issue "stop work" orders with respect to this Project to prevent any unanticipated damage to Historic Properties, and any recommencement of work shall only be permitted at such time that the Engineer and historic architect determine that the appropriate modifications have been made to the construction technique to assure that no damage will occur to Historic Properties.

4. PANYNJ shall furnish copies of the WTCRPP to SHPO, ACHP, NPS and Consulting Parties for review and comment on the WTCRPP with respect to the Project. NPS and Consulting Parties shall have 21 calendar days in which to comment on the WTCRPP with respect to the Project. SHPO and ACHP shall have 30 calendar days in which to review and comment on the WTCRPP with respect to the Project. Should SHPO and ACHP fail to respond within the 30 calendar day period, PANYNJ may assume

concurrence with the WTCRPP. PANYNJ shall consider all comments on the WTCRPP with respect to the Project received within this review period in preparing the final WTCRPP. The WTCRPP for the Project shall be in place prior to the commencement of construction of the WTC PATH Terminal.

G. CUMULATIVE EFFECTS

1. PANYNJ shall follow the process described below to address previously unanticipated cumulative adverse effects on the Historic Resources on the WTC Site during Project design, implementation, and testing, and the first six months of full operation of the Project that are caused in part by the permanent WTC PATH Terminal project together with other WTC Site project activities that, when considered along with existing conditions as well as reasonably foreseeable future conditions may cause irreversible or long-term adverse effects on qualifying characteristics of the WTC Site that were to be preserved or protected based upon the terms of this Agreement or other executed Section 106 Agreement document(s) associated with the WTC Site.

2. PANYNJ shall request all agencies that are constructing projects within the WTC Site to submit preliminary and pre-final documents to the PANYNJ to allow coordination of the Project activities with such other work and to permit the PANYNJ's assessment of the Project to include the potential for cumulative adverse effects on the WTC Site per I.G.1.

3. PANYNJ and its historic preservation consultant, will consult with SHPO and Lower Manhattan Emergency Preservation Fund (consisting of the following coalition of five preservation groups: Municipal Art Society, National Trust for Historic Preservation, New York Landmarks Conservancy, Preservation League of New York State, and the World Monuments Fund) in assessing whether there is a potential for cumulative adverse effects of the Project and other WTC Site projects per I.G.1.

4. If PANYNJ and SHPO agree that Project plans or completed activities have resulted in or are likely to result in cumulative adverse effects on the WTC Site per I.G.1 of this Agreement, then PANYNJ shall consider measures with respect to the Project to mitigate or minimize such effects, including technical or financial measures for the protection, rehabilitation, or repair and Project design modifications. Disagreements between the PANYNJ and SHPO, including those related to effects findings, will be resolved pursuant to Stipulation X.

5. PANYNJ shall make all appropriate PANYNJ-generated and prepared documentation related to the Project for Section 106 purposes and utilized in consideration of cumulative adverse effects in I.G.4 available to the Consulting Parties and NPS via the Project website. Consulting Parties will be notified of the documentation posting to the Project website via electronic notification. The Consulting Parties and NPS shall have 21 calendar days to comment on the documentation. PANYNJ will provide paper copies of such documentation to Consulting Parties upon request. SHPO, ACHP, and WTC project agencies will respond within 30 calendar days of receipt of all required documentation. Should SHPO, ACHP, or any project agency, fail to respond within 30 calendar days

after receipt of all documentation, it shall be assumed that they have no comments on the proposed action, if any, to minimize or mitigate cumulative adverse effects.

6. The review of the documentation by all parties per I.G.5 shall focus on the historic elements of the WTC Site Historic Property that may be affected by the Project relative to the potential for cumulative adverse effects.

7. PANYNJ, in coordination with other project agencies as appropriate, and SHPO will consider and respond to comments on the Project and its potential for cumulative adverse effects on the WTC Site Historic Property from Consulting Parties and attempt to resolve any concerns about how PANYNJ intends to address cumulative adverse effects per I.G.1 of this Agreement. If PANYNJ, in consultation with SHPO are unable to reach a resolution with the Consulting Parties who have commented pursuant to I.G.5. regarding an adverse effect with respect to the Project and its potential for cumulative adverse effects on the WTC Site Historic Property, the PANYNJ will notify the FTA, and as appropriate, consult with the ACHP, in accordance with Stipulation X.

8. PANYNJ shall comply with other agreement documents referenced in this Agreement and the EIS related to archaeological resource treatment, noise and vibration in the WTC Construction Protection Plan for the Barclay-Vesey Building, Former East River Savings Bank, Beard Building, 114-118 Liberty Street, and St. Paul's Chapel and Graveyard and the WTCRPP when considering cumulative adverse effects on the Historic Properties both on and off of the WTC Site that may result from the Project and other related, approved project undertakings.

H. OFF-SITE ARTIFACTS

PANYNJ shall safeguard all artifacts from the WTC Site that are now or may come to be in its custody and control, pending final disposition of such artifacts in accordance with the rights of the respective owners thereof. This obligation will be fulfilled in consultation with LMDC as specified in Stipulation 4(a)(3) and Stipulation 4(b) of the April 22, 2004 Programmatic Agreement among the ACHP, LMDC and SHPO for the WTC Memorial and Redevelopment Plan. A complete inventory listing of all off-site WTC artifacts in PANYNJ's custody and control as of August 2004 shall be available to the Consulting Parties upon written request to PANYNJ. Additional artifacts may come into the custody and control of PANYNJ, and the listing of these artifacts will be incorporated into the semiannual report to be distributed to the signatory parties and Consulting Parties.

II. HUDSON RIVER BULKHEAD

A. COORDINATION

Because the Hudson River Bulkhead is located in the APE of the proposed reconstruction of West Street (Route 9A) as well as in the APE for the Project, PANYNJ shall coordinate treatment of this Historic Property with FHWA and NYSDOT.

B. LOCATION AND IDENTIFICATION

In consultation with the SHPO, and, as appropriate with NYSDOT, PANYNJ shall develop and implement a plan to locate and identify intact portions of the Hudson River Bulkhead that will be affected by construction of the East-West Pedestrian Connector.

C. TREATMENT

In the event that intact portions of the Hudson River Bulkhead are identified as a result of execution of Stipulation II.B, PANYNJ shall, in consultation with the SHPO and NYSDOT, prepare a treatment plan for those portions of the Hudson River Bulkhead to be affected by the Project.

D. TREATMENT PLAN

1. Design plans for treatments will be developed in consultation with the SHPO and submitted for SHPO comment at the preliminary (35%) and pre-final (75%) completion stages. NPS and Consulting Parties will also be given the opportunity to comment.

2. Design plans will be made available to the Consulting Parties and the public via the Project website. The Consulting Parties will be informed of the availability of the plans by electronic notification as the plans are posted on the Project website and the Consulting Parties shall have 21 calendar days to comment on the plans. PANYNJ will provide paper copies of such design plans to Consulting Parties upon request.

3. The review of the plans shall focus on the Hudson River Bulkhead mitigation.

4. If SHPO makes substantive comments during the pre-final design review, SHPO may request the opportunity to concur on the final design.

5. SHPO will respond within 30 calendar days or earlier to the design plans at each stage of completion as described above. If SHPO does not respond within the comment period, PANYNJ may assume that SHPO concurs with the submitted plan.

6. PANYNJ will consider and respond to all comments received from SHPO within the specified comment period and Consulting Parties prior to approval of submitted plans and specifications.

III. BARCLAY-VESEY BUILDING, FORMER EAST RIVER SAVINGS BANK, BEARD BUILDING, 114-118 LIBERTY STREET, AND ST. PAUL'S CHAPEL AND GRAVEYARD

A. COORDINATION

Because the Historic Properties listed in the title of this Stipulation are located in the APE of the WTC Memorial and Redevelopment Plan as well as in the APE for the Project, PANYNJ shall coordinate treatment of them with LMDC.

The Former East River Savings Bank and St. Paul's Chapel and Graveyard are also located within the APE of the Fulton Street Transit Center. PANYNJ shall therefore coordinate treatment of these Historic Properties with MTA/NYCT.

B. CONSTRUCTION PROTECTION PLAN FOR THE BARCLAY-VESEY BUILDING, FORMER EAST RIVER SAVINGS BANK, BEARD BUILDING, 114-118 LIBERTY STREET, AND ST. PAUL'S CHAPEL AND GRAVEYARD

1. To protect these buildings from project-generated construction vibration from the Project, PANYNJ, in consultation with SHPO and in coordination with LMDC and, as appropriate, with MTA/NYCT, shall develop a Construction Protection Plan ("CPP") for the Project. The CPP will set forth measures for protection and avoidance of structural and architectural damage from the Project for these Historic Properties.

2. The CPP will be based on the requirements laid out in the "New York City Department of Buildings Technical Policy and Procedure Notice ("PPN") #10/88" regarding procedures for the avoidance of damage to historic structures resulting from adjacent construction. The PPN defines an adjacent historic structure as being contiguous to or within a lateral distance of 90 feet from a lot under development or alteration.

3. The CPP will describe in detail the construction procedures of the Project related to Historic Properties and the construction procedures associated with other projects under construction in the vicinity of each of these Historic Properties. With respect to the Project, the CPP will also provide for the inspecting and reporting of existing conditions at these properties; establishing protection procedures; establishing a monitoring program to measure vertical and lateral movement and vibration; establishing and monitoring construction methods to limit vibrations; and establishing methods and materials to be used for any repairs. The CPP shall also specify the implementation of special vibration protection measures to protect these Historic Properties from increased vibration levels associated with construction activities of the Project. For these extremely fragile buildings, these vibration protection measures for the Project shall reduce vibration levels to levels below FTA's vibration damage threshold criterion of 0.12 in/sec (approx 95 VdB). The CPP will provide for a historic architect meeting the Secretary of the Interior's professional qualifications standards (48 F.R. 44716) to work with an engineer with demonstrated comparable expertise in working with historic buildings to supervise implementation of the CPP.

4. The CPP will empower the historic architect, in consultation with the Chief Engineer of PANYNJ ("Engineer") or the Engineer's designee, to issue "stop work" orders with respect to this Project to prevent any unanticipated damage to Historic Properties, and any recommencement of work shall only be permitted at such time that the Engineer and historic architect determine that the appropriate modifications have been made to the construction technique to assure that no damage will occur to Historic Properties.

5. PANYNJ shall furnish copies of the CPP to SHPO, ACHP and Consulting Parties for review and comment with respect to the Project. The Consulting Parties will have 21 calendar days in which to comment on the CPP with respect to the Project. SHPO and ACHP shall respond

within 30 calendar days of the request for review and comment on the CPP with respect to the Project. Should SHPO and ACHP fail to respond within the 30 calendar day period, the PANYNJ may assume concurrence with the CPP. PANYNJ shall consider all comments received with respect to the Project within this review period in preparing the final CPP. The CPP for the Project shall be in place prior to the commencement of construction of the WTC PATH Terminal that could affect fragile buildings in the APE.

IV. ARCHAEOLOGICAL RESOURCES

A. COORDINATION

The areas of potential historic archaeological sensitivity in the Project's APE are former Lots 8-17 on former Block 85 (south side of Vesey Street between Greenwich and Church Streets) and former Lots 5, 6 and 10 on former Block 60 (north side of Liberty Street between Greenwich and Church Streets). Because these areas of potential historic archaeological sensitivity are located in the APE of the WTC Memorial and Redevelopment Plan as well as in the APE for the Project, PANYNJ shall coordinate fulfillment of this Stipulation with SHPO and LMDC. The locations of these archaeologically sensitive areas are shown on the map appended hereto as Exhibit B.

B. LOCATION, IDENTIFICATION, AND EVALUATION

Prior to any Project-related subsurface disturbance at any of the locations that have been determined to be sensitive for historic archaeological resources, PANYNJ shall, in consultation with the SHPO, and LMDC as appropriate, locate, identify, and evaluate the National Register eligibility of any archaeological resources at these locations in accordance with 36 CFR 800.4.

C. TREATMENT PLAN FOR ARCHAEOLOGICAL RESOURCES

1. In the event that FTA, in consultation with SHPO, determines that National Register-eligible archaeological resources will be adversely affected by construction of the Project, PANYNJ shall, in consultation with FTA, SHPO, and LMDC as appropriate, and the Consulting Parties, develop and implement a Treatment Plan for the Project. The Treatment Plan will balance Project (engineering, environmental and economic) and historic preservation concerns while addressing specific research questions. The Treatment Plan and documentation will adhere to the standards established by the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716), including the standards therein for professional qualifications

2. The Treatment Plan will be made available to the Consulting Parties via the Project website. The Consulting Parties will be informed of the availability of the plan by electronic notification as the plan is posted on the Project website and the Consulting Parties shall have 21 calendar days to comment on the plans.

3. SHPO shall have 30 calendar days in which to comment on the Treatment Plan. If SHPO does not respond within the comment period, PANYNJ may assume that SHPO concurs with the Treatment Plan.

4. The Treatment Plan described above will be posted on the Project website. PANYNJ will provide paper copies of the Treatment Plan to the Consulting Parties upon request.

V. UNANTICIPATED DISCOVERIES OF ARCHAEOLOGICAL RESOURCES AND UNANTICIPATED EFFECTS ON HISTORIC RESOURCES

A. UNANTICIPATED DISCOVERY OF ARCHAEOLOGICAL RESOURCES

In the event that unanticipated archaeological deposits or features are encountered during the construction of the Project, PANYNJ shall immediately implement the procedures described in Exhibit I hereto.

B. UNANTICIPATED EFFECTS ON HISTORIC RESOURCES

In the event that PANYNJ determines that construction of the Project will affect or has affected a Historic Resource in an unanticipated manner other than those identified in Stipulation I.F., PANYNJ shall stop Project construction in the vicinity of the affected resource and shall take reasonable measures with respect to the Project, to avoid harm to the resource until it has consulted with the SHPO to develop a treatment or mitigation plan with respect to the Project. PANYNJ may perform additional measures to secure the job site if it determines that unfinished work in the vicinity of the affected resource will cause major safety or security concerns. Upon notification, SHPO will have 14 calendar days to review and comment on the treatment or mitigation plans. Should SHPO fail to respond within the 14 calendar day period, the PANYNJ may assume concurrence with the treatment plan or mitigation plans. If PANYNJ and SHPO cannot agree on a treatment or mitigation plan, the dispute resolution process set forth in Stipulation X below will be followed.

VI. TEMPORARY RELOCATION OF HISTORIC ELEMENTS OF THE WTC SITE

TEMPORARY RELOCATION OF HISTORIC ELEMENTS

If PANYNJ determines that historic elements (potentially anticipated to be Tower Perimeter Column Remnants and E Subway Entrance of the WTC Site) must be temporarily relocated in order to protect them from damage during construction of the Project, PANYNJ shall:

1. Prior to relocation, notify SHPO and Consulting Parties of the elements requiring temporary relocation.

2. Prior to relocation, consult with their design/construction team historic architect who meets the Secretary of the Interior's professional qualifications standards (48 FR 44716) and in consultation with SHPO, develop a plan for (a) removing the elements in a manner that maintains their integrity of materials and workmanship; (b) safeguarding the removed elements while relocated to Hangar 17 or any other agreed upon location; (c) returning the elements to the WTC Site, based on criteria to be developed by PANYNJ and reviewed by ACHP and SHPO. Elements not returned to the WTC Site will remain in the control and custody of PANYNJ in Hangar 17 or other PANYNJ sites until the final disposition of all

artifacts in PANYNJ's custody has been determined. This determination of custody will take place outside the parameters of this Project.

3. Prior to relocation, SHPO will respond within 30 calendar days or earlier to the plan for temporary relocation and safeguarding of the element or elements. Should SHPO fail to respond within the 30 calendar day period, PANYNJ may assume concurrence with the relocation plan.

4. Prior to the relocation, PANYNJ will consider those comments provided within the specified time frame in finalizing the plans. PANYNJ shall implement the final plan.

5. PANYNJ shall notify SHPO and Consulting Parties in writing when temporarily removed elements have been returned to the WTC Site.

6. The Consulting Parties will be provided updates regarding the above 5 items through electronic notification and the Project website.

VII. MONITORING

SHPO may monitor activities carried out pursuant to this Agreement at its discretion. PANYNJ will cooperate with SHPO with respect to such monitoring activities.

VIII. ADDITIONAL COORDINATION REGARDING NEWLY AFFECTED HISTORIC PROPERTIES

1. If construction activities associated with the Project may affect Historic Properties other than those whose treatments will be coordinated with other agencies as set forth in Stipulations I, II and III of this Agreement, PANYNJ shall determine whether the newly affected Historic Property is within the APE of the WTC Memorial and Redevelopment Plan, the reconstruction of West Street, and/or the Fulton Street Transit Center. If the newly affected Historic Property is not also within the APE of one or more of these projects, PANYNJ will proceed as set forth in Stipulation V.B.

2. If PANYNJ determines that the newly affected Historic Property is also within the APE of one or more of these projects, PANYNJ shall include this information in any notification to the SHPO under Stipulation V.B and shall invite the relevant project sponsor(s) and respective lead agency to participate in consultation with SHPO to determine the appropriate course of action.

IX. ADMINISTRATION OF THIS AGREEMENT

A. COOPERATION

During implementation of this Agreement, each signatory party agrees to cooperate with the other signatory parties to facilitate the satisfaction of their respective obligations under this Agreement. The signatory parties each agree to work in good faith with the other signatory parties to meet their respective obligations in a timely manner.

B. SUBMITTALS TO SHPO

Unless otherwise specified in this Agreement, PANYNJ shall submit to SHPO all documents, drawings or other materials for which PANYNJ requests review, comment or concurrence.

C. SEMIANNUAL STATUS REPORTING

On or before January 31st and June 30th of each year and commencing on January 31, 2006, until the terms of this Agreement have been fulfilled, PANYNJ shall prepare and provide a semiannual report addressing the following topics:

- Progress in completing Stipulations I through V;
- Any unexpected issues encountered during the preceding six months; and
- Any changes that PANYNJ believes should be made in implementation of this Agreement.

PANYNJ shall make this report available to the signatory parties and Consulting Parties, and will invite Consulting Parties to provide comments to PANYNJ. PANYNJ will respond to comments received and, as appropriate, will provide the signatory parties with how PANYNJ responded to comments and notify the signatory parties if they need to further consider any comments. Any signatory party may request a meeting on the report. The report will also be posted on the Project website.

D. DOCUMENTATION

Notwithstanding any other provision in this Agreement, all documentation to be provided to the signatory parties, Consulting Parties, and the Public shall relate to the historic aspects of the Project as set forth in this Agreement subject to appropriate considerations, such as security concerns.

X. DISPUTE RESOLUTION

A. OBJECTIONS TO PLANS OR REPORTS BY SIGNATORY PARTIES

In the event any signatory party to this Agreement objects to any plan or report presented for the Project pursuant to this Agreement within 30 calendar days of its receipt, or within such other time frame specified in this Agreement, PANYNJ will consult further with the objecting signatory party to seek resolution. If PANYNJ is unable to reach resolution with respect to the Project, it will notify FTA, which in turn will consult with the objecting party to seek resolution with respect to the Project. If FTA determines that the objection cannot be resolved, FTA will invite the ACHP to review all Project documentation relevant to the dispute, including FTA's proposed resolution to an objection. ACHP will provide its comments to FTA within 30 calendar days. FTA will take these comments into account in reaching a final decision concerning the dispute.

Any recommendation or comment by the ACHP will pertain only to the subject of the dispute. The responsibility of the signatory parties to implement all actions pursuant to this Agreement that are not subject to the dispute will remain unchanged.

B. CONSULTING PARTY COMMENTS AND DISPUTE RESOLUTION

1. If PANYNJ receives written objections from any Consulting Party with respect to the Project regarding the treatment of Historic Properties, or on the design of the new structure or measures taken to implement the terms of this Agreement within 30 days of electronic notification of posting of plans, designs, or measures on the Project website, PANYNJ will consult with the objector regarding such objections.

2. PANYNJ shall consult with the objecting Consulting Party within 30 calendar days after receipt of written comments. If PANYNJ and the Consulting Party cannot resolve the matter with respect to the Project, PANYNJ shall notify SHPO and provide copies of the objection. SHPO, as appropriate, shall advise PANYNJ of measures, if any, that could resolve the matter.

3. If PANYNJ in consultation with SHPO cannot resolve the matter with respect to the Project, and PANYNJ and SHPO consider the issue of sufficient importance, PANYNJ and SHPO shall proceed as set forth in Stipulation X.A. above.

XI. AMENDMENT AND TERMINATION

A. AMENDMENT

Notwithstanding any other provision in this Agreement, any signatory party to this Agreement may request that it be amended, whereupon the signatory parties will consult to consider such amendment. PANYNJ will facilitate such consultation within 30 calendar days of such request. Any amendment must be in writing and signed by FTA, ACHP, SHPO and PANYNJ to be effective. The appropriate contacts for the signatory parties are provided in Exhibit J hereto.

B. TERMINATION

This agreement will terminate upon full completion of Project construction and after the first six months of full operation of the Project, or at such time as PANYNJ notifies the other parties in writing that the Project has been terminated.

This agreement may be terminated at the request of any of the signatory parties to this Agreement within 30 calendar days of written notification to the other signatory parties. In the event the Agreement is terminated, FTA, in consultation with SHPO, shall comply with 36 CFR Part 800 on a case-by-case basis for each proposed project activity.

Execution of this Agreement by FTA, SHPO, PANYNJ and ACHP and implementation of its terms will be evidence that FTA has taken into account the effect of the Project on Historic Properties, has afforded the ACHP and Consulting Parties an opportunity to comment on the Project and its effects on Historic Properties, and has completed all processes in accordance with Section 106 of the National Historic Preservation Act.

WTC Transportation Hub Section 106 Memorandum of Agreement

Execution and implementation of this Memorandum of Agreement evidences that FTA has satisfied its Section 106 responsibilities for the Project, has taken into account the effects of the Project on historic resource, and has afforded the ACHP an opportunity to comment.

FEDERAL TRANSIT ADMINISTRATION

By: _____ Date: April 19, 2005

Name Bernard Cohen

Title Director, Lower Manhattan Recovery Office

WTC Transportation Hub Section 106 Memorandum of Agreement

Execution and implementation of this Memorandum of Agreement evidences that FTA has satisfied its Section 106 responsibilities for the Project, has taken into account the effects of the Project on historic resource, and has afforded the ACHP an opportunity to comment.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: John M. Fowler Date: 4/8/05

Name John M. Fowler

Title Executive Director

WTC Transportation Hub Section 106 Memorandum of Agreement

Execution and implementation of this Memorandum of Agreement evidences that FTA has satisfied its Section 106 responsibilities for the Project, has taken into account the effects of the Project on historic resource, and has afforded the ACHP an opportunity to comment.

NEW YORK STATE HISTORIC PRESERVATION OFFICE

By: _____ Date: 4/6/05

Name Paul J. Laudato

Title Deputy State Historic Preservation Officer

WTC Transportation Hub Section 106 Memorandum of Agreement

Execution and implementation of this Memorandum of Agreement evidences that FTA has satisfied its Section 106 responsibilities for the Project, has taken into account the effects of the Project on historic resource, and has afforded the ACHP an opportunity to comment.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

By: _____ Date: 4/11/05
Name Kenneth J. Ringler, Jr.
Title Executive Director

CONSULTING PARTY CONCURRENCE
WTC Transportation Hub Section 106 Memorandum of Agreement

By: _____ Date: 3.31.05

Name: Carl Weisbrod

Title: President
Alliance for Downtown New York, Inc.

CONSULTING PARTY CONCURRENCE
WTC Transportation Hub Section 106 Memorandum of Agreement

By: William C. Love, Jr. Date: 3/26/05

Name: William C. Love, Jr.

Title: Vice Chair, Coalition to Save West Street

CONSULTING PARTY CONCURRENCE
WTC Transportation Hub Section 106 Memorandum of Agreement

By: _____ Date: 3/21/05

Name: BRUCE L. EHRMANN

Title: CHAIR, LANDMARKS COMMITTEE, COMMUNITY BOARD #1, MANHATTAN

CONSULTING PARTY CONCURRENCE
WTC Transportation Hub Section 106 Memorandum of Agreement

By: David E Stanke Date: March 30, 2005

Name: David E. Stanke

Title: Co-chair BPC United

CONSULTING PARTY CONCURRENCE
WTC Transportation Hub Section 106 Memorandum of Agreement

By: _____ Date: 3/20/08

Name: [illegible]

Title: [illegible]

CONSULTING PARTY CONCURRENCE
WTC Transportation Hub Section 106 Memorandum of Agreement

LOWER MANHATTAN DEVELOPMENT CORPORATION

By: _____ Date: 4/12/06
Name: Kevin M. Rampe
Title: President

CONSULTING PARTY CONCURRENCE
WTC Transportation Hub Section 106 Memorandum of Agreement

By: _____ Date: 9/15/05

Name: Peg Breen, President

Title: New York Landmarks Conservancy

CONSULTING PARTY CONCURRENCE
WTC Transportation Hub Section 106 Memorandum of Agreement

By: _____ Date: April 5, 2005

Name: Mysore L. Nagaraja, P.E.

Title: President, MTA Capital Construction

CONSULTING PARTY CONCURRENCE
WTC Transportation Hub Section 106 Memorandum of Agreement

By: _____ Date: 04/15/05

Name: Ken Lustbader

Title: Preservation Consultant, Lower Manhattan Emergency Preservation Fund

CONSULTING PARTY CONCURRENCE
WTC Transportation Hub Section 106 Memorandum of Agreement

By: _____ Date: 3/3/05

Name: Richard J. Schmalz, P. E.

Title: Route 9A Project Director, NYSDOT

CONSULTING PARTY CONCURRENCE
WTC Transportation Hub Section 106 Memorandum of Agreement

By: Bruce De Cell Date: March 30, 2005

Name: Bruce De Cell

Title: The Skyscraper Safety Campaign

CONSULTING PARTY CONCURRENCE
WTC Transportation Hub Section 106 Memorandum of Agreement

By: Bonnie Burnham Date: April 1, 2005

Name: Bonnie Burnham

Title: President, World Monuments Fund

CONSULTING PARTY CONCURRENCE
WTC Transportation Hub Section 106 Memorandum of Agreement

By: _____ Date: 3/28/05

Name: Albert Capsouto

Title: Director, Tribeca Organization
Tribeca Committee Chair CB #1

CONSULTING PARTY CONCURRENCE
WTC Transportation Hub Section 106 Memorandum of Agreement

By: Martin Connor Date: March 29, 2005

Name: MARTIN CONNOR

Title: State Senator

Mar 31 2005 12:31 P.02

CONSULTING PARTY CONCURRENCE
WTC Transportation Hub Section 106 Memorandum of Agreement

By: _____ Date: 03\31\2005

Name: CRAIG HALL

Title: WTCRC - PRESIDENT

(WORLD TRADE CENTER RESIDENTS COALITION)

LIST OF EXHIBITS

EXHIBIT A: AREA OF POTENTIAL EFFECT

EXHIBIT B: MAP OF ARCHAEOLOGICALLY SENSITIVE AREAS WITHIN THE PROJECT APE

EXHIBIT C: ENVIRONMENTAL PERFORMANCE COMMITMENTS

EXHIBIT D: ENVIRONMENTAL ANALYSIS FRAMEWORK

EXHIBIT E: AMENDMENT TO THE 1994 PROGRAMMATIC AGREEMENT DATED OCTOBER 13, 2004

EXHIBIT F: PROGRAMMATIC AGREEMENT FOR WORLD TRADE CENTER MEMORIAL AND REDEVELOPMENT PLAN

EXHIBIT G: LIST OF CONSULTING PARTIES

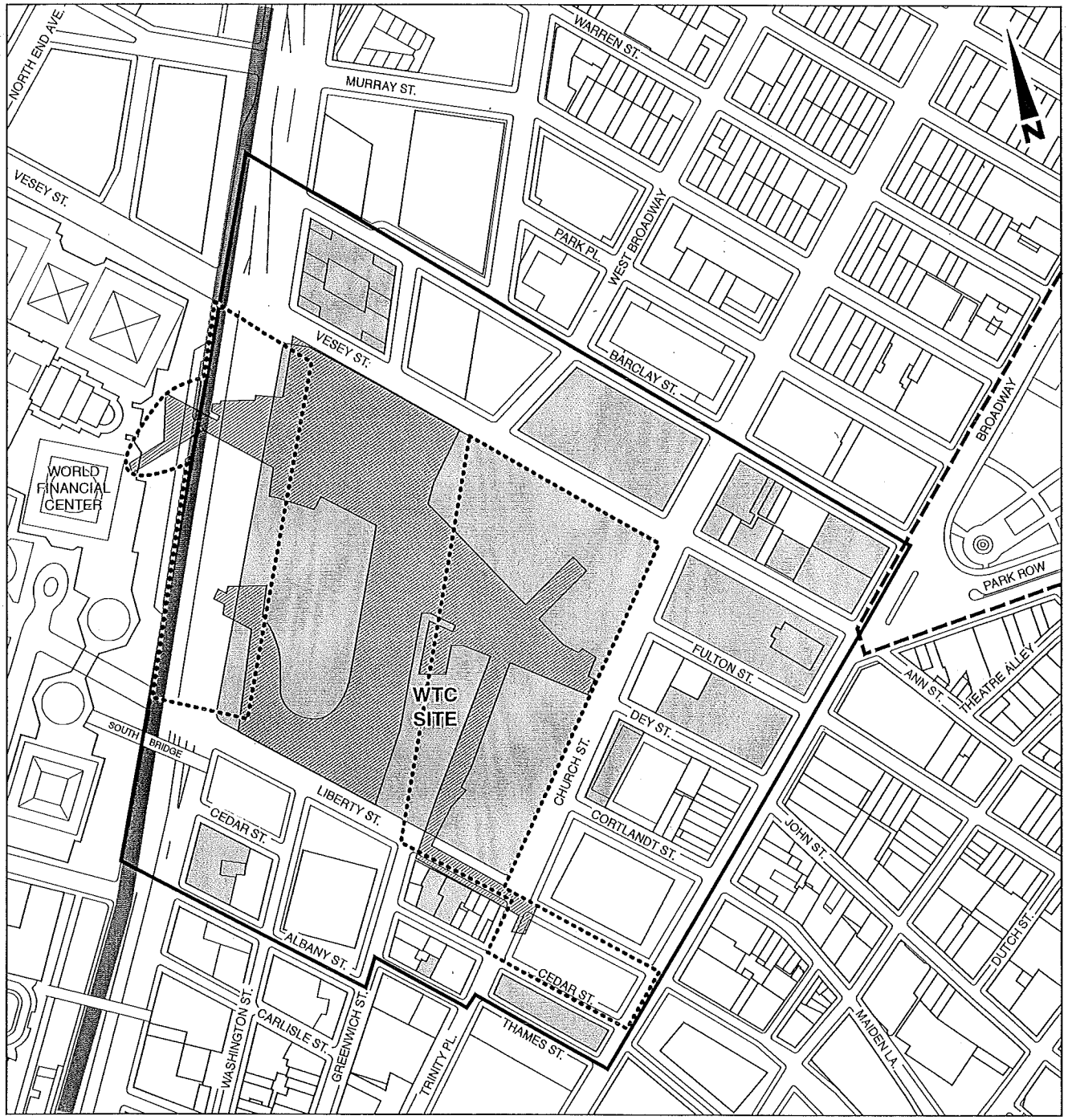
EXHIBIT H: SCHEDULE OF PHOTOGRAPHS FOR WORLD TRADE CENTER SITE

EXHIBIT I: PLAN FOR UNANTICIPATED DISCOVERY OF ARCHAEOLOGICAL FEATURES OR MATERIALS

EXHIBIT J: CONTACT INFORMATION

EXHIBIT A

10.13.04



Permanent WTC PATH Terminal

Area of Potential Effect for Archaeological Resources

Area of Potential Effect for Historic Resources

Known Historic Resource

Known Historic District

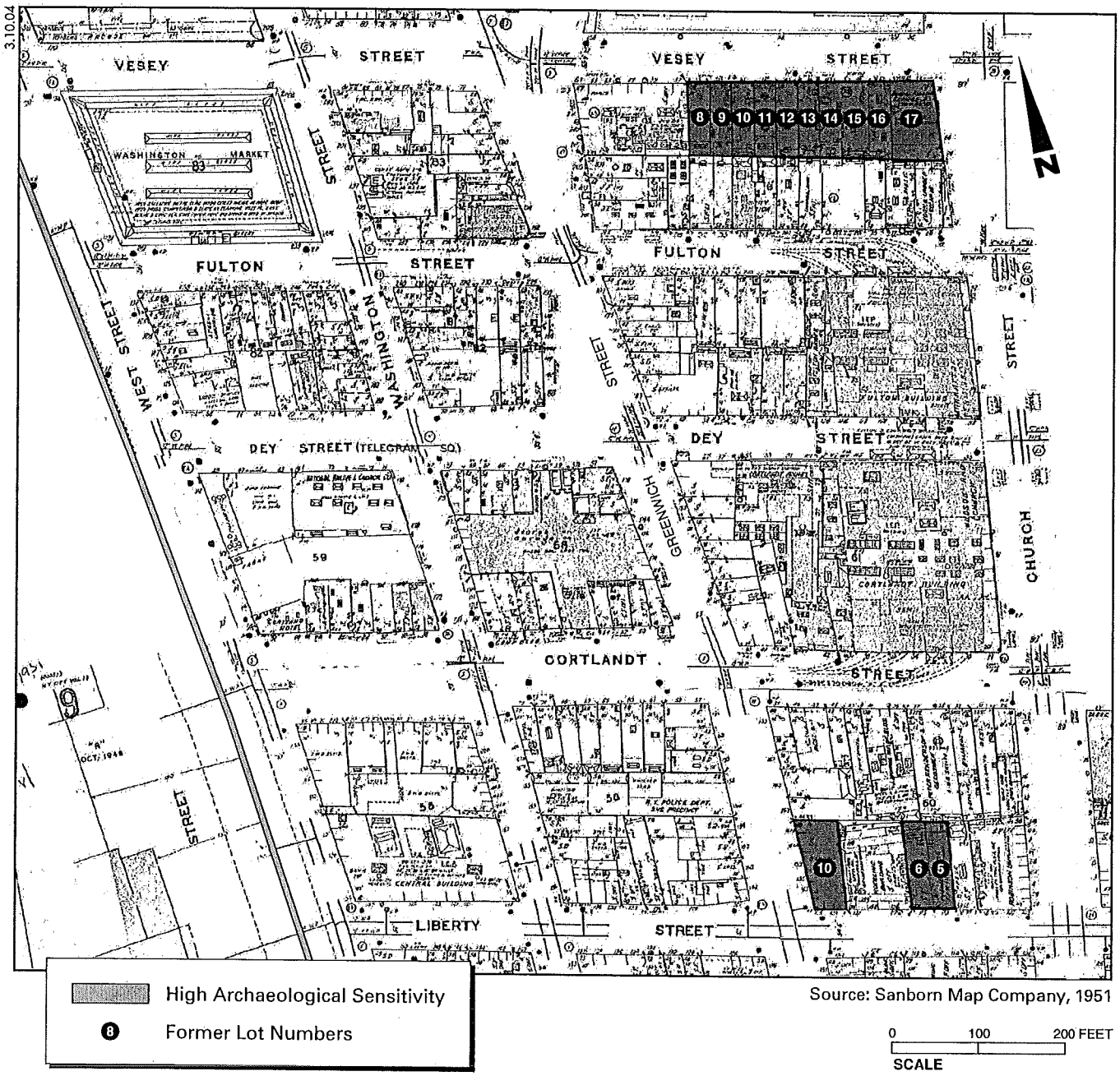
0 200 500 FEET

SCALE

Exhibit A

Area of Potential Effect

EXHIBIT B



PERMANENT WTC PATH TERMINAL
Draft Environmental Impact Statement

Figure 6-2
Areas of Potential Archaeological Sensitivity

LOWER MANHATTAN FEDERAL TRANSPORTATION RECOVERY PROJECTS
COMMON ENVIRONMENTAL PERFORMANCE COMMITMENTS

These common environmental performance commitments are made by the Project Sponsors accepting the Environmental Analysis Framework for Federal Transportation Recovery Projects in Lower Manhattan. As noted in the Environmental Analysis Framework, actual requirements and specifications implementing the commitments will be set forth in each Project Sponsor's public involvement and governmental entities coordination plan, construction environmental protection plan, design documents and contracts.

Air Quality:

Proposed Commitments
Use ultra low sulfur diesel fuel in off-road construction equipment with engine horsepower (HP) rating of 60 HP and above.
Where practicable, use diesel engine retrofit technology in off-road equipment to further reduce emissions. Such technology may include Diesel Oxidation Catalyst / Diesel Particulate Filters, engine upgrades, engine replacements, or combinations of these strategies.
Limit unnecessary idling times on diesel powered engines to 3 minutes.
Locate diesel powered exhausts away from fresh air intakes.
Control dust related to construction site through a Soil Erosion Sediment Control Plan that includes, among other things: a. spraying of a suppressing agent on dust pile (non-hazardous, biodegradable); b. containment of fugitive dust; and c. adjustment for meteorological conditions as appropriate.

Noise and Vibration:

Proposed Commitments
Where practicable, schedule individual project construction activities to avoid or minimize adverse impacts.
Coordinate construction activities with projects under construction in adjacent and nearby locations to avoid or minimize impacts.
Consider condition of surrounding buildings, structures, infrastructure, and utilities where appropriate.
Prepare contingency measures in the event established limits are exceeded.

Cultural and Historic Resources:

Proposed Commitments
Establish coordination among projects to avoid or minimize interruption in access to cultural and historic sites.
Initiate public information and involvement outreach with sensitivity to local cultural resources.
Identify public information outlets that will receive and provide current information about access during construction.
Consult with the New York State Office of Historic Preservation and the New York City Landmarks Preservation Commission regarding potentially impacted, culturally significant sites. Monitor noise and vibration during construction at such sites as appropriate.

Access and Circulation:

Proposed Commitments
Establish a project-specific pedestrian and vehicular maintenance and protection plan.
Promote public awareness through mechanisms such as: a. signage; b. telephone hotline; and c. Web site updates.
Ensure sufficient alternate street, building, and station access during construction period.
Regular communication with New York City Department of Transportation and participation in its construction coordination efforts.

Economic Effects:

Proposed Commitments
Coordinate with LMDC, Downtown Alliance or other entities to minimize residential and retail impacts as required through: a. relocation assistance, as applicable, to persons or businesses physically displaced by the project; and b. focus on essential businesses and amenities to remain in Lower Manhattan.
Add appropriate signage for affected businesses and amenities.

Design for the Environment:

Proposed Commitments
Energy Efficiency/Renewable Energy
Enhanced Indoor Environmental Quality (IEQ)
Conserving Materials and Resources
Environmentally-friendly Operations & Maintenance
Water Conservation and Site Management
Waste Management and Recycling (including during construction)

EXHIBIT D

ENVIRONMENTAL ANALYSIS FRAMEWORK FOR FEDERAL TRANSPORTATION RECOVERY PROJECTS IN LOWER MANHATTAN

In the aftermath of the September 11, 2001 attacks, a common framework of environmental analysis for reconstruction and redevelopment projects in Lower Manhattan can produce substantial benefits for each project, including the avoidance or minimization of environmental impacts and an increase in public understanding. The initiation of transportation recovery projects that are to be undertaken with the $4.55 billion in federal funding to restore and enhance functionality of the infrastructure and support the recovery of the area ("Federal Transportation Recovery Projects") will likely precede non-infrastructure projects. These projects therefore present an early opportunity for implementing a framework for evaluating and minimizing potentially adverse environmental effects, particularly cumulative effects, from other projects in Lower Manhattan that are constructed and put into operation during similar time frames and may affect the same resources (the "Framework"). As such, this Framework, which features a coordinated cumulative effects analysis approach, is offered to assist sponsors of Federal Transportation Recovery Projects ("Project Sponsors") in their environmental analyses.

The Framework for the Federal Transportation Recovery Projects was developed by a group of governmental entities involved with recovery in Lower Manhattan: the Metropolitan Transportation Authority ("MTA"), the Port Authority of New York and New Jersey ("Port Authority"), the New York State Department of Transportation ("NYSDOT"), and the Lower Manhattan Development Corporation ("LMDC"), in cooperation with the Federal Transit Administration ("FTA") and interested federal agencies. It is anticipated that at a minimum, this Framework, as applicable and where appropriate, will be used by the MTA, the Port Authority, and NYSDOT in connection with each of their proposed Federal Transportation Recovery Projects. This Framework will be introduced to additional local Project Sponsors, as appropriate, as additional Federal Transportation Recovery Projects are identified and prioritized. It is intended that, when completed, each Federal Transportation Recovery Project will result in an overall positive impact on the environment.

The temporary waiver of most transportation conformity requirements provided by Public Law 107-230 allows for these projects to proceed with out the need for a full conformity determination. To meet obligations set forth with the conformity waiver, the framework recognizes the need and value of interagency consultation and is consistent with the enhanced interagency consultation procedures during the transportation conformity waiver period.

In light of other reasonably foreseeable transportation and non-transportation actions in Lower Manhattan, this Framework for analyzing Federal Transportation Recovery Projects will establish a consistent set of information and commitments to be fulfilled in each Project Sponsor's project-specific environmental review and documentation. The Framework considers the regulations set forth by the Council on Environmental Quality ("CEQ") and takes into account the guidance in State Environmental Quality Review Act ("SEQRA") regulations, the City Environmental Quality Review ("CEQR") Technical Manual, industry best practices, and public input.

This *Environmental Analysis Framework* consists of the following components:

1. *Green Design, Green Construction, and Sustainability Principles;*
2. *Construction Environmental Protection Plan;*
3. *Public Involvement and Governmental Entities Coordination Plan; and*
4. *Baseline Assessment of Resources & Coordinated Cumulative Effects Analysis Approach*

1. Green Design, Green Construction, and Sustainability Principles

Each Project Sponsor cooperating with the FTA, and other interested federal agencies, recognizes the importance of avoiding and minimizing adverse impacts. Project Sponsors will address their advance commitment to undertake such avoidance efforts. In this regard, Project Sponsors have agreed to develop a common set of Environmental Performance Commitments ("EPCs") that they will each undertake. EPCs are items such as design elements, construction techniques, or operating procedures that will be implemented to lower the potential for adverse environmental impacts. This proactive approach is incorporated into this Framework and will diminish the likelihood of adverse cumulative effects. In addition, each Project Sponsor will undertake additional EPCs appropriate to its project based on the project's particular nature, timing, and scope.

Each Project Sponsor will describe the green practices that will be followed during construction for the following resources/areas of potential impact:

- Air Quality
- Pedestrian and Vehicular Access and Circulation
- Historic and Cultural Resources
- Noise and Vibration
- Business/Economic Interests

Project Sponsors will also set forth the green practices, high performance, and sustainable design features to be evaluated during design of the structures and facilities that will avoid or minimize adverse impacts and enhance overall environmental performance during operation.

2. Construction Environmental Protection Plan

Each Project Sponsor will provide a detailed outline of the EPCs and any other procedures to be implemented during the construction phase to protect sensitive resources that may be affected during construction. This plan will discuss how the initial condition of the resource will be assessed, where applicable; how the construction work will actually be implemented to avoid or minimize impacts; and how the environmental performance of the project will be monitored during construction. This plan will be based on the best available information and the ongoing construction coordination process in Lower Manhattan and a shared Lower Manhattan projects inventory being developed by LMDC. The plan will also provide an effective means for disseminating appropriate current information to the public and other developers.

3. Public Involvement and Governmental Entities Coordination Plan

Each Project Sponsor will describe how the environmental community, relevant governmental entities, and the general public will be involved as the Project Sponsor proceeds with its Federal

Transportation Recovery Project. Each Project Sponsor will develop a public and governmental entity involvement plan that will be coordinated with the public and governmental entity involvement plans for other Lower Manhattan projects. A key goal of the coordination will be to avoid or at least minimize adverse effects on the environment, particularly during construction. In addition, this plan will identify a protocol by which comments received during the construction phase will be addressed; appropriate current information will be provided to the public, including Project Sponsors' project implementation schedules; and coordination with other projects will occur. The process will build on an existing construction coordination protocol among parties already involved in rebuilding Lower Manhattan.

4. ***Baseline Assessment & Coordinated Cumulative Effects Analysis Approach.***
The components of the baseline assessment and coordinated cumulative effects analysis approach to be used by the Project Sponsors in Federal Transportation Recovery Projects are as follows:

- Each Project Sponsor will address cumulative effects, as applicable, as part of its independent project-specific environmental review process.
- The "baseline" to be used for the "No Build" comparison required under NEPA will be pre-September 11, 2001 conditions.
- The "baseline" for environmental review of construction-related impacts for each project will be adjusted to reflect, where appropriate, conditions anticipated to be in effect at the time of construction.
- Project Sponsors will share appropriate information, databases and documentation of the baseline and forecasted conditions.
- Each Project Sponsor will apply a consistent approach for the evaluation of cumulative effects focused on the five following "resources":
  - Air Quality (including the Enhanced Procedures during the Transportation Conformity Waiver Period);
  - Pedestrian and Vehicular Access and Circulation;
  - Historic and Cultural Resources
  - Noise and Vibration; and
  - Business/Economic interests
- The geographic area for analysis will be the area of Lower Manhattan south of Canal Street, but where appropriate, the geographic area may be adjusted for the specific resources.
- Each Project Sponsor will adhere, at a minimum, to the attached set of common EPCs to lower the potential for adverse environmental impacts as listed in Section 1 and above, thereby lessening the potential for each project to contribute to overall adverse cumulative effects.
- As each project matures through the NEPA process, the findings of the project will be incorporated into the cumulative effects analyses for the projects that follow it. As such, the project on which findings have been issued will constitute an "existing condition" for the cumulative effects analysis of the next project.

EXHIBIT E

AMENDMENT TO THE PROGRAMMATIC AGREEMENT
AMONG THE
FEDERAL HIGHWAY ADMINISTRATION
THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION
THE NEW YORK STATE HISTORIC PRESERVATION OFFICE
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE ROUTE 9A PROJECT
NEW YORK CITY, NEW YORK

WHEREAS, a Programmatic Agreement for the Reconstruction of Route 9A (Attachment A), executed in 1994 by the Federal Highway Administration (FHWA), New York State Historic Preservation Officer (SHPO), and Advisory Council for Historic Preservation (ACHP), with concurrence by the New York State Department of Transportation (NYSDOT), established procedures for implementation pursuant to Sections 106 and 110(f) of the National Historic Preservation Act (16 USC 470f); and

WHEREAS, the reconstruction of Route 9A (Battery Place to 59th Street) implemented pursuant to the 1994 FEIS was nearly complete at the time of the September 11, 2001 terrorist attacks, however those attacks destroyed an approximately half-mile section of Route 9A in the vicinity of the World Trade Center (WTC); and

WHEREAS, the New York State Department of Transportation (NYSDOT), in coordination with the FHWA, currently proposes reconstruction of the half-mile section of Route 9A in the vicinity of the WTC and lying between Chambers and West Thames Streets that was destroyed or damaged by the attacks on September 11, 2001, and subsequent WTC site cleanup and/or recovery activities; and

WHEREAS, the FHWA, the Lower Manhattan Development Corporation (LMDC), and the Federal Transit Administration (FTA) coordinated the Section 106 determination of National Register eligibility for the WTC Site due to the proximity to the Site of their respective proposed undertakings; and

WHEREAS, the Area of Potential Effect (APE) for the proposed reconstruction of Route 9A has been modified since 1994 and includes, as shown in Figure C-1:

(1) the right-of-way for the Route 9A roadway alignment between West Thames Street and Chambers Street; and
(2) areas along intersecting streets east of Route 9A between West Thames Street and Chambers Street, including locations where construction may occur outside of the Route 9A right-of-way (e.g. foundations of potential pedestrian bridges); and

WHEREAS, historic properties within the modified APE include, as shown in Figure C-1:

(1) the WTC Site, which was determined eligible for the National Register of Historic Places, and documented in the *Coordinated Determination of National Register Eligibility for the WTC Site,* dated March 31, 2004 (Attachment B); and
(2) additional resources listed in or eligible for listing in the National Register of Historic Places, identified in Attachment C; and
(3) the New York City Hudson River Bulkhead as a potential archaeological site.

WHEREAS, it is intended that the 1994 Programmatic Agreement be amended to address: 1) the potential effects of the proposed undertaking to the World Trade Center Site; 2) the identification of additional historic resources located within the Area of Potential Effect (APE); 3) inclusion of the treatment and documentation of the bulkhead; and 4) the increased role of consulting parties so as to fully consider the views of the consulting parties and ensure that FHWA/NYSDOT have the information needed to make a reasoned assessment of how the proposed undertaking affects historic properties; and

WHEREAS, the proposed undertaking is part of the overall restoration of the transportation system of Lower Manhattan, and is an independent undertaking from those undertakings mentioned above and proposed by LMDC and FTA for projects at or adjacent to the WTC site; and

WHEREAS, during the course of consultation to identify additional historic properties within the modified APE an expansive list of consulting parties (Attachment D) participated in the identification process and are hereby recognized under the terms of this agreement; and

WHEREAS, consulting parties under this agreement shall have all opportunities for review and comment stipulated for interested parties under the original 1994 agreement, and accorded to consulting parties under revised Section 106 regulations effective August 5, 2004; and

WHEREAS, in accordance with comprehensive efforts for redevelopment under the Coordinated Construction Act for Lower Manhattan (11700 and 11716-A), signed August 10, 2004, the development and implementation of mitigation measures will be coordinated with other agencies involved in the Lower Manhattan Redevelopment projects; and

NOW, THEREFORE, FHWA, NYSDOT, SHPO and ACHP agree that the proposed undertaking covered by this Agreement shall be administered in accordance with the terms of the 1994 Programmatic Agreement for the Reconstruction of Route 9A and the following stipulations to satisfy FHWA's Section 106 responsibilities.

STIPULATIONS

FHWA, in coordination with NYSDOT, will ensure that the following stipulations are implemented as part of the subsequent planning, design and construction of the selected project alternative:

1. If FHWA proposes a finding of no adverse effect, it shall notify all consulting parties of the finding and provide them with the Analysis of Effect documentation. If within the 30-day review period the SHPO or any consulting party notifies FHWA in writing that it disagrees with the finding and specifies the reasons for disagreement, FHWA shall either consult with the party to resolve the disagreement, or request the Council to review the finding pursuant to 36 CFR 800.5(c)(2)(i) or (c)(2)(ii).

2. If the project is found to have an adverse effect, the FHWA shall so notify the SHPO and the consulting parties accompanied by documentation consistent with that required pursuant to 36 CFR 800.11(e) of the revised regulations. FHWA and NYSDOT shall consult further to develop monitoring and treatment plans and mitigation measures in coordination with the SHPO pursuant to Stipulation II of the 1994 Programmatic Agreement and taking into account the views presented by any consulting parties.

3. Monitoring, treatment and mitigation of the Hudson River Bulkhead:

   (a) Archaeological monitoring will be conducted during construction in the location of the Hudson River Bulkhead in order to identify and document the condition, integrity, depth, and extent of any existing subsurface remains of the Hudson River Bulkhead. Monitoring will be conducted in accordance with a monitoring plan prepared by an archaeologist qualified under National Park Service standards (36 CFR 61). The monitoring plan shall include standard plans for treatment of any anticipated adverse effects to contributing features of the bulkhead. The monitoring plan will be developed and approved in accordance with Stipulation I.E.6 of the original agreement prior to implementation of any ground disturbing activity in the vicinity of the bulkhead.

   (b) Consulting parties will be afforded a 30-day period to review and comment on the monitoring and treatment plan. The standard treatment plan will be implemented if the project is found to have an adverse effect on contributing features of the Hudson River bulkhead. Unless unanticipated effects to contributing features are discovered, implementation of the standard treatment plan shall conclude the

requirements for mitigation of effects to this resource. Unanticipated effects shall be addressed in accordance with 36 CFR 800.13(b)(3) of the revised regulations implementing Section 106.

4. Provisions of the 1994 Programmatic Agreement for the Reconstruction of Route 9A shall be implemented for all other historic properties within the revised APE.

5. In accordance with the revised regulations implementing Section 106 (36 CFR Part 800), consulting parties shall be entitled to share their views, receive and review pertinent documentation, offer ideas, and consider possible solutions together with the Federal agency and other consulting parties. Consulting parties will receive copies of the analysis of effects and proposed treatment plans for each of the additional historic properties identified within the modified APE. Consulting parties shall have 30 days following the receipt of any documentation in which to provide their comments to FHWA and NYSDOT. FHWA/NYSDOT will fully consider any comments from consulting parties submitted within the 30-day review period in finalizing determinations of effect and in developing and evaluating measures to minimize or mitigate adverse effects.

6. Impacts to historic buildings and structures, due to vibrations associated with construction operations, will be minimized through coordination of construction activities associated with other Lower Manhattan projects, the Department's Standard Specifications, and Special Notes to be included in the Contract Documents.
    a. Special Notes to address potential vibration impacts will be developed in consultation with the SHPO. The SHPO will be afforded a 10-day period to review and comment on these Notes.
    b. Measures to avoid and minimize vibration impact will include:
        i. The examination of the conditions of structures and buildings by a NYS licensed Professional Engineer. These reviews will be conducted prior to the commencement of work, at locations and times during construction as determined by NYSDOT, and after the completion of work under this contract.
        ii. Vibration monitoring performed in accordance with the Special Note, titled: "Building Condition Survey and Vibration Criteria", in the Contract Documents.
    c. If it is determined that NYSDOT construction activities caused damage to "Adversely Effect" a historic building or structure, NYSDOT, after consultation with the SHPO and the property owner as noted in Stipulation #2, will repair that damage that is reasonably attributable to the project activities.

Route 9A - AMENDMENT TO THE PROGRAMMATIC AGREEMENT

Execution and implementation of this amendment to the original agreement evidence that FHWA has satisfied its Section 106 responsibilities for the Route 9A project.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: John M. Fowler Date: 10/13/04

John M. Fowler, Director

Route 9A - AMENDMENT TO THE PROGRAMMATIC AGREEMENT

Execution and implementation of this amendment to the original agreement evidence that FHWA has satisfied its Section 106 responsibilities for the Route 9A project.

NEW YORK STATE HISTORIC PRESERVATION OFFICER

By: _____ Date: 10/12/04

Bernadette Castro, Commissioner

Execution and implementation of this amendment to the original agreement evidence that FHWA has satisfied its Section 106 responsibilities for the Route 9A project.

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

By: _____ Date: 10.8.04

Richard Schmalz, Rte. 9A - Project Director

Route 9A - AMENDMENT TO THE PROGRAMMATIC AGREEMENT

Execution and implementation of this amendment to the original agreement evidence that FHWA has satisfied its Section 106 responsibilities for the Route 9A project.

FEDERAL HIGHWAY ADMINISTRATION

By: _____ Date: 10-12-04

Robert Arnold, Division Administrator

PROGRAMMATIC AGREEMENT
AMONG THE
FEDERAL HIGHWAY ADMINISTRATION,
THE
NEW YORK STATE HISTORIC PRESERVATION OFFICER,
AND THE
ADVISORY COUNCIL ON HISTORIC PRESERVATION,
REGARDING THE
RECONSTRUCTION OF ROUTE 9A
NEW YORK CITY, NEW YORK

WHEREAS, the Federal Highway Administration (FHWA) has determined that the Route 9A Reconstruction Project (Project) in New York City, New York may have an effect on properties/structures included in or eligible for inclusion in the National Register of Historic Places, and has consulted with the Advisory Council on Historic Preservation (Council) and the New York State Historic Preservation Officer (SHPO) pursuant to Sections 106 and 110(f) of the National Historic Preservation Act (16 U.S.C. 470f) and the Council's implementing regulations, "Protection of Historic Properties" (36 CFR Part 800); and

WHEREAS, the New York State Department of Transportation (DOT) has participated in the consultation and was invited to concur in this Programmatic Agreement;

WHEREAS, the FHWA, the SHPO and the Council agree that the undertaking shall be guided in principal by the methodologies outlined in the Draft Environmental Impact Statement (DEIS) / Supplemental DEIS (SDEIS) and Final Impact Statement (FEIS) for the project;

WHEREAS, the FHWA and DOT have agreed to provide all studies and other documentation to the New York City Landmarks Preservation Commission (LPC) for their information;

NOW, THEREFORE, FHWA, the SHPO and the Council agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of this Project on historic properties/structures.

STIPULATIONS

FHWA WILL ENSURE THAT THE FOLLOWING STIPULATIONS ARE IMPLEMENTED AS PART OF SUBSEQUENT PLANNING, DESIGN AND CONSTRUCTION OF THE SELECTED PROJECT ALTERNATIVE.

I. ARCHEOLOGICAL RESOURCES

Within the area of potential effect (APE) for archeological resources[1], a comprehensive program for the identification, evaluation, and treatment of archeological resources will be implemented in the manner set forth below.

A. Contextual Studies

To assess the large number of potential archeological sites that may exist within the APE and to refine predictions on locations of potential archeological sensitivity, FHWA and DOT will complete contextual studies for each of the following categories.

1. Prehistoric Sites.
2. Dwellings and Tenements.
3. Energy.
4. Meat Market.
5. Offices and Warehouses.
6. Land Transportation.
7. Unassociated Structures.
8. Lumber and Building Materials.
9. Manufacturing.
10. Services.
11. Piers and Wharves.
12. Landfill Devices and Sunken Ships.
13. 17th Century Fortifications and Foundations at Morris Street.

B. Review and Results of Contextual Studies

1. As the contextual studies for each category are completed, they will be provided to the SHPO for their review and comment.[2]

---

[1] The area of potential effect for archeological properties includes (1) the right-of-way; (2) streets intersecting Route 9A for a 50-foot distance east of the roadway; (3) at locations where construction may occur east of the roadway, e.g. between Battery Place and Joseph P. Ward Street, Chambers Street, between Canal and Spring Streets, between Gansevoort and 13th Streets, between 14th and 15th Streets, and Thomas F. Smith Park; (4) footprints at pedestrian over passes or other special features; and (5) construction staging areas outside of the areas listed in (1)-(4) above.

[2] In this instance and in all similar provisions provided for in this Agreement, unless otherwise noted, where comments are sought from the SHPO and/or LPC, it is understood that the party will be provided 30 days from the receipt of the request to submit comments. If no comments are submitted during this review period, it is understood that the party has no wish to comment and concurs with the recommendations or conclusions for which comments were sought. Extensions, totalling no more than 15 days, will be added to the 30-day review period in cases where timely requests are made for additional documentation deemed necessary to complete a review.

2. For each study, FHWA and DOT, based on comments received from the SHPO, will:

a. Determine the need, if any, to verify the assumptions made in the study. If the need for verification exists, an appropriate field testing methodology will be developed by FHWA and DOT in consultation with the SHPO (See Stipulation I.C. below).

b. Determine which presumed site locations do not require further consideration. Provided the SHPO agrees with these conclusions, such site locations need receive no further consideration under this Agreement.

c. Determine which presumed site locations do require further consideration. These site locations should be treated in accordance with Stipulation I.D. below.

If conclusions reached by FHWA and DOT are not consistent with comments and recommendations received from the SHPO, FHWA and DOT will consult to resolve the objection. If the objection cannot be resolved, the recommendations of the Council will be sought consistent with Stipulation V of this Agreement.

C. Field Testing Assumptions of Contextual Studies

In consultation with the SHPO, FHWA and DOT will develop and undertake a strategy for carrying out field testing. If the results of such field testing demonstrates that assumptions upon which predictions were made in the Contextual Studies are not valid, the Studies, as appropriate, will be revised in a manner acceptable to the SHPO.

The Council will be kept apprised of any such field testing that is carried out and its results and will be provided copies of field reports and any revised Contextual Studies.

D. Further Evaluation of Potential Sites

For those site locations determined to require further consideration pursuant to Stipulation I.B.2.c. and determined by FHWA and DOT, in consultation with the SHPO, to be subject to possible project impacts, field testing will be undertaken to determine site characteristics and the degree of site integrity and disturbance. This field evaluation and testing program will be carried out in consultation with the SHPO and at a level sufficient to be able to determine if sites meet the criteria for listing in the National Register of Historic Places (36 CFR Section 60.4). For each field tested site, FHWA and DOT, in consultation with the SHPO, will apply the National Register criteria and reach one of the following conclusions:

1. The site does not meet the National Register criteria; no further action is required.

2. The site does meet the National Register criteria, in which case the site will be treated in accordance with Stipulation I.E. below.

3. A dispute exists regarding whether the criteria are met, in which case the opinion of the Keeper of the National Register will be sought to resolve the disagreement, and the site treated in accordance with the Keeper's finding.

FHWA and DOT will notify the SHPO, and interested parties of conclusions regarding evaluation of all sites for National Register.

E. Data Recovery

For those sites determined to be eligible for inclusion in the National Register, FHWA and DOT, in consultation with the SHPO, shall develop and conduct a data recovery plan that is consistent with the Secretary of the Interior's Standards and Guidelines for Archeological Documentation(48 FR 44734-37) and the Council's Treatment of Archeological Properties and subsequent amendments (Advisory Council on Historic Preservation, 1980). The plan shall:

1. Be responsive to the relevant historic contextual study developed for this project;

2. Be designed to recover data sufficient to address significant research issues and to test assumptions set forth in the appropriate historic contextual study;

3. Provide adequate flexibility to allow for addressing unanticipated resource, site conditions, and alternative methods and scopes of work, as appropriate. The SHPO shall be kept apprised of any changes to the data recovery plan;

4. Include a process for consultation with the SHPO, LPC and interested parties, as appropriate, throughout the monitoring and data recovery phases; and,

5. Include a schedule of proposed data recovery efforts with reporting requirements.

6. In some cases, the data recovery plan may be implemented through a monitoring program during construction. The use of this method would be subject to approval by SHPO, DOT, and FHWA.

F. Professional Standards

DOT shall ensure that all archeology carried out pursuant to this Agreement is conducted by or under the direct supervision of a person or persons meeting at a minimum the Secretary of the Interior's Professional Qualifications Standards (48 FR 44138-9).

G. Curation

DOT shall develop and implement, in consultation with the SHPO and in accordance with 36 CFR Part 79, a plan for the analysis and curation of material and records from the archeological excavations are curated in accordance with 36 CFR Part 79.

H. Reports

DOT shall ensure that all final archeological reports resulting from the actions pursuant to this Agreement shall be provided to the SHPO, LPC and interested parties, and submission to the National Technical Information Service (NTIS). FHWA and DOT shall ensure that all such reports are responsive to contemporary professional standards, and to the Department of the Interior's Format Standards for Final Reports of Data Recovery Program (42 FR 5377-79).

I. Phasing of Construction Activities and Archeological Field Work

DOT will take all steps practical to ensure that needed archeological field analysis and data recovery can proceed in advance of construction activities. In establishing construction scheduling and staging, FHWA and DOT will fully consider, anticipate, and prepare for archeological work that must be undertaken. FHWA and DOT shall coordinate the site preparation in a manner

which allows maximum exposure of the areas to be tested at the earliest possible date. Further, FHWA and DOT will provide to the SHPO and LPC regularly scheduled status reports that will include notice about schedules, plans, and timing related to phasing archeological work with construction in order that the SHPO can better anticipate review requirements and thereby provide more timely advice.

II. HISTORIC PROPERTIES/STRUCTURES - WITHIN THE ROUTE 9A CORRIDOR

Within the area of potential effects for the Route 9A Corridor (APE) for historic properties/structures[1], a comprehensive program for assessment of effects and treatment of historic properties/structures will be implemented in the manner set forth below.

A. Analysis of Effects

In consultation with the SHPO, FHWA and DOT will determine if, there are any effects on the 39 historic properties/structures listed or determined eligible for listing in the National Register of Historic Places identified on Attachment A. Analysis of effects will be guided by the Criteria of Effect [36 CFR Section 800.9(a)]. A determination of effect will consider if there are physical takings, visual effects, vibrations resulting from construction and anticipated traffic increases, access changes, or noise impacts. These will be evaluated in light of those characteristics which make the properties/structures significant.

1. Findings of No Effect

If, after consultation with the SHPO; FHWA and DOT determines that there will be no effect to a property/structure, this finding will be documented and copies will be provided to the SHPO for review. Any objections and reasons therefore must be provided in writing within 30 days. Specific effects must be identified so that any possible mitigation measures can be considered and developed.

2. Findings of No Adverse Effect

If, after consultation with the SHPO; FHWA and DOT determines that there will be no adverse effect to a property/structure, this finding will be documented and copies will be provided to the SHPO for review. Should the SHPO object within 30 days, FHWA and DOT can either accept a finding of adverse effect for the property/structure or seek Council review pursuant to Stipulation V.

3. Findings of Adverse Effect

If, after consultation with the SHPO; FHWA and DOT determines that there will be adverse effects to a property/structure, FHWA and DOT will develop a treatment plan as set forth in Stipulation II.B.

---

[1]The area of potential effect for historic structures includes the roadway frontage for the selected alternative and those areas where pedestrian bridges will be located.

B. Treatment of Adverse Effects

1. Treatment Measures

If adverse effects to historic properties/structures are identified, FHWA and DOT will consider, depending on the nature of the effect and the significance of the property/structure, mitigation measures including, but not limited to, the following:

a. Avoidance of demolition or taking through project redesign,
b. Use of noise attenuation design features,
c. Landscaping to minimize visual impacts,
d. Monitoring of seismic impacts, with modifications in construction techniques if seismic impacts are detected,
e. Signalization and other traffic control measures to reduce traffic generated impacts,
f. Use of construction materials and design features that will improve visual compatibility with adjacent historic properties/structures,
g. Documentation of existing streetscapes and/or historic properties/structures.

2. Views of Interested Parties

In considering mitigation measures for treatment of adverse effects, FHWA and DOT will take fully into account the views of interested parties, in particular LPC and owners of affected historic properties /structures. A community liaison office will be kept open during design and construction to allow input from the general public. Depending on the level of public interest, FHWA and DOT will institute means to solicit and fully consider the views of the public in arriving at appropriate treatment measures.

3. Development of Treatment Plans

Giving full consideration to the views of the property owners, FHWA and DOT, in consultation with the SHPO, will develop a treatment plan for each historic property/structure adversely affected. The treatment plan will set forth the mitigation measures that will be undertaken and will contain evidence that it has been reviewed and approved by the SHPO. An informational copy of the treatment plan will be provided to the Council. FHWA and DOT will then implement the approved treatment plan.

4. If FHWA, DOT and the SHPO are unable to agree on a treatment plan for an historic property/structure adversely affected, FHWA will complete the steps set forth in Sections 800.5(e) - 800.6 of the Council's regulations to address adverse effects to the property /structure.

III. HISTORIC PROPERTIES/STRUCTURES - WITHIN THE INLAND STUDY AREA

Using traffic data and modeling, FHWA and DOT, in consultation with the SHPO, will identify possible areas, streets, and/or locations within the inland study area where traffic changes are expected to occur as a result of the selected alternative. In determining these areas, DOT will use a criteria, which includes, functional classification changes, congestion, above normal traffic variations, land use, expected noise level changes and level of service changes.

A. Determination of APEs

The above noted parameters will indicate areas that need to be examined to determine if they are areas of potential effect (APEs). These areas will be assessed by FHWA and DOT in consultation with the SHPO. This assessment, which will include onsite reviews, will arrive at one of the following conclusions:

1. No Further Study

The areas and expected traffic condition and effects indicate the areas identified are not APEs and no further study is warranted.

2. Historic District Areas

The areas identified are in a historic district and overall effects on the historic district need to be examined.

3. Areas of Potential Effect

The area and expected traffic conditions are such that an APE is evident. Further evaluation of the APE is warranted to determine if there is a high concentration of historic properties/structures. If there is a low concentration or no historic properties/structures in the APE, no further study is warranted.

4. Additional Study Needed

If the SHPO determine that preliminary evidence is inconclusive, FHWA and DOT will undertake additional studies of properties/structures in the identified area(s) in order that the SHPO can conclude with certainty that an area is of high of low concentration.

B. Analysis of Effect

For those determined APEs that contain a high concentration of historic properties/structures, FHWA and DOT, in consultation with the SHPO, will determine the nature and extent of effects.

1. Historic Districts

a. No Effect - The cumulative affects of the expected traffic conditions on the Historic Districts are negligible and no effect is expected.

b. No Adverse Effect - There are some perceptible changes in the expected traffic conditions, but no adverse effects to the Historic District are evident.

c. Adverse Effect - Specific adverse effects will result from expected traffic conditions that will affect the character and setting of the Historic District. Possible mitigation measures will follow those steps in Stipulation II.B.

2. APEs - High Concentration of Historic Properties / Structures

a. No Adverse Effect - The effects of the expected traffic conditions are perceptible and evident, but no specific adverse effects are expected on the specific historic properties/structures.

b. Adverse Effect - Specific adverse effects will result from expected traffic conditions that will affect the character and setting of the historic properties/structures. Possible mitigation measures will follow those steps in Stipulation II.B..

3. Views of Interested Parties

In considering mitigation measures for treatment of adverse effects, FHWA and DOT will take fully into account the views of interested parties. For those sites, the steps in Stipulation II.B.2. will be followed.

IV. REPORTING

One year from the date this agreement is concluded, and every year thereafter until project completion, DOT will provide to the Council, the SHPO, and LPC a report on activities carried under this Agreement during the preceding year. At the time the report is submitted the signatories of the Agreement will review implementation of the Agreement and determine whether revisions are needed. If revisions are needed, the parties to this Agreement will consult in accordance with 36 CFR Part 800 to make such revisions.

V. DISPUTE RESOLUTION

Should the Council or the SHPO object within 30 days to any actions proposed pursuant to this agreement, DOT and FHWA shall consult with the objecting party to resolve the objection. If FHWA determines that the objection cannot be resolved, FHWA shall forward all documentation relevant to the dispute to the Council. Within 30 days after receipt of all pertinent documentation, the Council will either:

A. provide FHWA with recommendations, which FHWA will take into account in reaching a final decision regarding the dispute; or

B. notify FHWA that it will comment pursuant to 36 CFR Section 800.6(b), and proceed to comment. Any Council comment provided in response to such a request will taken into account by FHWA in accordance with 36 CFR Section 800.6(c)(2) with reference to the subject of the dispute.

Any recommendation or comment provided by the Council will be understood to pertain only to the subject of the dispute; FHWA's responsibility to carry out all actions under this agreement that are not the subjects of the dispute will remain unchanged.

EXECUTION AND IMPLEMENTATION OF THIS PROGRAMMATIC AGREEMENT EVIDENCES THAT FHWA HAS SATISFIED ITS SECTION 106 RESPONSIBILITIES FOR THE ROUTE 9A RECONSTRUCTION PROJECT.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____ Date: 3-23-94

FEDERAL HIGHWAY ADMINISTRATION

By: _____ Date: 3/15/94

NEW YORK STATE HISTORIC PRESERVATION OFFICER

By: _____ Date: 12 March '94

CONCUR:

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

By: _____ Date: 3/15/94

SEE NEXT SHEET FOR ADDED SIGNATURE IDENTIFICATION

Added After Signatures

Signature Identification

Signatories:

Robert W. Bush, Executive Director
Advisory Council on Historic Preservation

Gene K. Fong, Assistant Division Administrator
Federal Highway Administration

John Winthrop Aldrich, Deputy Commissioner for Historic Preservation
New York State Office of Parks, Recreation and Historic Preservation

Concurrence:

Robert J. Ronayne, Executive Director
Route 9A Reconstruction
New York State Department of Transportation

EXHIBIT F

WORLD TRADE CENTER MEMORIAL AND REDEVELOPMENT PLAN PROGRAMMATIC AGREEMENT

Agreement, dated April 22, 2004, among the Advisory Council on Historic Preservation ("ACHP"), the New York State Historic Preservation Officer ("SHPO") and the Lower Manhattan Development Corporation ("LMDC") as a recipient of community development block grant assistance from the U.S. Department of Housing and Urban Development ("HUD").

WHEREAS, LMDC is responsible for planning and conducting environmental and historic reviews for a proposed undertaking known as the World Trade Center Memorial and Redevelopment Plan (the "Plan") for the World Trade Center site (the "WTC Site") and adjacent areas in New York City as shown on Exhibit A hereto (the WTC Site and such adjacent areas are referred to, collectively, as the "Project Site"); and

WHEREAS, The Port Authority of New York and New Jersey (the "Port Authority") is the owner of the WTC Site and has certain artifacts from the WTC Site in its custody and control, which it has catalogued and committed to continuing to maintain, as set forth in its letter, dated April 21, 2004, attached hereto as Exhibit H; and

WHEREAS, the Plan has been developed by LMDC, after extensive public input, to include at its heart a Memorial to honor the victims of September 11, 2001 and February 26, 1993 and commercial, retail, open space and other uses to revitalize Lower Manhattan while providing opportunities through the Memorial design for remembrance of the tragic events of September 11 and preservation of historic resources at the WTC Site; and

WHEREAS, as lead agency under the National Environmental Policy Act ("NEPA") and the New York State Environmental Quality Review Act ("SEQRA"), LMDC has undertaken a comprehensive environmental review of the Plan, as set forth in LMDC's Final Generic Environmental Impact Statement ("FGEIS") dated April, 2004, which includes an assessment of the potential impacts of the Plan on historic resources both on the Project Site and in an extended Area of Potential Effect ("APE") surrounding the Project Site, as shown in Exhibit B hereto and described in Exhibit E hereto; and

WHEREAS, LMDC has, in addition, undertaken a comprehensive review of the potential effects of the Plan on historic resources under Section 106 of the National Historic Preservation Act ("NHPA") and, as part of that review, has engaged in both (1) a joint review with the Federal Transit Administration ("FTA") and the Federal Highway Administration ("FHWA") of the potential eligibility of the WTC Site for listing on the National Register of Historic Places ("National Register") and (2) an extensive consultation process with approximately 60 consulting parties (identified in Exhibit C hereto) with respect to such eligibility and the potential effects of the Plan on historic properties; and

WHEREAS, after consulting with the SHPO and the consulting parties and taking into account and considering their respective comments on draft determinations of eligibility, LMDC determined, jointly with FTA and FHWA, that the WTC Site is eligible for listing on the National Register for the reasons set forth in the Coordinated Determination of National Register Eligibility for the WTC Site ("DOE"), dated March 31, 2004, a copy of which is attached as Exhibit D hereto; and

WHEREAS, LMDC has, as part of both its NEPA and Section 106 reviews, consulted with the SHPO and undertaken a comprehensive review of the National Register status of historic properties in the APE; and

WHEREAS, the purpose of this Agreement is to address any unanticipated or adverse effects on historic resources or properties that may occur as a result of the Plan's implementation and, in particular, to provide a further opportunity for the SHPO and the consulting parties to comment on plans for the Memorial and the Project Site as they are developed in order to avoid or minimize any potential for adverse effects to any historic resources on the Project Site;

NOW, THEREFORE, LMDC, the ACHP and the SHPO agree that implementation of the undertaking as covered by this Agreement shall proceed in accordance with the following stipulations to avoid, minimize or mitigate any adverse effects and satisfy LMDC's Section 106 responsibilities.

LMDC, in coordination with the Port Authority, will ensure that the following measures are carried out:

1. Project Site Documentation

LMDC will, within 60 days of the execution of this Agreement, consult with the National Park Service and submit existing documentation of the current appearance of the Project Site to the SHPO, the Historic American Engineering Record (HAER), the Historic American Building Survey (HABS) and/or the New York State Archives, as appropriate, to ensure that there is a permanent record of existing historic resources on the Project Site.

2. Adherence to the Treatment Plans in the FGEIS

LMDC shall ensure that all plans and contracts adhere to the treatment/no adverse effect plans set forth in the relevant portions of Chapter 5, "Historic Resources," Chapter 21, "Construction," and Chapter 22, "Mitigation Measures," of LMDC's FGEIS for the Plan in order to avoid or minimize adverse effects to those historic resources within the Project Site and the historic properties adjacent to (i.e., across the street from) the Project Site. Excerpts of the relevant sections of Chapters 5, 21 and 22 of the FGEIS are attached as Exhibit E hereto.

3. Design of the Memorial

(a) As part of the development of the plans for the Memorial, LMDC will preserve and provide for reasonable and appropriate access by Memorial visitors to (1) portions of the western slurry wall on the WTC Site and (2) truncated box beam column bases outlining portions of the lower "footprints" of the former Twin Towers at the WTC Site (collectively, the "Memorial Access Commitments").

(b) At such time as the Memorial plans have reached a design stage sufficient to permit reasonable review of architectural plans for the Memorial, LMDC will notify the SHPO and the consulting parties and furnish copies of schematic drawings relating to the Memorial Access Commitments and/or illustrative plans (which may include renderings) for the Memorial to the SHPO and any consulting party for review and comment. The review of the plans shall focus solely on the Memorial Access Commitments. LMDC will consult with the SHPO concerning such plans and subsequently convene a meeting, on no less than 10 days' notice, of the consulting parties for the purpose of affording the consulting parties an opportunity to share their views regarding the adherence of the preliminary plans to the Memorial Access Commitments. LMDC shall consider all such

comments in preparing final plans for the Memorial. It is understood, however, that, in considering comments related to the Memorial Access Commitments, LMDC shall not be required to consider modifications to its proposed activities for any other portion of the Plan except as may be otherwise required by this agreement. In view of relevant security considerations, such plans shall not be subject to further review under this Agreement once the review contemplated by this Stipulation 3(b) has been completed.

4. Artifact Review Process

(a) LMDC has committed to, and will, (1) develop a Memorial Center as part of the Plan; (2) establish a Memorial Center Advisory Committee that will assist in the review of suggestions from the consulting parties and other members of the public with respect to the installation or display at the Memorial Center of artifacts removed from the WTC Site; and (3) consult with the Port Authority to assure that the Port Authority safeguards all such artifacts that are in its custody and control, pending the final disposition of such artifacts in accordance with the rights of the respective owners thereof, and thereafter transfers any remaining items to LMDC or its designee for safekeeping or other appropriate disposition. All artifacts to be included in the Memorial or elsewhere on the WTC Site shall be evaluated by LMDC for their significance as part of the National Register eligible WTC Site.

(b) LMDC shall obtain from the Port Authority a copy of a complete inventory listing of all WTC artifacts in the Port Authority's custody and control as of July 1, 2004. LMDC shall request and obtain periodic updates of this inventory to include any additional artifacts that come into the Port Authority's custody and control. LMDC will consult with the Port Authority to share the inventory with the SHPO and each consulting party and provide an opportunity to comment regarding artifacts that may be installed in

or displayed at the Memorial Center and their potential significance to the WTC Site. LMDC will share the comments with the Memorial Center Advisory Committee, which shall assist LMDC in considering such comments, along with other relevant considerations (e.g., security, space, curation standards), with respect to the construction and operation of the Memorial Center.

5. **Consideration of Impacts to Additional Remnants of The WTC**

In preparing plans for the portions of the Plan on the WTC Site that would reasonably be expected to affect any of the Additional Remnants listed on Exhibit F hereto, LMDC and, where appropriate, the Port Authority will seek to minimize or mitigate, through reasonable and practicable steps, any potentially adverse effects to such Additional Remnants to the degree consistent with the overall Plan, sound engineering practice and relevant construction considerations. Such measures may include, for example, the relocation and display of Additional Remnants. At such time as the preliminary design plans permit a reasonable assessment of potential effects to such Additional Remnants, LMDC will furnish relevant preliminary design or illustrative plans and a summary of any proposed mitigation measures to the SHPO and the consulting parties. The SHPO and consulting parties shall be afforded no less than 30 days to submit comments to LMDC and, where appropriate, the Port Authority on the adequacy of such plans in minimizing or mitigating any such potential effects. LMDC and, where appropriate, the Port Authority will consider all such comments in developing its final mitigation plans. In view of relevant security considerations, such plans shall not be subject to further review under this Agreement once the review contemplated by this Stipulation 5 has been completed.

6. Treatment of Archeological Resources

Upon completion of the plans for further archaeological investigation and monitoring of the portions of the Project Site which have a high probability of containing archeological resources per preliminary studies, a map of which is attached as Exhibit G, LMDC will provide copies or summaries of the proposed plans to the SHPO and each consulting party for review and comment. The SHPO and consulting parties shall be afforded no less than 30 days to submit comments or recommendations to LMDC or the Port Authority, as appropriate, with respect to the adequacy of such plans. LMDC and, where appropriate, the Port Authority shall consider all such comments before finalizing the plans that will address, as appropriate, required surveys, National Register evaluation, monitoring procedures, treatment and mitigation, including data recovery.

7. Treatment of Unanticipated Adverse Effects or Unknown Historic Resources or Properties

(a) If, during project implementation, LMDC, the Port Authority, or any of their contractors discovers or identifies additional historic resources within the Project Site that may be adversely affected, or should there be any unanticipated adverse effects to historic resources on the Project Site or historic properties immediately adjacent to the Project Site beyond those referred to in the FGEIS or this Agreement, LMDC or the Port Authority shall promptly notify the SHPO and the ACHP and shall, in consultation with the SHPO, develop a treatment or mitigation plan for such resource or property or adverse effect condition and submit it to the ACHP and consulting parties as well as SHPO for comment within 15 days. The failure of the ACHP to comment within that time period shall constitute its concurrence with the proposed plan. LMDC shall consider comments before finalizing its treatment or mitigation plans. Under emergency conditions, the 15 day period may be shortened, with the ACHP's concurrence.

(b) LMDC and the Port Authority may proceed with all project activities while the treatment or mitigation plan is being developed and reviewed, but shall not take or permit actions that would adversely affect such resource or property during such period.

8. Coordination of Future Federally Funded Activities

In the event that the LMDC applies for other federal assistance to implement this undertaking, the federal funding agency may satisfy its Section 106 responsibilities by agreeing in writing to the terms of this Agreement and notifying the SHPO and ACHP accordingly.

9. Monitoring and Reporting Activities

LMDC will continue to provide relevant and up-to-date information related to its planning efforts on its website: www.RenewNYC.com. During project implementation, LMDC shall ensure that all monitoring plans and contracts adhere to the standards set forth in Chapters 5, 21 and 22 of the FGEIS. LMDC shall submit semi-annual reports to the SHPO and ACHP to summarize measures it has taken to comply with the terms of this Agreement. Reports shall be submitted in January and June of each year during the term of this Agreement or until the project is completed or the requirements of this Agreement are satisfied. The SHPO and the ACHP may monitor project activities carried out pursuant to this Agreement. The LMDC will cooperate with the SHPO and the ACHP in carrying out these monitoring and review responsibilities.

10. Dispute Resolution

In the event that the SHPO concludes, either on the basis of its own review or on the basis of an objection submitted to it by a consulting party or another member of the public, that LMDC has failed or is failing to carry out its obligations under this Agreement, the SHPO shall so advise LMDC and request it to consider taking

appropriate measures to remedy such failure. If, after considering the SHPO's views, LMDC determines that no such measures are warranted or appropriate, LMDC shall so advise the ACHP, which shall have 15 days to consider the matter and submit its recommendations, if any, to LMDC for further consideration. The failure of the ACHP to comment within that time period shall constitute its concurrence with LMDC's views on the disputed matter.

11. Terminating the Agreement

Any signatory to this Agreement may terminate it by providing 30 days' notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination and to clarify the procedures for future review of any outstanding activities subject to this Agreement. In the event of termination, LMDC shall either execute a new programmatic agreement per 36 CFR § 800.14(b) or request and consider the comments of the ACHP per 36 CFR § 800.7.

12. Duration of This Agreement

This Agreement constitutes a Programmatic Agreement as set forth in 36 CFR § 800.14(b) and will continue in full force for ten years following its execution or until such earlier time as it is terminated or the matters that are the subject of this Agreement have been performed in accordance with the provisions hereof.

13. Amendments

Should any of the signatories to this Agreement propose that it be amended, LMDC shall consult with the signatories in accordance with 36 CFR § 800.14(b)(3). Amendments shall be in writing and effective when approved in writing by all the signatories to this Agreement.

14. Successors

This Agreement shall be binding on and inure to the benefit of the parties' respective successors and assigns.

EXECUTION AND IMPLEMENTATION of this Agreement evidence that LMDC has afforded the ACHP a reasonable opportunity to comment on its Plan and that LMDC has taken into account the effects of the Plan on historic properties.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____
John L. Nau, III, Chairman

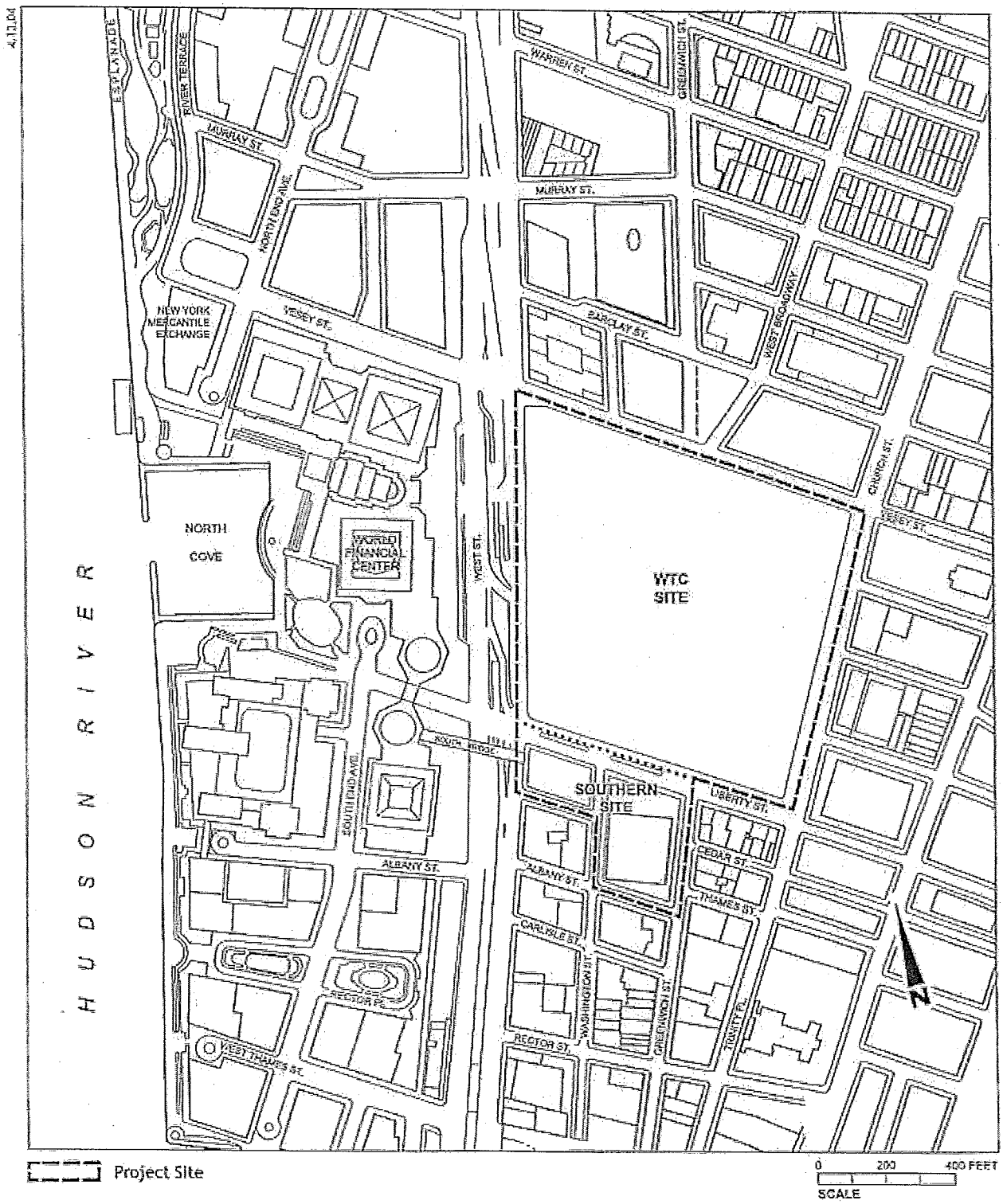
LOWER MANHATTAN DEVELOPMENT CORPORATION

By: _____
Kevin M. Rampe, President

NEW YORK STATE HISTORIC PRESERVATION OFFICER

By: _____
Bernadette Castro, Commissioner
New York State Office of Parks,
Recreation and Historic Preservation

Project Site
Exhibit A



Area of Potential Effect

Exhibit B

Exhibit C

List of Consulting Parties

Eric	Allison	American Planning Association – NY Metro Chapter
Frederic	Bell	American Institute of Architects – NY Chapter
Deborah	Bershad	New York City Art Commission
Laura	Blackman	Hudson River Park Trust
Douglas	Blais	Office of the Governor
Hon. Michael	Bloomberg	The City of New York
Amanda	Burden	New York City Department of City Planning
Jonathan	Cohen-Litant	Van Alen Institute
Megan	Cook	Verizon
Philip	Craft	Congresswoman Maloney's Office for United States Congress
Kate	Daly	Landmarks Preservation Commission
John	Dellaportas	Coalition to Save West Street
Bruce	Ehrmann	CB 1 Landmarks Committee
Marilyn	Fenollosa	National Trust for Historic Preservation
Mary	Fetchet	Voices of September 11th
Robin	Forst	Office of Councilmember Gerson
Monica	Gabrielle	Skyscraper Safety Campaign
Anthony	Gardner	Coalition of 9/11 Families
Raymond	Gastil	Van Alen Institute
Marilyn	Gaull	Coalition to Save West Street
Stephanie	Gelb	Battery Park City Authority
Michael	Gerrard	Silverstein Properties
Craig	Hall	WTC Residents' Coalition
Alex	Herrerra	New York Landmarks Conservancy
Scott	Heyl	Preservation League of New York State
Diane	Horning	WTC Families for a Proper Burial, Inc.
Kurt	Horning	WTC Families for a Proper Burial, Inc
Lee	Ielpi	9/11 Widows and Victims Family Association
Monica	Iken	September's Mission
Richard	Kennedy	CB 1 WTC Redevelopment Committee
Joel	Klein	Coalition of 9/11 Families (Consultant)
Robert	Kornfeld	Historic Districts Council
Deborah	Lester	Speak Silver's Office in the New York State Assembly
Louise	LoPresti	
Ken	Lustbader	Lower Manhattan Emergency Preservation Fund (Consultant)
Edie	Lutnick	Cantor Fitzgerald Relief Fund
Jack	Lynch	9/11 Widows and Victims Family Association
Kevin	Madigan	St Peter's Church
Keith	Martin	New York State Department of Transportation
Elizabeth	Mattson	Senator Corzine's Office
Anna	Melman	Alliance for Downtown New York, Inc.

Elizabeth	Merritt	National Trust for Historic Preservation
Peter	Miller	WTC Survivor's Network
Tricia	Mire	Lower Manhattan Cultural Council
Sharon-Frances	Moore	Tribeca Organization
Patty	Noonan	Partnership for New York City
Jesi	Pezzuoli	R.dot (Rebuild Downtown Our Town)
Noah	Pfefferblit	Wall Street Rising
Sally	Regenhard	Skyscraper Safety Campaign
Tom	Roger	Families of September 11th
Linda	Rosenthal	Congressman Nadler's Office for United States Congress
Michael	Samuelian	New York City Department of City Planning
Frank	Sanchis	Municipal Art Society
George	Schira	Greek Orthodox in America (St. Nicholas)
Richard	Schmalz	New York State Department of Transportation
Helene Z.	Seeman	BPC United
Ninfa	Segarra	WTC Residents Coalition
Christopher	Shays	United States Congress
Daniel	Slippen	Pace University - Center for Downtown NY
David	Stanke	BPC United
Nikki	Stern	Families of September 11th
Tim	Stickelman	The Port Authority of New York and New Jersey
Petra	Todorovich	Regional Plan Association/Civic Alliance
Matt	Viggiano	Senator Connor's Office in the New York State Senate
Phyllis	Wahahrockah-Tasi	Delaware Nation
Winonah	Warren	Shinnecock Nation Cultural Center and Museum
Vicki	Weiner	Municipal Art Society
Kathy	Wylde	Partnership for New York City
Christopher	Zeppie	The Port Authority of New York and New Jersey

Exhibit D

March 30, 2004 Coordinated Determination of National Register Eligibility

(separately provided)

EXHIBIT E

Excerpts of Relevant Sections of Chapters 5, 21, 22 of the FGEIS

EXCERPTS FROM CHAPTER 5 "HISTORIC RESOURCES" OF THE FGEIS

* * * * *

5.1.2 CONCLUSIONS

This section summarizes the conclusions of the analysis that follows in this chapter. The Proposed Action was analyzed with respect to historic resources under two scenarios, the Pre-September 11 Scenario and the Current Conditions Scenario.

Potential effects to historic resources can include both direct physical effects and indirect contextual effects. Potential effects to archaeological resources would occur during excavation and below-grade construction activities. These effects would occur within the area where construction and excavation for the Proposed Action would occur. In order to identify historic properties and assess the potential effects of the proposed project, a study area or Area of Potential Effect (APE) was defined and an inventory of historic and architectural resources located in the APE was compiled in consultation with the New York State Historic Preservation Officer (SHPO).

The Proposed Action would memorialize the tragic events of September 11 while returning the commercial, open space and other uses that existed on the Project Site on that date and reintroducing streets that pre-existed the WTC. The Memorial has been designed to reflect the former presence of the Twin Towers, and to provide access to portions of the west slurry wall and box-beam column bases outlining portions of the perimeters of the former Twin Towers. The Memorial Center would be a museum that would exhibit or incorporate significant artifacts from the former WTC.

Under either the Pre-September 11 or Current Conditions Scenario, the Proposed Action is not expected to have significant adverse impacts on historic resources on the Project Site—namely the WTC Site itself—or elsewhere in the APE. The Proposed Action would, however, have the potential to adversely affect some of the remaining remnants at the WTC Site. In implementing the Proposed Action, LMDC and the Port Authority would undertake appropriate efforts to avoid, minimize or mitigate any such adverse effects or any unexpected adverse effects on other historic resources. These efforts would include both the Environmental Performance Commitments described in Chapter 21, "Construction," and the measures described in Chapter 22, "Mitigation," and the Programmatic Agreement under consideration referred to below. Overall, the Proposed Action would serve to enhance the historic significance of the WTC Site and its role in the city's and the nation's consciousness.

PRE-SEPTEMBER 11 SCENARIO

As described in greater detail below, it is not expected that the Proposed Action would have any significant adverse impact on historic resources.

2009

Archaeological Resources

All below-grade construction activities would have occurred by 2009, with the possible exception of the foundation of Tower 5. Therefore, this phase is analyzed for potential effects to archaeological resources. Construction of the former Twin Towers and associated excavations on the west side of the WTC Site to create the existing bathtub have limited the potential for significant archaeological resources to exist in this area. However, the north and south portions of the WTC Site east of the No. 1/9 IRT subway and portions of the Southern Site may be potentially sensitive for archaeological resources, such as shaft features and wharf and/or cribbing features. In order to identify any potential impacts to archaeological resources, Phase IB investigations are recommended in those areas.

Architectural Resources

In the Pre-September 11 Scenario, the SHPO had determined that the WTC was not eligible for listing on the National Register, and no other agency had identified any historic resources on the Project Site. Therefore, absent the events of September 11, redevelopment would have no impact on historic resources on the Project Site. Fulton Street and Greenwich Street would be extended through the WTC Site, restoring the street linkage between historic resources to the north and south of the WTC Site. This would be particularly beneficial to resources south of Liberty Street that were isolated by the superblock of the WTC and the lack of view corridors through the WTC Site. The WTC Site would be divided at grade level into four separate blocks, instead of one large superblock, thus restoring part of the street grid and allowing development to relate better to the neighboring historic resources.

Lower Manhattan, specifically the WTC Site, has historically been developed with technologically advanced buildings—such as the Hudson and Manhattan (H&M) Terminal and the Twin Towers—that were pioneering achievements for their time of construction. The Proposed Action would continue this tradition of building evolution and design and would introduce a new and more modern skyscraper, Freedom Tower, to the Project Site and surrounding neighborhood.

The Proposed Action would shift the bulk of the buildings away from the footprints of the Twin Towers located in the southwest quadrant of the site, altering views of adjacent historic resources to the north of the Project Site. Freedom Tower would rise immediately south of the Barclay-Vesey Building, blocking views of the structure from the southwest that were previously afforded by the lower-rise 6 WTC. Although the Proposed Action would in these respects shift the bulk of development as compared to pre-September 11 conditions, this change would not be an adverse effect as the Project Site and immediate study area have historically been developed with tall and modern structures in close proximity to historic buildings.

On the other hand, the open spaces that would be part of the Proposed Action would benefit certain historic resources. Liberty Park would greatly improve the setting of 90

West Street and the Beard Building (125 Cedar Street). It would also generally improve the neighborhood for all the other historic resources south of the Project Site. Farther north on the WTC Site, Wedge of Light Plaza would link to St. Paul's Chapel and historic resources east of the WTC Site.

Because the proposed construction would take place within 90 feet of historic structures, adherence to Construction Protection Plans would be required to avoid potential damage to architectural resources located near the Project Site. (See Chapter 21, "Construction.") The increased traffic levels expected as a result of the Proposed Action are expected to have some effect on the setting of historic resources, but not to a degree that they would constitute an adverse effect. This is primarily because most of the traffic impacts would occur on streets already burdened with high levels of traffic, thus historic resources located in these areas have already existed in an urban environment with well-traveled city streets.

2015

The full development of the Proposed Action would further alter the Project Site. However, since there would have been no historic resources on the site, there would have been no impacts to on-site historic resources.

In addition to the impacts on off-site resources described in 2009, completion of the four other office towers would increase bulk along Church Street on the WTC Site and on the south end of the Southern Site. The proposed office tower and hotel on the northeast quadrant would face directly into the Federal Office Building/U.S. Post Office and block views of it from the southeast that were formerly afforded by the much lower 5 WTC building. The proposed office building south of the permanent WTC PATH Terminal entrance would tower over the former East River Savings Bank. Finally the tower at the southeast corner of the WTC Site would be taller and have a greater bulk than 4 WTC, altering the context of the Beard Building and 114-118 Liberty Street. Again this change would not be an adverse effect as the study area has historically been developed with tall, modern structures among smaller-scaled historic buildings.

As described for conditions in 2009, it is not expected that the increased traffic levels would have an adverse effect on historic resources.

CURRENT CONDITIONS SCENARIO

As described in greater detail below, it is not expected that the Proposed Action would have any significant adverse impact on historic resources.

2009

Archaeological Resources

All below-grade construction activities would have occurred by 2009, except, possibly, the foundation of Tower 5. Therefore, this phase is analyzed for potential effects to archaeological resources. As described above under the Pre-September 11 Scenario, the north and south portions of the WTC Site east of the No. 1/9 IRT subway and portions of the Southern Site may be potentially sensitive for archaeological resources, such as shaft features and wharf and/or cribbing features. In order to identify any potential impacts to archaeological resources, Phase IB investigations are recommended in those areas.

Architectural Resources

Based on the events of September 11, the WTC Site has been found eligible for listing on the National Register. Although the eligibility of the site does not depend on existing remnants of the prior structures, the Proposed Action would have an adverse effect on some of these remnants. LMDC will consult with SHPO, the Port Authority, and Silverstein Properties in order to minimize or mitigate such effects. LMDC is also considering a Programmatic Agreement with the Advisory Council on Historic Preservation (ACHP) and SHPO that would include additional consultation with the consulting parties who participated in the Section 106 process.

By 2009, Fulton Street and Greenwich Street would be extended through the WTC Site, restoring the street linkage between historic resources to the north and south of the WTC Site. This would be particularly beneficial to resources south of Liberty Street that are now isolated by the large construction site that remains on the WTC Site.

Although the Proposed Action would change the study area through the addition of tall and modern towers, this is not expected to have an adverse effect. The Project Site and immediate study area have historically been developed with tall and modern structures in close proximity to low-rise and high-rise historic buildings. In addition, the Proposed Action would be in keeping with the character of the Project Site and surrounding area, which were located in a densely developed urban setting.

New office towers would be constructed on the Project Site that would re-introduce tall, modern structures to this portion of the Lower Manhattan skyline. The towers of the Proposed Action would block views across the now largely open WTC Site to historic resources on the other side. In particular, views of the Barclay-Vesey Building and the Federal Office Building/U.S. Post Office from Church and Liberty Streets, and from the Winter Garden to St. Paul's Chapel and the former East River Savings Bank would be blocked. Views from the corner of Vesey and Church Streets and along Church Street to the Beard Building and 90 West Street would be blocked. The Proposed Action would create a series of structures with retail frontage along the north and east sides of the WTC Site. Freedom Tower would rise immediately south of the Barclay-Vesey Building. On the other hand, the open spaces that would be part of the Proposed Action would benefit certain historic resources. Liberty Park would greatly improve the setting of 90 West Street and the Beard Building. It would also generally improve the neighborhood for all the other historic resources south of the Project Site. Farther north on the WTC Site, Wedge of Light Plaza would link to St. Paul's Chapel and historic resources east of the WTC Site.

Due to the proximity of historic resources, adherence to Construction Protection Plans would be required to avoid potential construction period damage to architectural resources.

The increased traffic levels expected as a result of the Proposed Action are expected to have some effect on the setting of historic resources, but not to a degree that they would constitute an adverse effect. This is primarily because most of the traffic impacts would occur on streets already burdened with high levels of traffic, thus historic resources located in these areas have already existed in an urban environment with well-traveled city streets.

2015

In addition to the impacts on off-site resources described in 2009, completion of the four other office towers would increase bulk along Church Street on the WTC Site and on the south end of the Southern Site. The proposed office tower and hotel on the northeast quadrant would face directly into the Federal Office Building/U.S. Post Office. The proposed office building south of the permanent WTC PATH Terminal entrance would tower over the former East River Savings Bank. Finally the tower at the southeast corner of the WTC Site would alter the context of the Beard Building and 114-118 Liberty Street. Overall, this change would not be an adverse effect, as the study area has historically been developed with tall, modern structures among smaller-scaled historic buildings.

As described for conditions in 2009, it is not expected that the increased traffic levels would have an adverse effect on historic resources.

* * * * *

5.5.3 PROBABLE IMPACTS OF THE PROPOSED ACTION 2009—CURRENT CONDITIONS SCENARIO

ARCHAEOLOGICAL RESOURCES

The northeast and southeast corners of the WTC Site, as well as portions of the Southern Site, were found to be potentially sensitive for archaeological resources. Phase IB investigations would be conducted prior to project construction to document any potential resources. These investigations would be developed in consultation with SHPO and LPC.

ARCHITECTURAL RESOURCES

Project Site

By 2009 with the Proposed Action, Fulton and Greenwich Streets would run through the WTC Site and Freedom Tower would rise in the northwest quadrant. A proposed performing arts center would be located east of the Freedom Tower. The Memorial, the Memorial Center, September 11 Place, and other cultural institutions would occupy the southwest quadrant. Wedge of Light Plaza would occupy a portion of the northeast and southeast quadrants. The PATH Plaza would be located in the southeast quadrant. By 2009, the retail bases of three office buildings east of Greenwich Street would be complete. Liberty Park and a below-grade bus parking facility would be complete in the area south of Liberty Street.

The centerpiece of the Proposed Action is the creation of a Memorial to remember the victims of September 11, 2001 and February 26, 1993 and to record the events of September 11, which have changed our lives. The Memorial would be set in a context that provides a quiet and respectful setting for remembrance and contemplation. LMDC conducted the World Trade Center Site Memorial Competition pursuant to detailed Memorial Competition Guidelines, including diagrams of Libeskind's Memory Foundations design and the Memorial Mission Statement and Program. The Memorial Competition jury recently announced its selection of the design concept "Reflecting Absence" by Michael Arad and Peter Walker from 5,200 other entries (including seven

other finalists). This concept is being refined in order to accomplish the principles set forth in the Memorial Mission Statement and Program.

The Proposed Action would build up an approximately 4.87-acre area set aside for the Memorial from bedrock to 30 feet below grade in order to stabilize the slurry walls. The Memorial would be constructed in this area and at grade. It would make visible each of the 1-acre areas occupied by the Twin Towers, allow access to a portion of those footprints at bedrock and would keep exposed a portion of the west slurry wall, including a section to bedrock. In addition to the recognition of each victim, the unidentified human remains will be interred at a designated area within the Memorial. Visitors from around the world are expected to come to the WTC Site to learn about the events of September 11, 2001, and February 26, 1993, and to remember those who died and those whose lives were changed forever.

It is not anticipated that the Proposed Action would have any significant adverse impact on the WTC Site. The proposed Memorial and Memorial Center would recognize the history of September 11 and would be constructed around two large voids and other features that would represent the former location of the Twin Towers. The openness of the site plan for the Memorial would recall the openness of the WTC Site as it now exists after the recovery efforts and the openness of the Austin J. Tobin Plaza at the center of the WTC before September 11. The size and the location of the Memorial reflect LMDC's commitment from the very beginning of its planning efforts to leave open the space at grade level where the Twin Towers once stood.

The surviving column bases that outline the space where the Twin Towers stood would remain. The Proposed Action would also allow access to a portion of the west slurry wall. A special facility would be created to preserve the more than 12,000 human remains of victims of the WTC attacks that the Office of the Chief Medical Examiner has not been able to identify. The return of these human remains to rest at the WTC Site where these innocent individuals died would contribute to the feeling of the WTC Site's historic significance.

In implementing the Proposed Action, LMDC and the Port Authority would undertake appropriate efforts to avoid, minimize, or mitigate any such adverse effects or any unexpected adverse effects on other historic resources. These efforts would include both the Environmental Performance Commitments described in Chapter 21, "Construction," and the measures described in Chapter 22, "Mitigation," and a Programmatic Agreement under consideration with ACHP and SHPO. Before construction activities begin, LMDC will submit existing documentation of the current appearance of the WTC Site to SHPO, the New York State Archives, and other organizations as appropriate, to ensure that there is a permanent record of existing historic resources on the site. In developing its plans for the WTC Site, LMDC will also provide for appropriate access to portions of the west slurry wall on the WTC Site and the box-beam column bases outlining portions of the footprints of the former Twin Towers (collectively, the Memorial Access Commitments). LMDC has committed to develop a Memorial Center, establish a Memorial Center Advisory Committee that will review public suggestions and advise LMDC with respect to the installation or display at the Memorial Center of artifacts removed from the WTC Site, and consult with the Port Authority, which is safeguarding all such artifacts that are in its custody and control. The draft Programmatic Agreement (see Appendix K.7)

addresses these specific commitments relating to the Memorial Access Commitments, treatment of remnants on the WTC Site, consideration of artifacts removed from the site, and any potential adverse effects on historic resources. Overall, the Proposed Action would serve to enhance the historic significance of the WTC Site and its role in the city's and the nation's consciousness.

Primary Area of Potential Effect

Ground-Borne Vibrations

Several known and potential historic resources are located within 90 feet of the Project Site. Construction of the Proposed Action has the potential to cause damage to these buildings from ground-borne vibrations and dewatering. Specifically, historic buildings or sites located within 90 feet of the Project Site include the Barclay-Vesey Building at 140 West Street, the Federal Office Building/U.S. Post Office at 90 Church Street, 30 Vesey Street, St. Paul's Church Cemetery at Church Street between Vesey and Fulton Streets, the former East River Savings Bank at 26 Cortlandt Street, the Beard Building at 125 Cedar Street, 114-118 Liberty Street, the Western Electric Company Factory at 125 Greenwich Street, the American Stock Exchange at 86 Trinity Place, the Hazen Building at 120 Greenwich Street, 123 Washington Street, and 90 West Street. In addition there are potential historic resources at 106, 110, and 112 Liberty Street; 130 Cedar Street; and, 137-139 Greenwich Street. These resources survived the initial clearance of the WTC Site and the construction of the WTC, and also survived the destruction of the site on September 11. (Other historic resources are more distant from the Project Site and are not within the area that is expected to be affected by project construction.)

To avoid any potential adverse effects to historic resources, a Construction Protection Plan(s) would be developed in consultation with the SHPO and implemented before commencement of any excavation or construction. The Construction Protection Plan(s) would consist of an overall plan(s) of protection and avoidance of structural and architectural damage for all the potentially affected historic resources. Implementation of these plans would avoid or minimize the potential for adverse effects to historic resources during construction.

The Construction Protection Plans would be based on the requirements laid out in the "New York City Department of Buildings Technical Policy and Procedure Notice (PPN) #10/88," concerning procedures for avoidance of damage to historic structures from adjacent construction (see Chapter 21, "Construction" for more information). The PPN defines an adjacent historic structure as being contiguous to or within a lateral distance of 90 feet from a lot under development or alteration. In addition, EPCs have been made by LMDC to avoid or minimize any adverse effects on historic resources during construction (see Chapter 21).

Contextual and Visual Effects

The Proposed Action would extend Fulton and Greenwich Streets through the WTC Site, restoring the street linkage between historic resources to the north and south of the WTC Site. New office towers would be constructed on the Project Site that would re-introduce tall, modern structures to this portion of the Lower Manhattan skyline. By 2009, Freedom Tower would rise immediately south of the Barclay-Vesey Building, blocking views of

the structure from the southwest. However, views of this building would be available from other locations within the study area.

Additional open spaces would be part of the Proposed Action and would benefit certain historic resources. Liberty Park would greatly improve the setting of 90 West Street and the Beard Building. It would also generally improve the neighborhood for all the other historic resources south of the Project Site. Farther north on the WTC Site, Wedge of Light Plaza would link to St. Paul's Chapel and historic resources east of the WTC Site.

In terms of contextual or visual impacts, the study area is developed with a mix of historic and modern structures that range in height from one to 60 stories. The size and architectural styles of these buildings vary greatly, reflecting the architectural styles of the eras in which they were designed and constructed. The built fabric of Lower Manhattan is already composed of historic structures near more modern structures, where many streets contain a mixture of historic structures in immediate proximity to contemporary glass and metal structures. Thus, the Proposed Action would continue the existing trend of modern buildings juxtaposed against the historic fabric of Lower Manhattan.

As described earlier, the historic context of the study area was dramatically changed when the 16-acre site was cleared for the construction of the WTC. Thus, the proposed development would not alter the historic context of the surrounding area, as this context was significantly altered with the completion of the WTC and subsequent modern office buildings that were erected in the following decades. Overall, the Proposed Action is not expected to have any adverse contextual or visual effects on any known or potential historic resources in the area surrounding the WTC Site.

Secondary Area of Potential Effect

Traffic-Related Effects

The increased traffic levels expected as a result of the Proposed Action are expected to have some effect on the setting of historic resources, but not to a degree that they would be expected to have an adverse effect. The increased traffic is not expected to alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. This is primarily because most of the traffic impacts would occur on streets already burdened with high levels of traffic, thus historic resources located in these areas have already existed in an urban environment with well-traveled city streets.

5.5.4 FUTURE WITHOUT THE PROPOSED ACTION 2015—CURRENT CONDITIONS SCENARIO

ARCHAEOLOGICAL RESOURCES

On the Southern Site, construction of two office towers at 130 and 140 Liberty Street could impact any potential archaeological resources that exist.

ARCHITECTURAL RESOURCES

Project Site

In 2015 without the Proposed Action, it is assumed that the WTC Site will continue to remain largely vacant, with only the permanent WTC PATH Terminal on site and the No.

1/9 IRT subway lines crossing the site. On the Southern Site, it is assumed that two office towers would be developed at 130 and 140 Liberty Street. Construction of these towers could potentially affect adjacent historic resources, including 90 West Street.

Primary Area of Potential Effect

North of WTC Site
No specific potential projects have been identified for the North of WTC Site subarea in the 2009–2015 timeframe.

Broadway Corridor
Potential future development in the Broadway Corridor may include residential conversions at 115 Nassau Street and 3-9 Beekman Street (NYCL).

Greenwich South Corridor
New York City's Vision for a 21st Century Lower Manhattan calls for the creation of a park, Greenwich Square, over the Brooklyn Battery Tunnel ramps, and for the area to become a center of new residential uses that may renovate and occupy some of the historic structures. There are a number of historic resources in this area that might be altered in use or context.

Secondary Area of Potential Effect

No specific projects in the secondary APE were identified for this time frame. However, it is likely that residential renovation and reuse will continue to occur in historic buildings and districts in Tribeca. To the extent that these resources are not NYCLs or NYCHDs and if there is no federal or state action involved, they may be inappropriately altered or even demolished.

5.5.5 PROBABLE IMPACTS OF THE PROPOSED ACTION 2015—CURRENT CONDITIONS SCENARIO

ARCHAEOLOGICAL RESOURCES

As all construction activities that could potentially impact archaeological resources would be complete by 2009, there would be no potential for adverse effects to archaeological resources in 2015.

ARCHITECTURAL RESOURCES

Project Site

By 2015, it is assumed that the full program for the Project Site would be developed, with the completion of the three towers on the east side of the WTC Site and a fifth tower south of Liberty Street. A 65-story office building (Tower 2) and a 25-story hotel would be completed in the northeast quadrant. In the southeast quadrant, a 62-story office building (Tower 3) and a 58-story office building (Tower 4) would be completed. A 57-story office building (Tower 5) would be completed south of Liberty Street.
As described in "Probable Impacts of the Proposed Action 2009" and in section 5.2.1, it is not anticipated that the Proposed Action would have an adverse effect on the WTC Site.

Primary Area of Potential Effect

The towers of the Proposed Action would re-introduce tall, modern structures to this portion of the Lower Manhattan skyline. These towers would block views across the largely vacant WTC Site to historic resources on the other side. Views of the Barclay-Vesey Building and the Federal Office Building/U.S. Post Office from Church and Liberty Streets would be blocked. Views from the Winter Garden to St. Paul's Chapel and the Former East River Savings Bank would be blocked. Views from the corner of Vesey and Church Streets and along Church Street to the Beard Building and 90 West Street would be blocked. New structures would create a high-rise wall along the north and east sides of the WTC Site. The proposed office tower and hotel on the northeast quadrant would face directly into the Federal Office Building/U.S. Post Office. The proposed office building south of the permanent WTC PATH Terminal entrance would tower over the former East River Savings Bank. Finally the tower at the southeast corner of the WTC Site would alter the context of the Beard Building and 114-118 Liberty Street.

New open spaces that would be part of the Proposed Action would benefit historic resources by improving their setting.

Due to the proximity of historic resources, adherence to Construction Protection Plans would be required to avoid potential construction period damage to architectural resources.

As described above under "Probable Impacts of the Proposed Action 2009—Current Conditions Scenario," the study area is developed with a mix of historic and modern structures. The built fabric of Lower Manhattan is already composed of historic structures near more modern structures, where many streets contain a mixture of historic structures in immediate proximity to contemporary glass and metal structures. Thus, the Proposed Action would continue the existing trend of modern buildings juxtaposed against the historic fabric of Lower Manhattan.

Overall, the Proposed Action is not expected to have any adverse contextual or visual effects on any known or potential historic resources in the area surrounding the WTC Site.

Secondary Area of Potential Effect

As described above under "Probable Impacts of the Proposed Action 2009—Current Conditions Scenario," it is not expected that the increased traffic levels would have an adverse effect on historic resources.

5.6 PRE-SEPTEMBER 11 SCENARIO

5.6.1 BASELINE CONDITIONS

ARCHAEOLOGICAL RESOURCES

Prior to September 11, the same archaeological resources would have potentially existed on site as under the Current Conditions Scenario.

ARCHITECTURAL RESOURCES

Project Site

In the Pre-September 11 Scenario, the 16-acre WTC complex, built by the Port Authority between 1966 and 1981, comprised six buildings, including the 110-story Twin Towers (1 and 2 WTC). These 1,350-foot-tall aluminum-clad towers were the tallest buildings in the world when completed in 1972 and 1973. Other buildings located in the WTC included a 22-story hotel (3 WTC), two nine-story buildings (4 and 5 WTC), and an eight-story U.S. Customs House (6 WTC). These buildings were situated around the Austin J. Tobin Plaza, which was decorated with several sculptures by prominent artists, including Fritz Koenig (the Sphere), James Rosati (Ideogram), and Masayuki Nagare (unnamed granite). A concourse was located directly below the Plaza and consisted of a retail mall and transportation hub. A pedestrian bridge over Route 9A connected the northern part of the WTC with the commercial core of BPC.

All buildings in the WTC, except 3 WTC, were designed by Minoru Yamasaki & Associates and Emery Roth and Sons. The Marriott Hotel (originally the Vista International Hotel), located at 3 WTC, was designed by Skidmore, Owings & Merrill and was constructed in 1981.

Prior to September 11, the block at the corner of Liberty Street and Route 9A was an active parking lot and the site of the St. Nicholas Greek Orthodox Church, destroyed on September 11. This small Greek Orthodox church stood at 155 Cedar Street, south of the WTC. Established in 1916 by Greek immigrants, it was only 35 feet tall with a rooftop bell cote. The church was notable for its small scale and its icons, which were a gift from the last czar of Russia, Nicholas II. The block to the east was occupied by a 39-story office building at 130 Liberty Street. Located directly across Liberty Street from 2 WTC, it was a fully occupied office tower with ground-floor retail. It had a plaza with a fountain, above which was an additional plaza level that was originally intended to connect to the plaza level at the WTC.

As of September 11, none of the buildings in the WTC or on the Southern Site was listed on or determined to be eligible for listing on the S/NR or designated as a NYCL. Buildings that were part of the WTC were evaluated in 1989 as part of the Route 9A Project and were determined ineligible for S/NR listing. Buildings on the Southern Site had never been evaluated for eligibility.

Primary Area of Potential Effect

It is assumed that the identification of known and potential resources would be the same in the Pre-September 11 Scenario. Although several resources were listed on or determined eligible for listing on the NR or designated as NYCL or NYCHD after September 11, these resources would have been determined eligible or designated in any event because their characteristics that qualify them for listing were not altered.
All the historic buildings that were damaged on September 11 would not have been damaged and would still be occupied as they were on September 11. The Barclay-Vesey Building would be fully occupied by New York Telephone. The Federal Office Building/U.S. Post Office would be occupied with office tenants and the Church Street Station of the post office would be open and serving its customers. The offices in the building at 90 West Street would be fully tenanted.

Secondary Area of Potential Effect

The identification of known and potential resources would be the same in the Pre-September 11 Scenario, as described above. Resources in this area were distant from the WTC and not directly damaged in the attacks.

* * * * *

5.6.3 PROBABLE IMPACTS OF THE PROPOSED ACTION 2009—PRE-SEPTEMBER 11 SCENARIO

ARCHAEOLOGICAL RESOURCES

The northeast and southeast corners of the WTC Site, as well as portions of the Southern Site, were found to be potentially sensitive for archaeological resources. Phase IB investigations would be conducted prior to project construction to document any potential resources. These investigations would be developed in consultation with SHPO and LPC.

ARCHITECTURAL RESOURCES

Project Site

This scenario assumes that the buildings on the Project Site would be replaced by the Proposed Action. Buildings that were part of the WTC were evaluated in 1989 as part of the Route 9A Project and were determined ineligible for S/NR-listing. The building at 130 Liberty Street had never been evaluated for eligibility. Since these buildings were not officially recognized historic resources, their replacement would not be considered an adverse effect.

Primary Area of Potential Effect

The extension of Fulton and Greenwich Streets through the WTC Site would restore the street linkage between historic resources to the north and south of the WTC Site. This would be beneficial to resources south of Liberty Street that were isolated by the superblock of the WTC and the lack of view corridors through the WTC Site. The WTC Site would be divided at grade level into four separate blocks, instead of one large superblock, thus restoring part of the street grid and allowing development to relate better to historic resources in the surrounding area.

The Proposed Action would shift the bulk of the buildings away from the footprints of the Twin Towers located in the southwest quadrant of the site. Freedom Tower would rise immediately south of the Barclay-Vesey Building, blocking views of the structure from the southwest that were previously afforded by the lower-rise 6 WTC. However, the open spaces that would be part of the Proposed Action would benefit certain historic resources. Liberty Park would greatly improve the setting of 90 West Street and the Beard Building. It would also generally improve the neighborhood for all the other historic resources south of the Project Site. Farther north on the WTC Site, Wedge of Light Plaza would link to St. Paul's Chapel and historic resources east of the WTC Site.

Because the proposed construction would take place within 90 feet of historic structures, adherence to Construction Protection Plans would be required to avoid potential damage to architectural resources located near the Project Site.

Overall, the Proposed Action is not expected to have an adverse effect on historic resources in this scenario, since the historic context of the study area was significantly altered with the completion of the WTC as well as the construction of later modern skyscrapers.

Secondary Area of Potential Effect

The increased traffic levels expected as a result of the Proposed Action are expected to have some effect on the setting of historic resources, but not to a degree that they would be expected to have an adverse effect on those resources. The increased traffic is not expected to alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. This is primarily because most of the traffic impacts would occur on streets already burdened with high levels of traffic; historic resources located in these areas have long existed in an urban environment with well-traveled city streets.

* * * * *

5.6.5 PROBABLE IMPACTS OF THE PROPOSED ACTION 2015—PRE-SEPTEMBER 11 SCENARIO

ARCHAEOLOGICAL RESOURCES

As all construction activities that could potentially impact archaeological resources would be complete by 2009, there would be no potential for adverse effects to archaeological resources in 2015.

ARCHITECTURAL RESOURCES

Project Site

As no historic resources would be located on the Project Site, there would be no potential for adverse effects to historic resources.

Primary Area of Potential Effect

By 2015, all the office towers as well as the hotel would be completed. The proposed office tower and hotel on the northeast quadrant would face directly into the Federal Office Building/U.S. Post Office and block views of it from the southeast that were formerly afforded by the much lower 5 WTC building. The proposed office building south of the permanent WTC PATH Terminal entrance would tower over the former East River Savings Bank. Finally the tower at the southeast corner of the WTC Site would be taller and have a greater bulk than 4 WTC, altering the context of the Beard Building and 114-118 Liberty Street. Although the Proposed Action would shift the bulk of development as compared to pre-September 11 conditions, this would not be an adverse effect as the Project Site and immediate study area has historically been developed with tall and modern structures in close proximity to low-rise historic buildings.

Because the proposed construction would take place within 90 feet of historic structures, adherence to Construction Protection Plans would be required to avoid potential damage to architectural resources located near the Project Site.

Overall, the Proposed Action is not expected to have an adverse effect on historic resources in this scenario, since the historic context of the study area was significantly altered with the completion of the WTC as well as the construction of later modern skyscrapers.

Secondary Area of Potential Effect

As described in greater detail in Chapter 13A, "Traffic and Parking," traffic volumes with the Proposed Action in 2015 would only be about 5 percent higher than volumes that would have been expected had the events of September 11 not occurred. Therefore, as described above under "Probable Impacts of the Proposed Action 2009—Pre-September 11 Scenario," it is not expected that the increased traffic levels would have an adverse effect on historic resources.

EXCERPTS FROM CHAPTER 21 "CONSTRUCTION "OF THE FGEIS

* * * * *

21.1.2 CONCLUSIONS

* * * * *

CULTURAL RESOURCES

The pedestrian connection to the World Financial Center would be constructed through the Hudson River Bulkhead as part of the permanent WTC PATH Terminal project. Alteration of the bulkhead would require mitigation based on a Programmatic Agreement (previously established for Hudson River Park). Some limited areas of the eastern side of the WTC Site and of the Southern Site would require testing and monitoring, respectively to avoid adverse impacts to archaeological resources. Analysis as part of the environmental review for the permanent WTC PATH Terminal would insure the avoidance of any potential impacts to archaeological resources in the location of the potential below grade pedestrian connection under Church Street from the permanent WTC PATH Terminal to Liberty Plaza. Taken cumulatively, no significant adverse impacts to archaeological resources would be anticipated from the Proposed Action and the other major construction projects.

Construction of the Proposed Action has the potential to cause damage to nearby historic resources from ground-borne vibrations, dewatering (for the bathtub on the east side of the site and for the expansion of the existing bathtub to the south), and other activities. To avoid any adverse impacts to standing structures throughout the construction period, construction protection plans would be developed in consultation with the New York State Historic Preservation Officer. Taken cumulatively, it is not expected that there would be any adverse impacts to historic resources adjacent to the Project Site.

Construction activities on the WTC Site have the potential to adversely affect some of the remaining remnants from the former WTC Complex. To minimize or mitigate any such effects from the Proposed Action, LMDC has incorporated into the proposed Programmatic Agreement, referred to in Chapter 5, "Historic Resources," a series of commitments with respect to the future treatment of such remnants and procedures for consulting with the New York State Historic Preservation Officer (SHPO) and identified consulting parties concerning such treatment. It is expected that the sponsors of other Lower Manhattan Recovery Projects that might have the potential for similar effects on such remnants would enter into similar arrangements or take comparable actions to avoid or mitigate such impacts as well.

* * * * *

21.6.7 CULTURAL RESOURCES

ARCHAEOLOGICAL RESOURCES

This section considers the full range of impacts to archaeological and historic resources. However, effects to archaeological resources may occur sooner in areas that would be excavated sooner, and there would be the potential for effects to historic resources later as construction progresses to the sites that would be developed later. Accordingly, there is no basis to believe that the Proposed Action would contribute to any potential cumulative archaeological impacts in the area.

The potential for historic period archaeological resources (shaft features, such as privies, cisterns, wells, and cesspools pre-dating the 1850s) has been identified in limited areas of the WTC Site (see Chapter 5, "Historic Resources"). Phase IB testing would be carried out on the potentially sensitive areas of the WTC Site prior to excavation and if necessary any mitigation and retrieval activities could be accomplished before or during excavation for construction.

Potential 18th and 19th century shaft features as well as wharf and/or cribbing features may also on the Southern Site and within the beds of Liberty, Washington, Cedar and Albany Streets that would be disturbed during construction of the Proposed Action. Since avoidance of these potentially sensitive areas is not feasible, Phase IB investigation is recommended to document potential shaft features and potential wharf and cribbing features. The Phase IB investigations would consist of archaeological monitoring during excavation following a plan developed in consultation with the State Historic Preservation Office (SHPO) and Landmarks Preservation Commission (LPC).

The potential below grade pedestrian connection under Church Street from the permanent WTC PATH Terminal to Liberty Plaza is being considered in the environmental review for the permanent WTC PATH Terminal and, if necessary based on the findings of the research report, further investigation and mitigation would be carried out.

Taken cumulatively, no significant adverse impacts to archaeological resources would be anticipated from the Proposed Action and the other major construction projects.

HISTORIC RESOURCES

Construction of the Proposed Action has the potential to cause damage to nearby historic resources from ground-borne vibrations, dewatering (for the bathtub on the east side of the site and for the expansion of the existing bathtub to the south), and other activities. Buildings or sites located within 90 feet of the Project Site are considered to be in the area of potential effect for construction activities. Historic resources in this area include the Barclay-Vesey Building at 140 West Street, the Federal Office Building/U.S. Post Office at 90 Church Street, 30 Vesey Street, St. Paul's Chapel Cemetery at Church Street between Vesey and Fulton Streets, the East River Savings Bank at 26 Cortlandt Street, the Beard Building at 125 Cedar Street, 114-118 Liberty Street, the Western Electric Company Factory at 125 Greenwich Street, the American Stock Exchange at 86 Trinity Place, the Hazen Building at 120 Greenwich Street, 123 Washington Street, and 90 West Street. In addition there are potential historic resources at 106, 110, and 112 Liberty Street; 130 Cedar Street; and, 137-139 Greenwich Street (see Chapter 5, "Historic Resources").

In the analysis year of 2006 construction activity would be in progress across the WTC Site and the Southern Site. Activities on the perimeters of these sites would be the most likely to have impacts on historic resources in the surrounding area. On the northwest quadrant of the WTC Site below grade retail space would be in construction while the structural faming would be erected in the first half of the year. This construction would be taking place immediately south of the Barclay-Vesey Building across Vesey Street. On the two eastern quadrants construction of the foundations and below grade structure would be completed during the year and construction of the retail bases of Towers 2, 3, and 4 would be begun. This work would be across Vesey Street from the Federal Office Building/U.S. Post Office, across Church Street from the graveyard of St. Paul's Chapel and the East River Savings Bank, and across Liberty Street from 114-118 Liberty Street and the Beard Building. On the portion of the Southern Site along Liberty Street (excluding the area of the building at 130 Liberty Street) excavation inside the new slurry walls would be completed during the year and construction of the below-grade structure would be largely completed by the end of the year. This work, which would involve dewatering, would take place across Cedar Street from 90 West Street.

To avoid any adverse impacts to standing structures throughout the construction period, construction protection plans would be developed in consultation with SHPO, as described in Chapter 5, "Historic Resources." Typical protective measures in construction plans are described below:

1. To the extent permitted, a preconstruction inspection of the buildings will be undertaken by an engineering firm licensed to practice in the State of New York (the "Inspecting Engineer"), to determine existing foundation and structural condition information and ascertain any pre-existing damage, existing structural distress, and any potential structural weakness of the foundations or structures of these buildings. The Inspecting Engineer will have experience with historic structures.

2. A written report would be prepared by the Inspecting Engineer documenting any potential weakness or structural distress and an assessment of the stability of any applied ornament, together with a protocol addressing any recommended remediation and steps taken to secure problem areas prior to the commencement of any construction activities. The written report would be submitted to SHPO and will be supplemented with photo-documentation—in the form of 8 inch x 10 inch black-and-white photographs keyed to a map or plan—in order to provide a clear record of existing conditions and any problem areas.

3. Controls on construction vibration would be required as per the Landmarks Preservation Commission (LPC) standards, or the specifications of the Inspecting Engineer if the latter is lower. LPC requirements limit maximum peak particle velocity to 0.5 inches per second for historic structures and 2.0 inches per second for non-historic structures.

4. The Construction Contractor would thereafter ensure that the appropriate vibration limits and any other criteria deemed appropriate by the Inspecting Engineer are incorporated into the sub-contracts for the excavation work, which may include rock

removal operations. The Construction Contractor will be responsible for monitoring these controls with periodic inspection by the owner's representative.

5. Under supervision of the Inspecting Engineer, the Construction Contractor will provide continuous seismic monitoring at the Project Site and inside the buildings during excavation and any other construction operations that would cause vibrations. Seismographs will be installed on the interior and exteriors of the buildings, to the extent permitted by building owners. These units will be located such that they are away from the general public but that they are accessible to the technicians who must monitor them. The seismographs will measure vibration levels during excavation and construction. Prior to the commencement of excavation operations, the seismographs will be installed and tested to ensure that they are in working order and to enable taking baseline readings. Daily logs of the seismic monitoring will be maintained and submitted to SHPO upon request.

6. If any excessive vibration (that which meets or exceeds the peak particle velocity level) is detected, the Inspecting Engineer will stop the work causing this excessive vibration. Buildings will be inspected for any structural degradation that may have occurred. The Inspecting Engineer will submit a report to SHPO detailing the reason for exceeding the peak particle velocity level and the presence or lack of damage to buildings. If any damage was sustained, it will be secured, and the work that caused any damage will be altered to reduce the vibration levels to within acceptable limits. The resumption of work, if damage was sustained, must be authorized by SHPO.

7. In addition, during excavation the Inspecting Engineer will monitor any exposed vertical rock faces or fissures, joint orientation, and potential weaknesses to ensure that underground utilities serving the identified buildings are protected from damage.

8. Should any cracking occur in any of the buildings during excavation or construction, crack monitors will be installed over each crack and monitored on a weekly basis until the Inspecting Engineer deems the cracks to be stable.

9. All substantive requirements of the New York City Building Code applicable to construction activities, protection of adjacent structures (including party wall exposure) and utilities, and specific sections dealing with excavation and foundation operations will be met or exceeded. Construction of the Proposed Action will be performed in a safe manner with controlled inspections as required by the New York City Department of Buildings. Inspections will include but will not be limited to structural stability and foundation concrete. The Inspecting Engineer is required to be present during these and other operations to monitor the construction progress and conformance with contract documents.

Taken cumulatively, there would likely not be any adverse impacts to historic resources adjacent to the Project Site. Taken cumulatively, it is not expected that there would be any significant adverse impact on historic resources.

* * * * *

EXCERPTS FROM CHAPTER 22 "MITIGATION MEASURES "OF THE FGEIS

* * * * *

22.2. HISTORIC RESOURCES

22.2.1 ARCHEOLOGICAL RESOURCES

Three areas of the Project Site were found to be potentially sensitive for historic period archaeological resources, as described in Chapter 5, "Historic Resources." The northeast and southeast corners of the WTC Site as well as the portion of the Southern Site between Route 9A and Washington Streets may be sensitive for historic period archaeological resources, including shaft features (such as privies, cisterns, wells, and cesspools) predating the 1850s as well as wharf and/or cribbing features. To avoid or reduce to the extent practicable potential impacts on these resources, the Proposed Action would include a Phase IB investigation. On the Southern Site, the Phase IB investigations would consist of archaeological monitoring during construction. These commitments would also be included in the Programmatic Agreement described in section 22.2.2.

22.2.2 HISTORIC RESOURCES

As noted in Chapter 5, "Historic Resources," the Proposed Action could have an adverse effect on a number of the remaining remnants on the World Trade Center that contribute to the WTC Site's historic significance. In order to minimize or mitigate any such effects, LMDC has proposed to enter into a Programmatic Agreement with the New York State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation that would include specific commitments with respect to the treatment or removal of such remnants and procedures for consultation with SHPO and those consulting parties who participated in the Section 106 process referred to in Chapter 5. A draft of the proposed Programmatic Agreement is included in Appendix K-7.

* * * * *

Exhibit F

Additional Remnants on WTC Site

1. Slab and column remnants of below grade parking garage at northwest corner of WTC Site with smoke scars or other visible evidence of the September 11 attacks.

2. Portions of former stairway and escalator support at Greenwich and Vesey Streets.

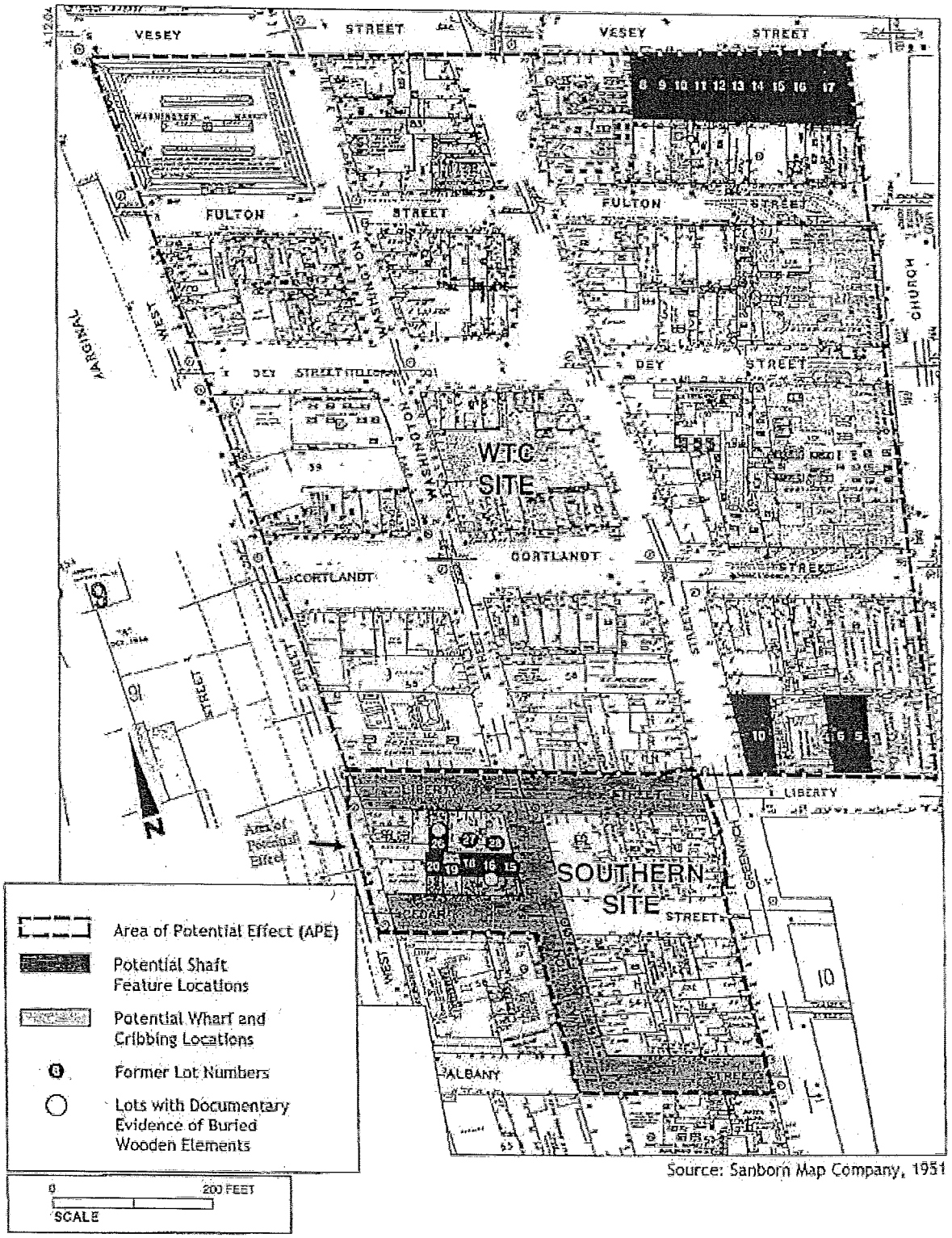
3. Steel column and crossbeam mounted on a concrete pedestal.

4. Visible temporary tie-back caps.

5. Remnants of Hudson & Manhattan Tubes and Terminal.

Areas of Potential Archeological Sensitivity

Exhibit G



Source: Sanborn Map Company, 1951

EXHIBIT H

THE PORT AUTHORITY OF NY & NJ

225 PARK AVENUE SOUTH
NEW YORK, NY 10003
(212) 435-7000

VIA HAND DELIVERY

April 21, 2004

Lower Manhattan Development Corporation
One Liberty Plaza – 20th Floor
New York, New York 10038
Attn.: Kevin Rampe - President

Re: World Trade Center Memorial and Redevelopment Plan

Dear Mr. Rampe:

Thank you for providing the Port Authority, as owner of the World Trade Center Site and a consulting party, with a copy of that certain draft agreement (the "Programmatic Agreement"), entitled "*World Trade Center Memorial and Redevelopment Plan Programmatic Agreement*", to be entered into by the Advisory Council on Historic Preservation, the New York State Historic Preservation Officer and the Lower Manhattan Development Corporation ("LMDC").

This letter will serve to confirm that the Port Authority will consult with the LMDC to assure that all artifacts from the WTC Site that are in the Port Authority's custody and control and are located at Hangar 17, John F. Kennedy International Airport ("WTC Artifacts"), will be safeguarded as appropriate pending the final disposition of the WTC Artifacts in accordance with the rights of the respective owners thereof, and thereafter, subject to future agreements or arrangements, the Port Authority will transfer any remaining WTC Artifacts to LMDC, its designee or other appropriate entities for safekeeping or other appropriate disposition. Additionally, the Port Authority (1) has provided LMDC with an inventory listing of the current WTC Artifacts, (2) will provide LMDC with a copy of a complete inventory listing of all WTC Artifacts as of July 1, 2004, and (3) will periodically update this listing if and when additional artifacts from the WTC Site come into the Port Authority's custody and control and are located at Hangar 17, John F. Kennedy International Airport.

Very truly yours,

A. Paul Blanco
Chief, Regional & Economic Development

EXHIBIT G

Consulting Parties

Alliance for Downtown New York, Inc.

American Institute of Architects - NY Chapter

American Planning Association - NY Metro Chapter

Architectural League of New York

Association for a Better New York

Battery Park City Authority

BCRE – 90 West Street Corp.

BPC United

Cantor Fitzgerald Relief Fund

Community Board 1 - Landmarks Committee

Community Board 1 - WTC Redevelopment Committee

Coalition of 9/11 Families

Coalition to Save West Street

Con Edison

Families of September 11th

Federal Highway Administration – United States Dept. of Transportation

Give Your Voice

Governor George Pataki – State of New York

Greek Orthodox in America (St. Nicholas)

Historic Districts Council

Hudson River Park Trust

Imagine New York

Lower Manhattan Cultural Council

Lower Manhattan Development Corporation

Lower Manhattan Emergency Preservation Fund (LMEPF)

Manhattan Borough President

MTA - New York City Transit Authority

Municipal Art Society

National Trust for Historic Preservation

New York City – Office of Mayor Bloomberg

New York City Art Commission

New York City Council – Office of Councilman Alan Gerson

New York City Department of City Planning

New York City Department of Transportation

New York City Fire Department

New York City Landmarks Preservation Commission

New York Historical Society

New York Landmarks Conservancy

New York New Visions

New York State Assembly, Office of Assemblyman Sheldon Silver

New York State Senate, Office of Senator Martin Connor

New York State Department of Transportation

Pace University – Center for Downtown NY

Partnership for New York City

Preservation League of New York State

R.dot (Rebuild Downtown Our Town)

Regional Plan Association/Civic Alliance

September `s Mission

Shinnecock Nation Cultural Center & Museum

Silverstein Properties, Inc.

Skyscraper Safety Campaign

St. Paul's Church

Team Twin Towers

Tribeca Organization

Tribeca Partnership

U.S. Department of Housing and Urban Development

U.S. General Services Administration, Northeast Division

U.S. Congress – Office of Gerry Nadler

U.S. Congress – Office of Carolyn Maloney

U.S. Congress – Office of Christopher Shays

U.S. Senate – Office of John Corzine

Van Alen Institute

Verizon Communications

Voices of September 11th

Wall Street Rising

World Monuments Fund

WTC Families for a Proper Burial

WTC Residents Coalition

WTC Survivors' Network

EXHIBIT H

EXHIBIT H

Schedule of Photographic Documentation

Context views from adjacent building (2-3) (overall)

West portion of the WTC site (1-2) (General)

East portion of the WTC site (1-2) (General)

Stabilized south wall and slurry walls remnant (3-4) (General & detail)

West Slurry wall (1-2) (General)

Vehicular entrance ramps (1-2) (General)

North and South piers (1-2) (details)

Cooling water pipes (1-2) (details)

Tiebacks (1-2) (details)

Southern projection (4) (general & detail)

Northern projection (1-2) (part of the parking deck)

PATH tunnel access (4) (general & detail)

Hudson Tubes (4)

Tower Footprints (6) (Typical views)

Plaza and subway access from Vesey Street (3-4)

Passageway to NYCT E subway station (3-4)

Remnants of Hudson Terminal and the H&M Railroad (8)

Steel in the form of a cross (1)

EXHIBIT I

EXHIBIT I

Unanticipated Archaeological Discovery Plan

Per Stipulation V. A of this Agreement if unanticipated archeological resources are discovered:

A. The Chief Engineer of the PANYNJ ("Engineer") will direct the contractor to flag or fence off the archaeological discovery location and direct the contractor to take measures to ensure site security. Any discovery made on a weekend will be protected until all appropriate parties are notified of the discovery. The Contractor will not restart work in the area of the identified archaeological resource until the process set forth below is followed and the Engineer has granted clearance.

B. The Engineer will engage the services of a Qualified Archaeologist (QA) who meets the Secretary of Interior's professional qualifications (48 FR 44716) and who will undertake a site visit or otherwise coordinate an on-site archaeological consultation. The QA will indicate the location and date of the discovery on the project plans. If the identified archaeological resource is determined to be isolated or completely disturbed by prior construction activities after notification and consultation per C., then the QA will advise the Engineer to resume construction activities.

C. PANYNJ will notify FTA, SHPO and Consulting Parties of the archaeological discovery. The notification will either explain why the QA believes the identified archaeological resource is not significant and request SHPO concurrence for construction to proceed, or describe a proposed scope of work for evaluating the significance of the identified archaeological resource and evaluating project effects.

D. If the SHPO determines that further archaeological investigation is necessary, the Engineer will direct the QA to begin a more detailed assessment of the identified archaeological resource's significance and the potential project effects.

E. The QA will conduct a Phase II Site Evaluation to determine if the archaeological resource possesses depositional integrity and may be eligible for listing on the National Register of Historic Places (NRHP). Archaeological sites can be determined eligible for inclusion in the NRHP, but individual artifacts may not. The QA will expose the archaeological resource (using hand tools), draw a plan view of the resource, photograph it, collect any archaeological material in association with the archaeological resource, section the resource (if appropriate), remove any large elements of the feature and draw the nearest soil profile (information will include Munsell soil color, matrix and a brief description of any associated artifacts). The Contractor, under the direction of the QA, in consultation with the Engineer, will assist the QA with the removal of any large elements of the archaeological feature by providing the lifting capabilities of heavy machinery only. All other archaeological investigations will be conducted by the QA using hand tools. All hand-excavated soils associated with this phase of work will be screened for archaeological resources. It is anticipated that the continued evaluation of the archaeological resource would require up to 16 hours beyond the initial minimum 30 minutes to inspect the resource.

F. At the conclusion of the evaluation of the archaeological resource (Phase II Site Evaluation), the QA will make a recommendation as to whether the archaeological resource is eligible for inclusion on the NRHP. If the identified archaeological resource appears to be eligible for inclusion on the NRHP, the QA will prepare and PANYNJ will submit documentation of this finding to SHPO and FTA for their review of the determination as part of a data recovery plan, to be developed by the QA as outlined below. PANYNJ will also notify the Consulting Parties via the Project Website of this finding. If the FTA, in consultation with SHPO, determines that the identified archaeological resource is not eligible for listing on the NRHP, the Engineer will direct the Contractor to resume work.

G. The data recovery plan will balance the Project (engineering, environmental and economic) and historic preservation concerns, while addressing specific research questions. All data recovery plans and documentation will adhere to the standards established by the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716). The data recovery plan will contain, at a minimum: a description of the archaeological resource including the resource's composition (stone, wood, metal, etc.), location within the area of excavation and known extent (both vertical and horizontal); photographs and profile drawings of the archaeological resource; research questions that recovery of information from archaeological resource can address.

H. The QA will prepare the data recovery plan for the identified archaeological resource within two business days following the completion of the Phase II Site Evaluation for the specific archaeological resource. PANYNJ will consult with SHPO to ensure the data recovery plan provides adequate mitigation for Project effects to the archaeological resource and provides sufficient documentation of the archaeological resource's NRHP-eligibility. The data recovery plan will be posted on the Project website for the information of Consulting Parties and the public. The Consulting Parties will be informed of the availability of the plan by electronic notification as the plan is posted on the Project website. SHPO will provide its comments on the data recovery plan within two business days upon receipt of the data recovery plan. If SHPO does not concur within two business days, the PANYNJ will assume SHPO concurs with the data recovery plan and will proceed with implementation of the plan. If SHPO should not concur with the data recovery plan, PANYNJ will follow the dispute resolution process outlined in Stipulation X of this Agreement. If SHPO responds within two business days with comments that require revising the data recovery plan, the PANYNJ will revise the data recovery plan to incorporate the received comments and resubmit the revised data recovery plan to SHPO for concurrence within two business days.

I. Data recovery of the identified archaeological resource will commence once SHPO has concurred with the data recovery plan. Data recovery of the identified archaeological resource may take up to a maximum of three business days, depending upon the horizontal and vertical extent of the NRHP-eligible archaeological resource.

J. At the completion of data recovery, the QA will inform the Engineer that construction may continue at the location of the mitigated archaeological resource.

EXHIBIT J

EXHIBIT J

CONTACT INFORMATION

For purposes of notices and consulting pursuant to this Agreement, the following addresses and contact information should be used for the following agencies:

FTA
Bernard Cohen
Director, Lower Manhattan Recovery Office
Federal Transit Administration
One Bowling Green, Rm. 436
New York, NY 10004-1415
Tel.: 212-668-1770
Fax: 212-668-2505

NYS SHPO
Ruth Pierpont
Director
New York State Office of Parks, Recreation, and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island
P.O. Box 189
Waterford, NY 12188-0189
Tel.: 518-237-8643, ext.3269
Fax: 518-233-9049

PANYNJ
Kenneth J. Ringler, Jr. , Executive Director
Port Authority of NY & NJ
225 Park Avenue South
New York, NY 10003
Tel. 212-435-7271
Fax. 212-435-6670

ADVISORY COUNCIL ON HISTORIC PRESERVATION
John M. Fowler, Executive Director
Advisory Council on Historic Preservation
1100 Pennsylvania Avenue NW #809
Washington, D.C. 20004
Tel. 202-606-8503
Fax. 202-606-8647

Appendix B-3: **Phase 1A Archaeological Assessment: World Trade Center Property**

HISTORICAL PERSPECTIVES INC.

PHASE IA ARCHAEOLOGICAL ASSESSMENT

WORLD TRADE CENTER PROPERTY
BOUNDED BY CHURCH, VESEY, LIBERTY AND WEST STREETS

NEW YORK, NEW YORK

PHASE IA ARCHAEOLOGICAL ASSESSMENT

WORLD TRADE CENTER PROPERTY, BLOCK 58, LOT 1
BOUNDED BY CHURCH, VESEY, LIBERTY, AND WEST STREETS
NEW YORK, NEW YORK

Prepared For:

AKRF, Inc.
117 East 29th Street
New York, NY 10016

Prepared By:

Historical Perspectives, Inc.
P.O. Box 3037
Westport, CT 06880

Primary Author: Julie Abell Horn, M.A., R.P.A.

October 2003

October 8, 2003

EXECUTIVE SUMMARY

The Lower Manhattan Development Corporation (LMDC) proposes to undertake, in cooperation with the United States Department of Housing and Urban Development and the Port Authority of New York and New Jersey, a World Trade Center Memorial and Redevelopment Plan (the Proposed Action) that includes construction of a World Trade Center Memorial and memorial-related improvements, as well as commercial, retail, museum and cultural facilities, new open space areas, new street configurations, and certain infrastructure improvements at the World Trade Center Site (WTC Site) and the Adjacent Sites including the two city blocks south of the WTC Site and portions of Liberty and Washington Streets (collectively the Southern Site) and possibly below grade portions of Site 26 in Battery Park City.

LMDC is conducting a coordinated environmental review pursuant to the National Environmental Policy Act (NEPA) and the New York State Environmental Quality Review Act (SEQRA). LMDC is preparing a Generic Environmental Impact Statement. This archaeological study was prepared as part of the environmental review process and to satisfy the requirements of Section 106 of the National Historic Preservation Act, and complies with the standards of the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP) (New York Archaeological Council 1994) and the guidelines of the New York City Landmarks Preservation Commission (LPC) (CEQR 2001; LPC 2002). This report focuses on the WTC Site; a separate study was prepared for the Southern Site.

The WTC Site is known as Block 58, Lot 1, and bounded by Church Street on the east, Vesey Street on the north, Liberty Street on the south, and West Street on the west. All of the buildings formerly on the site were destroyed during a terrorist attack on September 11, 2001, and subsequently, most of the remains of these buildings have been demolished and removed.

This Phase IA assessment describes both current and pre-9/11 conditions on the project site (including soil and geological boring data), previous cultural resources investigations undertaken within and adjacent to the project site, the history of the property, and based upon the preceding sections, the site's sensitivity for the recovery of archaeological resources. The Area of Potential Effect (APE) will be referred to throughout this report, and constitutes the footprint of planned construction and disturbance on the site. Because construction plans are still being revised, the APE is considered the entire World Trade Center site.

The World Trade Center APE consists of two distinct areas: the portion of the property east of Greenwich Street, which originally was located on firm land above the Hudson River shoreline, and the area west of Greenwich Street, which was once under the waters of the Hudson River. All of the area west of Greenwich Street and large portions of the area east of Greenwich Street have been significantly disturbed by construction and excavation activities, precluding the recovery of any potential archaeological resources in these areas. Ruling out these portions of the APE, the following report concentrates

chiefly on those remaining sections that may still have the potential for archaeological resources. These are the southern part of the block once bounded by Liberty, Church, Greenwich, and Cortlandt Streets (former Block 60); and the northern part of the block once bounded by Vesey, Church, Greenwich, and Fulton Streets (former Block 85).

There is little likelihood that precontact archaeological resources have survived within the World Trade Center APE. Within the portion of the APE west of Greenwich Street, the lowest level that precontact deposits could have survived under the river-deposited silts is about 40 feet below grade. The "bathtub" excavation extends to a depth of about 70 feet below grade, ensuring that any potential precontact resources have been removed. East of Greenwich Street, within the two areas of the APE outside the former World Trade Center footprint along Liberty and Vesey Streets, the likelihood is also low that precontact archaeological resources have survived. Here, it is probable that original precontact occupation surfaces have been destroyed by basement construction in these areas.

Potential shaft features predating the 1850s may survive under former basements along areas north of Liberty Street, between Church and Greenwich Street, and south of Vesey Street, between Church and Greenwich Street. Where former basements were 10 feet below grade or less, there is a good likelihood for preservation of shaft features; the project team has assigned these lots a high archaeological sensitivity. Lots with former basements 20 feet or more below grade have a much lesser likelihood of shaft feature preservation, and are assigned a low archaeological sensitivity.

Based on these conclusions, further archaeological consideration in the form of Phase IB archaeological field testing is recommended for former lots assigned a high sensitivity within the two areas of the APE considered potentially sensitive. Those lots assigned a low sensitivity require no further archaeological investigations.

TABLE OF CONTENTS

EXECUTIVE SUMMARY i

TABLE OF CONTENTS iii

I. INTRODUCTION 1
II. METHODOLOGY 3
III. ENVIRONMENTAL/PHYSICAL SETTING 4
IV. BACKGROUND RESEACH/HISTORICAL OVERVIEW 5
A. SITE FILE SEARCH RESULTS 5
B. SITE HISTORY 7
1. PRECONTACT PERIOD 7
2. HISTORIC PERIOD 9
3. DISTURBANCE RECORD 12
4. PRECONTACT ARCHAEOLOGICAL SENSITIVITY 14
5. HISTORICAL ARCHAEOLOGICAL SENSITIVITY 15
V. CONCLUSIONS AND RECOMMENDATIONS 16
A. PRECONTACT PERIOD RESOURCES 16
B. HISTORIC PERIOD RESOURCES 16
VI. REFERENCES 18

FIGURES

PHOTOGRAPHS

FIGURES

1. *Jersey City and Brooklyn Quadrangles, New Jersey and New York.* United States Geological Survey, 1976 and 1979.

2. World Trade Center APE. Sanborn 2001.

3. Ancient Sea Levels along the Hudson River with Potential Archaeological Sites. HCI 1983.

4. *New Yorke.* Miller 1696.

5. *A Plan of the City of New York from an actual Survey Made by James Lyne.* Bradford 1731.

6. *A Plan of the City of New York from an actual Survey Anno Domini – M,DCC,IV.* Maerschalck 1755.

7. *Map To His Excellency Sr. Henry Moore. Bart...This Plan of the City of New York, is Most Humbly Inscribed...* Ratzen 1776.

8. *Directory Plan of 1789.* McComb 1789.

9. *A New & Accurate Plan of the City of New York in the State of New York in North America.* Taylor-Roberts 1797.

10. *Topographical Map of the City and County of New-York, and the Adjacent Country.* Colton 1836.

11. *Plan Map of the City of New-York Extending Northward to Fiftieth Street.* Dripps 1852.

12. *Maps of the City of New York.* Perris 1857-62.

13. *Insurance Maps of the City of New York: Borough of Manhattan.* Sanborn 1884.

14. *Insurance Maps of the City of New York: Borough of Manhattan.* Sanborn 1922.

15. *Insurance Maps of the City of New York: Borough of Manhattan.* Sanborn 1951.

16. *Insurance Maps of the City of New York: Borough of Manhattan.* Sanborn 2001.

17. World Trade Center APE with archaeological sensitivity areas. Sanborn 1951.

PHOTOGRAPHS

1. Excavated "bathtub" area west of Greenwich Street, looking southwest. Covered I.R.T. subway along Greenwich Street in foreground. West Street in background.

2. Excavated "bathtub" area west of Greenwich Street, looking northeast. Vesey Street in background.

3. Covered I.R.T. subway line along Greenwich Street, dividing east and west halves of APE, looking south. Liberty Street in far background.

4. Former H & M Terminal train tubes, later converted to truck ramps, looking east. Church Street in background.

5. Footprint of WTC Building 4, looking southeast. Intersection of Liberty and Church Streets in background.

6. Footprint of WTC Building 5, looking northeast. Concrete wall is northern extent of building. Intersection of Vesey and Church Streets in background.

7. Area south of WTC Building 4 (at level where trailer is located), looking south. Liberty Street in background.

8. Area south of WTC Building 4, looking west. West Street in far background.

9. Area north of WTC Building 5, looking north (at level where cars are parked). Vesey Street in background.

10. Area north of WTC Building 5 (where majority of cars are parked), looking east. Intersection of Vesey and Church Streets in background.

I. INTRODUCTION

The Lower Manhattan Development Corporation (LMDC) proposes to undertake, in cooperation with the United States Department of Housing and Urban Development and the Port Authority of New York and New Jersey, a World Trade Center Memorial and Redevelopment Plan (the Proposed Action) that includes construction of a World Trade Center Memorial and memorial-related improvements, as well as commercial, retail, museum and cultural facilities, new open space areas, new street configurations, and certain infrastructure improvements at the World Trade Center Site (WTC Site) and the Adjacent Sites including the two city blocks south of the WTC Site and portions of Liberty and Washington Streets (collectively the Southern Site) and possibly below grade portions of Site 26 in Battery Park City.

LMDC is conducting a coordinated environmental review pursuant to the National Environmental Policy Act (NEPA) and the New York State Environmental Quality Review Act (SEQRA). LMDC is preparing a Generic Environmental Impact Statement. This archaeological study was prepared as part of the environmental review process and to satisfy the requirements of Section 106 of the National Historic Preservation Act, and complies with the standards of the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP) (New York Archaeological Council 1994) and the guidelines of the New York City Landmarks Preservation Commission (LPC) (CEQR 2001; LPC 2002). This report focuses on the WTC Site; a separate study was prepared for the Southern Site.

The WTC Site is known as Block 58, Lot 1, and bounded by Church Street on the east, Vesey Street on the north, Liberty Street on the south, and West Street on the west. All of the buildings formerly on the site were destroyed during a terrorist attack on September 11, 2001, and subsequently, most of the remains of these buildings have been demolished and removed.

This Phase IA assessment will describe both current and pre-9/11 conditions on the project site (including soil and geological boring data), previous cultural resources investigations undertaken within and adjacent to the project site, the history of the property, and based upon the preceding sections, the site's sensitivity for the recovery of archaeological resources. The Area of Potential Effect (APE) will be referred to throughout this report, and constitutes the footprint of planned construction and disturbance on the site. Because construction plans are still being revised, the APE is considered the entire World Trade Center site.

The World Trade Center APE consists of two distinct areas: the portion of the property located between Church Street and Greenwich Street, which originally was located on firm land above the Hudson River shoreline, and the area from Greenwich Street to West Street, which was once under the waters of the Hudson River. From the outset of this investigation, it was understood by the project team that the area from Greenwich Street to West Street, which was filled during the eighteenth and nineteenth centuries, has been significantly disturbed, first by excavation of the I.R.T. subway line along Greenwich

Street, and later for excavation of the 70-foot deep slurry wall (known as "the bathtub") that surrounded the twin towers complex. As will be described in detail, the excavation in these areas has extended well below the depth that any potential surviving archaeological resources could remain. Additionally, the portion of the site east of Greenwich Street that formerly contained the Hudson and Manhattan (H & M) Church Street Terminal (from Cortlandt to Fulton Streets), and later the World Trade Center complex itself (which rested on the old H & M foundations and extended north from Fulton Street and south from Cortlandt Street), has also been disturbed to a significant depth, precluding recovery of archaeological resources. Ruling out these portions of the APE, the following report concentrates chiefly on those remaining sections that may still have the potential for archaeological resources. These are the southern part of the block once bounded by Liberty, Church, Greenwich, and Cortlandt Streets (former Block 60); and the northern part of the block once bounded by Vesey, Church, Greenwich, and Fulton Streets (former Block 85). These two areas are shown on Figure 2.

The HPI project team consisted of Julie Abell Horn, M.A., R.P.A., who conducted the majority of the project research and wrote this report; Cece Saunders, M.A., R.P.A., who accompanied Ms. Horn on the site walkover, and Christine Flaherty, M.A., who collected the historic maps and prepared the graphics. Betsy Kearns and Faline Fox provided editorial and interpretive assistance.

II. METHODOLOGY

Preparation of this archaeological study involved using documentary, cartographic, and archival resources. Repositories visited (either in person or by using their on-line electronic resources) or contacted included the New York City Register; the New York City Municipal Archives; the New York City Department of Buildings; the New York City Department of Design and Construction; the New York Public Library; the Columbia University library; the LPC; and the NYSOPRHP. AKRF provided current site data and various maps.

A site walkover was undertaken on September 8, 2003 by Julie Abell Horn and Cece Saunders of HPI and Anne Locke of AKRF. Conditions were sunny and dry. The team made notes and took photographs of buildings, structures, and existing ground conditions.

III. ENVIRONMENTAL/PHYSICAL SETTING

As described above, prior to landfilling in the eighteenth and early nineteenth centuries, the portion of the World Trade Center APE east of Greenwich Street was on firm ground, whereas the area west of Greenwich Street was under water. Soil borings within and adjacent to the APE, conducted at various times during the twentieth century (most in the late 1960s and early 1970s, prior to construction of the former World Trade Center, the Westside Highway, and adjacent Battery Park City), are useful in reconstructing the past landforms and specific subsurface conditions on the site.

The foundation bedrock, which extends across the entire APE, is composed of a metamorphic rock known as the Manhattan formation. East of Greenwich Street, bedrock ranged from about 45-80 feet below sea level; bedrock was deepest between Cortlandt and Fulton Streets (70-80 feet), and shallowest at Liberty Street (45 feet). West of Greenwich Street, bedrock depths ranged from 45-70 feet below sea level, again with the shallowest area near Liberty Street (Moran et al. 1970).

Soil stratigraphy above the bedrock varied depending on location throughout the APE. In many soil borings, a stratum of decomposed rock, gravel, or boulders was found directly above the bedrock, ranging from 5-25 feet in thickness. In other locations, the rock layer was absent. In areas originally east of the Hudson River, a thick stratum of silt and sand (ranging from about 40-50 feet in thickness) was documented above the decomposed rock or bedrock. Above the silt and sand, there generally was a top layer, described variously as a mixture of sand, silt, and gravel, or decomposed rock, and in a few instances, fill material. This uppermost stratum ranged from 10-20 feet in thickness (Rock Data Map, Sheet 3).

Portions of the APE once under the Hudson River had bedrock or decomposed rock overlain by a thinner layer of coarse sand, 5-10 feet in thickness (which was the original glacially-deposited land surface prior to flooding of the Hudson River channel), then capped by a layer of silt, or "river mud" that accumulated on the river bottom over thousands of years (and ranged from 7-30 feet thick). The uppermost layer was historic fill, bringing the area up to its current elevation. In some instances, the fill material contained notations of wood, timbers, or cribbing, suggesting former wharf or bulkhead construction (Rock Data Map, Sheet 3).

Before landfilling occurred, all portions of the APE west of Greenwich Street were at about sea level, with Greenwich Street marking the approximate edge of the former shoreline. Historic filling, undertaken as the shoreline was moved west (and described in Section IV), raised these areas up to their twentieth century elevations. Sanborn maps indicate elevations above sea level of all intersections. Prior to construction of the former World Trade Center, these elevations within the APE were as follows:

Street intersection	Elevation
Church and Liberty	21
Church and Cortlandt	22

Street intersection	Elevation
Church and Dey	23
Church and Fulton	23
Church and Vesey	25
Greenwich and Liberty	11
Greenwich and Cortlandt	11
Greenwich and Dey	11
Greenwich and Fulton	9
Greenwich and Vesey	7
Washington and Liberty	5
Washington and Cortlandt	5
Washington and Dey	6
Washington and Fulton	5
Washington and Vesey	5
West and Liberty	4
West and Cortlandt	3
West and Dey	3
West and Fulton	3
West and Vesey	3

Dr. Dennis Weiss of City College has conducted research on reconstructing Paleo-shorelines in the metropolitan New York area. While working with Ed Rutsch on the Westway project (which later became the Route 9A project) he proposed that 6,000 years ago there was a cove at the intersection of West and Vesey Streets. It would now be about 30' below current sea level. He indicated a possible bay from Cedar Street to north of the World Trade Center, and an irregular shoreline forming a spit of land near Vesey Street, at about 40 feet below sea level (HCI 1983:57). The configuration of these drowned shoreline features is shown in Figure 3. Construction of the slurry wall surrounding the former twin towers complex (bounded by Liberty, West, Greenwich, and Vesey) necessitated excavation to a depth of 70 feet below street grade, a depth that far exceeds the Paleo shoreline location in this area (Port Authority 2003).

IV. BACKGROUND RESEARCH/HISTORICAL OVERVIEW

A. Site File Search Results

Research conducted at the NYSOPRHP, the LPC, and the library of HPI revealed one archaeological resource within the project APE, and a number of archaeological sites within a one-mile radius of the APE. Table 1, below, summarizes these resources. Those sites with NYSM or NYSOPRHP numbers are listed first; the remaining sites have been reported to the LPC and do not have site numbers.

The single archaeological resource documented within the APE was remains of a wooden ship dating to the Dutch period of occupation, and thought to be remains of the *Tyjger*, a vessel that burned and was abandoned along the shoreline in 1613. It was found during excavation for the I.R.T. subway line along Greenwich Street (at Dey Street) in 1916, and

documented by amateur historian James Kelly, who was a supervisor on the subway project. The ship, which consisted of a burned keelson and three rib frames, was found beneath about 9 feet of fill and 11 feet of river silt. Archaeologists Ralph Solecki and Bert Salwen returned to the area in 1967, when the World Trade Center was being built, and attempted to find the rest of the ship, which was thought to lie west of the I.R.T. line. Unfortunately, their efforts were unsuccessful, and the remains of the *Tyjger* were never found (Solecki 1974).

The remaining archaeological sites recorded within a one-mile radius of the APE are concentrated in the Financial District, the area within and surrounding the South Street Seaport, and the City Hall Park and Foley Square areas. Although researchers have undertaken a number of archaeological assessments in close proximity to the APE, such as the Westside Highway project (HCI 1983), the Route 9A project (Hartgen and HPI 1990), the 7 World Trade Center Project (Cobbs et al. 2002), and the AT&T building project (Greenhouse Consultants, Inc. 1985), these studies did not entail any archaeological testing, and therefore no sites were recorded. For that reason, these investigations are not included in the table, below. Sites that fall within larger historic districts (HD), either state or locally designated, are indicated.

Table 1: Archaeological sites within a one-mile radius of the APE

Site Number	Site Name	Location	Time Period	Remarks
NYSM 4059	Shell Point	Near Canal St.	Unknown Precontact	
NYSM 4060	N/A	Lower East side vicinity	Unknown Precontact	
A06101.000531	Clasons Point	Battery Park	Woodland	
A06101.007671	576 Broome St.	Above Canal St.	Unknown historic	Site form missing
A06101.001285	Washington Street Urban Renewal Site	Tribeca	Early nineteenth century	
A06101.001304	City Hall Park	City Hall Park	Eighteenth century	Part of Commons and African Burial Ground HD
A06101.000604	209 Water Street	South Street Seaport Area	c. 1775-1800	Within South Street Seaport HD
A06101.000623	Telco Block	South Street Seaport Area	c. 1740-1775	Within South Street Seaport HD
A06101.001283	Barclay's Bank	Financial District	1750s-1820s	
A06101.001284	Assay Site	Financial District	Revolutionary era	

Site Number	Site Name	Location	Time Period	Remarks
A06101.001272	64 Pearl Street	Financial District	Late 17th century	
A06101.001282	Broad Street Plaza	Financial District	17th century-modern	
A06101.001271	175 Water Street	Near South Street Seaport	c. 1740-1780	
A06101.006763	Schermerhorn Row	South Street Seaport Area	1780-1810	
	Tyjger	Greenwich and Dey Streets	1613	Within project area
	7 Hanover Square	Financial District	Late 17th century	
	Old Slip and Cruger's Wharf	Financial District	1690-1800	
	Stadt Huys Site	Financial District	17th-19th centuries	
	Foley Square	North of City Hall Park	19th century	
	African Burial Ground	North of City Hall Park	18th-19th century	Within the Commons and African Burial Ground HD

B. Site History

1. Precontact Period

Indian settlement near fresh-water rivers and salt bays is known both from early documents and archaeological research conducted over the past 100 years. For this assessment, it is necessary to establish whether the World Trade Center site would have been attractive to the Native American population, and if so, what kind of sites might be expected.

To understand how Native Americans exploited different environmental niches over time, researchers typically separate the prehistory into time periods according to their distinct cultural differences. Archaeologists divide the Native American period into three sub-periods: the Paleo-Indian, the Archaic, and the Woodland, which are further divided as shown below:

PERIOD	YEARS BEFORE PRESENT (BP)
Paleo-Indian	13,000 – 10,000
Early Archaic	10,000 – 8,000

PERIOD	YEARS BEFORE PRESENT (BP)
Middle Archaic	8,000 - 6,000
Late Archaic	6,000 - 3,700
Terminal Archaic	3,700 – 2,700
Early Woodland	2,700 - 2,000
Middle Woodland	2,000 – 1,200
Late Woodland	1,200 – 300

Paleo-Indian Period

The sea level was notably lower during this period, so many sites that were once on well-drained land near the ancient coast are now submerged, and sites that later became swamps could have been dry land. Leonard Eisenberg's research has indicated that three types of terrain were preferred for Paleo-Indian sites (Eisenberg 1978):

- lowland waterside camps near coniferous swamps and near larger rivers;
- upland bluff camps in the areas where deciduous trees dominated;
- ridge-top camps, also where deciduous trees dominated.

Eisenberg notes that the waterside settlements he studied were situated on locally well-drained soils (Eisenberg 1978). Archaeo-exploitation of upland zones was limited primarily to the Late Archaic Period and after, whereas Connecticut River Valley research indicates Paleo- Indian exploitation of the upland zone ridge terraces overlooking water courses (Gorman 1983:18-22). Paleo-Indian sites are scarce in the Northeast. More scientifically documented field excavations of this period would greatly aid our understanding of southern New York's past.

Archaic Period

The sea level began to rise during the Archaic Period, as the glacier melted and receded. In the coastal and tidewater area of New York, the Archaic Stage (ca. 9,000 years ago) is "represented by numerous, small, nearly always multi-component sites, variously situated on tidal inlets, coves and bays, particularly at the heads of the latter, and on fresh-water ponds on Long Island, Shelter island, Manhattan Island, Fisher's Island, and Staten Island and along the lower Hudson River on terraces and knolls, at various elevations having no consistent relationship to the particular cultural complex" (Ritchie 1980:143). These people were primarily hunters and gatherers, with recent indications of more permanent settlements.

Woodland Period

By the time of the Woodland Stage (c. 3,000 years ago) the sea level and exposed coastal regions were, in most respects, as they appear today. The archaeological evidence from Woodland Stage sites indicates a strong preference for large scale habitation sites to be within proximity to a major fresh water source (e.g., a river, a lake, an extensive wetland), and smaller scale extractive-functioning sites to be situated at other resource centers (e.g., quarrying sites, butchering stations, and shell gathering localities). The production of pottery and the use of the bow and arrow began in this period, as did the practice of agriculture.

Contact Period

This final period, after the arrival of the first Europeans, is characterized as a period of decline for the Native Americans. Their pattern of hunting was disrupted by the spread of settlement, many died from diseases to which they had no resistance, and there were wars, which drove them out of their homelands. As a result, a few fled to eastern Long Island while many others went west.

2. Historic Period

Prior to 1700, the large majority of the World Trade Center APE was either undeveloped farmland or under water, with the future line of Greenwich Street marking the approximate shoreline. The block between Fulton and Vesey Streets originally was part of an early seventeenth century Dutch farm grant to the "Bouwery of the West India Company" and known by various other names through the early eighteenth century. This land eventually became the property of Trinity Church (Stokes 1967, Vol. VI:79-80). The blocks between Liberty and Fulton Streets were part of the Jan Jansen Damen farm, also conveyed in the early seventeenth century, and later subdivided and sold to different buyers (Stokes 1967, Vol. VI:86). Although these farms had various structures on them, none are documented within the APE.

The first map that illustrates the APE in any detail (most maps before 1700 showed only the southern tip of Manhattan) is the Miller Plan, made in 1696 (Figure 4). Here, the first known structures are depicted – a house and windmill belonging to Peter Mesier on the west side of what would become Church Street, between Liberty and Cortlandt. The windmill was constructed at some point between 1682-1686, and demolished in 1788 (Stokes 1967, Vol. III:961). No other structures are shown within the APE.

By the turn of the eighteenth century, landfilling along the Hudson River shore had begun. Generally, early travelers had found the East River a better and safer harbor as the high bluffs and jagged edges of the Hudson River thwarted docking. However, the Hudson River did prove vital in linking northern territories to the growing village on Manhattan. Toward that end, between 1699 and 1701 several entrepreneurs filled and built docks on the three blocks between Cedar and Cortlandt Streets and Greenwich Street and Washington Street (Buttenwieser 1987:32). These docks are visible on the

Lyne-Bradford Plan, published in 1731 (Figure 5). The dock between Liberty and Cortlandt Street was called Thurman's Slip (HCI 1983:240). This map also reveals additional development along the north side of Liberty Street (then called Crown Street), and the road leading to the windmill.

The year before the Lyne-Bradford Plan was published, the Montgomery Charter was established, extending land ownership privileges an additional two blocks beyond the low water mark into the Hudson River. The charter included a provision for creating three streets – Greenwich, Washington and West – parallel to the river (Hoag 1905:32). The Maerschalck Plan, made in 1755, shows the continued outward spread of the waterfront, as well as additional development within the APE (Figure 6). By the 1740s, a slip had been built near Liberty Street (Valentine 1855:584), and Dey's Dock was built in 1743, just south of Dey Street (HCI 1983:240).

Activity along the Hudson River waterfront within the APE accelerated in 1764, when regular ferry service began between Paulus Hook, Jersey City and Mesier's Slip (at Cortlandt and the future intersection of Washington Street). King's Wharf was built between Cortlandt and Dey Streets by 1767, and by 1775, the city's dock, known as Corporation Dock, had been constructed at Fulton and Greenwich Streets, and received passengers from the new Hoboken Ferry (HCI 1983:240). The Ratzen Plan, published in 1776, illustrates the location of King's Wharf and an adjacent arsenal, as well as the ferry service route to Paulus Hook (Figure 7). It also shows that by this time, a portion of Greenwich Street had opened within the APE.

In 1789, the city's directory included a map for the first time, showing points of interest (Figure 8). Within the World Trade Center APE, the map indicates the location of the Bear Market, established in 1771 on Greenwich Street between Fulton and Vesey Streets (Stokes 1967, Vol. III:958). It also shows that Washington Street had been constructed within the APE. In the years following the Revolutionary War, an attempt was made to urge the construction of the street along the Hudson River originally provided for in the 1730 charter. In 1795 the Common Council again passed an ordinance creating West Street, a 70 foot wide outer street, demarcating the western boundary of the city. The proposed creation of West Street was intended to compel landowners to pursue landfilling where they were granted water rights. The Taylor-Roberts Plan of 1797 illustrates the pace of progress along the shoreline (Figure 9). In 1804 the Common Council increased the distance from Washington to West Street from 160 feet to 200 feet, lengthening the developed blocks between them by 40 feet (HCI 1983:153).

Construction of West Street was a slow process, occurring over the approximate 15-year stretch from 1817-1831 (HCI 1983:162). The City continued to pass ordinances during this period to impel development. In 1825, the Common Council passed an ordinance demanding the creation of West Street and filling of water lots. In 1828 the Council further requested that West Street be extended to cross the slip at Washington Market between Fulton and Vesey Streets (HCI 1983:161). Although the Common Council was relentless in their pursuit to assure the complete construction of West Street, filling and development was slow. Land reclamation and filling along the Hudson River waterfront

was pursued by either allowing unstructured harbor silts and river accretion to build up, or by placing fill in engineered retaining devices (Geismar 1983:672). In lower Manhattan, ships were sometimes deliberately sunk as cribbing to help stabilize fill (Berger 1983:9). After wharves and piers were built, derelict ships were sunk adjacent to them, and together these features contributed to and operated to retain fill.

Wooden cofferdams, wharves, and bulkheads were built as fill retaining devices, framed with hewn logs, filled with loose stone, and covered with earth (Geismar 1983:30). Timber grillage was commonly used as cribbing, a practice first employed in Europe. Colonists continued to use this method, as both the Dutch and English had previously, aided by the ample supply of wood in the region. To retain fill, quays were first built by driving a row of wooden piles into the river with diagonal braces bolted to the inside, forming the face work. Earth and fill was then placed in the vacant area behind the piles, and was then planked over to form a roadway level with adjacent streets (Geismar 1983:31). Wooden jetties were similarly built. Once the economic value of clean fill generated from building excavations was realized, this was no longer used as fill. Instead, wharves and piers were frequently used as dumping boards, where garbage was collected and pushed overboard into scows or directly into the river. Rubbish, ballast, and street trash pushed the shoreline further west. The 1836 Colton topographical map illustrates the configuration of West Street after years of landfilling (Figure 10).

The rapidly growing west side supported many successful business ventures. One of these was the Washington Market, also known as both the Bear and Oswego Markets. As described above, the market was established in 1771 on landfill between Fulton and Vesey streets, and Washington and West Streets, with the APE (HCI 1983:369). By 1800 the city purchased water grants between Vesey and Fulton Streets, formerly belonging to Mayor Varick, and piers were lengthened and the slips between them filled to expand the profitable Washington Market. After burning down, the market was rebuilt in 1812 on the same site. Just to the west were the Corporation Docks, built in 1817. These docks ran within several feet of the west side of the market and intruded into the path of West Street (De Voe 1867:427).

The pace of development within the APE is visible on several mid-nineteenth century maps. The Dripps 1852 map illustrates that by this time, all the streetfronts within the APE had been solidly filled with buildings (Figure 11). Labeled structures include a variety of banks, hotels, and markets, including the Washington Market, which endured until ca. 1960. The Perris 1857-62 maps show additional detail of the APE, indicating that the blocks had been nearly completely built up by this period (Figure 12). Of note, Church Street had not yet been extended from Fulton to Liberty Streets by this time. It was ordered cut through the APE in 1873 (Stokes 1967, Vol. V:1953).

By the 1850s, the APE had been supplied with piped city water, allowing residents to discontinue their reliance on public and private wells and cisterns for their water supply. The build out of lots within the APE shown on the Dripps and Perris maps is partially related to the introduction of piped water: private wells and cisterns were located in

backyard areas of lots; once they were no longer necessary, they could be covered over and the yard areas used for additional building space.

Sanborn Insurance maps depict the APE from the late nineteenth century through the mid-twentieth century (1894, 1923, and 1951). Figures 13, 14, and 15 illustrate the continued development within the APE during this period, with the blocks completely covered by multiple-story buildings containing various businesses. An early twentieth century construction milestone within the APE was the Hudson and Manhattan Railroad, which after emerging from a tunnel under the Hudson River, had subsurface lines running under Cortlandt and Fulton Streets to its Church Street Terminal, on the blocks bounded by Cortlandt, Church, Fulton, and Greenwich Streets. Above the terminal were the Cortlandt and Fulton Buildings, each 21 stories tall. The complex was built in 1907 (Sanborn 1923). Nearby, the I.R.T. subway was built under Greenwich Street, opening in 1918.

The World Trade Center complex, which encompassed 16 acres on newly designated "Superblock" 58 (and which required demapping the interior streets between the twelve original blocks), broke ground in 1966 and was completed in 1973 (Figure 16). Its construction necessitated demolishing all of the standing structures on the property. The area east of Greenwich Street, originally under the Hudson River before landfilling, was excavated down to bedrock (at about 70 feet below grade) and a slurry foundation wall was built around this area to keep out water. This portion of the site supported the twin towers, each 110 stories high, and seven underground levels. The area east of Greenwich Street was not excavated as deeply; it had four basement levels.

Following the terrorist attacks on September 11, 2001, all of the buildings in the World Trade Center APE were destroyed, and subsequently, debris from these structures was removed from the site. The area within the "bathtub" foundation, west of Greenwich Street, has been reexcavated. Portions of the site east of Greenwich Street have also been excavated, although the lower levels of the former H & M terminal are extant, and have not been removed.

3. Disturbance Record

The large majority of the World Trade Center APE has had significant subgrade disturbance to the original and historically created topography. The area west of Greenwich Street (the "bathtub") is disturbed down to bedrock (Photographs 1 and 2). The line of Greenwich Street has been disturbed by construction of the I.R.T. subway line (Photograph 3). Excavation for the H & M Terminal also has disturbed the area between Greenwich, Church, Cortlandt, and Dey Streets (Photograph 4). Last, construction of World Trade Center Building 4, south of the former H & M Terminal, has disturbed the area south of Cortlandt Street, and construction of World Trade Center Building 5, north of the former H & M Terminal, has disturbed the area north of Fulton Street (Photographs 5 and 6).

Discounting these portions of the APE that have been impacted by construction, there are only two remaining sections on Block 58 that may not be extensively disturbed. These are the areas north of Liberty Street, between Church and Greenwich Street (the area south of World Trade Center Building 4; Photographs 7 and 8); and south of Vesey Street, between Church and Greenwich Street (the area north of World Trade Center Building 5; Photographs 9 and 10). Both areas were outside the former World Trade Center construction footprint, although within the APE. Each of these areas will be subjected to future subsurface impacts as part of the reconstruction project.

In order to determine whether previous excavation had disturbed these two areas prior to the World Trade Center construction, building records (block and lot folders) were examined at the Municipal Archives for these lots. Frequently, these records document former depths of basements and foundations.

Liberty Street

The portion of the APE along Liberty Street encompassed Lots 1-10 on former Block 60. Lot 1 was at the Church Street intersection and Lot 10 was at the Greenwich Street intersection. Basement depths were available for several of these lots; where data were unavailable an estimate was made of former basement depths based on height and age of similar buildings that did have this information. Usually, nineteenth-century buildings up to 5-6 stories high had basements of about 10 feet in depth, whereas twentieth century buildings and/or buildings more than 10 stories high had deeper basements, usually at least 20 feet below grade.

Lot number	**Depth of Basement**
1 (includes former Lots 2 and 3)	24 feet below grade
4	22 feet below grade
5	13 feet below grade
6	10 feet below grade
7-9	Data unavailable, but building was 18 stories tall; assume basement at least 20 feet below grade
10	Data unavailable, but building was one story tall; assume basement no more than 10 feet below grade

Vesey Street

The portion of the APE along Vesey Street encompassed Lots 6-17 on former Block 85. Lot 6 was at the Greenwich Street intersection and Lot 17 was at the Church Street intersection. Basement depths were available for several of these lots. Again, where data were unavailable an estimate was made of former basement depths based on height and age of similar buildings that did have this information.

Lot number	Depth of Basement
6 (includes former Lot 7)	Data unavailable, but building was 12 stories tall; assume basement at least 20 feet below grade
8	10 feet below grade
9	10 feet below grade
10	Data unavailable, but building was 5 stories tall; assume basement depth ca. 10 feet below grade
11	Data unavailable, but building was 3 stories tall; assume basement depth no more than 10 feet below grade
12	Data unavailable, but building was 5 stories tall; assume basement depth ca. 10 feet below grade
13	Data unavailable, but building was 6 stories tall; assume basement depth ca. 10 feet below grade
14 (includes former Lot 15)	Data unavailable, but building was 5 stories tall; assume basement depth ca. 10 feet below grade
16	Data unavailable, but building was 5 stories tall; assume basement depth ca. 10 feet below grade
17	Data unavailable, but building was 2 stories tall; assume basement depth ca. 10 feet below grade

Sidewalks

On both Liberty and Vesey Streets, the building line for the former World Trade Center complex was pushed back approximately 40 feet from the original sidewalk boundaries in order to create extra lanes of traffic, which were separated from the main roadways by concrete islands. These traffic lanes were carved out of areas once supporting the street-fronting parts of the structures listed above. The sidewalks that bordered the former World Trade Center plaza also fell within the area once supporting the structures, above. According to utility data provided by the Port Authority, the original (pre-World Trade Center) sidewalk locations contain various subsurface conduits, to a depth of about five feet below grade, although the sidewalk areas surrounding the World Trade Center complex footprint are relatively free of subsurface utilities (Port Authority 2003).

4. Precontact Archaeological Sensitivity

There is little likelihood that precontact archaeological resources have survived within the World Trade Center APE. Within the portion of the APE west of Greenwich Street, the lowest level that precontact deposits could have survived under the river-deposited silts is about 40 feet below grade. The "bathtub" excavation extends to a depth of about 70 feet below grade, ensuring that any potential precontact resources have been removed. East of Greenwich Street, within the two areas of the APE outside the former World Trade Center footprint along Liberty and Vesey Streets, the likelihood is also low that precontact archaeological resources have survived. Here, it is probable that original

precontact occupation surfaces have been destroyed by basement construction in these areas.

Finally, under the original sidewalks abutting Liberty and Vesey Streets, which contain active utilities, searching for precontact resources would be extremely difficult. In addition, any area tested would be highly confined by these same utilities, prohibiting excavations to the depth necessary to explore potential precontact strata.

5. Historical Archaeological Sensitivity

The two areas of the APE that were not extensively disturbed as part of the World Trade Center construction, east of Greenwich Street along the north side of Liberty Street and the south side of Vesey Street, have the potential to contain historical archaeological resources associated with occupation of the blocks from the late 1600s through the 1850s, when the area was supplied with public piped water and sewers. Prior to the nineteenth century, when build out occurred on these blocks, properties would have had open yard areas where shaft features such as privies, cisterns, wells, and cesspools would have been located. Historical archaeological resources related to dwellings are often preserved in these features. The survival of these resources will depend on the extent to which former basements disturbed these former yard areas, and the depth to which these shaft features were excavated.

The potential depth of shaft features throughout Manhattan is varied, and depends, in part, on the subsurface conditions at the time they were excavated. Wells would have been excavated at least as deep as the water table, and possibly deeper to access potable water. For example, once the water from the Collect Pond in Lower Manhattan was no longer potable, having been declared "stagnant and mephitic" in 1796, deeper wells were dug throughout the city to access clean water (Kieran 1982:31). At Bleecker Street near Broadway, in 1832 a well was bored to a depth of 448', of which 400' was through solid rock (Ibid.). However, this was not the typical depth for wells hand excavated in backyards throughout the city prior to the availability of high pressure steam engines (ca.1815) which allowed for deep drilling. These would typically have extended through soil to the water table, at whatever depth that was encountered, and possibly deeper to access better water.

The anticipated depth of privies is also difficult to estimate, given that subsurface conditions such as soil permeability and the number of households served would have affected the size and depth of vaults. Geismar notes that a possible privy identified at 17 State Street extended 13' below the grade that existed at the time it was constructed, and that this depth coincided with the depth of a privy excavated at the Augustine Heerman warehouse site on the block bounded by Whitehall, Broad, Bridge, and Pearl Streets, also in Lower Manhattan (Geismar 1986:44). As noted above, by 1823 they were required to be at least five feet deep (Goldman 1988:45).

In areas along Liberty and Vesey Street where basements were 10 feet below grade or less, there is a reasonable likelihood that the lower reaches of early shaft features may be

extant under the former cellar floors. Where former basements were 20 feet or greater, this probability decreases. The historic level of the water table (which presumably would dictate the minimum depth of wells) along Liberty and Vesey Streets east of Greenwich Street is unknown, but Port Authority engineers are assuming it was at about sea level, or zero elevation. If the historic water table was at or just below sea level, wells would need to have been excavated a minimum of 15-25 feet below grade, depending on the location (see Section III for street intersection elevations).

V. CONCLUSIONS AND RECOMMENDATIONS

A. Precontact Period Resources

As the preceding sections have described, any precontact archaeological resources that may have once existed within the World Trade Center APE have almost certainly been either removed or destroyed by excavation and/or construction activities.

No archaeological field testing is recommended for precontact resources.

B. Historic Period Resources

Potential shaft features predating the 1850s may survive under former basements along areas north of Liberty Street, between Church and Greenwich Street, and south of Vesey Street, between Church and Greenwich Street. Where former basements were 10 feet below grade or less, there is a good likelihood for preservation of shaft features; the project team has assigned these lots a high archaeological sensitivity. Lots with former basements 20 feet or more below grade have a much lesser likelihood of shaft feature preservation, and are assigned a low archaeological sensitivity. The sensitivity rankings are summarized below, based on data presented in Section IV.

Liberty Street Lots (Former Block 60)

Lot number	Archaeological Sensitivity
1-3	Low
4	Low
5	High
6	High
7-9	Low
10	High

Vesey Street Lots (Former Block 85)

Lot number	Archaeological Sensitivity
6-7	Low
8	High
9	High
10	High
11	High
12	High

Lot number	Archaeological Sensitivity
13	High
14-15	High
16	High
17	High

Identifying and examining buried features associated with seventeenth through mid-nineteenth century occupation of these lots may reflect the daily activities of the residents and provide insight into cultural behavior. Shaft features were usually filled and capped, providing stratified deposits within the feature. Because of the unique depth of these resources, the lowest levels are rarely disturbed even if the feature becomes truncated by subsequent historical activity. The deepest layers often act as a time capsule, preserving historical artifacts within the enclosed environment.

If undisturbed deposits of cultural material from the historic development of the World Trade Center APE do still exist, they may have the potential to provide meaningful information regarding the lives of the people who lived there. When recovered from their original context and in association with a specific historical occupation, historical deposits can provide a wealth of information about consumption patterns, consumer choice, gender relations, ethnicity, economic status, and other important issues.

Based on these conclusions, the following recommendations are offered for the two areas of the APE considered potentially sensitive. No additional archaeological investigations are recommended for those former lots whose basements were 20 feet or more below grade, and assigned a low archaeological sensitivity. However, further archaeological consideration in the form of Phase IB archaeological field testing is recommended for former lots with basements 10 feet below grade or less, and assigned a high sensitivity. Figure 17 illustrates those former lots assigned a high sensitivity, where Phase IB testing is recommended.

All Phase IB archaeological testing should be conducted according to applicable archaeological standards (New York Archaeological Council 1994; LPC 2002), and in consultation with the NYSOPRHP and the LPC. RPA-certified professional archaeologists, with an understanding of and experience in urban archaeological excavation techniques, would be required to be part of the archaeological team.

REFERENCES

Buttenwieser, Ann L.
1987 *Manhattan Water Bound.* New York University Press, New York.

City Environmental Quality Review (CEQR)
2001 *City Environmental Quality Review Technical Manual.* City of New York, Mayor's Office of Environmental Coordination. October, 2001.

City of New York, Borough of Manhattan, Building Department
n.d. *Block and Lot Folders.* On file at the Municipal Archives.

Cobbs, Martha, Betsy Kearns, Sara Mascia and Faline Fox
2002 *Phase IA Archaeological Survey, 7 World Trade Center, Manhattan, New York.* Prepared by Historical Perspectives, Inc. for Allee King Rosen Fleming, Inc.

Cohen, Paul E. and Robert T. Augustyn
1997 *Manhattan in Maps: 1527-1995.* Rizzoli International Publications, Inc., New York.

Colton, Joseph H.
1836 *Topographical Map of the City and County of New York and the Adjacent Country.* Published by J.H. Colton & Co., New York.

De Voe, Thomas F.
1867 *The Market Assistant.* Riverside Press, New York.

Dripps, Matthew
1852 *Map of the City of New York Extending Northward to 50th Street.*

Eisenberg, Leonard
1978 "Paleo-Indian Settlement Patterns in the Hudson- Delaware River Drainages." *Occasional Publications in Northeastern Anthropology*, No. 4.

Geismar, Joan
1983 *The Archaeological Investigation of the 175 Water Street Block, New York City.* Soil Systems Division of Professional Services Industries, Inc.

1986 17 State Street: An Archaeological Evaluation, Phase I Documentation. For:17 Vista Associates through Webster and Sheffield. CEQR 85-215M

Goldman, Joanne Mara
1988 *The Development of a Sewer System in New York City, 1800-1866; Evolution of a Technological and Managerial Infrastructure.* Dissertation for the State University of New York at Stony Brook, May 1988.

Hoag, S.W., Jr.
1905 *Dock Department and New York Docks.* The Municipal Engineers of the City of New York, New York.

Kieran, John
1982 *A Natural History of New York City.* Second edition. Fordham University Press, New York.

Greenhouse Consultants, Inc.
1985 Cultural Resource Sensitivity Study And Impact Analysis Of The Western Half Of The AT&T Block, Block 80 - Lots 4-12 (Kalikow Office Site). For: Eli Attia Architects. CEQR 84-192M.

Hartgen Archaeological Associates and Historical Perspectives, Inc.
1990 *Route 9A Reconstruction Project. Draft Archaeological Assessment Report, Battery Place to Harrison Street.* Prepared for the New York State Department of Transportation in cooperation with the Federal Highway Administration & the City of New York. March 1990.

Historic Conservation and Interpretation, Inc.
1983 *Westside Highway Cultural Resource: Survey Archaeological Work Program: Cultural Resources Research.* For: New York State Department of Transportation.

Landmarks Preservation Commission (LPC)
2002 *Landmarks Preservation Commission Guidelines for Archaeological Work in New York City.*

Louis Berger & Associates, Inc.
1983 *An Archaeological and Historical Assessment of the Barclay's Bank Site, 100 Water Street, New York, New York.* For: The Barclays Bank International, Ltd., Head Office, North America.

Lyne, James
1730 *A Plan of the City of New York From an Actual Survey.* (Lyne-Bradford Plan). William Bradford, New York. (Source: Cohen and Augustyn).

Maerschalck, Francis
1755 *A Plan of the City of New York from an actual Survey Anno Domini-M,DCC,IV.* Gerardus Duyckinck, New York. (Source: Cohen and Augustyn).

McComb, John Jr.
1789 *The New-York Directory and Register for the Year 1789.* (Source: Cohen and Augustyn).

Miller, John
1695 *New Yorke.* John Miller, New York. (Source: Cohen and Augustyn).

Moran, Proctor, Mueser and Rutledge, Consulting Engineers
1970 *North River Waterfront Area, Economic and Physical Survey and Study, Area I Contours of Bedrock Surface.* On file at the Municipal Archives, Department of Ports and Trade. DPT-SD 10, No. S-174.

New York Archaeological Council (NYAC)
1994 *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections.* New York Archaeological Council.

Office of the President of the Borough of Manhattan
1970 *Rock Data Map – Borough of Manhattan.* Sheet 3. Original date 1937, updated to 1970. Office of the President of the Borough of Manhattan of the City of New York, New York.

Perris, William
1857 *Map of the City of New York.*

Port Authority
2003 *Downtown Restoration Program. World Trade Center Complex Pre-9/11 Conditions.* Prepared by the Port Authority of New York and New Jersey Engineering Department.

Ratzen, Bernard
1767 *To His Excellency Sr. Henry Moore, Bart...This Plan of the City of New York, Is Most Humbly Inscribed.* (Source: Cohen and Augustyn.).

Ritchie, William A.
1980 *The Archaeology of New York State.* Revised edition. Harbor Hill Books, New York.

Sanborn Map Company
1923 *Insurance Maps of the City of New York: Borough of Manhattan.*

1951 *Insurance Maps of the City of New York: Borough of Manhattan.*

1976 *Insurance Maps of the City of New York: Borough of Manhattan.*

2001 *Insurance Maps of the City of New York: Borough of Manhattan.*

Solecki, Ralph S.
1974 "The 'Tiger,' An Early Dutch Seventeenth Century Ship, And An Abortive Salvage Attempt." *Journal of Field Archaeology.* Vol. 1:109-116.

Stokes, I. N. Phelps
1967 *The Iconography of Manhattan Island, 1498-1909.* Volumes I-VI. Originally published 1915-1928. Republished by Arno Press, New York.

Taylor, Benjamin and John Roberts
1797 *A New & Accurate Plan of the City of New York in the State of New York in North America.* (Source: Cohen and Augustyn.)

Valentine, D. Thomas
1855 *Manual of the Corporation of the City of New York.*

FIGURES

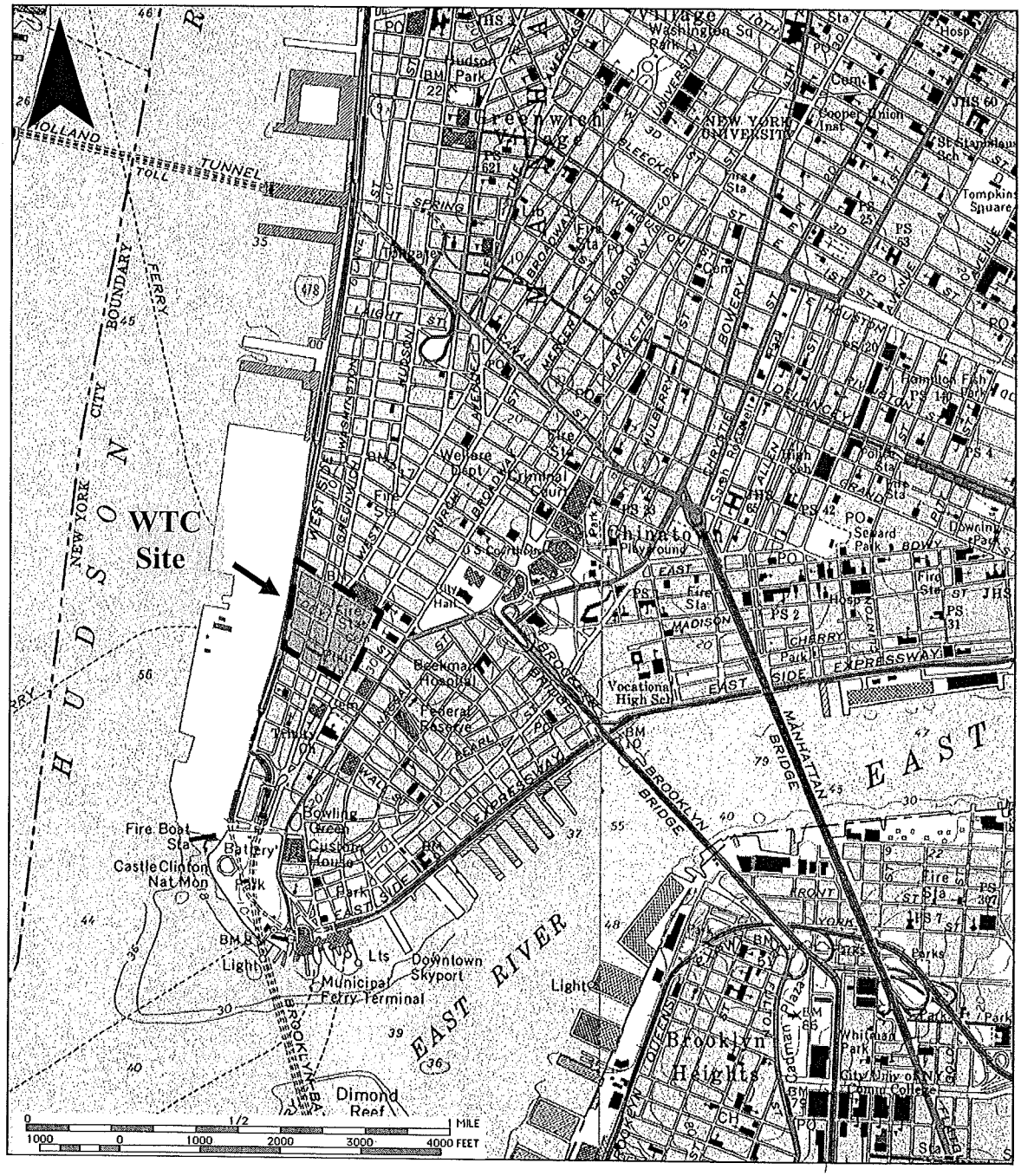


FIGURE 1

USGS Jersey City, NJ and Brooklyn, NY Quadrangles, 1976 and 1995.

World Trade Center Project Site.

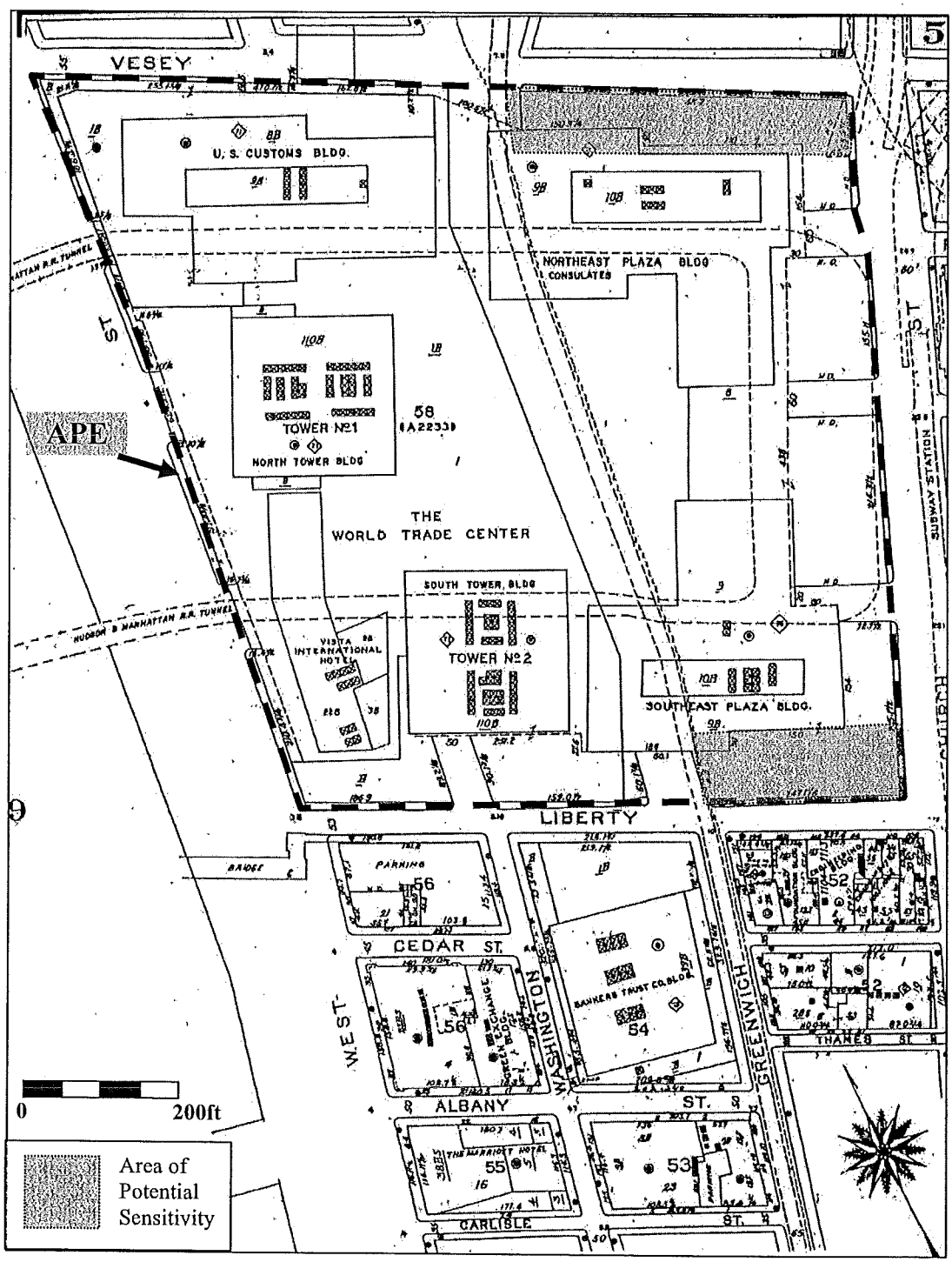


FIGURE 2

World Trade Center APE.
Sanborn 2001.

World Trade Center Project Site.

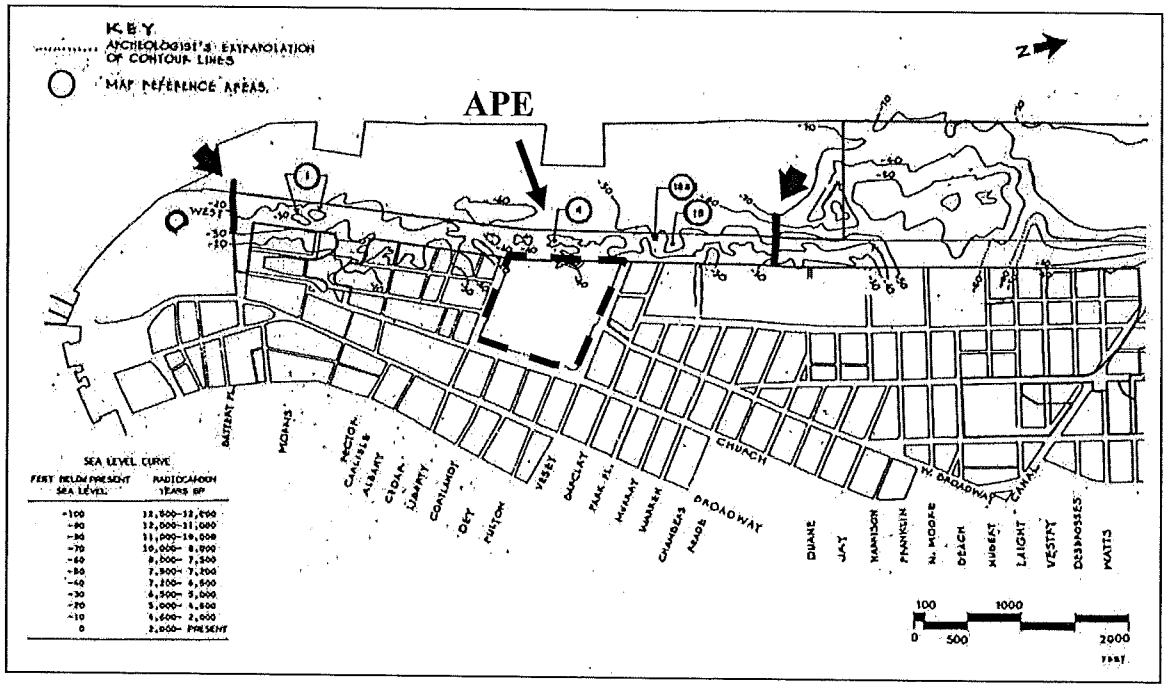


FIGURE 3

Ancient Sea Levels along the Hudson River with Potential Archaeological Sites.
HCI 1983, Figure 4, p. 48.

World Trade Center Project Site.

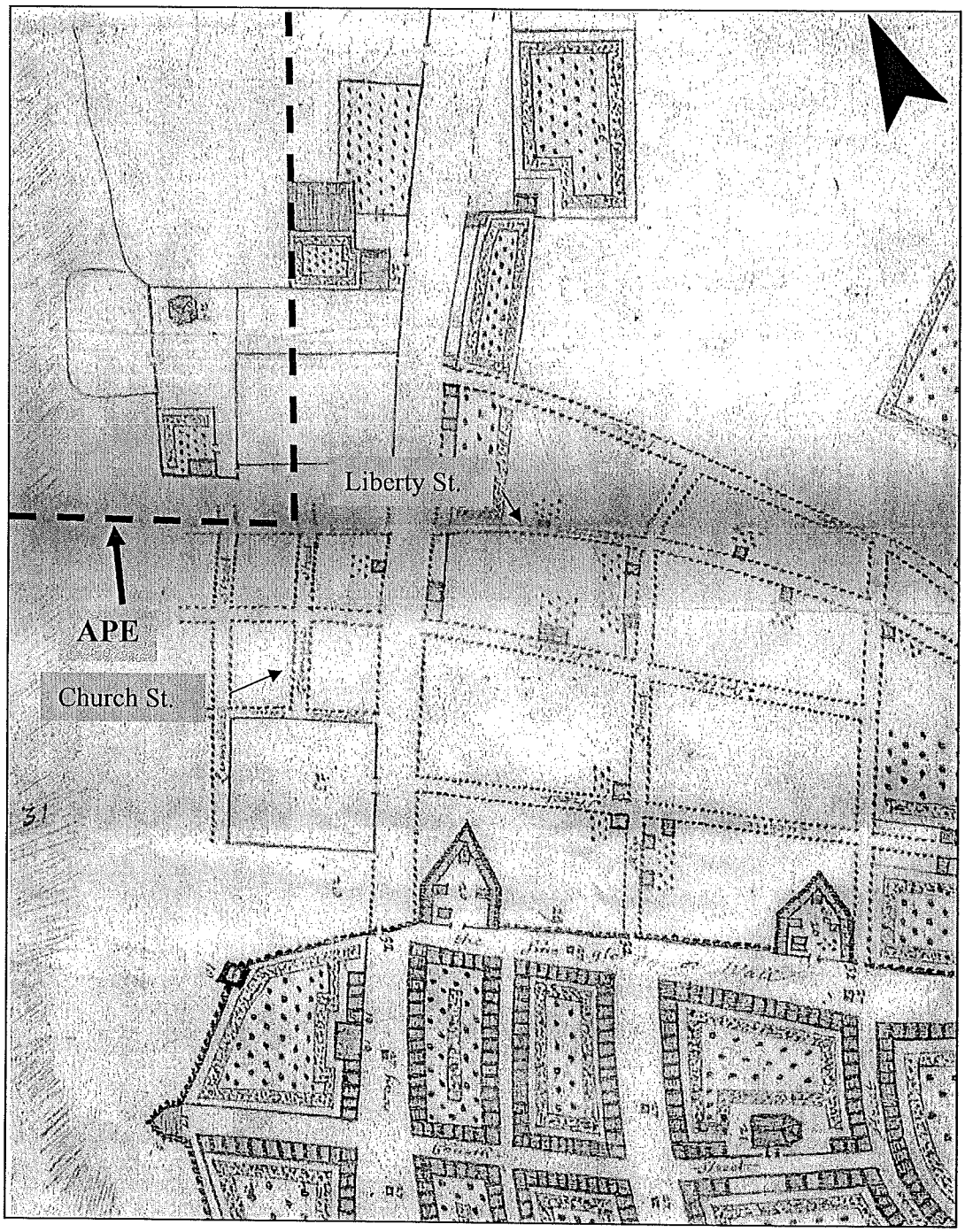


FIGURE 4

New Yorke.
Miller 1696.

World Trade Center Project Site.

Approximate Scale: 1 inch= 400 feet

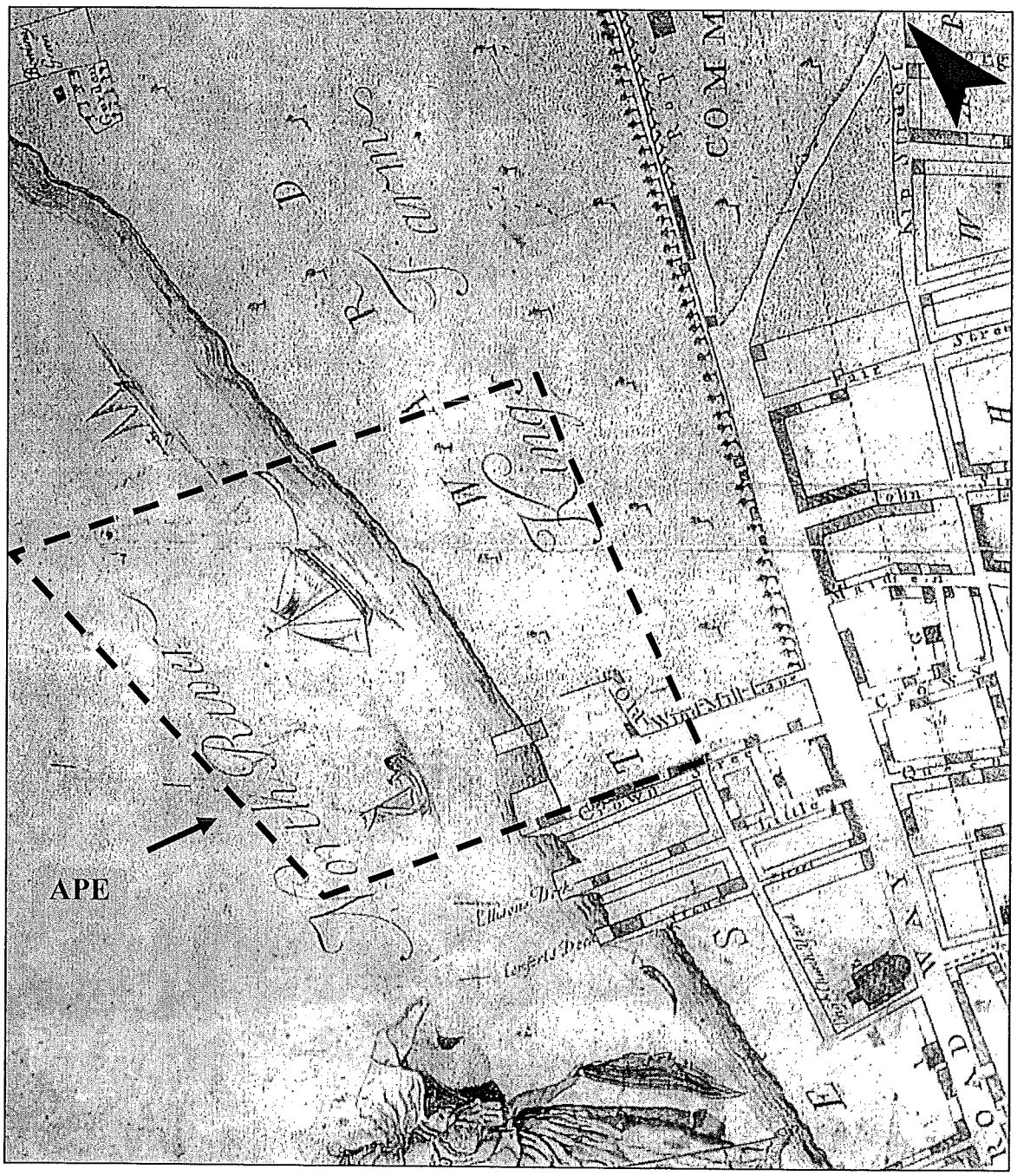


FIGURE 5

A Plan of the City of New York from an actual Survey Made by James Lyne. Bradford 1731.

World Trade Center Project Site.

Approximate Scale: 1 inch= 250 feet

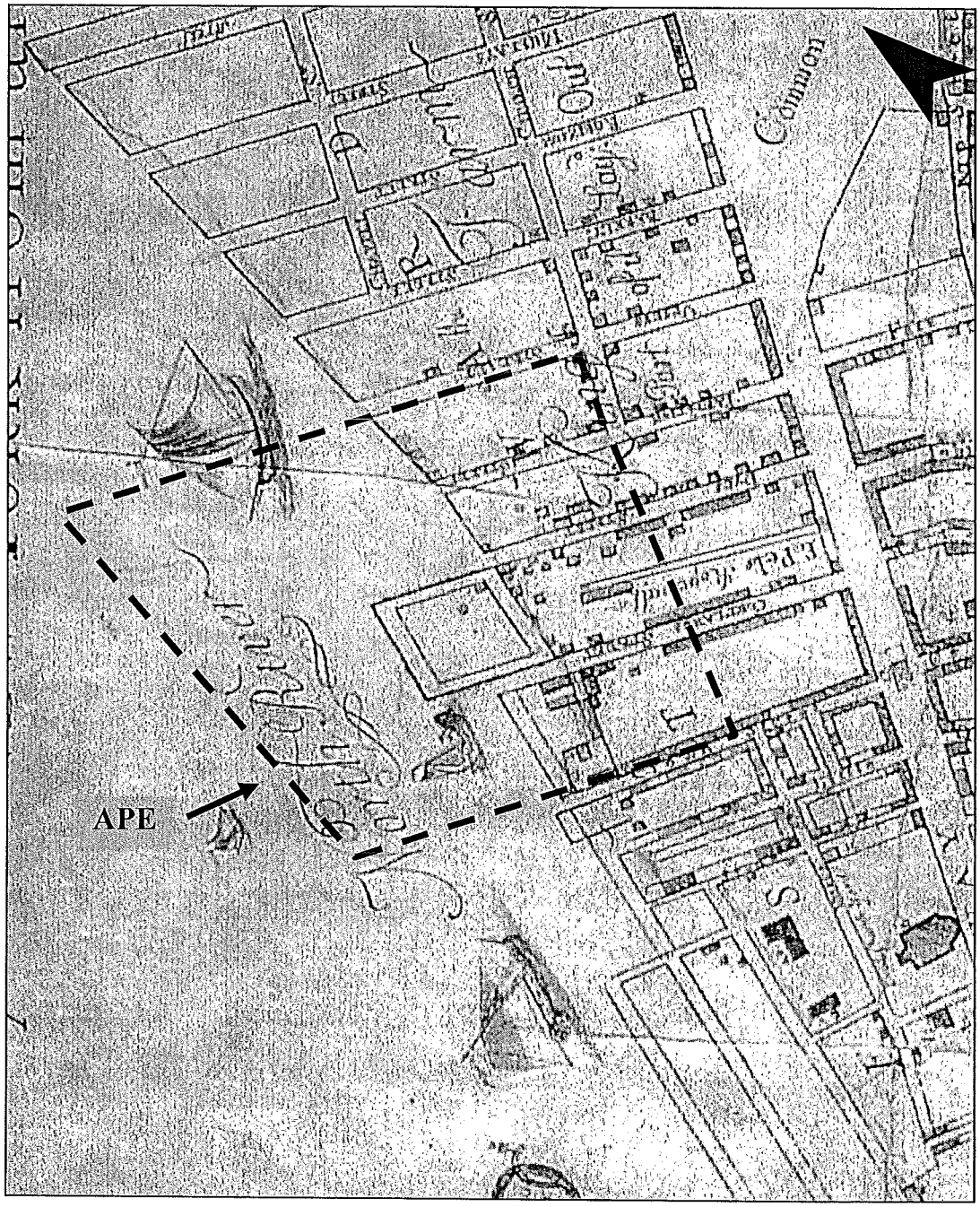


FIGURE 6

A Plan of the City of New York from an actual Survey Anno Domini – M,DCC,IV.
Maerschalk 1755.

World Trade Center Project Site.

Approximate Scale: 1 inch= 250 feet

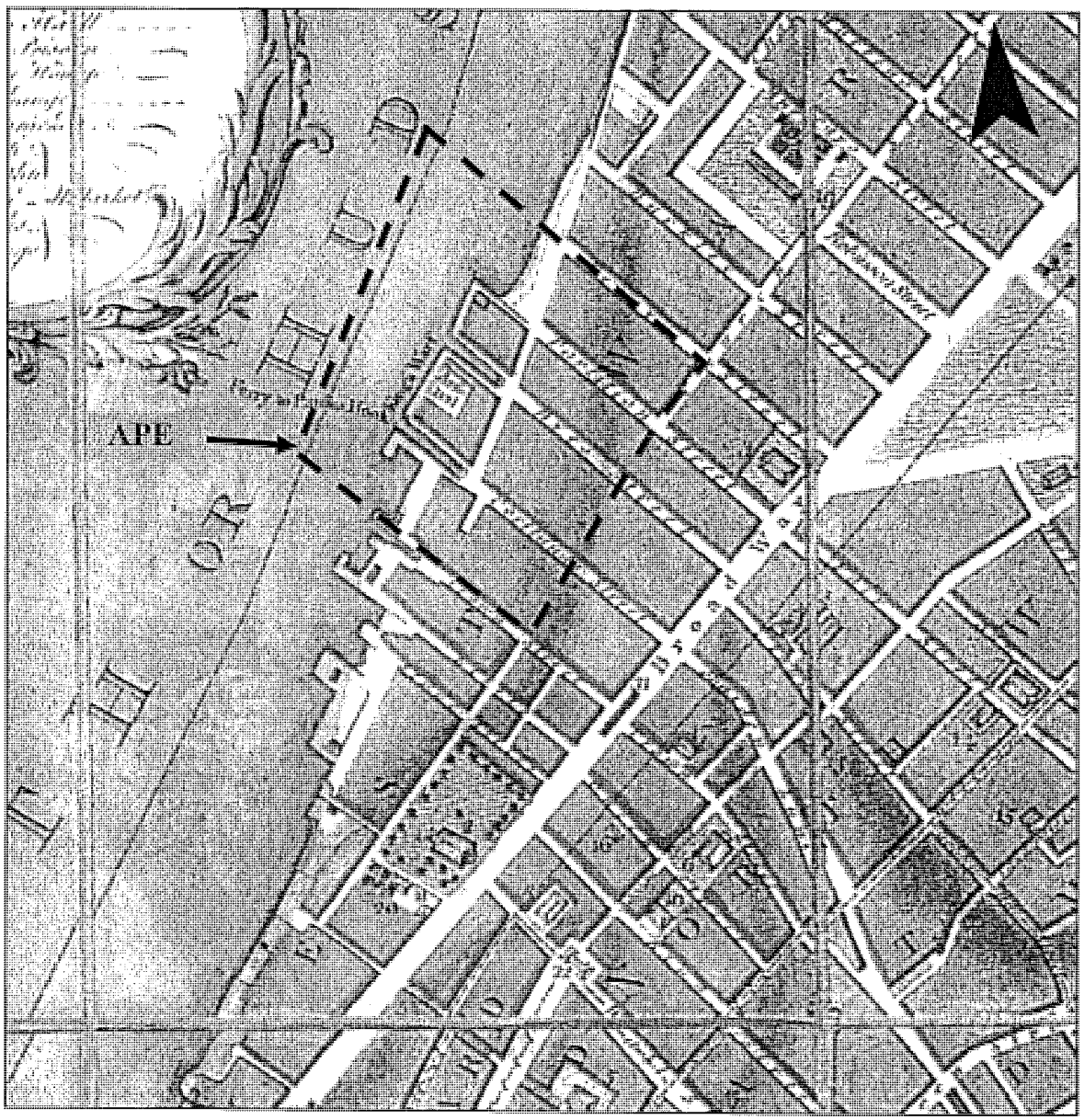


FIGURE 7

To His Excellency Sr. Henry Moore, Bart...This Plan of the City of New York, Is Most Humbly Inscribed.
Ratzen 1776.

World Trade Center Project Site.

Approximate Scale: 1 inch= 400 feet

FIGURE 8

The New-York Directory and Register for the Year 1789.
McComb 1789.

World Trade Center Project Site.

Approximate Scale: 1 inch= 500 feet

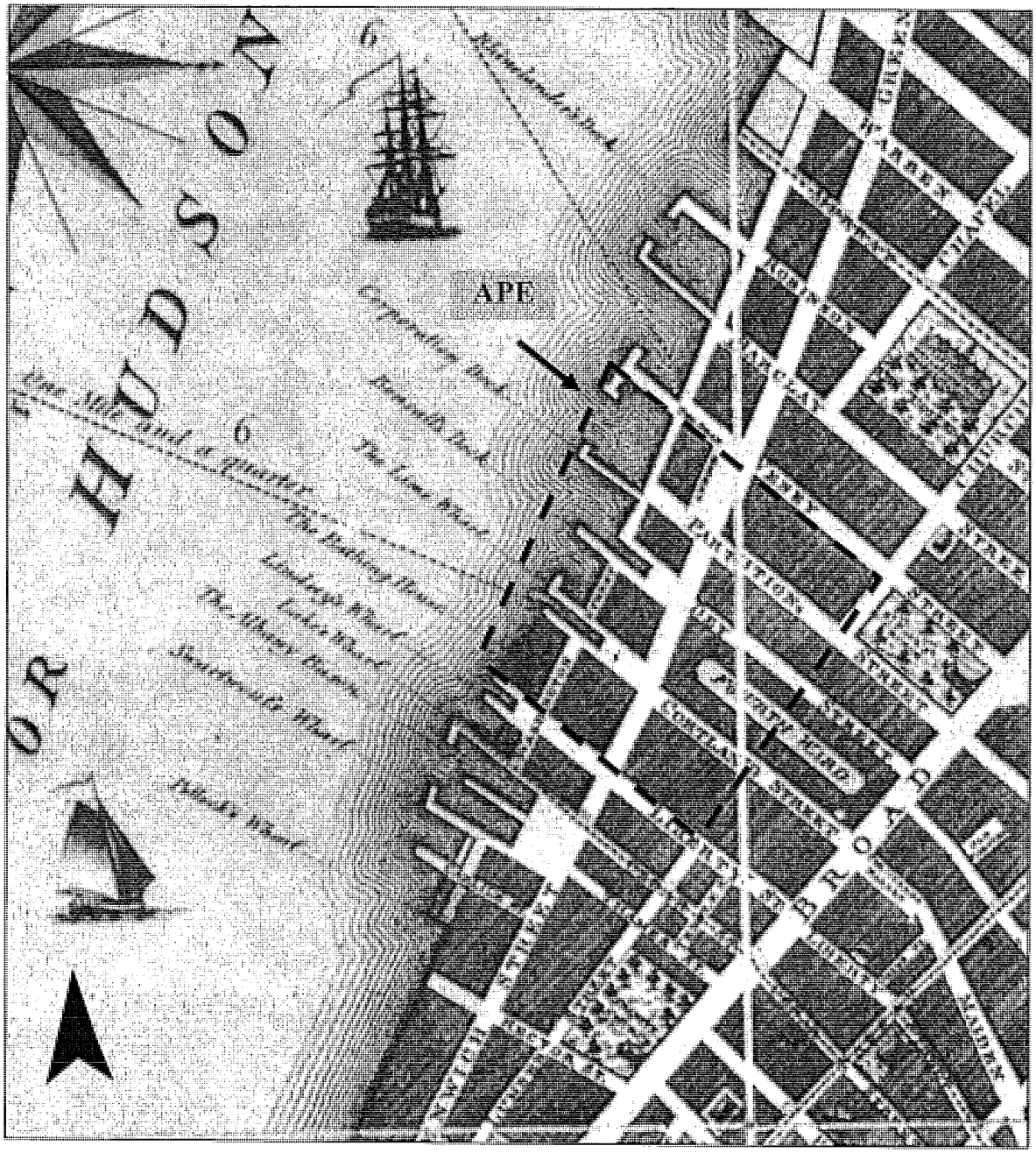


FIGURE 9

A New & Accurate Plan of the City of New York in the State of New York in North America.
Taylor-Roberts 1797.

World Trade Center Project Site.

Approximate Scale: 1 inch= 400 feet

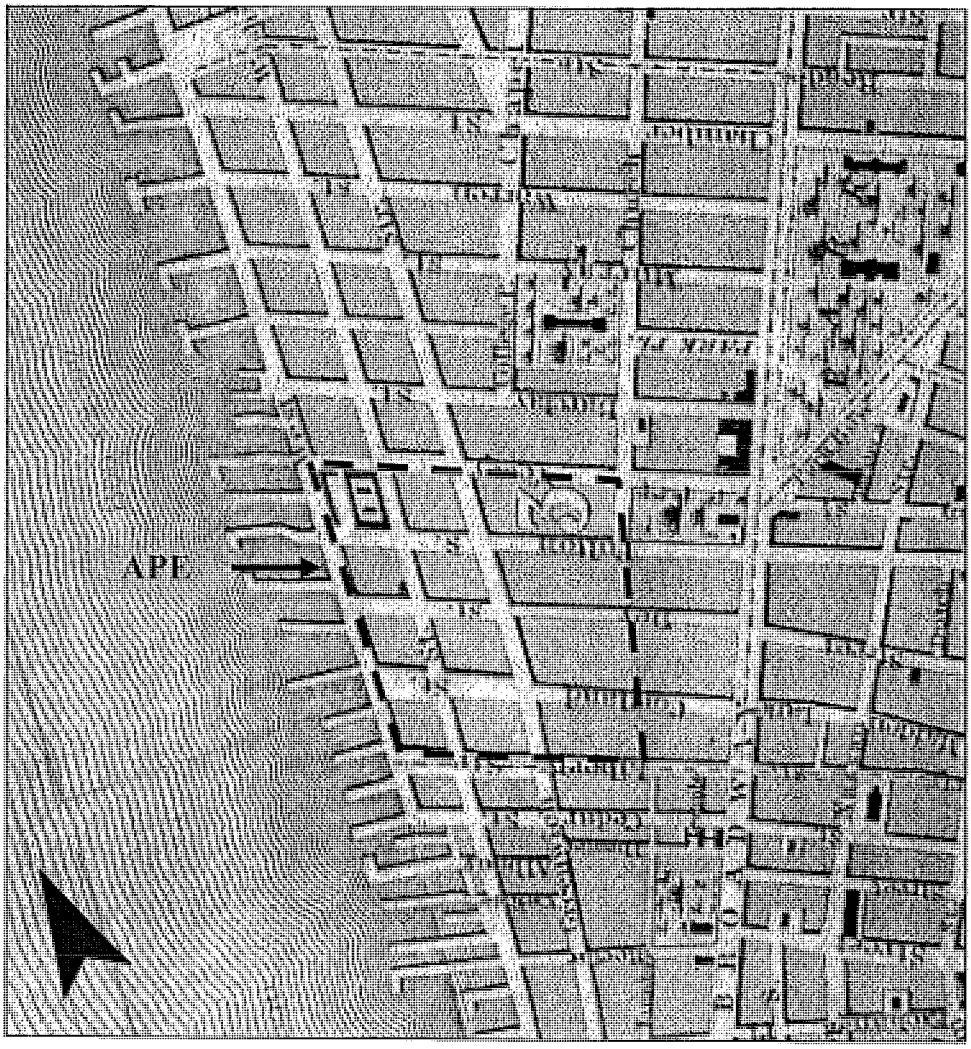


FIGURE 10

Topographical Map of the City and County of New-York, and the Adjacent Country.
Colton 1836.

World Trade Center Project Site.

Approximate Scale: 1 inch= 600 feet

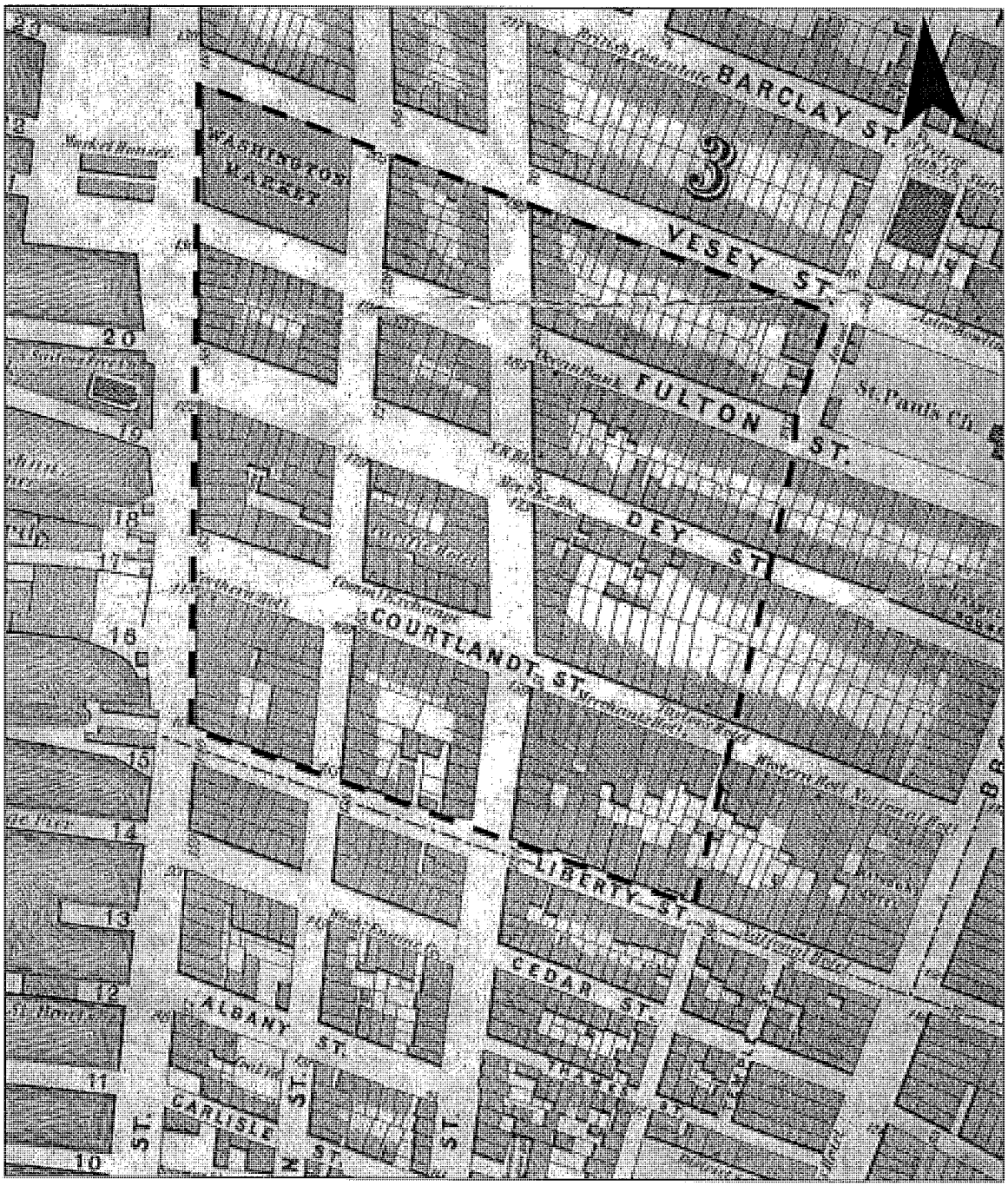


FIGURE 11

Map of the City of New York Extending Northward to 50th Street.
Dripps 1852.

World Trade Center Project Site.

Approximate Scale: 1inch= 200 feet

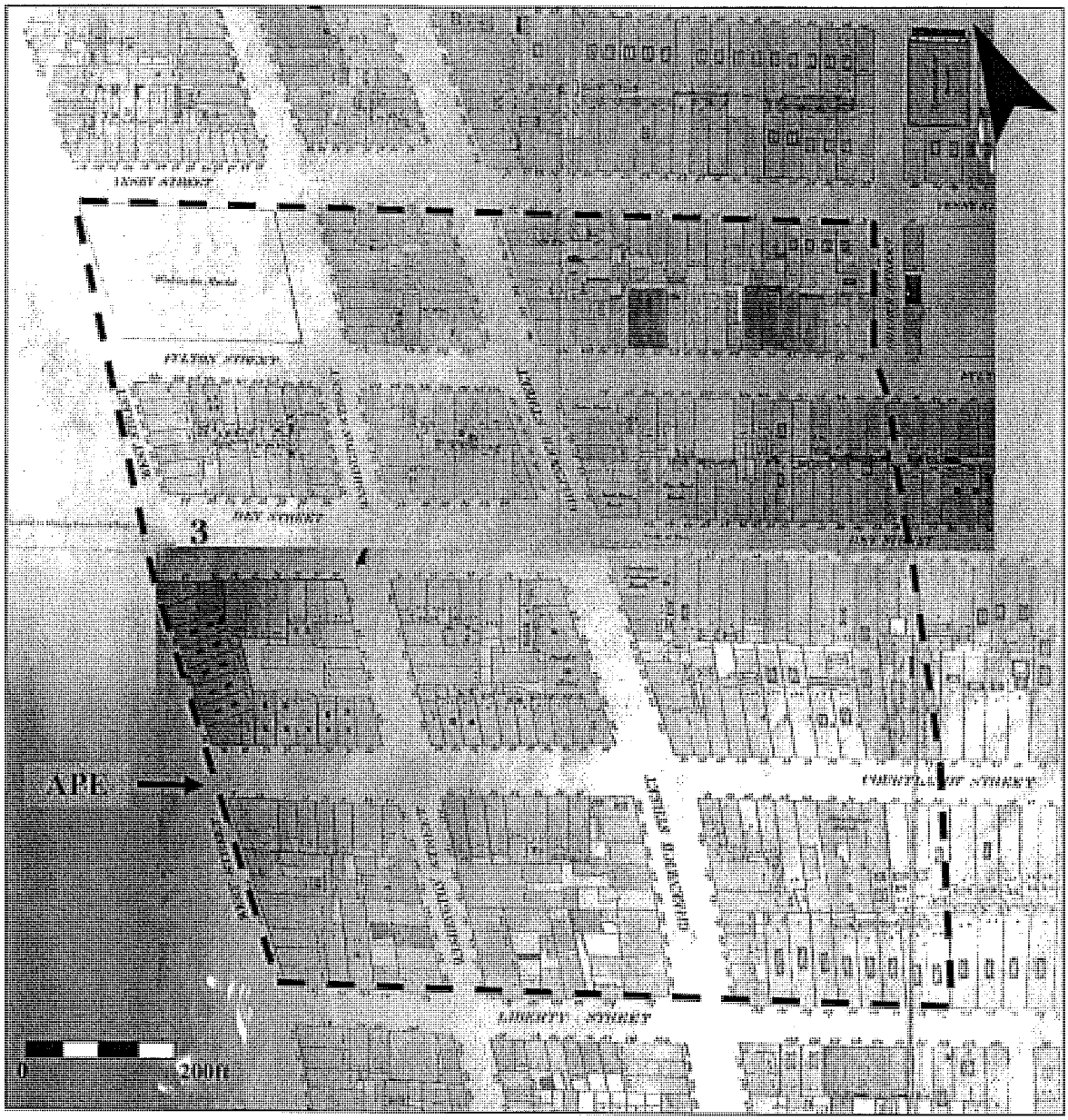


FIGURE 12

Maps of the City of New York.
Perris 1857-62.

World Trade Center Project Site.

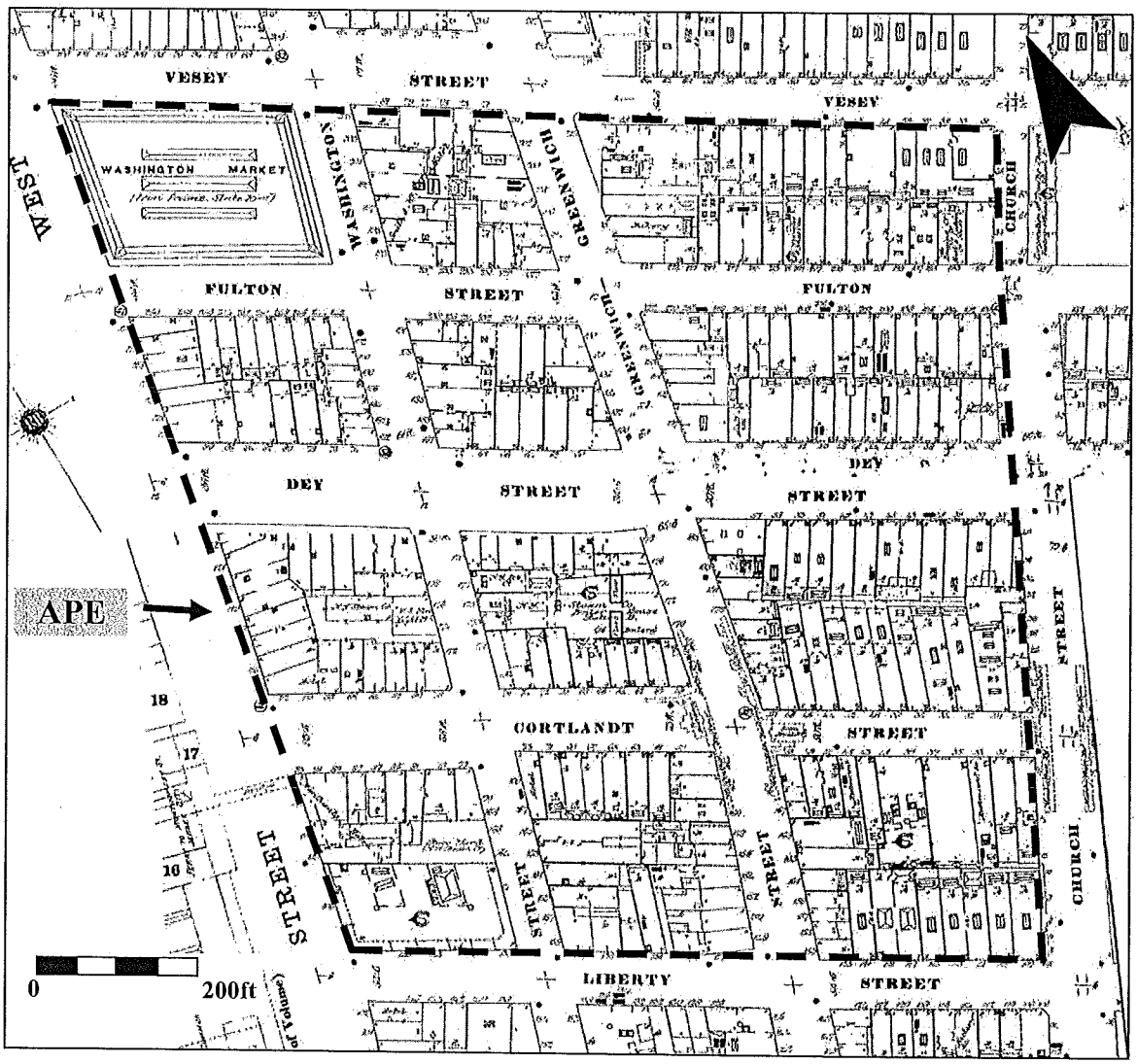


FIGURE 13

Insurance Maps.
Sanborn 1894.

World Trade Center Project Site.

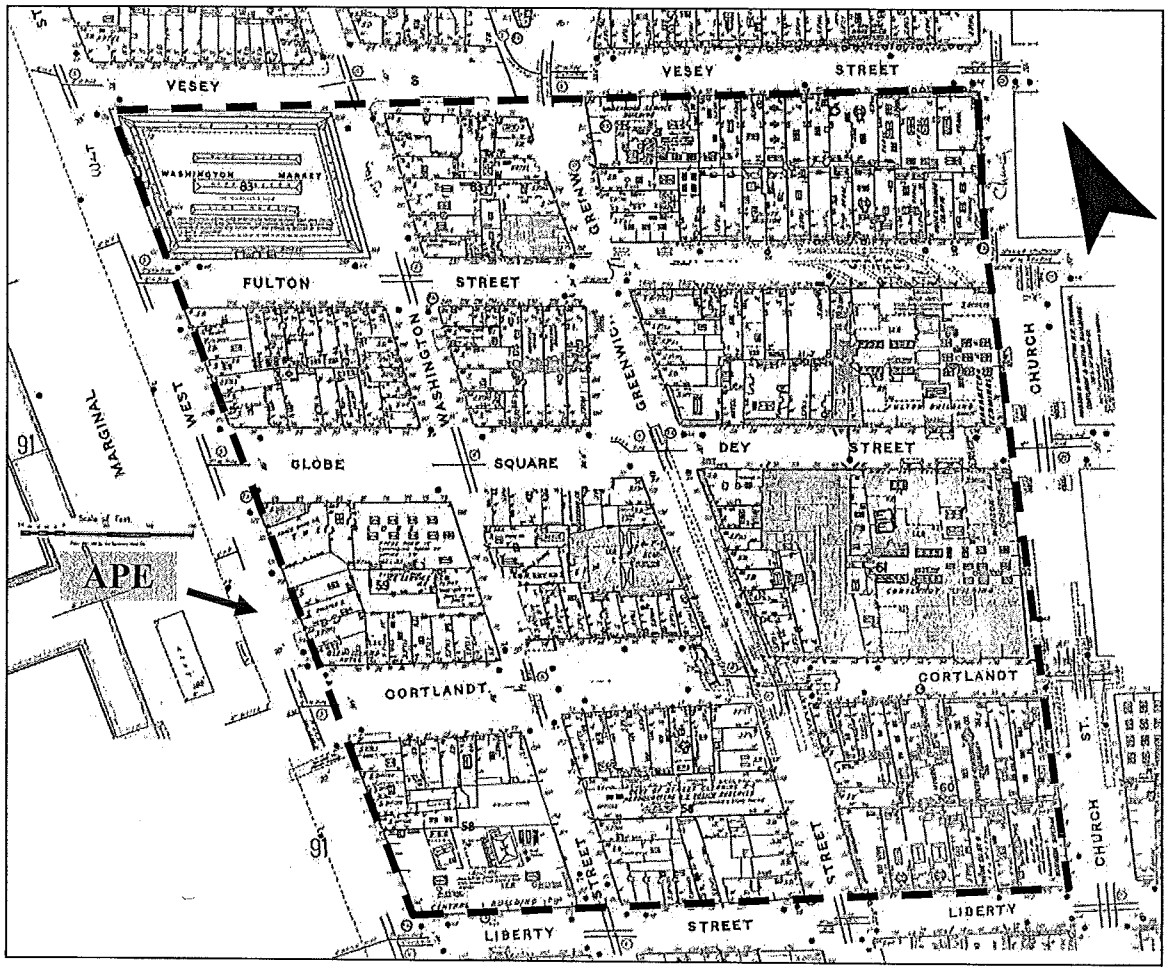


FIGURE 14

Insurance Maps.
Sanborn 1923.

World Trade Center Project Site.

FIGURE 15

Insurance Maps.
Sanborn 1951.

World Trade Center Project Site.

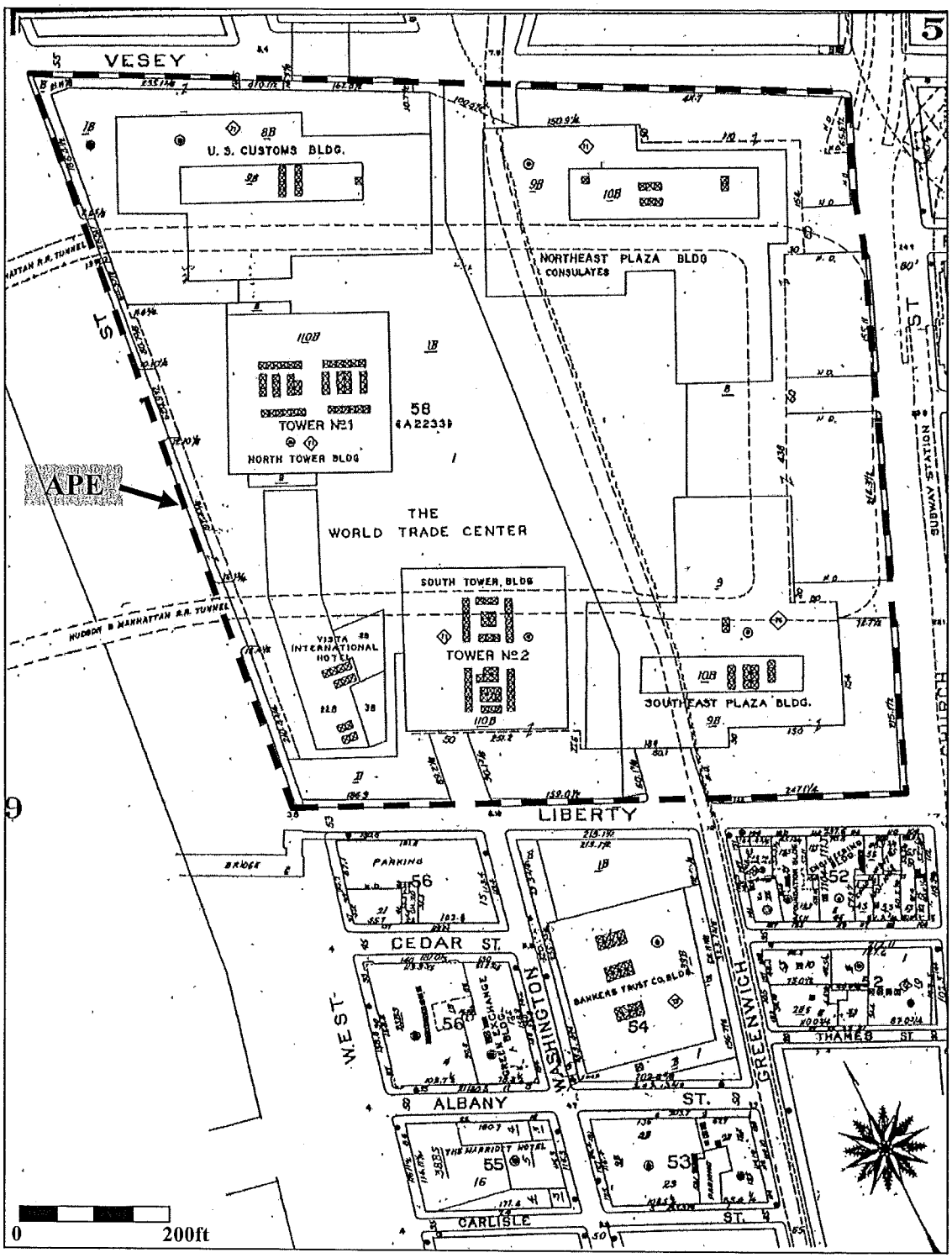


FIGURE 16

Insurance Maps.
Sanborn 2001.

World Trade Center Project Site.

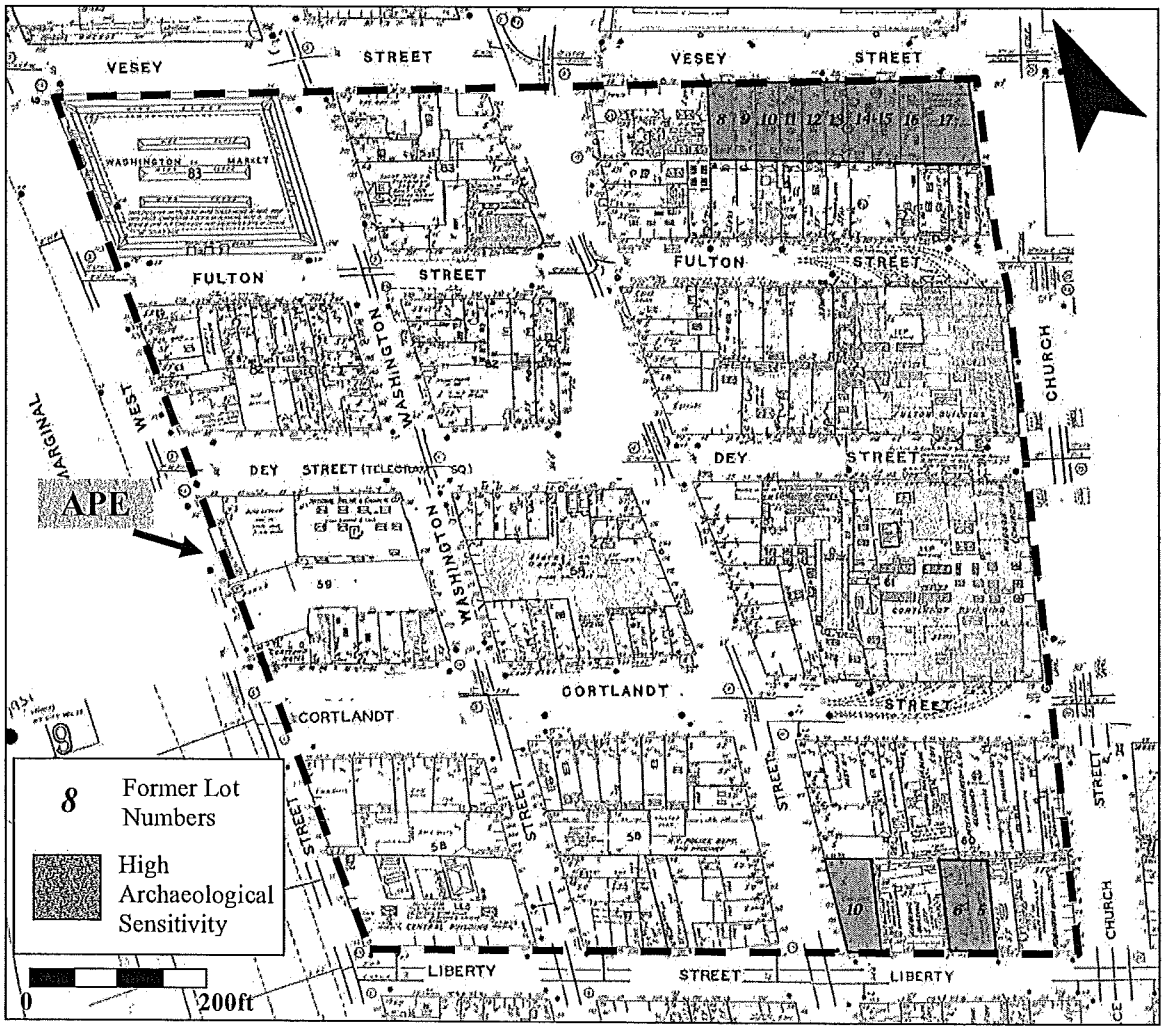
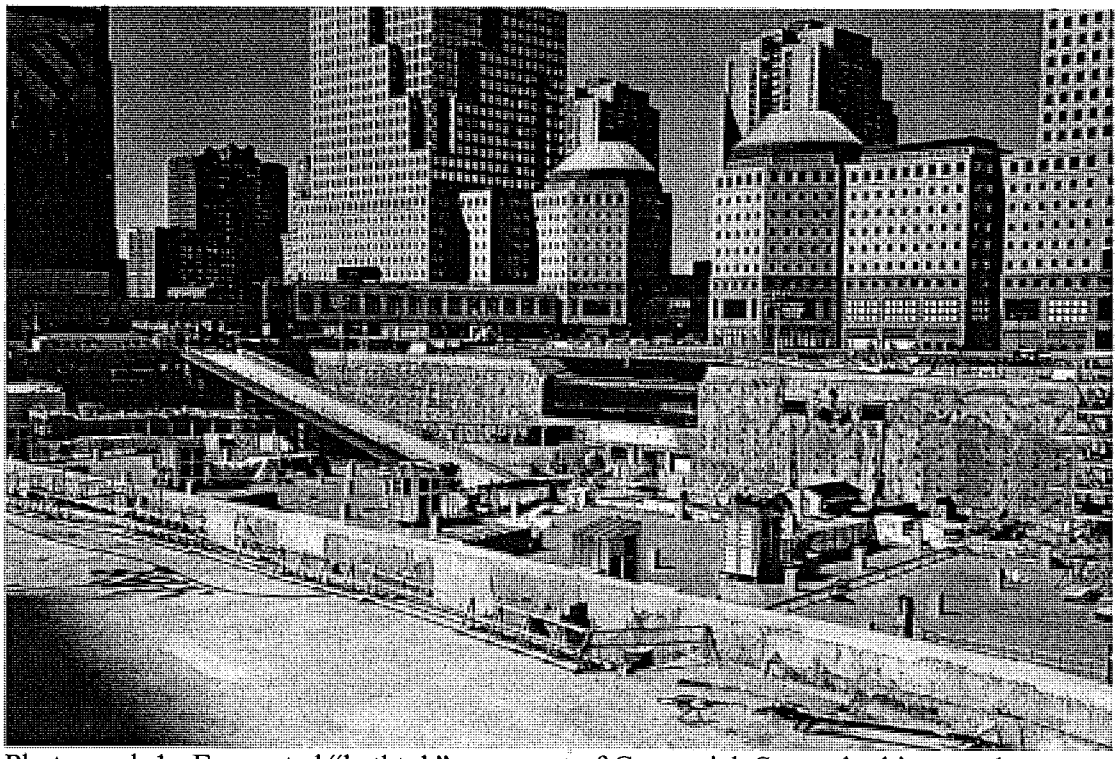


FIGURE 17

Area of Proposed Archaeological Sensitivity.
World Trade Center Project Site.
Sanborn 1951.

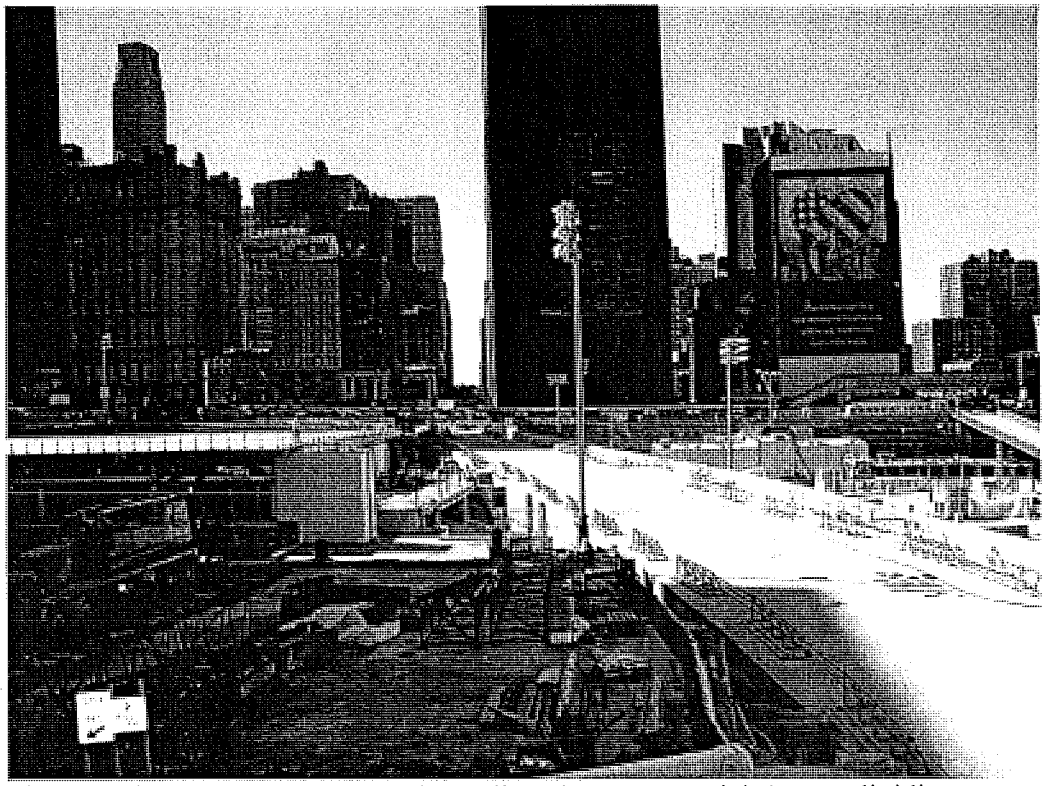
PHOTOGRAPHS

October 8, 2003

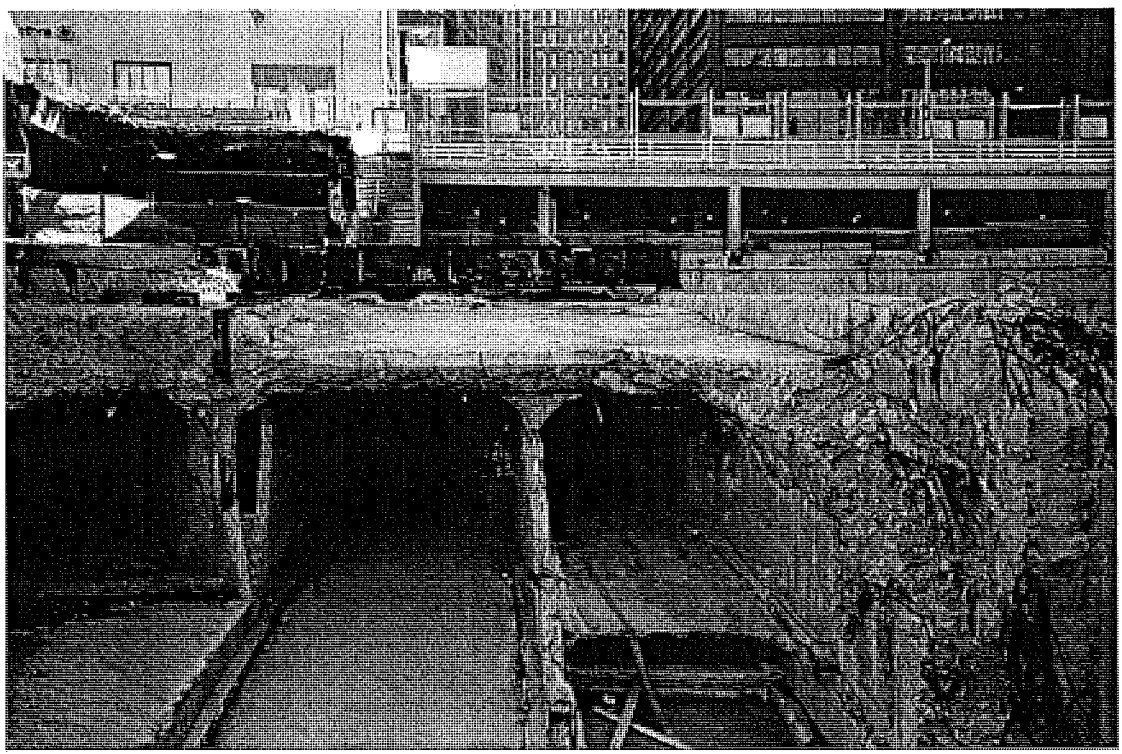


Photograph 1: Excavated "bathtub" area west of Greenwich Street, looking southwest. Covered I.R.T. subway along Greenwich Street in foreground. West Street in background.

Photograph 2: Excavated "bathtub" area west of Greenwich Street, looking northeast. Vesey Street in background.

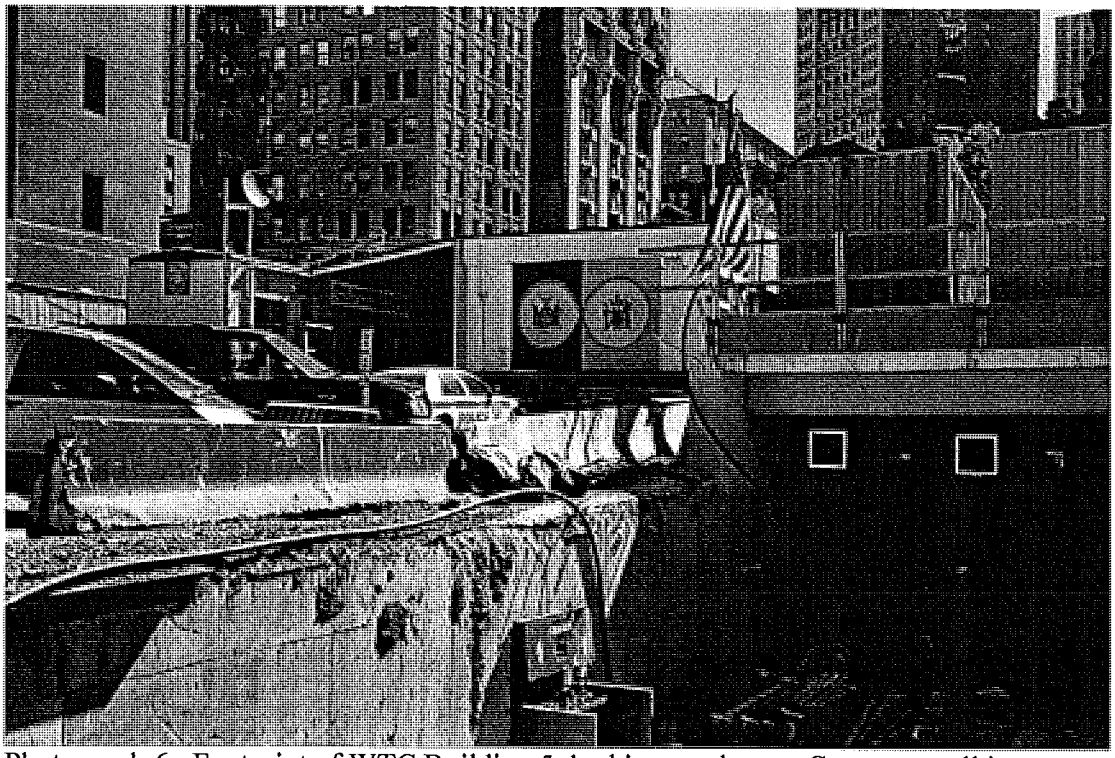


Photograph 3: Covered I.R.T. subway line along Greenwich Street, dividing east and west halves of APE, looking south. Liberty Street in far background.



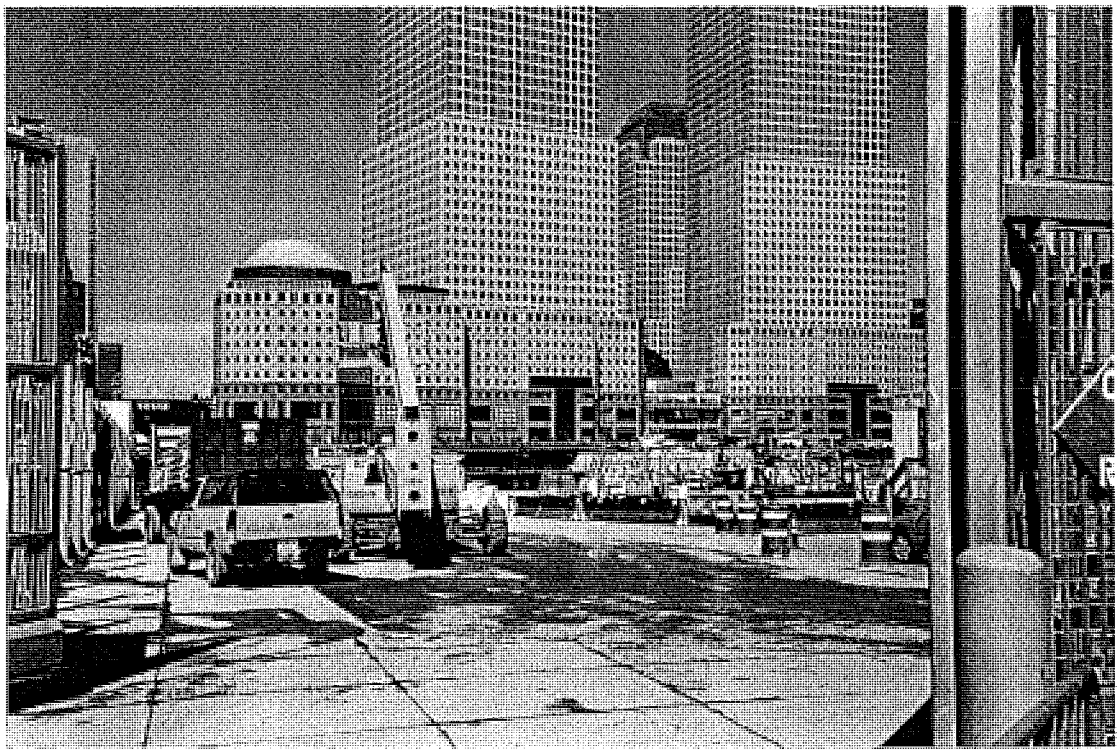
Photograph 4: Former H & M Terminal train tubes, later converted to truck ramps, looking east. Church Street in background.

Photograph 5: Footprint of WTC Building 4, looking southeast. Intersection of Liberty and Church Streets in background.

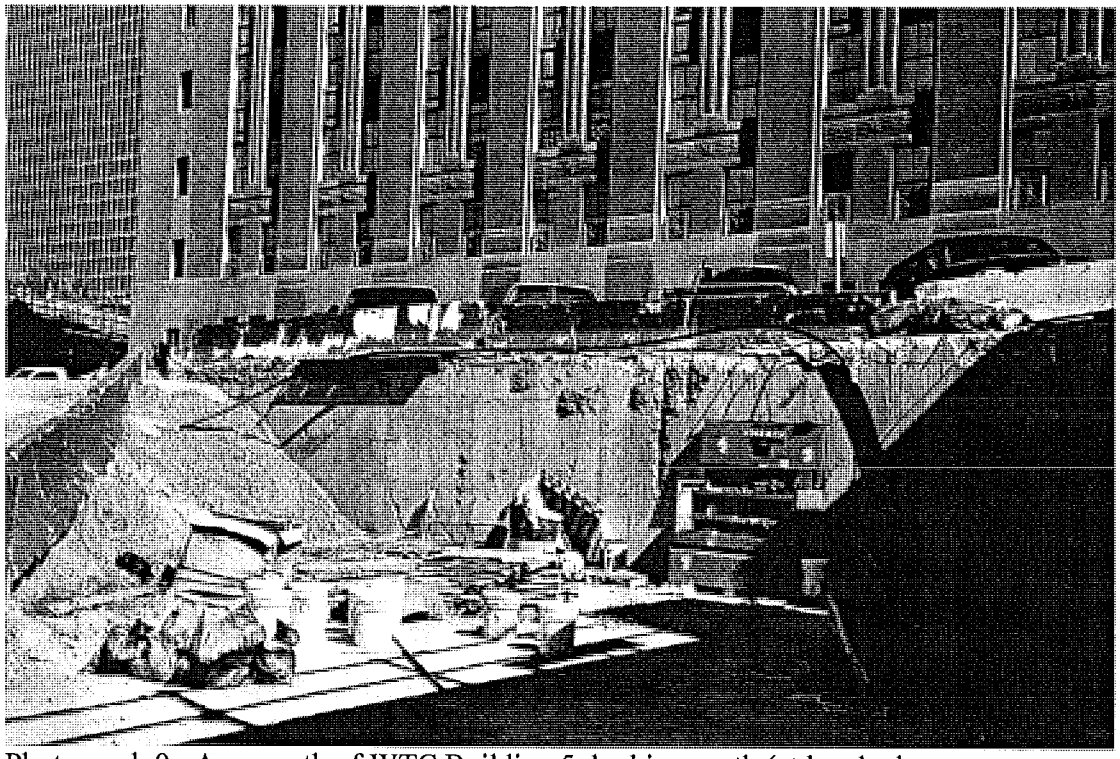


Photograph 6: Footprint of WTC Building 5, looking northeast. Concrete wall is northern extent of building. Intersection of Vesey and Church Streets in background.

Photograph 7: Area south of WTC Building 4 (at level where trailer is located), looking south. Liberty Street in background.



Photograph 8: Area south of WTC Building 4, looking west. West Street in far background.



Photograph 9: Area north of WTC Building 5, looking north (at level where cars are parked). Vesey Street in background.

Photograph 10: Area north of WTC Building 5 (where majority of cars are parked), looking east. Intersection of Vesey and Church Streets in background.

Appendix B-4: **Topic Intensive Archaeological Study: World Trade Center Property**

HISTORICAL PERSPECTIVES INC.

TOPIC INTENSIVE ARCHAEOLOGICAL STUDY

WORLD TRADE CENTER MEMORIAL AND REDEVELOPMENT PROJECT SITE, BLOCK 58, LOT 1 BOUNDED BY CHURCH, VESEY, LIBERTY AND WEST STREETS

NEW YORK, NEW YORK

TOPIC INTENSIVE ARCHAEOLOGICAL STUDY

WORLD TRADE CENTER MEMORIAL AND REDEVELOPMENT PROJECT SITE, BLOCK 58, LOT 1 BOUNDED BY CHURCH, VESEY, LIBERTY, AND WEST STREETS NEW YORK, NEW YORK

Prepared For:

AKRF, Inc.
117 East 29th Street
New York, NY 10016

Prepared By:

Historical Perspectives, Inc.
P.O. Box 3037
Westport, CT 06880

Authors:
Julie Abell Horn, M.A., R.P.A.
Nancy Dickinson
Sara Mascia, Ph.D., R.P.A.
Tina Fortugno, M.A.

March 2004

EXECUTIVE SUMMARY

The Lower Manhattan Development Corporation (LMDC) proposes to undertake, in cooperation with the United States Department of Housing and Urban Development and the Port Authority of New York and New Jersey, a World Trade Center Memorial and Redevelopment Plan (the Proposed Action). The project calls for the construction of a World Trade Center Memorial and memorial-related improvements, as well as commercial, retail, museum and cultural facilities, new open space areas, new street configurations, and certain infrastructure improvements at the World Trade Center Site (WTC Site) and the Adjacent Sites including the two city blocks south of the WTC Site and portions of Liberty and Washington Streets (collectively the Southern Site) and possibly below grade portions of Site 26 in Battery Park City.

LMDC is conducting a coordinated environmental review pursuant to the National Environmental Policy Act (NEPA) and the New York State Environmental Quality Review Act (SEQRA). LMDC is preparing a Generic Environmental Impact Statement. In November 2003, Historical Perspectives, Inc. completed a Phase IA archaeological assessment for the WTC Site as part of the environmental review process and to satisfy the requirements of Section 106 of the National Historic Preservation Act. The study was intended to comply with the standards of the New York State Historic Preservation Office (SHPO) (New York Archaeological Council 1994) and the guidelines of the New York City Landmarks Preservation Commission (LPC) (CEQR 2001; LPC 2002). The Phase IA report focused on the WTC Site; a separate study was prepared for the Southern Site.

The WTC Site is known as Block 58, Lot 1, and bounded by Church Street on the east, Vesey Street on the north, Liberty Street on the south, and West Street on the west . All of the buildings formerly on the site were destroyed during terrorist attacks on September 11, 2001, and subsequently, most of the remains of these buildings have been demolished and removed. The Area of Potential Effect (APE), as defined by the Phase IA study, constitutes the footprint of planned construction and disturbance on the site. Because construction plans are still being revised, the APE is considered the entire WTC site.

The Phase IA study divided the WTC APE into of two distinct areas: the portion of the property east of Greenwich Street, which originally was located on firm land above the Hudson River shoreline, and the area west of Greenwich Street, which was once under the waters of the Hudson River. All of the area west of Greenwich Street and large portions of the area east of Greenwich Street have been significantly disturbed by construction and excavation activities, precluding the recovery of any potential archaeological resources in these areas. Due to this obvious disturbance, the Phase IA report concentrated chiefly on those remaining sections that may still have the potential for archaeological resources. These are the southern part of the block once bounded by Liberty, Church, Greenwich, and Cortlandt Streets (former Block 60); and the northern part of the block once bounded by Vesey, Church, Greenwich, and Fulton Streets (former Block 85).

The Phase IA archaeological assessment concluded that there was little likelihood that precontact archaeological resources have survived within the WTC APE east of Greenwich Street, within the two areas of the APE not subjected to excavation as part of the former WTC construction, along Liberty and Vesey Streets. Here, it is probable that original precontact occupation surfaces have been destroyed by former basement construction.

However, the Phase IA archaeological assessment concluded that potential shaft features predating the 1850s (when public water and sewer services became available in this neighborhood) may survive under former basements along areas north of Liberty Street, between Church and Greenwich Streets, and south of Vesey Street, between Church and Greenwich Street. Where former basements were 10 feet below grade or less, there is a good likelihood for preservation of shaft features; the project team assigned these lots a high archaeological sensitivity. Lots with former basements 20 feet or more below grade have a much lesser likelihood of shaft feature preservation, and were assigned a low archaeological sensitivity. Based on these conclusions, Phase IB archaeological field testing was recommended for former lots assigned a high sensitivity within the two areas of the APE considered potentially sensitive. Three lots were given a high sensitivity along Liberty Street (former Lots 5, 6, and 10) and 10 lots were assigned a high sensitivity along Vesey Street (former Lots 8-17). No further archaeological investigations were recommended for those lots assigned a low sensitivity.

The Phase IA archaeological assessment was submitted to the SHPO and the LPC for review. The LPC response, dated December 17, 2003, indicated that additional research was necessary on the lots considered potentially sensitive prior to the agency's review of the Phase IA report. Specifically, the LPC indicated that occupational histories of each lot flagged as highly sensitive would need to be generated. These histories would include review of primary source documents such as conveyance records, tax assessments, censuses, and city directories. Dates of installation for public utilities also would need to be documented. The LPC recently has established thresholds that must be met before a historic lot is to be carried forward for further testing, such as (1) direct association between a specific occupant and a lot over time and (2) lot residency for more than five years prior to the introduction of public utilities.

Archival research conducted for the present Topic Intensive Study concluded that all of the lots recommended as archaeologically sensitive by the Phase IA archaeological assessment had two or more occupancies spanning at least five years (and in most cases, many more years) before the introduction of the first public utilities in 1842. Furthermore, several of the lots on Block 85 also had five-year plus occupancies that extended beyond 1842. On Block 60, the first occupants were identified beginning in the 1790s, and on Block 85, the first occupants were identified beginning in the 1750s. Thus, all eleven of the historic lots appear to retain archaeological sensitivity and are recommended for archaeological field testing.

All archaeological field testing should be conducted according to applicable archaeological standards (New York Archaeological Council 1994; LPC 2002), and in

consultation with the SHPO and the LPC. RPA-certified professional archaeologists, with an understanding of and experience in urban archaeological excavation techniques, would be required to be part of the archaeological team.

TABLE OF CONTENTS

EXECUTIVE SUMMARY i

TABLE OF CONTENTS iv

I. INTRODUCTION 1
II. METHODOLOGY 3
III. RESULTS 5
A. BLOCK 60 EARLY HISTORY 5
B. BLOCK 60 INDIVIDUAL LOT HISTORIES 6
C. BLOCK 85 EARLY HISTORY 10
D. BLOCK 85 INDIVIDUAL LOT HISTORIES 12
E. SUMMARY OF ARCHIVAL RESULTS 27
F. POTENTIAL FOR ARCHAEOLOGICAL RESOURCE SURVIVAL WITHIN HISTORIC LOTS 29
IV. CONCLUSIONS 34
V. RECOMMENDATIONS 38
VI. REFERENCES 39

FIGURES

APPENDIX

FIGURES

1. *Jersey City and Brooklyn Quadrangles, New Jersey and New York.* United States Geological Survey, 1976 and 1979.

2. World Trade Center APE. Sanborn 2001.

3. World Trade Center APE with archaeological sensitivity areas. Sanborn 1951.

I. INTRODUCTION

The Lower Manhattan Development Corporation (LMDC) proposes to undertake, in cooperation with the United States Department of Housing and Urban Development and the Port Authority of New York and New Jersey, a World Trade Center Memorial and Redevelopment Plan (the Proposed Action). The project calls for the construction of a World Trade Center Memorial and memorial-related improvements, as well as commercial, retail, museum and cultural facilities, new open space areas, new street configurations, and certain infrastructure improvements at the World Trade Center Site (WTC Site) and the Adjacent Sites including the two city blocks south of the WTC Site and portions of Liberty and Washington Streets (collectively the Southern Site) and possibly below grade portions of Site 26 in Battery Park City.

LMDC is conducting a coordinated environmental review pursuant to the National Environmental Policy Act (NEPA) and the New York State Environmental Quality Review Act (SEQRA). LMDC is preparing a Generic Environmental Impact Statement. In November 2003, Historical Perspectives, Inc. completed a Phase IA archaeological assessment for the WTC Site as part of the environmental review process and to satisfy the requirements of Section 106 of the National Historic Preservation Act. The study was intended to comply with the standards of the New York State Historic Preservation Office (SHPO) (New York Archaeological Council 1994) and the guidelines of the New York City Landmarks Preservation Commission (LPC) (CEQR 2001; LPC 2002). The Phase IA report focused on the WTC Site; a separate study was prepared for the Southern Site.

The WTC Site is known as Block 58, Lot 1, and bounded by Church Street on the east, Vesey Street on the north, Liberty Street on the south, and West Street on the west (Figures 1 and 2). All of the buildings formerly on the site were destroyed during terrorist attacks on September 11, 2001, and subsequently, most of the remains of these buildings have been demolished and removed. The Area of Potential Effect (APE), as defined by the Phase IA study, constitutes the footprint of planned construction and disturbance on the site. Because construction plans are still being revised, the APE is considered the entire WTC site.

The Phase IA study divided the WTC APE into of two distinct areas: the portion of the property east of Greenwich Street, which originally was located on firm land above the Hudson River shoreline, and the area west of Greenwich Street, which was once under the waters of the Hudson River. All of the area west of Greenwich Street and large portions of the area east of Greenwich Street have been significantly disturbed by construction and excavation activities, precluding the recovery of any potential archaeological resources in these areas. Due to this obvious disturbance, the Phase IA report concentrated chiefly on those remaining sections that may still have the potential for archaeological resources. These are the southern part of the block once bounded by Liberty, Church, Greenwich, and Cortlandt Streets (former Block 60); and the northern part of the block once bounded by Vesey, Church, Greenwich, and Fulton Streets (former Block 85).

The Phase IA archaeological assessment concluded that there was little likelihood that precontact archaeological resources have survived within the WTC APE east of Greenwich Street, within the two areas of the APE not subjected to excavation as part of the former WTC construction, along Liberty and Vesey Streets. Here, it is probable that original precontact occupation surfaces have been destroyed by former basement construction.

However, the Phase IA archaeological assessment concluded that potential shaft features predating the 1850s (when public water and sewer services became available in this neighborhood) may survive under former basements along areas north of Liberty Street, between Church and Greenwich Streets, and south of Vesey Street, between Church and Greenwich Street. Where former basements were 10 feet below grade or less, there is a good likelihood for preservation of shaft features; the project team assigned these lots a high archaeological sensitivity. Lots with former basements 20 feet or more below grade have a much lesser likelihood of shaft feature preservation, and were assigned a low archaeological sensitivity. Based on these conclusions, Phase IB archaeological field testing was recommended for former lots assigned a high sensitivity within the two areas of the APE considered potentially sensitive. Three lots were given a high sensitivity along Liberty Street (former Lots 5, 6, and 10) and 10 lots were assigned a high sensitivity along Vesey Street (former Lots 8-17). No further archaeological investigations were recommended for those lots assigned a low sensitivity. Figure 3 illustrates those lots designated highly sensitive by the Phase IA report.

The Phase IA archaeological assessment was submitted to the SHPO and the LPC for review. The LPC response, dated December 17, 2003, indicated that additional research was necessary on the lots considered potentially sensitive prior to the agency's review of the Phase IA report. Specifically, the LPC indicated that occupational histories of each lot flagged as highly sensitive would need to be generated. These histories would include review of primary source documents such as conveyance records, tax assessments, censuses, and city directories. Dates of installation for public utilities also would need to be documented. The LPC recently has established thresholds that must be met before a historic lot is to be carried forward for further testing, such as (1) direct association between a specific occupant and a lot over time and (2) lot residency for more than five years prior to the introduction of public utilities. The following Topic Intensive Archaeological Study presents the results of this research.

The HPI project team consisted of Julie Abell Horn, M.A., R.P.A., Nancy Dickinson, Sara Mascia, Ph.D., R.P.A., and Tina Fortugno, M.A., who together conducted the majority of the project research and wrote this report; Betsy Kearns, M.A., R.P.A. who assisted with the research; and Cece Saunders, M.A., R.P.A., who oversaw the research process and provided editorial and interpretive assistance. Christine Flaherty, M.A. prepared the graphics.

II. METHODOLOGY

Preparation of this topic intensive archaeological study involved using documentary, cartographic, and archival resources. Repositories visited (either in person or by using their on-line electronic resources) or contacted included the New York City Register; the Municipal Archives of New York City; the New York Public Library; the New-York Historical Society; the Trinity Church Archives, and the New York Genealogical and Biographical Society.

The following specific resources were consulted:

- Deeds, leases, and other conveyances, available at the City Register and the New York Genealogical and Biographical Society. Summaries of additional transactions were reviewed using tract reports at the Municipal Archives of New York City and in I.N. Phelps Stokes' *The Iconography of Manhattan Island* (1967).

- Leases, indentures, and other documents (for the period of time that portions of the APE were owned by Trinity Church), available at the Trinity Church Archives. Additional information on leases and indentures made by the church was taken from Nan Rothschild's *New York City Neighborhoods: The 18th Century* (1990) and Elizabeth Blackmar's *Manhattan For Rent: 1785-1850* (1989).

  Specific primary sources consulted at the Trinity Church Archives included:

  - 1700-1800s Register of Lots with New Numbers
  - 1750-1766 Original Leases, pages 1-315 [all that are available]
  - 1769-1835 Register of Lots
  - 1767-1794 Rent Roll
  - 1775 Observation on Church Grounds
  - 1781 Observation on Church Grounds
  - 1782 Trinity Church Rent Roll
  - 1784-1826 Sale of Lots
  - 1794 Register of Lots
  - to 1805 Register of Lots (5)
  - to 1815 Register of Lots (5)
  - 1834-1836 Expiration of Leases – Church Farm
  - n.d. Rents of Church Ground
  - n.d. Block 85, Division 1, Block 1 map [includes present tax lot number]
  - n.d. Index of Lessees (Old) (18th/early 19th) [book/page locations unknown]

- Assessment of Real Estate Records (also referred to as tax assessment records), available on microfilm at the Municipal Archives of New York City. Records that list specific house numbers begin in 1807. Earlier records only list properties

by street for this neighborhood, and were of limited utility. Personal taxes, filed in tandem with the real estate taxes, indicate those individuals or businesses that were also occupying the properties.

- New York City Jury Census records for 1816, available on microfilm at the Municipal Archives of New York City. Other New York City Jury Censuses from 1819 and 1821 did not include this ward and so were not consulted.

- Federal Census records (for 1790, 1800, 1810, 1820, 1830, 1840, and 1850) available on microfilm and electronically at the New York Public Library.

- New York City Directories, available on microfiche at the New York Public Library. These directories were reviewed beginning in about 1790; earlier directories do not specify house numbers for this neighborhood and were of limited utility. Of particular value were two "reverse directories," where occupants were identified by location, rather than by name. These directories were published in 1812 and 1851. Because numerous city directories were reviewed for this study, they will be cited as "New York City Directory" with the year. The two exceptions are the reverse directories, which will be cited as Elliot 1812 and Doggett 1851, to distinguish them from the other sources.

- A collection entitled "Surveys of Streets (1780-1800)" that details owners and occupants of certain streets in lower Manhattan, including the APE, available at the New-York Historical Society. Stokes (1967) refers to this collection as part of the "Holden Sale." It has since been reclassified under its current name.

- *Annual Reports of the Croton Aqueduct Department*, available at various repositories (HPI has excerpts on file at its offices), which document dates of installation for sewers in Manhattan. Dates for installation of Croton water pipes within the APE were taken from *Map of the Croton Water Pipes with the Stop Cocks* (made in ca. 1842), on file at the New-York Historical Society and reprinted in *Manhattan in Maps* (Cohen and Augustyn 1997:119).

Additionally, comparative archaeological studies from New York City and other urban locations were reviewed in order to place the results in their proper context.

III. RESULTS

A. Block 60 Early History

Beginning with the European occupation, the project area was farmland and remained so into the at least the 1680s. In the 1620s and 1630s, the Dutch West India Company encouraged the settlement of New Amsterdam by offering leases and land grants for "bouweries", and Jan Jansen Damen was granted property in the project area in 1644 (R.D. Map 351, Plate 1; Tract Report 935; Stokes 1967, Vol. VI:86).

Some time after Damen's grant, but before 1686, land on the southern half of Block 60 was conveyed to William Dyre and his wife, Mary Dyre (Liber 13, 1686:202 in Tract Report 934; Stokes 1967, Vol. VI:86). A conveyance from 1686 identifies the Dyres as the grantors and Thomas Lloyd as the grantee (Ibid.). Thomas Lloyd's tract of land abutted Peter Mesier's land, which included the northern portion of Block 60 (Tract Report 941). The conveyance to Thomas Lloyd listed his northern boundary as "...beginning at the corner of the way or passage which leads to the mill of Peter Jansen Mesier, and so going south...." (Liber 13, 1686:202 in Tract Report 935). The way or passage noted appears to be the "Old Wind Mill Lane" on the Lyne-Bradford Plan of 1731 (Cohen and Augustyn 1997:55). Thus, Thomas Lloyd held roughly the southern half of Block 60, while Peter Mesier held roughly the northern half. Of note, Peter Mesier's windmill, which has been identified by LPC as a potentially sensitive archaeological resource within former Block 60, appears to be north of the Liberty Street lots addressed here (LPC 1982:Appendix 9). The windmill is depicted on several early historic maps (Miller 1696; Lyne-Bradford 1731).

In 1692 Crown Street (now Liberty Street), the southern boundary of Block 60, was laid out (Stokes 1967, Vol. VI:592). Crown Street appeared on the Miller Plan, which was drawn from memory in 1696 and depicted 1695 colonial New York (Cohen and Augustyn 1997:52-53). Of note, two structures and a garden are depicted on this map near the southeastern end of what would become Block 60, although it is unclear who occupied this plot, or whether there was any overlap with the current Liberty Street lots. Considering the Miller Plan was drawn from memory and not using a ground survey, the exact location of this small plot is probably not precise.

It is not known when Block 60 was first divided into city lots, but there are conveyances referred to for "not-lotted" parcels on Block 60 as early as 1706 (Liber 26, 1707:204). After Thomas Lloyd's death (late of Philadelphia [Liber 23, 1699:126]), his tract of land may have been divided when his daughter, Elizabeth, appeared as grantor and quit claimed to John Rodman and William Huddleston, grantees, five parcels of land that included the project area (Liber 23, 1698:125 in Tract Report 934). It is likely that after these conveyances, the first structures were built along the north side of Crown (Liberty) Street. The Lyne-Bradford map of 1731 clearly depicts several buildings within the Liberty Street portion of the APE, although their exact locations, sizes, and functions are unclear. Similarly, the occupants of these properties are unknown.

Of note, a map accompanying a predictive model generated by LPC identifies a potentially sensitive archaeological resource on Block 60 beginning in this period, Livingston's Sugar House, located at 28-36 Liberty Street from 1754-1840 (LPC 1982:Appendix 10). However, this map appears to be in error, as both the address on Liberty Street and other archival records place the sugar house more than two blocks to the east of Block 60, on the south side of Liberty Street, east of Nassau Street (Stokes 1967, Vol. III:963).

Determining the owners of the Liberty Street lots during the remainder of the eighteenth century, much less the names of those who lived and/or worked on the parcels, has been limited by the breaks in the records for the chain of title and the absence of a series of city directories that cover this neighborhood, particularly for the seventeenth and the first half of eighteenth centuries.[1] After Elizabeth Lloyd's 1698 conveyances, the earliest transactions gleaned from available records at the City Register indicate that Lot 5 was conveyed sometime before 1786; Lot 6, before 1792; and Lot 10, before 1768.

The 13 conveyances for the "not lotted" parcels on Block 60 for the time period between 1686 and 1773 are difficult to match up with later city lots, yet there may be a connection between

> *all that certain dwelling house and parcell of land...bounded East by land now or late of Stephen Richard; North by land now or late of Peter Jansen Masier; West by land now or late of John Hutchins; South by Crown Street...* (Liber 35, 1759:293)

and Lot 10. The 1759 indenture lists James Wells of the City of New York, "Corderwainer," and his wife, Ann, as the grantors to David Allgeo of the City of New York, Merchant. Allgeo paid £1010, current New York money, for the lot, which was 50x110 feet, all English measure. The lot dimensions work well with the size of Block 60's Lot 10. This 1759 transaction appears to precede the 1768 conveyance, the result of David Algeo's will being filed, in which Lot 10 was granted to his grandsons, David and William Algeo. It is risky to connect any other of the "not lotted" parcels with Block 60's Lots 5, 6, and 10, especially since there are no city directories that can place a particular name on a specific lot between the late seventeenth century and the late eighteenth century.

B. Block 60 Individual Lot Histories

The following section details the specific histories of the three lots (Lots 5, 6, and 10) along Liberty Street recommended as archaeologically sensitive in the Phase IA study (Abell Horn 2003). Tables for each lot summarizing deed, tax, census, and city directory data are included in Appendix 1. Those individuals or businesses that occupied the lots are shown in boldface type. The lot histories were researched from the time of their

[1] According to the City Register's Grantor/Grantee Index for Block 60 there are no Instruments of Record for the years 1654-1685; 1687-1698; 1701-1706; 1708-1717; 1719-1759; 1761-1763; 1765-1772; and 1774-1783.

initial use and/or development to the approximate years when public water and sewers became available, which marks the end of the period when shaft features (such as wells, cisterns, and privies) are expected to have been in use on the properties, according to LPC. The entire block was supplied with piped Croton water by 1842 (Cohen and Augustyn 1997:119). Sewers were installed under Liberty Street in 1845 and under Greenwich Street in 1853 (Croton Aqueduct Department 1857:121, 123).

Lot 5

Historic Lot 5 was located on the northern side of Liberty Street. The Lot measured 25 feet 3⅞ inches wide and was roughly 100 feet 4 inches deep. From its first development, Lot 5 was known as 113 Liberty Street.

Although Lot 5 was included in various land transactions, and was identified as a city lot by the eighteenth century, available archival records do not indicate names of any tenants or occupants until the early 1800s, when the first residents were noted for the property. In 1807, the first year tax records were filed that specifically listed the Lot 5 address (113 Liberty Street), John Boorman was listed as the occupant. Boorman apparently only stayed on the lot for two years; however, the next known occupant, John Labaugh, lived on Lot 5 from 1810 through 1823 (Assessed Valuation of Real Estate). Labaugh was a stonecutter and a fireman; his household included four additional white males and four white females during the 1810s (NYC Jury Census 1816; Federal Census 1820). After Labaugh vacated the property, it was occupied for three years by a J. Smith, from 1826-1828 (Assessed Valuation of Real Estate).

Through most of the 1820s, the occupants of Lot 5 all had been renters; however, the second long-term occupant of Lot 5 was also its owner. Gurdon Buck acquired Lot 5 in 1820, and by 1829, had moved onto the property (Liber 148, 1820:65; Assessed Valuation of Real Estate). Buck was a merchant who worked on South Street. His business was listed for a time as "Gurdon Buck and Son" (New York City Directories 1830-1841). The Lot 5 property appears to have been used by Buck and his family (the 1820 Federal Census indicated his household contained three additional white males and seven white females) as their residence through 1840 (New York City Directories 1830-1841). The last year Buck was noted on Lot 5, two other merchants were listed in the tax records as living there as well (Assessed Valuation of Real Estate).

By 1841, Buck and his family appear to have vacated Lot 5. A chancery court case, in which Buck was a defendant, seems to have stripped him of his property in 1844, when the title of the lot went to a new owner (Liber 445, 1844:478). From the 1840s onward, the lot seems to have been home to a variety of short-term tenants, generally with at least two households occupying the lot at a time. The last recorded occupants, from 1850, may also have been conducting a mercantile business on the property (Assessed Valuation of Real Estate; New York City Directories 1841-1855).

Lot 6

Historic Lot 6 was located on the northern side of Liberty Street. The Lot measured 25 feet three inches wide and was 100 feet 7 inches deep. From its first development, Lot 6 was known as 115 Liberty Street.

Lot 6 also was lotted by the eighteenth century, and an 1807 deed indicates it had been conveyed to John Peers at an unknown date, although the actual conveyance could not be located (Liber 76, 1807:239). By at least 1792, the property was owned by John Gosman, but it does not appear he lived on the property, and no other tenants could be found in archival records for this period (Survey of Streets 1780-1800, Folder 34).

The first documented resident on Lot 6 was Joshua Horten Megie, a cartman, who was noted at 115 Liberty Street by 1798, and continued to be listed (sometimes as Joshua McGee or Harlan Megie) on the property until 1808 (New York City Directories 1798-1808). Several other people were listed at the address in addition to Megie during this span, although none stayed for more than two years. During the 1810s, the property was home to a series of short-term occupants, again with none staying more than two years (New York City Directories 1810-1820).

In 1821, John Gelston moved onto Lot 6, and stayed there through 1828 (Assessed Valuation of Real Estate). Although his occupation is unknown, it is likely Gelston was a merchant, as his business address was on Broad Street, where a number of other stores and businesses were located during this period (New York City Directories 1821-1829). Gelston used the Lot 6 property as his residence; no other people were listed in the tax records during Gelston's stay on the lot, suggesting that he and his family were the sole occupants (Assessed Valuation of Real Estate).

After John Gelston moved from Lot 6, Joseph Otis occupied the property from 1829-1831 (Assessed Valuation of Real Estate). Like Gelston, Otis may have been a merchant, as his business address was on South Street, another mercantile center at the time (New York City Directories 1829-1831). Otis also used the property as his residence, and no other occupants were noted during his stay (Assessed Valuation of Real Estate).

During the 1830s through the 1850s, Lot 6 was home to a variety of tenants, but only a few of them could be documented in archival records. Based upon the few names that could be located, it appears the lot supported several families at any given time, and by the 1850s, possibly several businesses as well (Assessed Valuation of Real Estate; Federal Census 1850; Doggett 1851). During the entirety of the Lot 6 occupational history, records indicate that the owners of the lot never lived on the property (Assessed Valuation of Real Estate).

Lot 10

Historic Lot 10 was located at the northeast corner of Greenwich and Liberty Streets. The Lot measured 36 feet 8 inches on the south (Liberty Street) and 50 feet on the north;

it was 102 feet 11 inches deep along Greenwich Street. From the 1790s-1820, the Lot was known as 135-139 Greenwich Street, after which it became 147-151 Greenwich Street.

Lot 10 was conveyed in several transactions during the eighteenth century, although it is unclear if any of the owners lived on the property. The lot was divided into two parcels, though: the northern section measured 25 feet north-south and the southern section measured 81 feet north-south. By 1792, a deed from George Lindsay, a stonecutter, to Robert Hunter, a merchant, notes that southern section of the property had a dwelling house located on it, indicating that this end of the lot had been occupied by someone prior to this date, albeit of unknown identity (Liber 48, 1792:12).

Despite purchasing the southern portion of Lot 10 in 1792, the Hunter family did not move onto the lot until about 1799 (New York City Directories 1797-1799). By this time, the lot was divided into three separate addresses: 135, 137, and 139 Greenwich Street. From 1799-1806, the Hunter family (now consisting of George Hunter, John Hunter, and Ruth Hunter, Robert's widow) occupied 135 and 137 Greenwich Street, the southern two addresses, while renters occupied 139 Greenwich Street, which was the northernmost address (New York City Directories 1799-1806). From 1798-1800, Thomas Meeks, listed first as a mason and then as a grocer, was the tenant at 139 Greenwich Street (New York City Directories 1798-1800). From 1805-1813, Thomas Brown, another grocer, and his family rented 139 Greenwich Street. One family member, Mary Brown, was a mantua maker.

The Hunter family vacated the southern two addresses of Lot 10 after 1806 (New York City Directories 1805-1806; Assessed Valuation of Real Estate). From 1807-1812, these houses were occupied by a variety of tenants, with 135 Greenwich Street possibly containing a boarding house (tax records indicate a Widow McKenzie paid the real estate taxes for the address but did not live there, yet a number of unrelated men were living on the property) (Assessed Valuation of Real Estate). From 1808-1812, a single tenant, Gabriel V. Ludlow, a counsellor, occupied the middle address on the lot (New York City Directories 1808-1812; Assessed Valuation of Real Estate).

In 1811, Robert Hunter, Jr. moved back to his family's property on Lot 10. He is listed in 1811, and continuing through 1817, first as the occupant of 135 Greenwich Street (the southernmost address), and then 137 Greenwich Street, the middle address on the lot (Assessed Valuation of Real Estate). In 1812, Robert Hunter's widow Ruth, who since leaving the property had remarried (and then likely was widowed again), moved back onto Lot 10 as well. Through 1824, Ruth Broome was listed as the owner and occupant of 135 Greenwich Street (after 1821 renumbered 147 Greenwich Street), the southernmost of the three addresses on the lot. From 1810-1815, Francis Sennes, a fruiter, was also listed at 135 Greenwich Street (Sennes had actually moved onto the property prior to the return of the Hunters) (New York City Directories 1810-1815; Assessed Valuation of Real Estate).

After 1824, although the Hunters continued to own the southern portion of Lot 10, none of them lived there. Rather, the houses on the lot were rented to a variety of tenants, few of whom could be traced in the archival records for more than a year or two at a stretch. Meanwhile, the northern portion of the lot had been acquired by the Gill family by at least 1817 (although no conveyance could be found to document the transaction), and also continued to be rented out to mostly unknown tenants (Assessed Valuation of Real Estate). In 1835, the Hunters appear to have lost ownership of their holdings on Lot 10, due to debts incurred by the husband of one of the Hunter daughters, and the property was then managed by various agents (Liber 340, 1835:34, 36). In 1845, Theophilus A. Gill acquired the last of the Lot 10 holdings once controlled by the Hunters, so that he now owned the entire lot (Liber 457, 1845:129).

Tenancy for Lot 10 is unclear after the 1820s, when the Hunter family moved from the lot. Few occupants could be found in the archival records, although it appears that the property was in fact occupied, perhaps in part by businesses rather than residents, which might explain part of the difficulty in locating names. The 1850 federal census and the 1851 reverse city directory (Doggett 1851) both indicate that the lot was occupied by a number of residents and businesses, although tracing these names backward in time revealed that most of them only occupied the property for very short terms.

C. Block 85 Early History

Beginning with the European occupation, the project area was farmland and remained so until the 1750s. In the 1620s and 1630s, the Dutch West India Company encouraged the settlement of Manhattan by offering leases and land grants for "bouweries" (R.D. Map 351). Upon the shift from the colonial town's name of New Amsterdam to that of New York, the English Crown, who had purchased the bouwery, renamed it the King's Farm, and then the Queen's Farm upon the ascension of Anne to the throne (Schine 2002). In 1697, the Crown leased the King's Farm to Trinity Church (Stokes 1967, Vol. VI:79-80; Schine 2002:4; R.D. Map 353). In 1705, Queen Anne gave the Queen's Farm to Trinity Church, renaming it the Church Farm. Block 85 lay entirely within the Church Farm (Block Indices of Reindexed Conveyances 1917).

The ten lots on the Vesey Street side of Block 85 within the APE were in the southern part of Trinity Church's Church Farm. Vesey Street, named after the first Rector of Trinity Church, appears first on Maerschalck's Plan of 1754 (Cohen and Augustyn 1997:65). According to Gwynedd Cannan, Archivist at Trinity Church Archives, the earliest leases available (1750) for the blocked and lotted Trinity Church Farm parcels on Vesey Street corroborate the map evidence. These original leases were for up to 21 years in length. In the block to the east across the street from the Vesey Street lots, St. Paul's Chapel was erected in 1764. It makes sense that the residences and work places on Vesey Street would have preceded the building of the chapel and burial ground.

Trinity Church owned the Vesey Street lots on Block 85 from 1705 until at least 1815, and perhaps some lots until 1904. During that time Trinity Church was the lessor of the lots to various people for anywhere from a 10-year to a 99-year lease. The lessees had

several options. They could live and work on their lot(s). In many cases, they could sublet their lot(s). They could also relinquish their lot(s) before the end of the lease (and Trinity Church would then lease the lot(s) to another person). They could lose their lease(s) should they be in arrears for their annual rent due each March 25 (and Trinity Church would again lease the lot(s) to another person). Thus, within any lease there may have been several different surnames identified with the lot(s).

According to the available land records, for the 100 years between 1750 and 1850, the ten lots on Vesey Street within the APE appear to have served as a way for either Trinity Church, artisans and craftsmen, including women (see Lots 13 and 14) as well as gentlemen and merchants to participate as lessors or lessees, rather than as grantors and grantees, in a growing real estate market, as a way to accumulate capital and credit.

HPI is confident that, by and large, the original 1750s and 1760s leaseholders were the occupants of the ten Vesey Street lots within the APE during the period 1750-1766, and in some cases perhaps longer. A house carpenter, a gardener, a silversmith, a "free negro woman," and another woman were among the original leaseholders of the Vesey Street Church Farm lots. Both Blackmar (1989) and Wilentz (1984) discuss the advantages of lot leasing for artisans, craftsmen, and women.

According to the original indentures, these leaseholders maintained their lots during the 1750-1766 time period without having other people as sub-lessees. Of the ten lots involved, all but one lot (Lot 15, see table) was leased to only one leaseholder during the 1750-1766 time period. John Hendrick Gauthor stayed the leaseholder of Lot 15 for two years of his 21-year lease, after which David Brewer had a 17-year lease for Lot 15. So far as can be determined, during the 1750-1766 time period there was a stable occupancy in terms of leaseholders for the Vesey Street lots in the APE.

The conservative date of 1766 is used as the end date for these initial leases, instead of the 1771 or 1775 date (which would represent the full term of the leases), because the records for Trinity Church's Church Farm original leases end in 1766. Other information concerning leases derives from rent rolls, auction sales, and the like, but not from the indentures themselves. During the 1750-1766 time period, all but three leaseholders were identified with their leased lot(s) for more than five years, as shown in the following table.

Lot	Occupant[2]	Occupation	Lease length	Years on the lot[3]
8	Johannes Ackerman		21	7 (1759-1766)
9	David Brewer	house carpenter	21	7 (1759-1766)
10	Jacobus Ver Veelen		21	7 (1759-1766)
11	John Bradburn		21	8 (1758-1766)
12	Jacobus Ver Veelen		21	8 (1758-1766)
13	Catherine Miller	free negro woman	11	5 (1761-1766)
14	Catherine Francis		21	8 (1758-1766
15	John Hendrick Gauthor		21	2 (1760-1762)
15	David Brewer	house carpenter	17	4 (1762-1766)

[2] This information is derived from the extant three volumes of Trinity Church's original leases, 1750-1766.
[3] The conservative end date of 1766 is given because the original leases available end in 1766.

Lot	Occupant[2]	Occupation	Lease length	Years on the lot[3]
16	Godfrey Wall	gardner	21	**16** (1750-1766)
17	Godfrey Wall	gardner	21	**16** (1750-1766)
18	George Young	silversmith	21	**16** (1750-1766)

During the period that Trinity Church owned the Church Farm lots, two rough time periods are evident in which lessees tended to sublease their lots. From 1750 to 1766, and probably to the end of several of the 21-year leases in 1771, lessee-occupants appear to have periodically subleased the lots. Three of these instances are shown in the above table. The second period began in the early 1780s and continued to 1836 and, in some cases, to 1904. In this period the lessees acted as absentee landlords (although technically they were lessees themselves) who subleased the lots they had, in turn, leased from Trinity Church.

In the following individual lot histories, the records at the Trinity Church Archives serve as the primary documents for the first period (1750-1766). City directories, which began in 1786, serve to document the people who lived and worked on the Vesey Street lots on Block 85, all within the WTC APE during the second period (1780-1850).

D. Block 85 Individual Lot Histories

The following section details the specific histories of the ten lots (Lots 8-17) along Vesey Street recommended as archaeologically sensitive in the Phase IA study (Abell Horn 2003). Of note, an eleventh lot (Lot 18) is also included here, as the western portion of it now is included in modern Lot 17. Tables for each lot summarizing deed, tax, census, and city directory data are included in Appendix 1. Those individuals or businesses that occupied the lots are shown in boldface type. The lot histories were researched from the time of their initial use and/or development to the approximate years when public water and sewers became available, which marks the end of the period when shaft features (such as wells, cisterns, and privies) are expected to have been in use on the properties, according to LPC. The entire block was supplied with piped Croton water by 1842 (Cohen and Augustyn 1997:119). Sewers were installed under Vesey Street in 1854 (Croton Aqueduct Department 1857:128).

Lot 8

Historic Lot 8 was located on the southern side of Vesey Street. It was formerly known as Trinity Church Farm Lot 49. The lot measured roughly 25 feet on the north (Vesey Street) and on the south; it was approximately 81 feet 3 inches deep. From 1800 until the mid-1810s, Lot 8 was known as 53 Vesey Street, after which it became 55 Vesey Street.

In 1759 Johannes Ackerman's name appeared on an indenture with a 21-year lease. Ackerman was probably on the lot for no more than 16 years. In 1775 he was no longer there, and between 1775 and 1781, the lot was vacant. Between that time and 1792, there were three sets of lessees for Lot 8. In 1792 Simon Van Antwerp's name appeared on an indenture with a 21-year lease, which, if he were to have remained the lessee, he would have been on the Trinity Church Rent Roll until 1813. This was not the case. Between

1792 and 1805, three different men were lessees of Lot 8, and in 1805 L. Lispenard was given a 99-year lease. These multiple leases for the same lot suggest that there were a series of absentee landlords. None of these people appeared to have been occupying the lot.

After Johannes Ackerman's initial lease of Lot 8, the property seems to have been vacant for periods during the 1780s and 1790s, despite the notation of lessees, and then a series of short-term tenants appear to have occupied the property during the late eighteenth century. These included George Sutton, a broker, in 1794; Thomas Greswold, a distiller, in 1795-1796; and Amelia Holden, who had a boarding house, in 1800 (New York City Directories 1794-1801). After the turn of the nineteenth century, other short-term tenants included John Dover in 1808; Benjamin and Henry Stagg in 1809; and Jothan Smith, Samuel Gruman, and Thomas Jones in 1810. Jothan Smith stayed on the lot until 1812; the others were only documented for one year (Assessed Valuation of Real Estate).

Beginning in 1812, the first occupant to remain more than two years appeared on the property. Andrew Raymond, an attorney, leased the lot from Trinity Church in this year, and maintained a household on the property (which included another white male and two white females) through 1817 (Liber 313, 1812:395; Assessed Valuation of Real Estate; NYC Jury Census 1816; Elliot 1812). After Raymond's departure, William Dodge, a coal merchant, lived on the lot for three years, from 1818-1820 (Assessed Valuation of Real Estate; New York City Directories 1818-1820). Dodge's household included nine white males, five white females, and one female slave (Federal Census 1820).

In 1823, the firm of John Connor and Jacob Van Winkle, auctioneers, began occupying Lot 8 (Assessed Valuation of Real Estate). Connor and Van Winkle had received a lease of the property from Trinity Church in 1812, but may have assigned this lease to Raymond instead. Neither Connor nor Van Winkle lived on Lot 8 (as opposed to Raymond and Dodge, who did), but rather ran part of their auctioneering business on the property. The two men are listed variously as having their business at this address from 1823-1834, but also appear to have maintained another business addresses at 63 Vesey Street, four doors to the west, near the corner of Greenwich Street.

In 1834, Connor and Van Winkle assigned their lease of Lot 8 to John Morrison, who in turn assigned it to Leonard Gordon, a cordials distiller (Liber 313, 1834:395; Liber 313, 1834:397). From 1834 through 1855 (the last year that was researched for this property), Lot 8 was occupied by Leonard Gordon, and later Philip Gordon, who were listed variously as distillers, cordials distillers, and manufacturers of cordials and syrups (lemon and raspberry syrups, specifically) (New York City Directories 1834-1855). Neither of the Gordons lived on the property, but rather appear to have used the lot strictly for business.

Lot 9

Historic Lot 9 was located on the southern side of Vesey Street. It was formerly known as Trinity Church Farm Lot 48. The lot measured roughly 24 feet 8 inches on the north

(Vesey Street) and on the south; it was approximately 81 feet 5 inches deep. From its first development until the mid-1810s, Lot 9 was known as 51 Vesey Street, after which it became 53 Vesey Street.

In 1759 house carpenter David Brewer's name appeared on an indenture with a 21-year lease. Brewer was probably on the lot for no more than 16 years. In 1775 he was no longer there, and between 1775 and 1781, the lot was vacant. Meanwhile, in 1773 Thomas Lincoln appears to have received a 63-year lease from Trinity Church for Lots 8-12 (the expiration date is noted in the records, although the original lease is not). It is unclear how long Lincoln actually kept this lease. By 1787, there were two new lessees for Lot 9. One, Cornelius Ray, had probably bought the lease at auction, with the intention to lease it to others, paying rent to Trinity Church while receiving rent from another lessee, William McKenny.

It becomes confusing when, in 1792, in the City Register conveyances, Gabriel Verplanck Ludlow, a Gentleman (and Trinity Church Vestryman [1771-1784]) was the grantor to Cornelius Ray, the grantee, for a conveyance of "two certain Lots of Ground", that is, Lots 9 and 10 on Block 85 (Liber 47, 1792:459). Yet Trinity Church records indicate that the church continued to lease the lot, first in 1796 with a ten-year lease, then again in 1810 with a 99-year lease. The 1796 lessee, John Griswold, had a ten-year lease for all the lots facing Vesey Street in the APE (Lots 8 through 17). The 99-year lessees, Lispenard and Stewart, had 99-year leases for Lots 9 through 12.

Land conveyances for 1833 in the City Register list the executors of Cornelius Ray as the grantor to the grantee, John C. Morrison. Again, Trinity Church continued to lease the lot, at least until 1836 when Thomas Lincoln's lease expired. Lincoln's leases expired in 1836 for Lots 8 through 12. These multiple leases for the same lot suggest that there were a series of absentee landlords. None of the lessees could be confirmed as occupying the lot.

After David Brewer's initial lease of Lot 9, the property seems to have been vacant for periods during the 1780s and 1790s (one leaseholder, William McKenny, may have briefly lived on the property in 1787, although this could not be confirmed). The first known occupants of Lot 9 appeared in 1795. These were John Hallam, a saddler, and John Haswell, a carman, both of whom appear to have only stayed on the lot for that year (New York City Directories 1795). From 1796-1798, Mrs. Eleanor Ray (perhaps a relative of leaseholder Cornelius Ray) was listed as the occupant of the property (New York City Directories 1796-1798). In the final few years of the eighteenth century, the occupancy of the lot is unclear.

In 1800, however, the first slightly longer-term resident moved onto Lot 9. This was Samuel Moore, who appears to have run a boarding house on the lot through 1806. A number of other residents were listed in the 1800 Federal Census, including Isaac Johnson and James Moncriesse, both ship carpenters (New York City Directories 1800). After Moore's tenancy, Benjamin Gilmore, a merchant, was noted on the property for 1807 and 1808 (Assessed Valuation of Real Estate).

In 1809, Joseph Burjeau moved onto Lot 9, and stayed until 1820 (Assessed Valuation of Real Estate; Federal Census 1810, 1820; NYC Jury Census 1816; New York City Directories 1809-1820). At least for a time, Burjeau was listed as a member of the military. His household included another white male and two white females in 1810, and a third white female by 1816. During his occupation of Lot 9, there were usually two other households sharing the property, although none (except William Shaw, from 1820-1824) stayed for more than two or three years at a stretch (Assessed Valuation of Real Estate; New York City Directories 1809-1820; Federal Census 1820).

Once Joseph Burjeau moved from Lot 9 in 1820, occupancy of the property becomes less clear. Through 1830, a series of tenants continued to live on the lot, although again none stayed for more than a few years. During the 1830s and 1840s, no occupants could be located for the lot. It is possible that during this time the property shifted from being strictly a residence to the location of businesses, which are more difficult to trace in archival records. By 1850, the lot was home to Charles Lalin, who in that year is listed as having a boarding house and in 1851 was noted as running a porter house (New York City Directories 1850; Doggett 1851). Henry Ludwig briefly operated a printing business on the lot as well (Doggett 1851). Of note, during the entire history of Lot 9, Charles Lalin was the only confirmed occupant who also was a leaseholder or owner. All the other occupants on the property were renters.

Lot 10

Historic Lot 10 was located on the southern side of Vesey Street. It was formerly known as Trinity Church Farm Lot 47. The lot measured roughly 25 feet 2 inches on the north (Vesey Street) and on the south; it was approximately 81 feet 4 inches deep. From the 1790s until the mid-1810s, Lot 10 was known as 49 Vesey Street, after which it became 51 Vesey Street.

In 1759 house carpenter Jacobus Ver Veelen's name appeared on an indenture with a 21-year lease. The previous year he had also leased Lot 12 for 21 years. Ver Veelen was probably on the Lot 10 for no more than 16 years. In 1775 he was no longer there, and between 1775 and 1781, the lot was vacant. Several years earlier, though (in 1773) Thomas Lincoln appears to have received a 63-year lease from Trinity Church for Lots 8-12 (the expiration date is noted in the records, although the original lease is not). It is unclear how long Lincoln actually kept this lease. In 1782 W. Wighton was on Lot 10 without a lease. As was the case for Lot 9, by 1787, there were two lessees for Lot 10. Similar to Lot 9, Cornelius Ray had probably bought the lease at auction, with the intention to lease it to others, paying rent to Trinity Church while receiving rent from another lessee, William McKenny, who was given a 30-year lease.

Like Lot 9, Lot 10 was included in the 1792 conveyance of Gabriel Verplanck Ludlow to Cornelius Ray (Liber 47, 1792:459). Again, though, Trinity Church records indicate that the church continued to lease the lot(s), first in 1796 with a ten-year lease (John Griswold, as above), then again in 1810 with the 99-year lease to Lispenard and Stewart.

Trinity Church continued to lease the lot, at least until 1836 when Thomas Lincoln's lease expired. These multiple leases for the same lot suggest that there were a series of absentee landlords. None of the lessees could be confirmed as occupying the lot.

After Jacobus Verveelen's initial lease of Lot 10, the property seems to have been vacant for periods during the 1780s and 1790s (one leaseholder, William McKenny, may have briefly lived on the property in 1787, although this could not be confirmed). By 1799, city directories indicate one or two year long occupants for Lot 10, including merchant Isaac Riley, Isaac Jones, Isaac and Catharine Cox, and several women from the Beekman family (New York City Directories 1799-1800). The Widow Nicholson was listed as an occupant in 1807 (Assessed Valuation of Real Estate).

From 1808-1810, Peter and Robert Ludlow occupied the property. The 1810 Federal Census indicated this household included eight white males, three white females, and one slave. Henry King, a merchant, occupied the property from 1812-1817; his household included two white males, six white females, and two female slaves (Assessed Valuation of Real Estate; NYC Jury Census 1816; New York City Directories 1812-1817).

Following Henry King, the property was occupied for short periods by Henry Lott (1818-1819), Sarah Gunn (who had a boarding house in 1820), M. Deposway (1821-1822), Michael and P. Dykers (1824-1827), Mrs. Crygier (1830), and Lewis Forman (1830-1831) (Assessed Valuation of Real Estate; Federal Census 1820; New York City Directories 1818-1831).

In 1833, the Executors of Cornelius Ray, the original leaseholder of the property, conveyed Lot 10 to druggist John C. Morrison (Liber 298, 1833:155). Morrison in turn conveyed this land to William Post, a business partner (Liber 312, 1834:374). In 1840, Post turned over the lot to trustees for several of the former firm's children, including William Post, Jr., Christian Morrison, and Sarah Morrison (Liber 407, 1840:530). By 1837, however, Christian Morrison, who now worked in his father's drug business, had begun to live on Lot 10. Christian Morrison kept his residence on Lot 10 through 1851 (Assessed Valuation of Real Estate; New York City Directories 1837-1850; Doggett 1851). In 1850, his household included himself (then 40 years old) his wife, three children, and three unrelated females (Federal Census 1850). No residents could be traced for Lot 10 after Christian Morrison's departure in 1851.

Lot 11

Historic Lot 11 was located on the southern side of Vesey Street. It was formerly known as Trinity Church Farm Lot 46. The lot measured roughly 24 feet 11 inches on the north (Vesey Street) and on the south; it was approximately 81 feet 3½ inches deep. From the 1790s until the mid-1810s, Lot 11 was known as 47 Vesey Street, after which it became 49 Vesey Street.

In 1758 house carpenter John Bradburn's name appeared on an indenture with a 21-year lease. Bradburn was probably on the lot for no more than 17 years. In 1775 he was no

longer there, and between 1775 and 1781, the lot was vacant. In 1773 Thomas Lincoln appears to have received a 63-year lease from Trinity Church for Lots 8-12 (the expiration date is noted in the records, although the original lease is not). It is unclear how long Lincoln actually kept this lease. In 1782 W. Wighton was on Lot 11 as well as on Lots 10 and 9, without a lease for any of the lots.

In 1787, John Sullivan seems to have bought a lease at auction, with the intention to lease it to others, paying rent to Trinity Church while receiving rent from another lessee, Richard Westervelt, who was given a 21-year lease by Trinity Church in 1788. The notation "46R" in the 1787 A.L. Bleecker auction listings suggests that there may have been a front and a rear lot division not only for Lot 11, but also for four other Church Farm lots that fronted on the south side of Vesey Street (Church Farm Lots 46-45, 42-40; Block 85's Lots 11-12, 15-17). The 1796 lessee of Lot 11, John Griswold, had a ten-year lease for all the lots facing Vesey Street in the APE (Lots 8 through17).

Westervelt's 21-year lease for Lot 11 expired in 1809, and in 1810 Trinity Church gave a 99-year lease to Lispenard and Stewart, who had 99-year leases for Lots 9 through 12. Meanwhile, Thomas Lincoln's lease from Trinity Church for same Lot 11 expired in 1836. It is unclear whether the overlapping leases, at least between 1810 and 1836, were for the entire lot or for front and rear portions of Lot 11. These multiple leases for the same lot suggest that there were a series of absentee landlords.

Following John Bradburn's initial lease, Lot 11 was likely vacant for periods during the 1770s through the 1790s. None of the later leaseholders from these decades could be confirmed as living on the property, although it is possible that there was some short-term occupation by some of them.

The next known residents on Lot 11 were Silas and George Talbot, who were recorded on the property from 1800-1813 (New York City Directories 1800-1813; Assessed Valuation of Real Estate; Elliot 1812; Federal Census 1800, 1810). Silas, who lived on the lot from 1800-1801, was the Captain of the *U.S.S. Constitution*. His household included two white males, two white females, one free black, and one slave (Federal Census 1800). George Talbot, recorded as the head of the household from 1802-1813, was a merchant; his household included four white males, three white females, and two free blacks (Federal Census 1810).

After the Talbots left the property in 1813, Lot 11 was occupied by Isabella Steele, the widow of Robert Steele, from 1815-1822 (New York City Directories 1815-1822; Assessed Valuation of Real Estate; Federal Census 1820; NYC Jury Census 1816). Mrs. Steele headed a household consisting primarily of women and girls (in 1816 there were seven white females and one female slave; in 1820 there was one white male and seven white females [five of them were under 16]).

John P. Schermerhorn, a merchant, was the next occupant of Lot 11, residing on the property from 1823-1826 (Assessed Valuation of Real Estate; New York City Directories 1823-1826). After a one-year occupation by Henry Inman in 1827 (who as will be seen,

lived consecutively at a number of different addresses within the APE in the late 1820s), the property's longest-term occupant moved onto the lot. Frederick Pentz, the President of the Mechanics Association Bank, and his family are documented on Lot 11 from 1830-1851. In 1830, the year he first lived on the property, Pentz's household consisted of four white males, two white females, and one free black female (Federal Census 1830). Pentz could not be located in the 1840 Federal Census, but in 1850, his household included himself, 50, his wife (whose name and age are illegible), his sons Frederick Pentz, Jr., 23, a merchant; John Pentz, 35, who worked in a store; and Elizabeth Pentz, 70, presumably his mother. Frederick Pentz appears to have vacated Lot 11 after 1851, when he no longer could be traced in the archival records.

Lot 12

Historic Lot 12 was located on the southern side of Vesey Street. It was formerly known as Trinity Church Farm Lot 45. The lot measured 25 feet on the north (Vesey Street) and on the south; it was approximately 81 feet 5 inches deep. From the 1790s until the mid-1810s, Lot 12 was known as 45 Vesey Street, after which it became 47 Vesey Street.

In 1758 Jacobus Ver Veelen's name appeared on an indenture with a 21-year lease. Ver Veelen was probably on Lot 12 for no more than 17 years. (He also had a 21-year lease for Lot 10, beginning in 1759.) In 1775 he was no longer on Lot 12. Between 1775 and 1781, the lot was vacant. Meanwhile, in 1773 Thomas Lincoln appears to have received a 63-year lease from Trinity Church for Lots 8-12 (the expiration date is noted in the records, although the original lease is not). It is unclear how long Lincoln actually kept this lease. In 1782 W. Wighton was on Lot 12 as well as on Lots 11 through 9, without a lease for any of the lots. He paid rent to Trinity Church for the four lots and probably leased to others at least one lot.

In 1787, John Sullivan appears to have bought a lease at auction, with the intention to lease it to others, paying rent to Trinity Church while receiving rent from another lessee, Isaac Halsey, who was given a 21-year lease by Trinity Church in 1788. Again, the notation "45R" in the 1787 A.L. Bleecker auction listings suggests that there may have been a front and a rear lot division for this lot.

According to City Register documents, in 1792 John Sullivan, a merchant, and his wife, Mary, were grantors of "certain Lotts of Ground", that is, Lots 11 and 12 to John Holdron, Gentleman (Liber 49, 1792:343-344). Nonetheless, Trinity Church continued to be the lessor not only to individuals, but also to Grace Church, endowing the fledgling church with Lot 12 (as well as Lots 14 and 17), thereby allowing Grace Church to receive the annual rent from the lot. In 1796, John Griswold obtained a ten-year lease for all the lots facing Vesey Street in the APE (Lots 8 through 17).

According to further land conveyance records at the City Register, John Holdron, who was the grantee to Lot 12 in 1792, became the grantor in 1811, even though Trinity Church had given Lispenard and Stewart a 99-year lease for this lot in 1810. Not only that, Thomas Lincoln's lease for the same Lot 12 did not expire until 1836, after which

Trinity Church does not appear in the conveyance records for Lot 12. It is unclear whether the overlapping leases, at least between 1810 and 1836, were for the entire lot or for front and rear portions of Lot 12. In any case, the multiple leases for the same lot suggest that there were a series of absentee landlords.

After Jacobus Verveelen's initial lease, Lot 12 may have been vacant for periods during the 1770s through the 1790s. None of the later leaseholders from these decades could be confirmed as living on the property, although it is probable that there was some short-term occupation by some of them.

In 1798, however, Alexander Hosack, a merchant, and his family began a long, well documented tenancy on Lot 12, which ended in 1824. Hosack was already past 60 years old when he moved onto Lot 12; his household seems to have been small (consisting of himself, at times another white male, one to three white females [depending on the year], and a slave) (Federal Census 1800, 1810, 1820; NYC Jury Census 1816). For two disparate years (1798 and 1812) William Hosack, an attorney, was also listed on the property, suggesting that for short periods at least one other member of Hosack's family stayed with him (Assessed Valuation of Real Estate; Elliot 1812; New York City Directories 1798-1822). For five years of the Hosack family residency on the lot (1817-1822), Dr. Jacob Dyckman was also listed on the property (Assessed Valuation of Real Estate). Hosack seems to have died in 1821; his family continued to live on the lot through 1824 (Assessed Valuation of Real Estate).

After the Hosack family vacated Lot 12, the property supported a series of short-term occupants, none of whom stayed for more than two or three years. Generally, these people tended both to live and work on the property. These people included Henry Inman and Thomas Cummings, portrait painters (1825-1827); William W. Scrughams (1830-1831); and John Fenniman (or Fineman) and Caesar Vanderbilt, grocers (ca. 1845-1847) (Assessed Valuation of Real Estate; Federal Census 1830; New York City Directories 1825-1847). In 1851, the last year occupants could be found for the lot, a variety of different people were documented on the property, including a wine dealer, a grocer, and a shovel maker (Doggett 1851).

Lot 13

Historic Lot 13 was located on the southern side of Vesey Street. It was formerly known as Trinity Church Farm Lot 44. The lot measured roughly 24 feet 10½ inches on the north (Vesey Street) and on the south; it was approximately 81 feet 7 inches deep. From the 1790s until the mid-1810s, Lot 13 was known as 43 Vesey Street, after which it became 45 Vesey Street.

In 1761 Catherine Miller's name appeared on an indenture with an 11-year lease. She was listed as a "free negro woman." Miller was probably on this lot until 1772. In 1773 Thomas Lincoln received a 63-year lease from Trinity Church. A five-year lease was granted to George Hass in 1787, the same year that Andrew Morris bought a lease from Trinity Church at auction. The Church continued to grant seemingly overlapping 21-year

and 10-year lessees for Lot 13 in 1788 and 1796. John Griswold's 10-year leases were for Lots 8 though 17 on Block 85, which suggests that he was paying Trinity Church annually while collecting rent from some subleases on the lots. These multiple leases for the same lot suggest that there were a series of absentee landlords.

Like other lots with the Vesey Street APE, tenancy for Lot 13 is not well documented after the initial lease by Catherine Miller in the 1760s. Several leaseholders were documented during the 1780s, but it is unclear whether they actually occupied the property. None of these people could be traced in early city directories or other archival records for the period.

In the 1790s, Lot 13 housed a series of short-term occupants, including Stephen Cooper (1792), James Hepburn, a mason (1795), and Pierre Depeyster, a shipmaster (1798-1800) (Survey of Streets 1780-1800, Folders 20 and 21; New York City Directories 1791-1800).

The lot's longest-term resident first appears in the archival documents in ca. 1805. Philip Grim, a merchant, used Lot 13 as for his residence from about this year through 1820; after he died his family continued to occupy the lot through 1830 (Assessed Valuation of Real Estate; Federal Census 1810, 1820; New York City Directories 1805-1830). The Grim household at times included from five to nine white males, four to five white females, and [in 1810 and 1816] two free blacks (Federal Census 1810, 1820; NYC Jury Census 1816).

After the Grim family left Lot 13, various short-term tenants occupied the property during the 1830s. In 1840, Joseph T. Bell (who had a military store on Fulton Street) moved onto the property, and stayed there until 1849 (Assessed Valuation of Real Estate; New York City Directories 1840-1849). Following Bell's departure, however, tenancy is less clear. In 1851, Thomas H. Beale appears to have operated a cabinet shop on the property, and in 1855, the lot housed Henry Ludwig's printing establishment, which in previous years had been located on Lot 9 (Doggett 1851; New York City Directories 1854-1855).

Lot 14

Historic Lot 14 was located on the southern side of Vesey Street. It was formerly known as Trinity Church Farm Lot 43. The lot measured 25 feet on the north (Vesey Street) and on the south; it was approximately 81 feet 7 inches deep. From the 1790s until the mid-1810s, Lot 14 was known as 39 or 41 Vesey Street, after which it became 43 Vesey Street.

In 1758 Catherine Francis's name appeared on an indenture with a 21-year lease. Miller was probably on this lot until 1775 when the lot was listed as vacant. The lot remained vacant into 1781. In 1782 a five-year lease was granted to George Hass (he would lease Lot 13 in 1787), two years before Henry Sharp leased Lot 14 from Trinity Church at auction. The Church continued to grant seemingly overlapping leases for Lot 14 in 1786.

In 1787 Andrew Morris, and maybe Henry Sharp, leased Lot 14 from Trinity Church at auction, or perhaps they actually bought the lot because in 1792 Andrew Morris, a tallow chandler, and Eleanor, his wife, appear as grantors in City Register records of the lot to David Pierson, a house carpenter. Nonetheless, between 1794 and 1805, Trinity Church continued to lease the lot to two separate individuals and also endow the lot to Grace Church. John Griswold's ten-year lease (1796) was for Lots 8 though 17.

In 1798 house carpenter Daniel Pierson, and his wife, Hester, were the grantors of Lot 14 to John Bard, Jr., insurance broker. The City Register conveyance detailed what was to be devised, "...Together with all the houses outhouses kitchens stores storehouses cellars vaults wells cisterns buildings improvements ways profits easements commodities conveniences advantages hereditaments and appurtenances...." (Liber 56, 1798:22)

Even though Lot 14 had been conveyed through City Register documents to Andrew Morris (no later than 1792), then to David Pierson (1792), and after that to John Bard, Jr. (1798), Trinity Church continued be a lessor of Lot 14. The church's Vestry provided a 99-year lease in 1805 to William Paulding, who also had a 99-year lease in 1805 for the contiguous Lot 15. Another lease was granted by the Vestry in 1815 (to Obadiah Holmes), with the expiration of another lease in 1834 (Nicholas Slakor). At some point around 1820, Lot 14 was devised to Philip Grim, which was then devised to Almet Reed in 1847, at which time Paulding's 99-year lease may have continued to be in effect. These multiple leases for the same lot suggest that there were a series of absentee landlords.

Early occupation of Lot 14 is unclear after Catherine Francis' initial lease. Several leaseholders were documented during the 1780s, but it is unknown whether they actually occupied the property. None of these people could be traced in early city directories or other archival records for the period.

In the 1790s, David Pierson, a house carpenter, was documented on the property from ca. 1792-1794 (Survey of Streets 1780-1800, Folders 20 and 21; New York City Directories 1792-1794). From 1796-1801, the property was occupied by John Bard, an insurance broker (New York City Directories 1796-1801; Federal Census 1800).

During the first decades of the nineteenth century, the lot continued to be occupied by a series of short-term tenants including Dr. William Barrow (1807-1809), John Keese and Rosa Keese (1810), John Blagge (1812-1813), and a number of additional people who stayed only one year each, through 1819 (Assessed Valuation of Real Estate; New York City Directories 1807-1819; Federal Census 1810; NYC Jury Census 1816). In the early 1820s, Abraham Bussing was documented on the property, from 1820-1824 (New York City Directories 1820-1824). His household included eight white males, seven white females, two free black males, and one free black female (Federal Census 1820). Occupants of the property in during the remainder of the 1820s are unknown. In 1830, Henry Inman had a one-year tenancy on the property (Federal Census 1830; New York City Directories 1830).

Unlike many other lots within the Vesey Street APE, Lot 14 had its two longer term residents in the later part of its history. The first was Dr. Grayson, who occupied the property from 1831-1845 (Assessed Valuation of Real Estate). Later, John Boyd, a liquor store proprietor, lived and worked on the lot, from 1847 through at least 1855, the final year researched for this lot (Assessed Valuation of Real Estate; Doggett 1851; New York City Directories 1831-1855).

Lot 15

Historic Lot 15 was located on the southern side of Vesey Street. It was formerly known as Trinity Church Farm Lot 42. The lot measured roughly 32 feet 2 inches on the north (Vesey Street) and on the south; it was approximately 81 feet 9 inches deep. From the 1790s until the mid-1810s, Lot 15 was known as 37 Vesey Street, after which it became 41 Vesey Street.

In 1760 John Hendrick Gauthor was the lessee of Lot 15. In 1762 house carpenter David Brewer's name appeared on an indenture with a 17-year lease for the same lot. (Beginning in 1759, he also had a 21-year lease for Lot 2). During the time period 1750-1766, this is the only instance within the APE in which an original lease was terminated for one reason or another, and a subsequent leaseholder had his own indenture.

Brewer was probably on this lot until 1775, when the lot was listed as vacant. The lot remained vacant in 1781. In 1782 a 19-year lease was granted to John Besonet. Four years later James Carter had a 21-year lease for the same lot. Some time between 1786 and 1794 James Westervelt was the lessee. In succession, they either defaulted on their annual rent or else returned the lease to Trinity Church.

Meanwhile, at auction in 1787, Hubert Van Wagenen, a Gentleman, purchased a lease for "42R" (Lot 15) at A.L. Bleeker's auction. The notation may indicate that the lease was for the rear part of Lot 15 (Church Farm Lot 42). Together with Lots 16 and 17, Van Wagenen first leased the "R" sections of the lots in 1787, and then, in 1794, was granted a 21-year lease for Lots 15 through 17 while he was a Vestryman (1787-1806). This 21-year lease was filed at the City Register, one of the few eighteenth-century leases within the APE to be filed there.

Trinity Church granted further leases for Lot 15 (as many as three) between 1794 and 1805, when the Vestry granted William Paulding a 99-year lease for both Lots 15 and 14. One of the other leases was to John Griswold, who, in 1796, had a ten-year lease for all the lots in the Vesey Street APE. There was also an endowment to New Town Church. These multiple leases for the same lot suggest that there were a series of absentee landlords.

Although during the initial years of Lot 15's history, it was leased by Trinity Church for residential use, and several leaseholders have been identified, at least by the 1790s the lot use had changed. In 1792, records indicate Lot 15, along with adjacent Lots 16 and 17,

contained a "manufactory," although the kind of product the business was making is unknown (Survey of Streets 1780-1800, Folders 20 and 21). No specific individuals or businesses could be confirmed as occupying the lot during this period.

By 1803, however, the lot became part of the holdings of the New York Bread Company, which was represented by individuals David Grim, Samuel Mansfield, and Walter Bowne (Liber 63, 1803:398). The following year, when these three men sold Lot 15 to John Hyslop, a baker, a map that accompanied the conveyance indicated that the lot supported a street-fronting structure noted as a store house belonging to the New York Bread Company, and a rear stable (Liber 108, 1804:13).

It is likely that from 1804, the year Hyslop acquired the lot, through 1845, Lot 15 contained both a bakery and residential quarters. Archival records list a series of bakers living on the lot during this period. They include William Cammyer (1815-1816), William Farrow (1817-1818), John McKenzie (1818-1822), John Bruce (1823-1824), John Limberger (1825-1839), and Henry and Frederick Sparks (1840-1845) (Assessed Valuation of Real Estate; New York City Directories 1815-1845; Federal Census 1820, 1830; NYC Jury Census 1816). Of these men, McKenzie and Limberger were also owners or leaseholders of the lot (Liber 159, 1822:285; Liber 187, 1825:439). Between 1804 and 1815, the tenancy on the lot is less clear (William Sandford, a merchant, was living and working on the lot from 1810-1812 but other residents or businesses could not be located) (Assessed Valuation of Real Estate; Federal Census 1810; New York City Directories 1810-1812). In addition to the bakery and bakers' families on Lot 15, records indicate other non-bakers periodically shared space on the property as well (NYC Jury Census 1816; New York City Directories 1804-1815).

The bakery seems to have been converted into a grocery store after about 1845, when Peter Lynch, a grocer, acquired the property. Lynch's grocery and home were both listed on the property through 1855, the last year that was researched for this lot (New York City Directories 1845-1855; Doggett 1851; Assessed Valuation of Real Estate).

Lot 16

Historic Lot 16 was located on the southern side of Vesey Street. It was formerly known as Trinity Church Farm Lot 41. The lot measured approximately 25 feet on the north (Vesey Street) and on the south; it was 81 feet 10 inches on the west, and 88 feet 9 inches on the east. From 1790 until the mid-1810s, Lot 16 was known as 35 Vesey Street, after which it became 39 Vesey Street.

In 1750 "gardner" Godfrey Wall's name appeared on an indenture with a 21-year lease. (In the same year he also had a 21-year lease for Lot 17.) Wall probably remained on Lots 16 and 17 until the lease expired in 1771. In 1771 Trinity Church leased Nicholas Slakor both Lots 16 and 17 for a term of 63 years; thus, the expiration of his lease was 1834.

Yet, Trinity Church granted two other leases between 1771 and 1787 when, at auction in 1787, Hubert Van Wagenen, a Gentleman, purchased a lease for "41R" (Lot 16, or the rear of Church Farm Lot 41). Van Wagenen first leased the "R" sections of Lots 15, 16, and 17 in 1787, and then, in 1794, was granted a 21-year lease for Lots 15 through 17 while he was a Vestryman (1787-1806). This 21-year lease was filed at the City Register, one of the few eighteenth-century leases to be filed there.

Trinity Church granted a further lease for Lot 16 between 1794 and 1805, at which time the Vestry granted Lem Wells a 99-year lease for both Lots 16 and 17. In 1796 John Griswold was the lessee of Lots 8 through 17 (all the Vesey Street lots in the APE) for a period of ten years.

Meanwhile, in 1803, filed in the City Register, William Pultney, as grantor, conveyed Lots 15 and 16 to the grantees, David Grim, Samuel Mansefield, and Walter Bowne. Except for Lem Wells's 99-year lease in 1805 and Nicholas Slakor's 63-year lease's expiration in 1834 (both noted in the Trinity Church records only), the remaining nineteenth-century conveyances for Lot 16 were grantor/grantee rather than lessor/lessee. These multiple leases for the same lots suggest that there were a series of absentee landlords.

Lot 16 was also leased by Trinity Church for residential use during its early history, and several leaseholders have been identified, but like neighboring Lots 15 and 17, this lot changed use at least by the 1790s. As described above, 1792 records indicate Lots 15, 16 and 17 contained a "manufactory," although the kind of product the business was making is unknown (Survey of Streets 1780-1800, Folders 20 and 21). One resident, Daniel Campbell, a laborer, was identified as living on the lot for 1790 only (New York City Directories 1790). No other individuals or businesses could be confirmed as occupying the lot during this period.

By 1803, the lot was also part of the holdings of the New York Bread Company (Liber 63, 1803:398). The 1804 conveyance for Lot 15 (described above) indicated that Lot 16 also contained an adjoining street-fronting store house belonging to the New York Bread Company (Liber 108, 1804:13). The company relinquished this lot in 1805 (Liber 69, 1805:117).

Use of the lot is less well known following the New York Bread Company's tenure, although it appears at least part of the lot was used for housing. A variety of residents were identified on the property for the next twenty years, although none stayed for more than two years at a stretch (Assessed Valuation of Real Estate; New York City Directories 1805-1823; Federal Census 1810, 1820; NYC Jury Census 1816).

From 1824-1835, however, the lot supported a boarding house, run by Jennet McDonald (New York City Directories 1824-1835; Federal Census 1830). After McDonald left the lot, tenancy is again unclear until 1843, when Samuel Conlan, a grocer, moved onto the property. Conlan lived and worked on the property until 1847 (New York City Directories 1843-1847). Once Conlan left the property, several short-term tenants lived

on the property, including a grocer and several bakers (New York City Directories 1848-1855; Doggett 1851).

Lot 17

Historic Lot 17 was located on the southern side of Vesey Street. It was formerly known as Trinity Church Farm Lots 39 and 40. The Lot measured roughly 42 feet 9 inches on the north (Vesey Street) and on the south; it was approximately 88 feet 6 inches deep. From the 1790s until the mid-1810s, Lot 17 was known as 31-33 Vesey Street, after which it became 35-37 Vesey Street.

In 1750 "gardner" Godfrey Wall's name appeared on an indenture with a 21-year lease. (That year he also had a 21-year lease for Lot 16.) Wall probably remained on Lots 16 and 17 (West and East) until the lease expired in 1771. In 1771 Trinity Church leased Nicholas Slakor both Lots 16 and 17 for a term of 63 years; thus, the expiration of his lease was 1834. Church records note that, in 1834, the Slakor lease had expired.

On the west side of Lot 17 (Church Farm Lot 40), Trinity Church granted another 21-year lease in 1786 to Samuel Holloway. At auction in 1787, Hubert Van Wagenen, a Gentleman, purchased a lease for "40R" (Lot 17, or the rear of Church Farm Lot 40). Van Wagenen first leased the "R" sections of Lots 15, 16, and 17 in 1787, and then, in 1794, was granted a 21-year lease for Lots 15 through 17 while he was a Vestryman (1787-1806). This 21-year lease was filed at the City Register, one of the few eighteenth-century leases to be filed there. In 1796 Trinity Church granted a further lease of ten years for Lot 17 (west side), leasing to John Griswold (he leased all the lots in the Vesey Street APE).

On the east side of Lot 17 (Church Farm Lot 39) Trinity Church granted another lease to Philip Linzie in 1782. In 1786 Trinity Church leased Lot 17 East to John V. Blarcum for 21 years. At A. L. Bleeker's auction in 1787, James Quackenbush purchased the lease for Lot 17 East. In 1794, the church made two leases for Lot 17 East, one to John Torbune; the other to John Vanderhoof. It may be that these two leases were for front and rear parts of the lot. In 1796 Trinity Church granted a further lease of ten years for Lot 17 East, leasing to John Griswold (he leased all the lots in the Vesey Street APE).

During the nineteenth century, Lot 17 was both leased to Lem Wells for 99 years and endowed Grace Church in 1805. Nicholas Slakor's 63-year lease, made in 1773, expired in 1834.

The initial use of Lot 17 was for residential leases by Trinity Church, and several leaseholders have been identified. However, as with neighboring Lots 15 and 17, this lot changed use at least by the 1790s. As described above, 1792 records indicate Lots 15, 16 and the west half of 17 contained a "manufactory," although the kind of product the business was making is unknown (Survey of Streets 1780-1800, Folders 20 and 21). One resident, Richard Moore, a cooper, was identified on the east half of Lot 17 from 1793-

1800 (Survey of Streets 1780-1800, Folders 20 and 21; New York City Directories 1793-1800).

By 1803, this lot was also part of the holdings of the New York Bread Company (Liber 63, 1803:401). The 1804 conveyance for Lot 15 (described above) indicated that Lot 17 also contained an adjoining street-fronting store house belonging to the New York Bread Company on its western half, and a bakery on its eastern half (Liber 108, 1804:13). In 1805, the company conveyed this lot to Frederick Depeyster (Liber 69, 105: 117).

Following the acquisition of the property by Depeyster, the lot appears to have contained a store or store house on its eastern half through 1832. The store/store house was attributed to Frederick Depeyster (1805-1808), Thomas Satterthwaite (1809-1813), and James Farquhar (1816-1832). It is unknown the types of wares being sold or stored under the Depeyster and Satterthwaite tenure on the property, but James Farquhar was consistently listed as a wine merchant (New York City Directories 1816-1832). The western half of the lot was occupied by a series of residents through about 1830, although none appeared to stay for more than two years at a stretch (New York City Directories 1810-1836; Assessed Valuation of Real Estate; Federal Census 1810, 1820, 1830; NYC Jury Census 1816).

For a period during the 1830s, tenancy on both halves of the lot is unknown, but from 1837-1848, merchant Nathaniel Paulding was recorded on the eastern half of the lot, and from 1843-1853, grocer Patrick Hogan was documented on the western half of the lot (New York City Directories 1837-1853).

Lot 18

Modern Lot 17 now includes the western portion of historic Lot 18, which was located at the southwestern corner of Vesey and Church Streets (the lots were combined when Church Street was widened in the twentieth century). Like Lot 17, historic Lot 18 formerly contained two halves, which had different occupational histories. The following chronology concentrates primarily on the west side of historic Lot 18, which was part of Trinity Church Farm Lot 38. From the 1790s until the mid-1810s, the western portion of Lot 18 was known as 29 Vesey Street, after which it became 31 Vesey Street.

In 1750 silversmith George Young's name appeared on an indenture with a 21-year lease. Young probably remained on Lot 18 until the lease expired in 1771. In 1771 Trinity Church leased Nicholas Slakor Lot 18 in addition to Lots 16 and 17 for a term of 63 years; thus, the expiration of his lease was 1834.

In 1787, A. L Bleeker's auction sold a lease for this lot, but it was noted as "sold not accounted for." The following year, Trinity Church leased Samuel Holmes Lot 18 for 21 years. By 1794, Trinity Church records note that Rob Perin had a lease for an indeterminate number of years, but in 1796 Trinity Church granted a lease of ten years for Lot 18 to John Griswold (he leased all the lots in the Vesey Street APE). In 1805, Lot 18 was endowed to Grace Church, and in 1834 Nicholas Slakor's 63-year lease expired.

Following the initial leases made by Trinity Church for this lot, a series of residents occupied the western half of Lot 18, often with several families living on the lot at any given time. After an occupation by tailor John Halliday, and later his widow Catharine, from 1795-1800, archival records indicate no residents remained on the property for more than two years in a row.

E. Summary of Archival Results

The archival research pertaining to the three historic lots on Liberty Street (former Block 60), and eleven historic lots on Vesey Street (former Block 85), outlined above, has revealed a series of occupants on each of the properties. Those occupants who were documented on the lots for two years or more are summarized in the tables, below. Where occupancy could be documented for five or more years before the introduction of piped Croton water in 1842, the data are shown in boldface type. The five-year occupancy before the introduction of public utilities is a threshold that has been established by LPC in order to evaluate potential significance of archaeological resources. The tables also indicate professions of occupants, when known, and whether the use of the lot consisted of a residence, a business, or both. If the use of the lot was unclear (particularly for early occupants), a residence was assumed.

Block 60

Lot	Years of occupation	Occupants	Residence/Business
5	**1810-1823**	**John Labaugh, stonecutter and fireman**	**Residence**
5	**1829-1840**	**Gurdon Buck, merchant**	**Residence**
6	**1798-1808**	**Joshua/Harlan Megie, cartman**	**Residence**
6	**1821-1828**	**John Gelston, merchant?**	**Residence**
6	1829-1831	Joseph Otis, merchant?	Residence
10	**1799-1806**	**Robert Hunter family**	**Residence**
10	**1810-1815**	**Francis Sennes, fruiter**	**Residence**
10	**1812-1824**	**Robert Hunter family**	**Residence**
10	1798-1800	Thomas Meeks, mason and grocer	Residence
10	**1805-1813**	**Thomas Brown, grocer**	**Residence**
10	1808-1812	Gabriel V. Ludlow, counsellor	Residence

Block 85

Lot	Years of occupation	Occupants	Residence/Business
8	**1759-1766**	**Johannes Ackerman**	**Residence**
8	**1812-1817**	**Andrew Raymond, attorney**	**Residence**
8	1818-1820	William Dodge, coal merchant	Residence
8	**1823-1834**	**Connor and Van Winkle auction house**	**Business**
8	**1834-1855+**	**Leonard and Philip Gordon distillery/manufactory**	**Business**
9	**1759-1766**	**David Brewer, house carpenter**	**Residence**
9	1796-1798	Mrs. Eleanor Ray	Residence
9	**1800-1806**	**Samuel Moore, boarding house**	**Residence and Business**

Lot	Years of occupation	Occupants	Residence/Business
9	**1809-1820**	**Joseph Burjeau, military**	**Residence**
9	1820-1824	William Shaw	Residence
10	**1759-1766**	**Jacobus Ver Veelen**	**Residence**
10	1808-1810	Peter and Robert Ludlow	Residence
10	**1812-1817**	**Henry King, merchant**	**Residence**
10	1824-1827	Michael and P. Dykers, doctor	Residence
10	**1837-1851**	**Christian Morrison, druggist**	**Residence**
11	**1758-1766**	**John Bradburn**	**Residence**
11	**1800-1813**	**Silas Talbot, ship captain** **George Talbot, merchant**	**Residence**
11	**1815-1822**	**Mrs. Steele, widow**	**Residence**
11	1823-1826	John P. Schermerhorn, merchant	Residence
11	**1830-1851**	**Frederick Pentz, bank president**	**Residence**
12	**1758-1766**	**Jacobus Ver Veelen**	**Residence**
12	**1798-1824**	**Alexander Hosack, merchant**	**Residence**
12	**1817-1822**	**Dr. Dyckman, doctor**	**Residence**
12	ca. 1845-1847	John Fenniman/Fineman, Caesar Vanderbilt, grocers	Business
13	**1761-1766**	**Catherine Miller, free negro woman**	**Residence**
13	1798-1800	Pierre Depeyster, shipmaster	Residence
13	**1805-1830**	**Philip Grim, merchant**	**Residence**
13	1840-1849	Joseph Bell, military store	Residence
14	**1758-1766**	**Catherine Francis**	**Residence**
14	1792-1794	David Pierson, house carpenter	Residence
14	**1796-1801**	**John Bard, broker**	**Residence**
14	1807-1809	William Barrow, doctor	Residence
14	1820-1824	Abraham Bussing	Residence
14	**1831-1845**	**William Grayson, doctor**	**Residence**
14	1847-1855+	John Boyd, liquors	Residence and Business
15	1760-1762	John Hendrick Gauthor	Residence
15	1762-1766	David Brewer, house carpenter	Residence
15	by 1792	Manufactory	Business
15	**by 1804-1845**	**Bakery**	**Business**
15	**1815-1845**	**A series of bakers reside on the lot**	**Residence**
15	ca. 1845-1855+	Peter Lynch, grocer	Residence and Business
16	**1750-1766**	**Godfrey Wall, gardener**	**Residence and Business(?)**
16	by 1792	Manufactory	Business
16	by 1804	Storehouses	Business
16	**1824-1835**	**Jennet McDonald, boarding house**	**Residence and Business**
16	1843-1847	Samuel Conlan, fruiter and grocer	Residence and Business
17	**1750-1766**	**Godfrey Wall, gardener**	**Residence and Business(?)**
17	**1793-1800**	**Richard Moore, cooper**	**Residence**
17	by 1804	Bakery and storehouses	Business
17	**through 1832**	**Store or storehouse continues**	**Business**
17	**1837-1848**	**Nathaniel Paulding, merchant**	**Business**
17	1843-1853	Patrick Hogan, grocer	Residence and Business
18	**1750-1766**	**George Young, silversmith**	**Residence and Business(?)**
18	**1795-1800**	**John Halliday, tailor** **Catharine Holhaday, widow**	**Residence**

F. Potential for Archaeological Resource Survival within Historic Lots

Residential Resources

In order to understand the behavior of past peoples, archaeologists rely on locating undisturbed resources that can be associated with a specific group or individual during a particular time period. Evaluating the significance of archaeological resources hinges on two factors: the integrity of the potential features, and if associations with individuals and/or groups can be documented. It is possible that the archaeological examination of these resources can reveal information pertinent to many issues that do not exist in the documentary record. Because of the somewhat elusive nature of these resources and the fact that only a limited number are likely to have survived subsequent development, it is vital that the remaining sites where potential resources may be present are studied. Therefore, the recovery of intact resources in an urban setting is very likely to yield new information pertaining to land use, settlement patters, socioeconomic status/class patterns, ethnic patter (potentially), trade and commerce patterns and consumer choice issues.

Archaeologists have found that former residential sites are often sensitive for shaft features, such as privies, wells, and cisterns. In addition, yard scatter and artifact concentrations associated with the domestic population might also yield meaningful data. In New York City and other urban locales, complete or truncated shaft features have yielded rich archaeological deposits. In some cases, subsequent construction episodes have aided the preservation process by covering over the lower sections of these deep features and sealing them below structures and fill layers.

Archaeological research conducted in New York City and other urban locales indicates that the positioning of privies, as well as other shaft features, within a residential lot had become somewhat standardized by the nineteenth century. For those lots containing only one building, privies were located at the extreme back of the lot, farthest from the residence, either in the corner or center of the lot (Cantwell and DiZerega Wall 2001:246-247). In lower income neighborhoods (typically in tenement style housing), where these lots often had two residences per lot, the privy would have been located somewhere between both residences. Some privies were intentionally excavated and the "nightsoil" removed in order to extend the period of viable usage (Roberts and Barrett 1984:108-115). In some cases, wells and cisterns no longer needed for water were used as privies or cesspools. For example, Jean Howson's research found that following the introduction of an effective water system in Manhattan, wells and rainwater cisterns were reused as privies (1994: 141-142). Cisterns were often located closer to the residence and in some cases were directly against the building itself.

Potential Depths of Shaft Features

The depth of shaft features has always been one of the reasons these resources survive subsequent development. Typically, the domestic yard feature that extends to the greatest depth is the drinking water well. The depth of a well is often contingent upon on the

depth of the water table, the type of excavation method employed, and the construction materials used. In urban locations, where potable water was at a premium, wells often extend to great depths (Garrow1999:8; Glumac et al. 1998).

Cisterns, built to hold captured rainwater, were not constructed to the same depths as wells. These features are much more common on nineteenth century urban sites than wells (Garrow 1999:12). In some cases, cisterns used by the residents of large buildings have extended to depths greater than 10 feet (e.g., Ericsson Place Site and the Long Island College Hospital Site).

Privies, like cisterns, were not typically built to extend to great depths. In urban areas, however, many have been constructed to depths greater than 10 feet. In his review of several nineteenth century privies excavated in Alexandria, Stephen Judd Shepard found several extended to depths between 10 and 26 feet deep (1987:171). In his discussion of privy "architecture" M. Jay Stottman found that in one neighborhood in urban Louisville the privies examined by archaeologists extended to depths between 11 and 22 feet below the surface (2000:50). In New York City, truncated privy shafts survived subsequent development in many locations (e.g., Sullivan Street, Five Points).

Comparative Sites

Five Points

Archaeological studies conducted in Manhattan and the outer boroughs have found that residentially related shaft features have survived behind, beneath, and adjacent to subsequent construction. One of the most important archaeological studies took place in the Five Points neighborhood. The discovery of numerous shaft features and archaeological deposits in lower Manhattan has contributed extensively to the collective understanding of one of the poorest and least documented communities in nineteenth century New York. Numerous professional papers (including a session at the 29th Annual Meeting of the Society for Historical Archaeology, Cincinnati 1996) as well as an entire issue of *Historical Archaeology* have been devoted to the archaeological discoveries made within these fourteen lots studied in lower Manhattan. Archaeologists found that the interconnectedness and subsequent development of the area actually enabled the preservation of these important archaeological sites. According to Rebecca Yamin "the Courthouse Block yielded 50 backyard features, all of which had been subsequently enclosed within later tenement walls" (2001a:2). Yamin further wrote:

> *a complex of features on Lot 6...illustrates the intensification of spatial use over time and the degradation of living conditions. Wood-lined privies...apparently served the early residents of the block. They were located well behind a house that would have faced Pearl Street...A more substantial stone-lined privy, Feature B, was constructed further back on the lot, possibly at the same time a cistern, Feature Z, was put in.*

This tenement population was served by a sewage system that virtually filled the backyard...All of these features had been filled by 1875. A William Clinton is assessed for the property in that year, its value having increased from $10,500 to $15,000, probably as a reflection of a second tenement that had been built at the back of the lot, into and over the edge of the cesspool. (2001b:10-11).

The archaeological investigations at Block 160 demonstrated that truncated features with significant archaeological deposits can be found on lots which were subsequently developed. The resulting studies conducted on the material recovered have made a significant contribution to the understanding of the history of a working class neighborhood in nineteenth century New York City.

Sullivan Street

The results of excavations within 6 lots on Sullivan Street in Greenwich Village also indicate that many nineteenth century shaft features have survived the subsequent intense development of Manhattan. Salwen and Yamin found that:

Although the nineteenth century backyard surfaces were destroyed by construction of Sullivan Street, truncated features were found on all but one of the lots. All were packed with artifactual material (1990).

During the subsurface investigations, archaeologists found a total of five privies, three cisterns, one well, and two "other" features. Each of these significant features was found in the location where Sullivan Street had cut though the former backyard. Research conducted on the site by Jean Howson also found that although there was a City policy in place that encouraged residents to connect their dwellings into the public sewer system, many continued to utilize their privies for a decade or more after the public sewer was installed (Howson 1994:142-143).

Ericsson Place

Excavations conducted by Historical Perspectives, Inc. at the Ericsson Place Site found several undocumented features in the back yards of nineteenth century residential lots.

Excavation revealed several walls and foundations-some were expected, but a few, in the rear lots of the residences along Beach Street, were undocumented. The presence of two nineteenth century cisterns indicate that backyard features relating to the adjacent residences were indeed present as predicted. The most productive area of the site had two features (the foundations of an at-grade twentieth century outbuilding and a nineteenth century cistern) and two concentrations of historic artifacts.

The large double brick cistern found in the rear lot of 126 Hudson Street was most likely introduced to the site before the late 1850s.... The cistern

may not have been in use for long and was probably filled in a single dumping episode.

Lower East Side

Excavations in two lots in the Lower East Side unexpectedly encountered a cistern and a series of drainage system features in the location of the former rear yards. The features were discovered under what had been a tailor's shop. Subsequent demolition activity had buried and sealed the features beneath three to five feet of twentieth century debris. A rectangular stone foundation wall that enclosed and post-dated the cistern was also discovered. The find "provided a unique vertically stratified record of early to mid-nineteenth century history within the Lower East side. The features dated from 1840-1867, indicating that water was not connected to residences in this area until after the Civil War "at least a decade after the documentary record has previously suggested" (Grossman 1995:2). Excavations also found a late nineteenth to early twentieth century privy feature and a mid to late nineteenth century pit feature. According to the project archaeologist, the pre-Croton Reservoir water control cistern structure was found to be totally intact and undisturbed by the subsequent 150 years of later nineteenth and twentieth century building and demolition activities at the site. No mixed late nineteenth or twentieth century materials were encountered in association with it, and no later building activities had intruded into, or disturbed, the feature in any way (Grossman 1995).

Hoyt-Schermerhorn Site

During recent archaeological excavations at the Hoyt-Schermerhorn site in Brooklyn, New York, archaeologists discovered a large privy and a small cistern (Historical Perspectives 2002).

Feature 4 (located along the back lot line)

A truncated stone-lined privy was discovered near the northeast corner of Trench B. During the mechanical removal of the fill in this location the backhoe encountered a pile of flagstones. When the area was cleared, the truncated feature was discovered at a depth of 121 cmbs.... A large domestic artifact assemblage was recovered from Feature 4. The examination of the assemblage indicates that it dates to the 1860s.

The majority of the artifacts recovered indicate that the privy was likely filled during the late 1860s. This would coincide with the introduction of public utilities (sometime prior to 1869), the demolition of the small house, and the construction of the larger tenement. (Historical Perspectives 2002:19-20)

Feature 5

Approximately 7.2 meters from the northeast corner of Trench B, excavators encountered the western 1/2 of a truncated brick cistern approximately 41 cmbs. The trench was expanded slightly to expose the entire feature.

The cistern was irregularly shaped because it had been constructed in the narrow space between the foundation of the former building on the adjacent property (Lot 54) and the property line. The body of the cistern was two bricks thick at the surface and it measured 3.4 feet (101 cm) wide (e-w) and 5.4 feet (165 cm) long (n-s).... The traditional placement of outbuildings and shaft features is usually to the rear of the house. Because of the space constrictions on urban lots, many property owners found creative ways of utilizing any space available. The cistern found in Trench B is an example of the builder's ingenuity and use of all available space... This suggests that the builder might have wanted to place this feature close to the kitchen, or just some distance away from the privy. The fact that a cistern was present, along with the many bottles of spring water, clearly indicates that the site occupants were concerned about the quality of water available to them (Historical Perspectives 2002:33-35).

As expected the privy was located at the rear of the lot, but unexpectedly, the cistern was found in a former alleyway. Although the alley was extremely narrow, measuring less than about five feet in width, prior occupants of the site utilized this space to create a shaft feature.

Long Island College Hospital Site

Three large cisterns were discovered during the excavation of several back lots at the Long Island College Hospital site in Brooklyn. The cisterns examined extended to depths greater than 10 feet below the ground surface. Two of the cisterns contained discrete deposits of late nineteenth century artifacts indicating that the interiors were filled after the introduction of public water (Historical Perspectives 1995).

In all of these cases, the assemblages found in primary and secondary fill deposits enabled archaeologists to determine complex site deposition histories. Although only a few archaeological sites were briefly mentioned in this review, additional examples of the excavation of these deeply buried resources are on file at the LPC and SHPO.

IV. CONCLUSIONS

Archival research concentrating on the specific histories of the potentially significant lots on Block 60 (Lots 5, 6, and 10) and Block 85 (Lots 8-17 and a portion of former Lot 18) has revealed a series of occupants on each lot.

- Block 60: although historic maps indicate that there were structures along the north side of Liberty (then Crown) Street at least by the 1730s (Lyne-Bradford 1731), the identity of these occupants could not be confirmed using available archival records. Extensive research found that the first occupants on Block 60 whose identities could be documented dated to the 1790s.
- Block 85: the earliest identified occupants dated to the 1750s and were associated with initial leases of the Trinity Church Farm lots, which later were renumbered and converted into city-regulated lots.

The research concentrated on the period up to about 1851 for lots on Liberty Street, and up to about 1855 for lots on Greenwich Street and Vesey Street. Public water was available on all three blocks by 1842; sewers were laid under Liberty Street in 1845, under Greenwich Street in 1853, and under Vesey Street in 1854.

The documentary record revealed that all of the lots had two or more occupancies spanning at least five years (and in most cases, many more years) before the introduction of the first public utilities in 1842. Furthermore, several of the lots on Vesey Street also had five-year plus occupancies that extended beyond 1842.

There are several patterns that become evident when comparing the occupants who stayed on the lots more than five years. The earliest occupants within the APE were on the Trinity Church Farm lots along Vesey Street. Archival research has revealed that all of the lots within the APE were occupied by leaseholders during the period from 1750-1766 (and possibly longer, into the mid-1770s), and on all but one of the lots, these occupancies lasted more than five years. The early leaseholders of the Church Farm lots were predominantly semi-skilled workers (often in the construction trades) and artisans, for whom home and work locations usually existed in separate places (Blackmar 1989; Rothschild 1990). Of the early leaseholders on Vesey Street whose occupations are listed, one was a house carpenter (he held two non-contiguous lots), one was a gardener (with two contiguous lots) and one was a silversmith. The house carpenter probably could not work from home, although the gardener with two lots may have used part of his leased property as a garden, and the silversmith may have had a home workshop. For the remainder of the early Church Farm leaseholders whose occupations are unknown, a residence, rather than a business use, is assumed.

From the mid-1770s through the early 1790s, no occupants could be identified on any of the lots within the APE. That is not to say that these lots were collectively untenanted during these years, but due to the imprecision of the archival records available for these decades (the few city directories that were published did not attach house numbers to residents in this neighborhood and the sporadic tax records that survive also do not

specify lot or house numbers, as they did in the nineteenth century), it was impossible to determine who these people might have been. Although a number of Church Farm leases exist for this period (as well as some deeds for Block 60), it seems many of the people whose names appeared on these documents acted as absentee landlords, and rented their properties out to unknown tenants.

The next set of multiple year occupants that could be confirmed for lots within the APE appeared in the mid-1790s, and often stayed through the 1810s. Residents during this period tended to hold a mix of professions. The earlier occupants (who frequently left before 1805) often worked in the maritime and construction trades, or the service industry. Professions included a cartman, a mason, a ship captain, a ship master, a house carpenter, a cooper, and a tailor. However, several merchants and other professionals (including an insurance broker and a physician) are present in this sample as well (they tended to stay in the APE past 1805); a trend that would continue into the nineteenth century. With the exception of a boarding house, which can be construed as both a residence and a business, all of the people documented for this period appeared to use the lots for their residences, and worked elsewhere.

Portions of the Vesey Street APE were also becoming associated with manufacturing and commerce at an early date. A manufactory (of unknown function) was present on Lots 15, 16, and 17 by 1792, and a bakery and associated store house were located on these same lots by 1804. Both the bakery and store house continued to be present on portions of these lots through the 1840s.

During the 1810s, most of the artisans and service people had left the APE (although there were still a few), to be replaced with merchants, grocers, and other professionals. Still, with the exception of the bakery and store house on Lots 15 and 17 during this period, the lots appeared to be used nearly exclusively as residences, and not businesses.

In the 1820s and 1830s, the residents of the lots within the APE tended to be merchants and other well-paid professionals, who worked at locations outside their homes. However, the switch of some lots to business-related ventures increased during this period; included in the sample are an auction house and later a distillery on Block 85, Lot 8, as well as the continuing use of Block 85, Lots 15 and 17 for a bakery and store house. Between these two lots, on Block 85, Lot 16, was a boarding house.

By the 1840s, two trends become evident for the APE. The first was the shift towards mixed residence and business use of the lots within the APE, or in some cases the change to strictly business use. The second was the rapid turnover of both residents and businesses on many of the lots, which made tracing occupation difficult, using available archival records during this period.

The three lots on Liberty Street and the ten lots (including a portion of an eleventh lot) on Vesey Street included in this study appear to possess potential archaeological significance. Each of the lots was occupied by a household or business for an extended period of time (ranging from 5 years to 26 years for single occupants, and from 27 years

to 38 years for the bakery, the series of bakers, and the store house occupied by different people on the same lots, before the introduction of piped water in 1842) spanning the 1750s through the 1850s. The lots were used for both residences, businesses, and a combination of residences and businesses, where the proprietor lived and worked at the same location.

Archaeological resources associated with occupations on these thirteen historic lots have the potential to answer a variety of research questions pertaining to use and occupation of home lots by different types of individuals and businesses in lower Manhattan during the second half of the eighteenth and first half of the nineteenth century.

Some research questions that could be addressed using potential archaeological resources from these lots include:

- Analysis and comparison of households from early leaseholders on Trinity Church Farm lots, spanning the 1750s-1770s. As Blackmar (1989) and Rothschild (1990) have shown, this was a geographically and occupationally distinct group, which has never been documented in the archaeological record. However, other archaeological sites dating to the Colonial era have been excavated in lower Manhattan (generally below Wall Street) and would afford ample comparative data (Cantwell and DiZerega Wall 2001).
- Analysis and comparison of households spanning the 1790s-1810s, when the neighborhood contained a mix of socioeconomic groups, including households headed by workers in the maritime and construction trades, the service industry, as well as some merchants and other professionals. The lots were occupied primarily as residences during this period.
- Analysis and comparison of households spanning the 1820s-1830s, when the socioeconomic makeup of the lots changed to include mostly merchants and well-paid professionals. Again, the lots continued to be occupied primarily as residences during these decades.
- Analysis and comparison of archaeological assemblages associated with mixed use of the lots for both residences and businesses, dating to the 1840s and early 1850s.
- Commercial and manufacturing use of certain lots, including the manufactory, bakery, storehouse, auction house, and distillery on Vesey Street.
- Overall research issues examining patterns of ethnicity, gender, social status, occupation, household makeup, and consumer choice on different lots and from different time periods. This particular neighborhood (the former West Ward, or the area north of Wall Street and west of Broadway) is severely underrepresented in the archaeological record; recovery of household and/or business related assemblages would afford the opportunity to investigate a portion of lower Manhattan that to date has been largely understudied.

Finally, comparative site research regarding the potential of archaeological resources to survive within home lots despite later construction and demolition episodes has revealed that on a number of urban archaeological sites, including those in New York City and

other East Coast locations, truncated shaft features containing sealed archaeological deposits have been recovered at significant depths below the current and/or historic ground surface. Frequently, later construction has capped these truncated features, in effect sealing them from later disturbance rather than causing it. Thus, on Blocks 60 and 85, where later nineteenth century basements were excavated over the original home lots, there is still a good likelihood that the bottom portions of these shaft features could be found beneath the later basement floors. As described in the Phase IA study, the depth of the nineteenth century basements on these lots extended 10 feet below grade or less, while the historic water table is believed to have been about 15-25 feet below grade, depending on location, leaving between 5-15 feet of space under the former basements that could contain truncated shaft features (Abell Horn 2003).

V. RECOMMENDATIONS

Based upon the conclusions presented above, the following recommendations are offered. The Phase IA study concluded that a total of three historic home lots on Liberty Street and ten historic home lots on Vesey Street should be subjected to archaeological field testing. The present Topic Intensive Archaeological Study has documented that all of these eleven lots supported a series of occupations lasting five or more years prior to the introduction of public utilities, and therefore appear to retain archaeological sensitivity. These eleven lots are recommended for archaeological field testing.

All archaeological field testing should be conducted according to applicable archaeological standards (New York Archaeological Council 1994; LPC 2002), and in consultation with the SHPO and the LPC. RPA-certified professional archaeologists, with an understanding of and experience in urban archaeological excavation techniques, would be required to be part of the archaeological team.

REFERENCES

Abell Horn, Julie
2003 *Phase IA Archaeological Assessment, World Trade Center Memorial and Redevelopment Project, Block 58, Lot 1, Bounded by Church, Vesey, Liberty, and West Streets, New York, New York.* Prepared by Historical Perspectives, Inc., Westport, Connecticut for AKRF, Inc., New York, New York.

Assessed Valuation of Real Estate
1807-1855 On microfilm at the New York City Municipal Archives.

Blackmar, Elizabeth
1989 *Manhattan for Rent, 1785-1850.* Cornell University Press, Ithaca and London.

Cannan, Gwynedd, Archivist, Trinity Church Archives
2004 Personal communication with Nancy Dickinson of HPI. March 2, 2004.

Cantwell, Anne-Marie and Diana diZerega Wall
2001 *Unearthing Gotham: The Archaeology of New York City.* Yale University Press, New Haven.

City Environmental Quality Review (CEQR)
2001 *City Environmental Quality Review Technical Manual.* City of New York, Mayor's Office of Environmental Coordination. October, 2001.

City of New York, Borough of Manhattan, Department of Finance, City Register (City Register)
n.d. *Block Indices of Reindexed Conveyances, pre 1917.*

1686 *Liber 13*, page 202.

1699 *Liber 23*, pages 125-128.

1707 *Liber 26*, pages 204-205.

1759 *Liber 35*, pages 293-295.

1787 *Liber 46*, pages 451-453.

1787 *Liber 50*, pages 5-6.

1792 *Liber 47*, pages 401-402.

1792 *Liber 47*, pages 457-460.

1792 *Liber 48*, page 12.

1792 *Liber 49*, pages 343-344.

1792 *Liber 53*, page 76-77.

1794 *Liber 50*, pages 323-325.

1798 *Liber 56*, page 21-22.

1803 *Liber 63*, page 398.

1803 *Liber 63*, page 401.

1804 *Liber 108*, page 13.

1805 *Liber 69*, page 117.

1807 *Liber 76*, page 239.

1812 *Liber 313*, page 395.

1812 *Liber 313*, page 397.

1820 *Liber 148*, page 65.

1822 *Liber 159*, page 285.

1825 *Liber 187*, page 439.

1833 *Liber 298*, page 155.

1834 *Liber 312*, page 374.

1834 *Liber 313*, page 395.

1834 *Liber 313*, page 397.

1835 *Liber 340*, page 34.

1835 *Liber 340*, page 36.

1840 *Liber 407*, page 530.

1916 Tract Report 935, Jan Jansen Damen, 1662. Available at Municipal Archives.

1917 Tract Report 934, Thomas Lloyd, 1694? Available at Municipal Archives.

1917 Tract Report 941, Peter Mesier, June 1, 1784. Available at Municipal Archives.

City of New York, Reindexing Department, Map Division
1917 Reindexing Map, R.D. 353, Plates 1 and 3. Available at Municipal Archives.

Cohen, Paul E. and Robert T. Augustyn
1997 *Manhattan in Maps: 1527-1995.* Rizzoli International Publications, Inc., New York.

Croton Aqueduct Department
1857 *Annual Report of the Croton Aqueduct Department.* New York.

Doggett, John Jr.
1851 *Doggett's New York City Street Directory for 1851.* John Doggett, Jr., New York.

Elliot, William
1812 *Elliot's Improved New-York Double Directory.* William Elliot, New-York.

Garrow, Patrick
1999 The Excavation and Interpretation of Large Historic Features. Paper presented at the 1999 Meeting of the Society for Historical Archaeology, Salt Lake City, Utah.

Glumac, Petar, Julie Abell, Brian Crane, Daniel Hayes and Marie-Lorraine Pipes
1998 *Square 455 (51NW115) Archaeological Data Recovery.* Prepared for EDAW, Inc., Alexandria, VA by Parsons Engineering Science, Inc., Fairfax, VA.

Grossman, Joel W.
1995 *The Archaeology of Civil War Era Water Control Systems on the Lower East Side of Manhattan, New York.* Prepared for the New York City Housing Authority.

Historic Conservation and Interpretation, Inc.
1983 *Westside Highway Cultural Resource: Survey Archaeological Work Program: Cultural Resources Research.* For: New York State Department of Transportation.

Historical Perspectives, Inc.,
1995 *Results of Phase 1B Fieldwork* Long Island College Hospital Site, Brooklyn, New York.

1997 *Results of Phase 1B Fieldwork, Ericsson Place, Manhattan.*

2002 *Stage 1B Field Investigation, Blocks 70, 171, and 176, Hoyt-Schermerhorn, Brooklyn, New York.* NYSOPRHP# 01PR2180.

Howson, Jean
1994 "The Archaeology of 19th century Health and Hygiene at the Sullivan Street Site in New York City." In *Northeast Historical Archaeology* Vol. 21-22. Nan Rothschild and Diana diZerega Wall editors. Pp. 137-160.

Landmarks Preservation Commission (LPC)
1982 *Towards an Archaeological Predictive Model for Manhattan: A Pilot Study.*

2002 *Landmarks Preservation Commission Guidelines for Archaeological Work in New York City.*

Lyne, James
1731 *A Plan of the City of New York From an Actual Survey.* (Lyne-Bradford Plan). William Bradford, New York. (Source: Cohen and Augustyn).

Maerschalck, Francis
1755 *A Plan of the City of New York from an actual Survey Anno Domini-M,DCC,IV.* Gerardus Duyckinck, New York. (Source: Cohen and Augustyn).

Miller, John
1695 *New Yorke.* John Miller, New York. (Source: Cohen and Augustyn).

New York Archaeological Council (NYAC)
1994 *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections.* New York Archaeological Council.

New York City Directories [microform]
1790-1855 Various city directories available at the New York Public Library on microfiche, including *The New York Directory*; *Longworth's New York Directory*, *Doggett's New York City Directory,* and *Rode's New York City Directory.*

New York City Jury Census
1816 On microfilm at the Municipal Archives.

Roberts, Daniel and David Barrett
1984 "Nightsoil Disposal Practices of the Nineteenth century and the Origin of Artifacts in Plowzone Provenience." *Historical Archaeology* Vol. 18, No. 1, pp. 108-115.

Rothschild, Nan A.
1990 *New York City Neighborhoods: The 18th Century.* Academic Press, San Diego.

Salwen, Bert and Rebecca Yamin
1990 *The Archaeology and History of Six Nineteenth Century Lots: Sullivan Street, Greenwich Village, New York City.* Prepared for New York University Law School. With contributions by Deborah Crichton, Joseph Diamond, and Stephanie Rippel.

Sanborn Map Company
1951 *Insurance Maps of the City of New York: Borough of Manhattan.*

2001 *Insurance Maps of the City of New York: Borough of Manhattan.*

Schine, Cathleen
2002 That Was New York: The "Holy Ground." *The New Yorker*, September 16. Posted online on September 9, 2002.

Shepard, Stephen Judd
1987 "Status Variation in antebellum Alexandria: An Archaeological Study of Ceramic Tableware." In *Consumer Choice in Historical Archaeology*. Suzanne Spencer-Wood ed., Plenum Press, New York. pp 163-198.

Stokes, I. N. Phelps
1967 *The Iconography of Manhattan Island, 1498-1909.* Volumes I-VI. Originally published 1915-1928. Republished by Arno Press, New York.

Stottman, M. Jay
2000 "Out of Sight, Out of Mind: Privy Architecture and the Perception of Sanitation." In *Historical Archaeology* Vol. 34, No. 1.pp 39-61.

Surveys of Streets
1792 Manuscript Collection (1780-1800), on file at the New-York Historical Society, Folders 20, 21, and 34.

Trinity Church Archives (reviewed)

1700-1800s	Register of Lots with New Numbers.
1750-1766	Original Leases, pages 1-315 [all that are available].
1769-1835	Register of Lots.
1767-1794	Rent Roll.
1775	Observation on Church Grounds.
1781	Observation on Church Grounds.
1782	Trinity Church Rent Roll.
1784-1826	Sale of Lots.
1794	Register of Lots.
to 1805	Register of Lots (5).
to 1815	Register of Lots (5).
1834-1836	Expiration of Leases – Church Farm.
n.d.	Rents of Church Ground.

n.d. Block 85, Division 1, Block 1 map [includes present tax lot number].

United States Federal Census for New York City
1790 On microfilm and available electronically at the New York Public Library.

1800 On microfilm and available electronically at the New York Public Library.

1810 On microfilm and available electronically at the New York Public Library.

1820 On microfilm and available electronically at the New York Public Library.

1830 On microfilm and available electronically at the New York Public Library.

1840 On microfilm and available electronically at the New York Public Library.

1850 On microfilm and available electronically at the New York Public Library.

Wilentz, Sean
1984 *Chants Democratic: New York City & the Rise of the American Working Class, 1788-1850.* Oxford University Press, New York and Oxford.

Yamin, Rebecca
2001a "Becoming New York: The Five Points Neighborhood." In *Historical Archaeology* Volume 35, No. 3. Rebecca Yamin, ed. Pp.1-5.

2001b "From Tanning to Tea: The Evolution of a Neighborhood." In *Historical Archaeology* Volume 35, No. 3. Rebecca Yamin. ed. Pp.6-15.

Yamin, Rebecca, Session Chair
1996 Tales of Five Points: Working Class Life in Nineteenth Century New York. Session 7 at the 29th Annual Meeting of the Society for Historical Archaeology, Cincinnati.

FIGURES

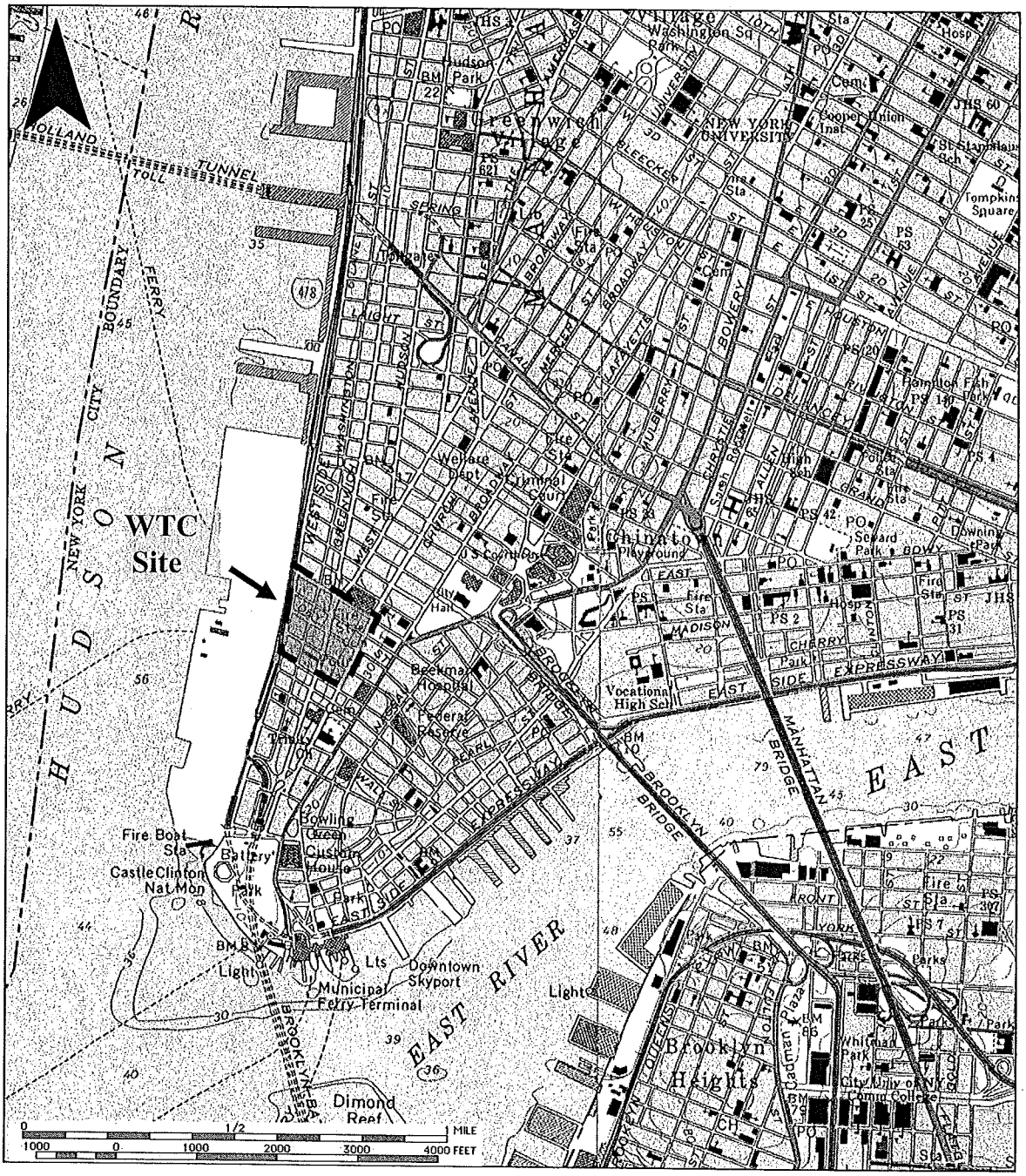


FIGURE 1

USGS Jersey City, NJ and Brooklyn, NY Quadrangles, 1976 and 1995.

World Trade Center Project Site.

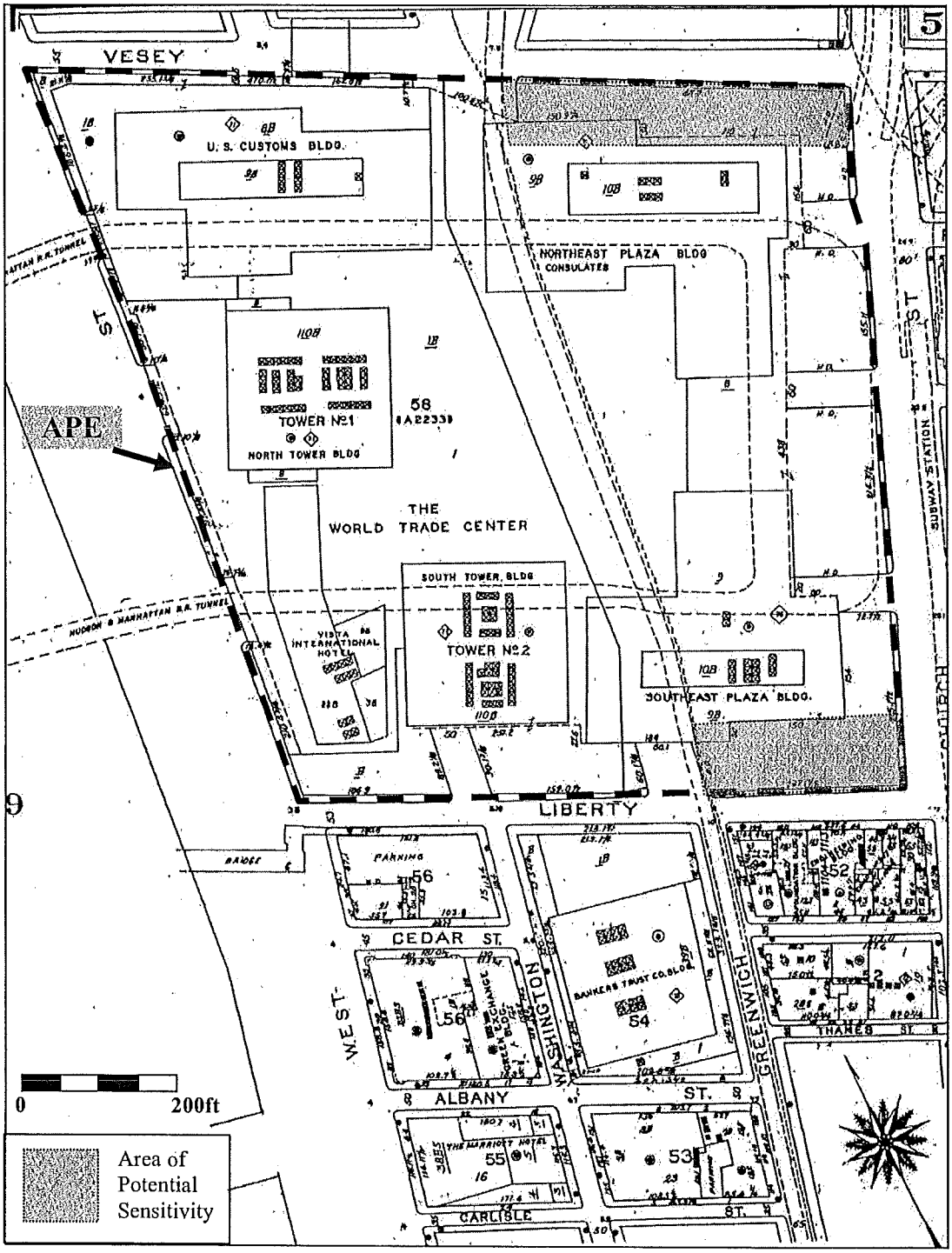


FIGURE 2

World Trade Center APE.
Sanborn 2001.

World Trade Center Project Site.

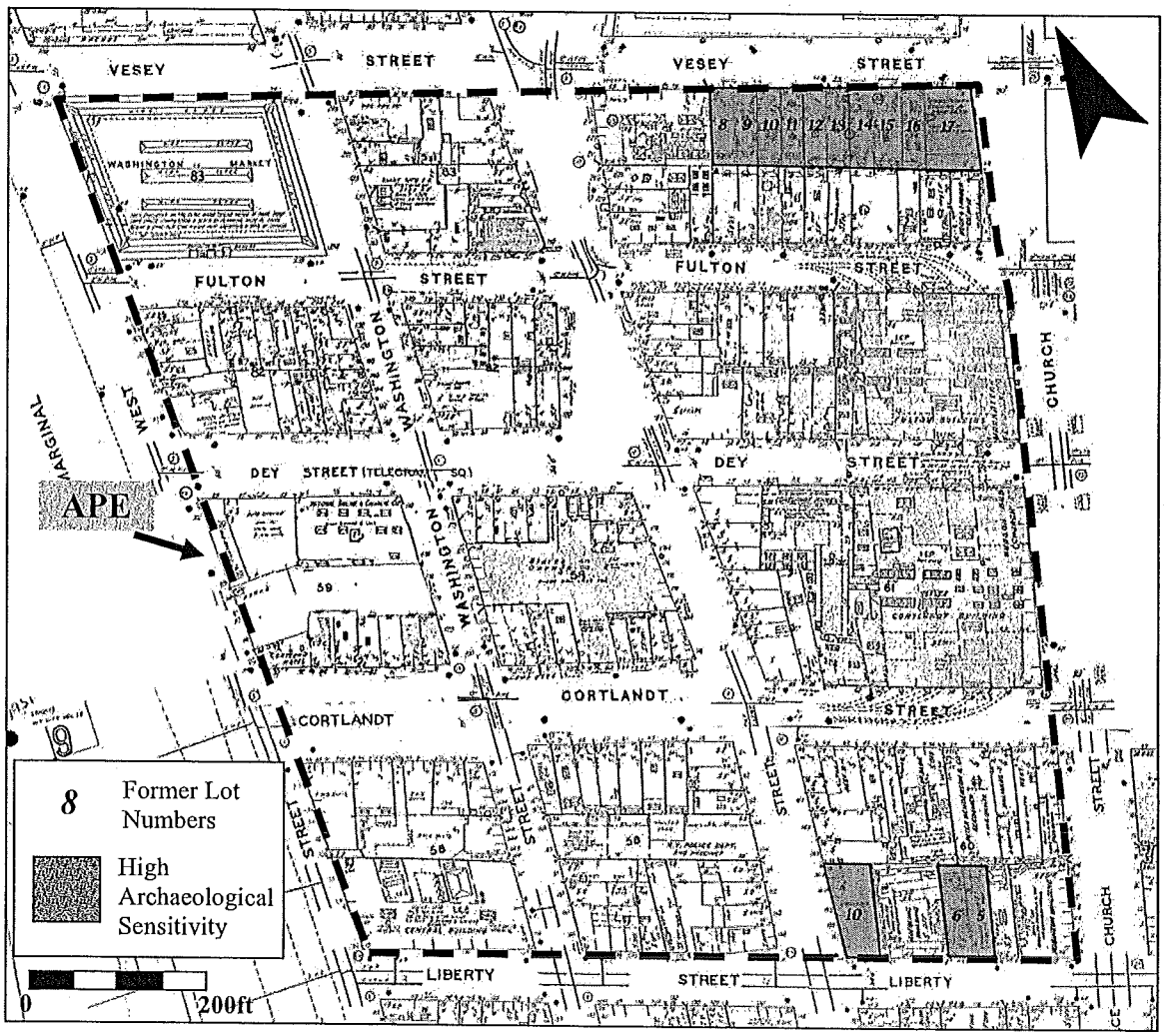


FIGURE 3

Area of Proposed Archaeological Sensitivity.
World Trade Center Project Site.
Sanborn 1951.

APPENDIX

Tables Detailing Individual Lot Histories

Block 60, Lot 5 (113 Liberty Street)

Year	Grantor	Grantee	Tax	Census	Directory
Unkn.	Lydia and John Davis	Jacob Stoutenburgh			
1786	Jacob Stoutenburgh Executors	Gulian Ver Planck			
1790				No residents identified for property	Ver Planck not on property; no other residents identified[1]
1795					Ver Planck not on property
1800				No residents identified for property	Ver Planck not on property
1806-1808					John Boorman not on property
1807			**John Boorman**		
1808			**John Booman**		
1809			John Gordon		
1810			**John Labagh**	**John Labagh (4 white males, 4 white females)**	Labagh not on property
1812			**John Labach**		**Rutgers and Seaman**
1813			**J. Labach**		
1815			**John Labach**		
1816	Gulian Ver Planck Executors	Samuel Gouverneur		**John Labach, stonecutter and fireman, 37 (5 white males, 4 white females)**	
1816	Samuel and Mary Gouverneur	William Howel			
1816	William and Harriet Howel	Joseph McKinne			
1817			**J. Labach**		
1818			**Jno. Labagh**		
1819			**Jno. Labagh**		
1820	Gideon and Margaret Pott; Joseph and Margaret McKinne	John Palmer (Master in Chancery)	John Labaugh	**John Labaugh (5 white males, 4 white females)**	
1820	John Palmer (Master in Chancery)	Gurdon Buck			
1821			John Labach		
1822			**John Labagh**		

[1] In 1792, G. V. Planck was listed as the "proprietor" (owner) for this lot, but no tenants were listed (Surveys of Streets 1780-1800, Folder 34).

Year	Grantor	Grantee	Tax	Census	Directory
1823			**John Labach**		
1824			John Labach		Labach not on property
1825			John Labach		
1826			Abraham Labach, **J. Smith**		
1827			Abraham Labach, **J. Smith**		
1828			Abraham Labach, **J. Smith**		
1829			**Gurdon Buck**		
1830			**Gurdon Buck**	**Gurdon Buck (4 white males, 7 white females)**	**Gurdon Buck and Son, merchants,** 68 South, **h. 113 Liberty**
1835			**Gurdon Buck**		**Gurdon Buck and Son, merchants,** 68 South, **h. 113 Liberty**
1836-1838					**Gurdon Buck and Son, merchants,** 68 South, **h. 113 Liberty**
1839					**Gurdon Buck, merchant,** 68 South, **h. 113 Liberty**
1840			Gordon Buck, **William Lathrop, Alfred Clapp (both merchants)**	Unable to find residents	**Gurdon Buck, merchant,** 68 South, **h. 113 Liberty**
1841					Buck no longer living on property
1844	Benjamin Sherman (Master in Chancery; Gurdon Buck et al. defendants)	Francis Loring			
1845			William C. Russell, **Ebenezer L. Hunt**		
1847			**Samuel F. Crafts, E.L. Hunt**		

Year	Grantor	Grantee	Tax	Census	Directory
1850			J.P. Russell, Agent; **Jacobsen, Max Mantzek**	**Isaac Jacobsen, Merchant, wife, 8 children, 7 male boarders (merchants, musicians, opera workers), 1 female boarder**	
1851					**Isaac Jacobsen, commercial merchant; Max Maretzek, manager**
1852	Trustees of Francis Loring et al.	George Adee			
1855			George Adee		George Adee not on property; Isaac Jacobsen not on property

Block 60, Lot 6 (115 Liberty Street)

Year	Grantor	Grantee	Tax	Census	Directory
Unkn.	Unknown	John Peers			
1790				Unable to find residents	
By 1792	Heir of John Peers	Robert Gosman[2]			
1798					**Joshua Horten Megie, cartman**
1800				Unable to find residents	**William Bradford, tailor; John Marrenner, hairdresser**
1805					**Joshua Megie, cartman;** Gosman not on property
1807	Robert and Joanna Gosman	John Ellis	Widow Parks, **Alexander Campbell, Barnet Tims, Joshua McGee**		
1808			**Harlan Megie, Burnit Frins(?)**		
1809			Alexander Campbell, **Thomas Boyd,** John Jabel(?) and J. Durand		

[2] Gosman acquired this lot from the heir of John Peers at least by 1792, when Gosman was listed as the lot's "proprietor." No tenants were listed for the lot at this time (Surveys of Streets 1780-1800, Folder 34).

Year	Grantor	Grantee	Tax	Census	Directory
1810			**Abraham King**	**Abraham King (2 white males, 3 white females, 1 slave);** (Rueben Knapp and one female listed next, but unclear which lot they were living on)	Rueben Knapp at 117 Liberty; Charles Bostwick not on property
1812			**Rueben Knapp, Charles Bostwick**		**Charles Bostwick;** (Rueben Knapp at 117 Liberty)
1813			**Widow Barfe(?), Robert Barfe(?)**		
1815	John Ellis Executors	David Austen	**Samuel Gannage**		
1816				**Samuel Garnage, merchant, 34 (2 white males, 3 white females); James Skinner, blacksmith, 30 (3 white males, 4 white females)**	
1817			**Joseph Bakings(?)**		
1818			Mrs. Van Alstine		
1819			Mrs. Van Alstine		
1820			Mrs. Van Alstine, **2 occupants (illegible)**	Unclear (but not John Gelston)	
1821			**John Gelston**		
1822			**John Gelston**		
1823			**John Gelston**		
1824			**John Gelston**		
1825			**John Gelston**		**John Gelston,** 11 Broad, **h. 115 Liberty**
1826			**John Gelston**		
1827			**John Gelston**		
1828			**John Gelston**		
1829			**Joseph Otis**		
1830			**Joseph Otis**	**Joseph Otis (1 white male, 4 white females)**	**Joseph Otis,** 47 South, **h. 115 Liberty**
1831			**Joseph Otis**		
1832			Elisha Cait		
1835			Eliza Cait		
1837	David and Mary Austen	William Wilmerding			
1837	Margaret Anthony, heir of John Peers	Robert Gosman			

Year	Grantor	Grantee	Tax	Census	Directory
1837	William and Joanna Wilmerding	Gurdon Buck			
1840			Gordon Buck, **Charles Van Wyck (merchant), Vanschaick**	Unable to find residents	
1841	Charles and Francis Loring, Trustees of Susannah Hammond, will of Gardiner Greene	Gurdon Buck			
1841	Gurdon Buck	Dudley Gregory			
1844	Thomas Emmet (Master in Chancery, Gurdon Buck et al. defendants)	Francis Loring			
1845			William Russell, **John Hillas, E. Caprano, Benjamin Ferris**		
1850			J.P. Russell, Agent	**Thomas Britt, porter, wife and 2 children; Albert Soren, porter, wife, 4 children, non-related female; William Swain, ship carpenter, wife, 5 children; John Hollien, saddler, wife; John Wehmer, carman, wife, 2 children; John O'Harra, porter, wife, 6 children; Patrick Moore, porter, wife, 5 children, non-related female; Henry Moore, porter, wife, 3 children; Andrew Flood, cordwainer, wife, 2 children**	
1851					**Thomas Britt; Albert Lorey, porter; Henry Moon, porter; Edward Hueguenin; William Swain, shipcarpenter; Patrick Moore, porter; J. Denys& Wim. Guggenheim, importers**
1852	Charles and Francis Loring, Trustees of Susannah Hammond, will of Gardiner Greene	Herman Le Roy Newbold			
1855			Newbold		Newbold not on property

Block 60, Lot 10 (135-139 Greenwich through mid-1820s; later 147-151 Greenwich)

Year	Grantor	Grantee	Tax	Census	Directory
1768	David Algeo's will filed	David and William Algeo, grandsons of David Algeo			
1790				Unable to find residents	
1792	David and William Algeo, heirs of David Algeo	Samuel Stillwell			
1792	Samuel and Elizabeth Stillwell	George Lindsay (south ¾ of lot)			
1792	George and Eliza Lindsay	Robert Hunter (south ¾ of lot; one house noted)[3]			
1797					No Meeks or Hunters listed on property
1798					**139 Gr.: Thomas Meeks, mason** (no Hunters listed on the property)
1799					**135 Gr.: George Hunter; 139 Gr.: Thomas Meeks, mason** (no other Hunters listed on property)
1800				**John Hunter (2 white males, 1 white female, 3 free blacks); Ruth Hunter (1 white male, 3 white females, 3 free blacks, 1 slave); Thomas Meeks (2 white males, 3 white females)**	**135 Gr.: George Hunter, John Hunter, auctioneer; 137 Gr.: Hunter, widow of Robert; Samuel Bell, accountant; 139 Gr.: Thomas Meeks, grocer** (no Browns on property)
1803					**137 Gr.: Hunter, widow of Robert**

[3] In 1792, Robert Hunter was listed as the "proprietor" of this lot, but no tenants were listed (Surveys of Streets, 1780-1800, Folders 33 and 34).

Year	Grantor	Grantee	Tax	Census	Directory
1805					**137 Gr.: Hunter, widow of Robert; 139 Gr.: Mary Brown, mantuamaker**
1806					**137 Gr.: Hunter, widow of Robert**
1807			**135 Gr.:** Widow McKenzie, **Mr. Melick, James Boyd, Mr. McDole, Mr. Sprigg, Mr. Gibben; 137 Gr.: Silvanus Miller; 139: Francis Cochran, Thomas Brown**		No Hunters on property
1808			**135 Gr:** Widow McKenzie, **P. Melick, James Boyd, John King, Stephen Baker, Benjamin Palmer, John Givent, John P. Foot, Mr. Asten; 137 Gr.: G.V. Ludlow; 139 Gr.: Thomas Brown**		
1809			**135 Gr.:** Widow Mary McKenzie, **B.P. Melick, Archibald Austin, James Boyd, James Van Vecten, Benjamin Palmer, John Given, John P. Foot, William Chapman; 137 Gr.: Gabriel V. Ludlow; 139 Gr.: Thomas Brown**		

Year	Grantor	Grantee	Tax	Census	Directory
1810			135 Gr.: Ranson Clark, Donal Malcomb; 137 Gr.: G.V. Ludlow; 139 Gr.: Thomas Brown	Ranson Clark (5 white males, 3 white females, 2 free blacks, 3 slaves); Gabriel V. Ludlow (4 white males, 4 white females, 1 slave); Thomas Brown (2 white males, 3 white females)	135 Gr.: Francis Sennes, fruiter; 137 Gr.: G.V. Ludlow, counselor; 139 Gr.: Thomas Brown, grocer
1811			135 Gr.: G.V. Ludlow, Robert Hunter, Francis Sennes; 137 Gr.: G.V. Ludlow; 139 Gr.: Thomas Brown		
1812					135 Gr.: Ruth Broome, Francis Sennes; 137 Gr.: G.V. Ludlow; 139 Gr.: Thomas Brown
1813			135 Gr.: Mrs. Broome, Francis Sennes; 137 Gr.: Jacob Valentine, Isaac Valentine; 139 Gr.: Thomas Brown		
1815			135 Gr.: Mrs. Broome, Francis Sennes; 137 Gr.: Robert Hunter; 139 Gr.: John McKenna		
1816				135 Gr.: Mrs. Broom (2 white males, 2 free blacks); 137 Gr.: Robert Hunter, 27, gentleman (1 white male, 7 white females, 1 male slave); 139 Gr.: John McKenna, 22, grocer(2 white males, 2 white females)	
1817	James Gill conveys his interest	Theophilus A. Gill (north ¼ of lot)	135 Gr.: Mrs. Broome; 137 Gr.: Robert Hunter; 139 Gr.: Gill		

Year	Grantor	Grantee	Tax	Census	Directory
1818			**135 Gr.: Mrs. Broome; 137 Gr.: John Crawford, Jno. Lantwell(?);** 139 Gr.: Theo. Gill		
1819			**135 Gr.: Mrs. Broome;** 137 Gr: Mrs. Broome; 139 Gr.: Theo. Gill		
1819-1829	Various other family members convey their interest	Theophilus A. Gill (north ¼ of lot)			
1820			**135 Gr.: Mrs. Broome;** 137 Gr: Mrs. Broome; 139 Gr.: Theo. Gill	**Mrs. Broome (3 white females, 2 free back females, 1 free black male)**	
1821			**147 Gr.: Mrs. Broome;** 149 Gr: Mrs. Broome; 151 Gr.: Theo. Gill		
1822			**147 Gr.: Mrs. Broome;** 149 Gr: Mrs. Broome; 151 Gr.: Theo. Gill		
1823			147 Gr.: Mrs. Broome; **149 Gr: Mrs. Broome;** 151 Gr.: Theo. Gill		
1824			**147 Gr.: Mrs. Broome;** 149 Gr: Mrs. Broome; 151 Gr.: Theo. Gill		

Year	Grantor	Grantee	Tax	Census	Directory
1825			147 Gr.: Mrs. Broom, **Wm. A.G. Thompson, merchant, Timothy Armsted, merchant, Mr. Scriber, broker;** 149 Gr.: Mrs. Broom; 151 Gr.: Theophilus A. Gill, **Charles A. Carpenter**		
1830			Mrs. Broom (147, 149 Gr.); T.A. Gill (151 Gr.)	Unable to find residents	Gill not on property
1835	Horatio Gates Lewis (Robert Hunter's heir's husband)	Richard Harison (attorney owed money) (interest in middle portion of lot with house); Ruth Broome, Hunter's widow (retains south portion of lot and house as dower right)	147, 149 Gr.: Mrs. Broome; 151 Gr.: Thomas A. Gill, **David Jones**		Gill not on property
1835	Richard Harison	Robert Ludlow			
1840			Philip Schuyler, agent (147, 149 Gr.); Theo. Gill (151 Gr.)	Unable to find residents	Gill not on property
1845	Philip Ruggles (Master in Chancery, Robert Ludlow et al., defendants)	Theophilus A. Gill (south ¾ of lot with 2 houses, now 147 and 149 Greenwich)	Thomas A. Gill (147 and 149 Gr. noted as "unfinished")		
1850			Theo. A. Gill, **Edw. Volger(?) (147 Gr.); Wm. Firderer (149 Gr.); Wm. McKenna (151 Gr.)**	**Charles Speroni, tailor, wife, 2 children; Mathias Bauer, confectioner, wife, 6 children, 3 non-related males; Wilhemina Kipash; John Rust, cabinet maker, wife, 2 children; Marius Roger, watch maker, wife, 2 children**	

Year	Grantor	Grantee	Tax	Census	Directory
1851					**147 Gr.: Merkle & Dung, drugs, Philip Merkle, Albert Dung, William Frank, caps; 149 Gr.: William Firderer, fancygoods, F.W.C. Ruthardt, Wm. Roche, secondhand books; 151 Gr.: John Lutz, thread & needles, Frederick Wolz, butcher, Charles Speroni, tailor, Marius Roger, watchcases, Catherine Falconer, milliner**
1855			T.A. Gill (153, 157, 161 Gr.); **M. Lederer (157 Gr.); E. Graw(?) (161 Gr.); Joseph Meyers (161 ½ Gr.)**		**Michael Lederer, clothing,** 182 and 158 Gr., **h. 157 Gr.;** no Gill, Meyers, or Graw on property

Block 85, Lot 8 (Lot 49 of Trinity Church Farm, 53 Vesey through the mid-1810s, then 55 Vesey afterwards)

Year	Grantor	Grantee	Tax	Census	Directory
1705		Church			
1759	Church	Johannes Ackerman (21-yr lease)			
1773		Thomas Lincoln (lease assumed based on later expiration data)			
1775	Church	"lease expired and vacant"			
1780		1759 lease expired			
1781	Church	"lease expired and vacant"			

Year	Grantor	Grantee	Tax	Census	Directory
1787	Church	George & Carle Pollock			
1787	Church	"T.C....tenant pays T.C."			
1787	Church	Thomas Jones (no lease)			
1790				Unable to find residents	Unable to find residents[4]
1792	Church	Simon Van Antwerp (21-yr lease)			
between 1792 and 1794	Church	George Sutton (lease)			**George Sutton, broker** (1794 only)
between 1792 and 1794	Church	Edward I. Platt			
1795					**Thomas Greswold, distiller**
1796	Church	John Griswold			**Thomas Greswold, distiller**
1800				No residents listed for this lot	**Amelia Holden, boarding house**
1805	Church	L. Lispenard (99-yr lease)			Holden not on property
post 1805		John Murray (lease)			
1807			Israel Titus		
1808			**John Dover**		
1809			Widow Ann Stagg, **Benjamin Stagg, Henry Stagg**		
1810			**Jothan Smith, Samuel Gruman**	**Jothan Smith (5 white males, 3 white females); Thomas Jones (4 white males, 1 white female)**	Jothan Smith and Samuel Gruman not on property
1812	Church	Conner & Van Winkle (42-yr lease, w/o "Covenant of Renewal")			
1812	Church	Andrew Raymond (lease)	**Jothan Smith**		**Andrew Raymond**
1813		1792 lease expiration	**Andrew Raymond**		

[4] No "proprietor" (owner) or tenant listed in 1792 (Survey of Streets 1780-1800, Folders 20, 21).

Year	Grantor	Grantee	Tax	Census	Directory
1815			**Andrew Raymond**		
1816				**Andrew Raymond, 50, attorney (2 white males, 2 white females)**	
1817			**Andrew Raymond**		
1818			**William Dodge, Jr., Jno. L. Robins**		
1819			**William Dodge, Jr., George A. Baker**		
1820			**William Dodge, Jr.**	**William Dodge (9 white males, 5 white females, 1 female slave)**	**William Dodge, coal merchant**
1822			Connor and Van Winkle		Connor and Van Winkle, auctioneers, not listed on property
1823			Connor and Van Winkle		**Jacob Van Winkle, 55 Vesey,** h. 66 Vesey
1824			Connor and Van Winkle		**Jacob Van Winkle, 55 Vesey,** h. 66 Vesey
1825			Connor and Van Winkle		**Jacob Van Winkle, 55 Vesey,** h. 66 Vesey
1826			Van Winkle and Connor		
1827	Church	Abraham Van Buskirk (lease)	Connor and Van Winkle		
1830			Connor and Van Winkle	Unclear	**John Connor, auctioneer, 55 Vesey,** h. 225 Hudson
1831			Jacob Van Winkle		
1834	John Connor and Jacob Van Winkle assign lease	John Morrison			**Jacob Van Winkle, auctioneer, 55 Vesey,** h. 305 Greenwich
1834	John C. Morrison, druggist, assigns lease	Leonard Gordon, cordial distiller			

Year	Grantor	Grantee	Tax	Census	Directory
1835			Leonard Gordon		**Leonard Gordon, cordial distiller, lemon and raspberry syrup manuf., 55 Vesey,** h. 189 Duane; Connor and Van Winkle not on property
1836	Church	Thos. Lincoln (lease expiration)			
1840			Leonard Gordon	Unable to find residents	**Leonard Gordon, cordial distiller, lemon and raspberry syrup manuf., 55 Vesey,** h. 189 Duane
1845			P. Gordon		
1850			Philip Gordon	Unable to find residents	
1851					**Philip Gordon, cordials and syrup manufactory,** house Jersey City
1855			P. Gordon		**Philip Gordon, distiller,** h. Jersey City

Block 85, Lot 9 (Lot 48 of Trinity Church Farm; 51 Vesey through mid 1810s, 53 Vesey afterwards)

Year	Grantor	Grantee	Tax	Census	Directory
1705		Church			
1759	Church	David Brewer, house carpenter (21-yr lease)			
1773		Thomas Lincoln (lease assumed based on later expiration data)			
1775	Church	"lease expired and vacant"			
1780		1759 lease expired			
1781	Church	"lease expired and vacant"			
1787	Church	William McKenny			

Year	Grantor	Grantee	Tax	Census	Directory
1787	Church	Cornelius Ray (sold at A.L. Bleeker Auction)			
1790				Unable to find residents	
1792	Gabriel Verplanck Ludlow, *Gentleman*	Cornelius Ray			
1795					**John Hallam, saddler; John Haswell, carman;** Cornelius Ray not on property
1796	Church	John Griswold (10-yr lease)			**Mrs. Eleanor Ray**
1797					**Mrs. Eleanor Ray**
1798					**Mrs. Eleanor Ray**
1799					Samuel Moore, Isaac Johnson, William Thompson and James Moncriesse not on property
1800				**Samuel Moore (6 white males, 1 white female, 1 slave); William Thompson (1 white male, 1 white female); Isaac Johnson (1 white male, 2 white females); James Moncriesse (1 white male, 2 white females)**	**Isaac Johnson, ship carpenter; James Moncreisse, ship carpenter** (William Thompson, Samuel Moore and Cornelius Ray not listed on property)
1805					**Samuel Moore, boarding house;** Joseph Burjeau and Cornelius Ray not on property
1806		1796 lease expired			**Samuel Moore, boarding house;** Benjamin Gilmore not on property
1807			**Benjamin Gilmore**		**Benjamin Gilmore, merchant;** Samuel Moore not on property

Year	Grantor	Grantee	Tax	Census	Directory
1808			Benjamin Gilmore, Samuel Gillian		
1809			Joseph Burjeau, James Moore, Joseph Miller, Benjamin Bartlett, Noah Bartlett		
1810	Church	Lispenard & Stewart (99-yr lease)	Joseph Burjeau, Wm. Angus, Mr. Coon	Joseph Berjeau (2 white males, 2 white females); William Angus (1 white male, 2 white females); Abby Lowell (2 white females); William Coon (3 white males, 1 white female)	Joseph Burjeau; Abraham Coon, hatter; Wm. Angus, carpenter
1811					
1812			Joseph Berjeau, Mr. Wells, Mr. Angus		Joseph Burjeau
1813			Joseph Burjeau, Wm. Higgins		
1815			Joseph Burjeau, John Burrows, Jr.		
1816				Joseph Berjeau, 33, artillery, (1 white male, 3 white females); John Burrows, Jr., 26, carpenter, (2 white males, 1 white female); William Buck, 29, carpenter, (2 white male)	
1817			Joseph Burjeau		
1818			Joseph Burjeau, William Nald		
1819			Joseph Burjeau		
1820			Joseph Burjeau	William Shaw (1 white male, 1 white female); Joseph Burjeau (2 white males, 3 white females); John Nald (1 white male, 3 white females); Bartholomew Martin (1 white male, 1 white female)	Bartholomew Martin, wine merchant; John, William, and Widow Catherine Nald; Burjeau and Shaw not listed on property
1821			Joseph Burjeau, Wm. Shaw		
1822			Joseph Burjeau		

Year	Grantor	Grantee	Tax	Census	Directory
1823			Cornelius Ray, **Mr. Shaw, Dominick Eggert**		
1824			Cornelius Ray, **Wm. Shaw**		
1825			Cornelius Ray, **Jared Willers, fisherman**		
1826			Cornelius Ray, **Jared Willers**		
1827			Estate of Cornelius Ray, **Jared Wilinks, Nathan Eldridge**		
1830			Estate of Cornelius Ray	**N. Eldridge (4 white males, 3 white females)**	**Nathan Eldridge, fisherman**
1831			Estate of Cornelius Ray		
1833	Executors of Cornelius Ray	John C. Morrison			
1833	John C. and Hilah Morrison	Charles Trinder			
1835			Charles Trinder		Trinder not on property
1836	Church	Thos Lincoln (lease expired)			
1840			Estate of Charles Trinder	Unable to find residents	
1845			Estate of Charles Trinder		
1849	Executors of Charles Trinder	Charles Lalin			
1850			Charles Lalin	Unable to find residents	**Charles Lalin, boarding, 53 Vesey, h. 53 Vesey**
1851					**Charles Lalin, porter house; Henry Ludwig and Co., printers**
1855			Charles Lalen		Lalin and Ludwig not on property
1909		1810 lease expired			

Block 85, Lot 10 (Lot 47 of Trinity Church Farm; 49 Vesey through mid-1810s, then 51 Vesey afterwards)

Year	Grantor	Grantee	Tax	Census	Directory
1705		Church			

Year	Grantor	Grantee	Tax	Census	Directory
1759	Church	Jacobus verveelen (21-yr lease)			
1773		Thomas Lincoln (lease assumed based on later expiration data)			
1775	Church	"lease expired and vacant"			
1780		1759 lease expired			
1781	Church	"lease expired and vacant"			
1782	Church	W. Wighton (no lease)			
1787	Church	William McKenny (30-yr lease)			
1787	Church	Cornelius Ray (sold at A.L. Bleeker Auction)			
1790				Unable to find residents	
1792	Church	A. Raymond (21-yr lease)			
1792	Gabriel Verplanck Ludlow, *Gentleman*	Cornelius Ray			
1796	Church	John Griswold (10-yr lease)			
1799					**Isaac Riley, merchant;** no Cox or Jones on property
1800				**Isaac Cox (2 white males, 3 white females, 3 slaves); Isaac Jones (2 white males, 2 white females, 1 slave)**	**Isaac Riley, merchant; the Misses and Miss M. Beekman; Catharine Cox**
1805					Ludlow not on property
1806		1796 lease expired			
1807			**Widow Nicholson**		
1808			**Peter Ludlow**		
1809			**Peter and Robert Ludlow**		
1810	Church	Lispenard & Stewart (99-yr lease)	**Peter and Robert Ludlow**	**Peter Ludlow (8 white males, 3 white females, 1 slave)**	
1812			**Henry King**		**Henry King**
1813		1792 lease expired	**Henry King**		
1815			Henry King		

Year	Grantor	Grantee	Tax	Census	Directory
1816				**Henry King, 30, merchant (2 white males, 6 white females, 2 female slaves)**	
1817		1787 lease expired	**Henry King**		
1818			**Henry Lott**		
1819			**Henry Lott**		
1820			Cornelius Ray	**Sarah Gunn (4 white males, 8 white females, 1 free black female)**	**Sarah Gunn, boarding house**
1822			**M. Deposway**		
1823			**M. Deposway**		
1824			Cornelius Ray, **Michael Dykers**		
1825			Cornelius Ray, **Michael Dykers**		**P. Dykers, M.D., 51 Vesey** and 80 Pearl; no Michael Dykers on property
1826			Cornelius Ray, **Michael Dykers**		**Michael Dykers; P. Dykers, M.D.**
1827			Estate of Cornelius Ray, **Michael Dykers**		
1830			Estate of Cornelius Ray, **Lewis Forman**	**Mrs. Crygier (5 white males, 6 white females, 1 free black female)**	**C. Crygier;** Forman not on property
1831			Estate of Cornelius Ray, **Lewis Forman**		
1833	Executors of Cornelius Ray	John C. Morrison			
1834	John C. and Hilah Morrison	William Post			
1835	John and Mary King	William Post, surviving partner of Post, Gerardus and John C. Morrison	John C. Morrison		No Morrisons on property
1835	Executors of Gerardus Post	William Post	John C. Morrison		
1836	Church	Thos Lincoln (lease expired)			
1837					**Christian Morrison**
1839					**Christian Morrison**
1840	William and Catherine Post	John S. Giles, Trustee for Christian B. Morrison, William Post, Jr. and Sarah Morrison	Wm. Post, **Christian Morrison, druggist**	Unable to find residents	**Christian Morrison,** 186 and 188 Greenwich, **h. 51 Vesey**

Year	Grantor	Grantee	Tax	Census	Directory
1845			Wm. Post, Trustee, **Christian Morrison**		
1850			Wm. Post and John Giles, Trustees	**Christian Morrison, 40, occupation illegible, wife, 3 children, 3 unrelated females**	
1851					**Christian Morrison**
1852					Christian Morrison not on property
1855			Wm. Post and John Giles, Trustees		Christian Morrison not on property
1909		1810 lease expired			

Block 85, Lot 11 (Lot 46 of Trinity Church Farm; 47 Vesey through mid-1810s, then 49 Vesey afterwards)

Year	Grantor	Grantee	Tax	Census	Directory
1705		Church			
1758	Church	John Bradburn (21-yr lease)			
1773		Thomas Lincoln (lease assumed based on later expiration data)			
1775	Church	"lease expired and vacant"			
1779		1758 lease expired			
1781	Church	"lease expired and vacant"			
1782	Church	G. Wighton (no lease)			
1787	Church	John Sullivan (46R) (sold at A.L. Bleeker auction)[5]			
1788	Church	Richard Westervelt (21-yr lease)			
1790				Unable to find residents	
Between 1788 and 1794	Church	Benj. Westervelt (lease)			

[5] John Sullivan was listed as the "proprietor" (owner) of this lot in 1792 (Survey of Streets 1780-1800, Folders 20, 21), along with adjacent Lot 12.

Year	Grantor	Grantee	Tax	Census	Directory
1796	Church	John Griswold (10-yr lease)			
1800				Silas Talbot (2 white males, 2 white females, 1 free black, 1 slave)	Silas Talbot, captain of the *Constitution*
1801					Silas Talbot, captain of the *Constitution*
1803					George W. Talbot, merchant
1805					George W. Talbot, merchant
1806		1796 lease expired			
1807			G.W. Talbot		
1808			G. W. Talbot		
1809		1788 lease expired	George W. Talbot		
1810	Church	Lispenard & Stewart (99-yr lease)	George Talbot	George W. Talbot (4 white males, 3 white females, 2 free blacks)	George W. Talbot, merchant
1812			John Holden, Geo. W. Talbot		George Talbot
1813			George W. Talbott		
1815			Mrs. Steal		
1816				Mrs. Steel, no age or profession given, (7 white females, 1 female slave)	
1817			Mrs. Steele		
1818			Mrs. Steele		
1819			Mrs. Steele		
1820			Mrs. Steele	Isabella Steele (1 white male, 7 white females)	Steel, widow of Robert M.
1821			Mrs. Steele		
1822			Mrs. Steele		
1823			Jno. P. Schemmerhorn		
1824			John P. Schemmerhorn		
1825			John P. Schemmerhorn		J. P. Schermerhorn, merchant
1826			John P. Schemmerhorn		J. P. Schermerhorn, merchant
1827			Thompson, Henry Inman		Henry Inman

Year	Grantor	Grantee	Tax	Census	Directory
1830			**Frederick Pince**	**Frederick Pentz (4 white males, 2 white females, 1 free black female)**	
1831			**Frederick Pense**		
1835			**Frederick Pince**		
1836	Church	Thos Lincoln (lease expired)			
1840			Frederick and **John Pentz**	Unable to find residents	
1845			**Frederick and John Pentz**		
1847			**Frederick and John Pentz**		
1850			**Frederick Pentz**	**Frederick Pentz, 50, President Mechanics Association Bank, wife; Frederick Pentz (Jr.), 23, merchant; John Pentz, 35, store; Elizabeth Pentz, 70**	
1851	Alfred Thompson, Trustee of William A. Thompson	Samuel P. Bell			**Frederick Pentz**
1855			S.P. Bell		Frederick Pentz no longer on property; Bell not on property
1909		1810 lease expired			

Block 85, Lot 12 (Lot 45 of Trinity Church Farm; 45 Vesey through mid-1810s, then 47 Vesey afterwards)

Year	Grantor	Grantee	Tax	Census	Directory
1705		Church			
1758	Church	Jacobus Ver Veelen (21-yr lease)			
1773		Thomas Lincoln (lease assumed based on later expiration data)			
1775	Church	"lease expired and vacant"			
1779		1758 lease expired			
1781	Church	"lease expired and vacant"			
1782	Church	G. Wighton (no lease)			
1787	Church	John Sulivon (45R) (sold at A.L. Bleeker auction)			

Year	Grantor	Grantee	Tax	Census	Directory
1788	Church	Isaac Halsey (21-yr lease)			
between 1788 and 1794	Church	James Lergent (?)			
1790				Unable to find residents	
1792	John Sullivan, Merchant Mary, his wife	John Holdron, Gentleman			
between 1794 and 1805	Church	John Hoes			
between 1794 and 1805	Church	Trinity Church endowed Grace Church. Grace leased out lot and used the rent (lease)			
1796	Church	John Griswold (10-yr lease)			
1797					Alexander Hosack not on property
1798					**Alexander Hosack, merchant; William Hosack, attorney**
1800				**Alexander Hosack (1 white male, 2 white females, 1 slave)**	**Alexander Hosack, merchant**
1805					**Alexander Hosack, merchant**
1806		1796 lease expired			
1807			**Alexander Husick**		
1808			**Alexander Hosack**		
1809		1788 lease expired	**Alexander Hosack**		
1810	Church	Lispenard & Stewart (99-yr lease)	**Alexander Hosack**	**Alexander Hosack (1 white male, 1 white female, 1 slave)**	**Alexander Hosack, merchant**
1811	John Holdron	Abraham Van Gelder			
1812			**Alexander Hosack**		**Alexander Hosack; William Hosack**
1813			**Alex. Hosack**		

Year	Grantor	Grantee	Tax	Census	Directory
1815			Alex. Hosack		
1816				Alexander Hosack, 80, gentleman (1 white male, 1 white female, 1 female slave)	
1817			Alex. Hosack, Jacob Dyckman		
1818			Alex. Hosack, Dr. Dyckman		
1819			Alex. Hosack, Dr. Dyckman		
1820			Alexander Hosack, Dr. J. Dyckman	Alexander Hosack (2 white males, 3 white females, 1 male slave)	Alexander Hosack, merchant
1821			Mrs. Van Gelder, Alex. Hosack, Dr. Dyckman		
1822			Mrs. Van Gelder, Estate of Alex. Hosack, Dr. Dyckman		
1823			Mrs. Van Guilder, Estate of Alex. Hosack		
1824			Mrs. Van Guilder, Estate of Alex. Hosack		
1825			Henry Inman, Portraits		
1826			Henry Inman, Thos. Cummings		Henry Inman, portrait painter; Inman and Cummings, portrait and min. paint
1827			John Lamb		Henry Inman, portrait painter; Inman and Cummings, portrait and min. paint
1830			W.W. Scrughams	W.W. Scrughams (2 white males, 6 white females)	
1831			Wm. W. Schrughams		
1835			P. Besennard, P. Pressedder(?)		
1836	Church	Thos Lincoln (lease expired)			
1840			Martha Wheeler	Unable to find residents	

Year	Grantor	Grantee	Tax	Census	Directory
1845			Martha Wheeler, **John Fenniman, grocer, Ceasar Vanderett**		**Jacob Fineman & Co., grocers**
1847			**John Fenniman, Caesar Vanderbilt**		
1848	James Maurice (Master in Chancery), Abraham Rose et al., defendants	Samuel Ely, Abraham Rose, Jonathan Seely			
1848	Abraham and Eliza Rose and Jonathan and Martha Seely	Samuel Ely			
1850			Dr. Samuel Ely	Unable to find residents	
1851					**Louis Schworer, wines; J.C. Pulschan, grocer; F.C. Kinney, shovel maker; W.H. Smith; James Powell; Joseph Butler**
1855			Ely and Rose		Ely and Rose not on property
1909		1810 lease expired			

Block 85, Lot 13 (Lot 44 of Trinity Church Farm; 43 Vesey through mid-1810s, then 45 Vesey afterwards)

Year	Grantor	Grantee	Tax	Census	Directory
1705		Church			
1761	Church	**Catherine Miller, " free negro woman" (11-yr lease)**			
1772		1761 lease expired			
1773	Church	Thomas Lincoln (63-yr lease)			
1782	Church	Geo Hass (5-yr lease)			
1787		1782 lease expired			
1787	Church	Andrew Morris (sold at A.L. Bleeker auction)			

Year	Grantor	Grantee	Tax	Census	Directory
1788	Church	John Horne (21-yr lease)			
1790				Unable to find residents	[6]
1795					**James Hepburn, mason**
1797					Pierre Depeyster not on property
1796	Church	John Griswold (10-yr lease)			
1798					**Pierre Depeyster, shipmaster**
1799					**Pierre Depeyster, shipmaster**
1800				**Pierre DePeyster (3 white males, 3 white females, 3 slaves)**	**Pierre Depeyster, shipmaster**
1805	Church	A.L. Stewart (99-year lease)			**Philip Grim, merchant;** Pierre Depeyster not on property
1806		1796 lease expired			
1807			**Philip Grim**		
1808			**Philip Grim**		
1809		1788 lease expired	**Philip Grim**		
1810			**Philip Grim**	**Philip Grim (5 white males, 4 white females, 2 free blacks)**	**Philip Grim, merchant**
1812			**Philip Grim**		**Philip Grim**
1813			**Philip Grim**		
1815			Philip Grim		
1816				**Philip Grim, 50, merchant (8 white males, 4 white females, 2 free black females); John Baddy, 24, sail maker and fireman (1 white male)**	
1817			**Philip Grim**		
1818			**Philip Grim**		
1819			**Philip Grim**		

[6] Stephen Cooper is listed as a tenant in 1792 (Survey of Streets, 1780-1800, Folders 20 and 21).

Year	Grantor	Grantee	Tax	Census	Directory
1820			**Philip Grim**	**Philip Grim (9 white males, 5 white females)**	**Philip Grim, merchant**, 30 Old Slip, **h. 45 Vesey**
1822			Estate of Philip Grim		
1823			**Estate of Philip Grim**		
1824			**Estate of Philip Grim**		
1825			**Estate of Philip Grim**		
1826			**Estate of Philip Grim**		
1827			**Estate of Philip Grim**		
1830			**Estate of Philip Grim**	**Mrs. Grayhorn (4 white males, 6 white females)**	No Grayhorn listed on property
1831			Estate of Philip Grim, **Henry Salisbury, Ransom Brody**		
1835			Nathaniel Bunn(?)		
1837-1839					Joseph Bell not listed on property
1840			**Joseph T. Bell,** Eliza Grim	Unable to find residents	
1845			**Joseph T. Bell**		**Joseph T. Bell,** military store, 186 Fulton, **h. 45 Vesey**
1847			**Joseph T. Bell**		
1848	Almet and Helen Reed	Thomas Cargill			
1848	Thomas and Harriet Cargill	Margaret Stephens			
1849	John J.V. Westervelt (sherrif), interest of Thomas Cargill	Almet Reed			**Joseph T. Bell,** military store, 186 Fulton, **h. 45 Vesey**
1849	Almet and Helen Reed	Thomas H. Beale			
1850	Thomas H. and Eliza Beale	John Lowerre	Thomas H. Beale	Unable to find residents	Bell not listed on property
1851					**T.H. Beal, cabinet maker**
1853	Thomas Carnley (sherrif), interest of Thomas H. Beale	Peter Lynch and George Harrison			

Year	Grantor	Grantee	Tax	Census	Directory
1855			T.H. Beal		**Henry Ludwig, printer and publisher, 45 Vesey,** h. 188 Grand; no Beal or Harrison on property; Peter Lynch listed for Lot 15
1904		1805 lease expired			

Block 85, Lot 14 (Lot 43 of Trinity Church Farm; 39 or 41 Vesey through the mid-1810s, then 43 Vesey afterwards)

Year	Grantor	Grantee	Tax	Census	Directory
1705		Church			
1758	Church	**Catherine Francis (21-yr lease)**			
1775	Church	"lease expired and vacant"			
1779		1758 lease expired			
1781	Church	"lease expired and vacant"			
1782	Church	Geo Hass (5-yr lease)			
1784	Church	Henry Sharp (sold at A.L. Bleeker auction)			
1786	Church	Joseph Devoe (21-yr lease)			
betwe en 1786 and 1794	Church	John Heron (lease)			
1787		1782 lease expired			
1787	Church	Andrew Morris (H. Sharp) (sold at A.L. Bleeker auction)			
1790				Unable to find residents	
1792	Andrew Morris, Tallow Chandler Eleanor, his wife	David Pierson, House Carpenter[7]			

[7] David Pearson is listed as a tenant on the lot in this year (Survey of Streets 1780-1800, Folders 20, 21).

Year	Grantor	Grantee	Tax	Census	Directory
1794					**David Pierson, house carpenter; James Piekton, house carpenter**
between 1794 and 1805	Church	John Heron			
between 1794 and 1805	Church	Robert Penne (lease)			
between 1794 and 1805	Church	Trinity Church endowed Grace Church. Grace leased out lot and used the rent (lease)			
1795					John Bard not listed on property
1796	Church	John Griswold (10-yr lease)			**John Bard, broker**
1797					**John Bard, broker**
1798	Daniel Pierson, House Carpenter Hester, his wife	John Bard, Jr., Insurance Broker			**John Bard, Jr.**
1800				**John Bard (2 white males, 3 white females, 1 free black)**	**John Bard;** Grim not on property
1801					**John Bard**
1804	Anne Elder	Philip Grim			
1805	Church	William Paulding (99-yr lease)			Barrow not on property
1806		1796 lease expired			Barrow not on property
1807		1786 lease expired	**William Barrow**		
1808			**Dr. William Barrow**		
1809			**Dr. William Barrow**		
1810			**John Keese**	**John Keese (4 white males, 5 white females, 2 free blacks)**	**John Keese, druggist; Rosa Keese, widow**
1812			**John Blagge, James Blagge**		**John Blagge**
1813			**John Blagge, Alex. Hamilton**		

Year	Grantor	Grantee	Tax	Census	Directory
1815			John Blagge, **Theodore V. Varick**		
1816				**John O'Dey, 30, merchant (1 white male, 6 white females, 1 male slave); Asa Worthington, 27, merchant (5 white males, 2 female slaves)**	
1817	Church	Obadiah Holmes, assignment of lease	Mrs. Blagge, **Richard Hamilton, Charles Douglas, Alex. McDonald, Edward Livingston**		
1818			Mrs. Blagge, **Jones, Robert Given**		
1819			Nathaniel Pendleton, **J. P. Schemmerhorn**		
1820			Nath. Pendleton	**Abraham Bussing (8 white males, 7 white females, 2 free black males, 1 free black female)**	**Abraham Bussing**
1822			Estate of Nathaniel Pendleton		**Abraham Bussing**
1823			Estate of Nathaniel Pendleton		**Abraham Bussing**
1824			Nathaniel Pennington		**Abraham Bussing**
1825			Nathaniel Pendleton		Abraham Bussing not on property
1826			Nathaniel Pendleton		
1827			Nathaniel Pendleton		
1830			Estate of Nathaniel Pendleton, **Henry Inman**	**Henry Inman (4 white males, 4 white females)**	**Henry Inman, portrait painter**
1831			Estate of Nathaniel Pendleton, **Dr. Grayson**		
1832			**Dr. Grayson**		
1834	Church	Nicholas Slakor (lease expired)			
1835			**Dr. Grayson**		
1840			**Dr. Grayson**	Unable to find residents	

Year	Grantor	Grantee	Tax	Census	Directory
1845			**Dr. Wm. Grayson**		
1846					Grayson not listed on property
1847	Widow (Elizabeth Grim) and heirs (Philip and Augustus Grim, Maria and Isabella Schermerhorn) of Philip Grim	Almet Reed			Grayson not listed on property
1847	John Schernerhorn, assignee of George Schermerhorn	Almet Reed	**John Boyd**		
1850			Estate of Dr. Grayson	Unable to find residents	
1851					**John Boyd, liquors**
1855			Estate of Dr. Grayson		**John Boyd, liquors, 45 Vesey, h. 45 Vesey**
1904		1805 lease expired			

Block 85, Lot 15 (Lot 42 of Trinity Church Farm; 37 Vesey through the mid-1810s, then 41 Vesey afterwards)

Year	Grantor	Grantee	Tax	Census	Directory
1705		Church			
1760	Church	John Hendrick Gauthor (21-year lease)			
1762	Church	**David Brewer, house carpenter (17-yr lease)**			
1775	Church	"lease expired and vacant"			
1781	Church	"lease expired and vacant"			
1782	Church	John Besonet (19-yr lease)			
1783		1762 lease expired			
1786	Church	James Carter (21-yr lease)			
betwe en 1786 and 1794	Church	James Westervelt (lease)			

Year	Grantor	Grantee	Tax	Census	Directory
1787	Corporation of Trinity Church	Hubert Van Wagenen (42R) (sold at A.L. Bleeker auction)			
1790				Unable to find residents	[8]
no later than 1794	Church	Benjamin Smith (lease)			
1794	James Renwick, James Nicholson, John Murray, Jr., James Watson, Matthew Clarkson, Henry Ten Broeck, Jacob Hallett, William W. Gilbert, Nicholas Cruger	Hubert Van Wagonen, Gentleman, Vestryman 1787-1806 (21-year lease)			
between 1794 and 1805	Church	Benj Smith (lease)			
between 1794 and 1805	Church	New Town Church (lease)			
1795					Van Wagonen not on property
1796	Church	John Griswold (10-yr lease)			Van Wagonen not on property
1800				**John Mandebee(?) (1 white male, 3 white females, 2 slaves)**	
1801		1782 lease expired			
1803	William Pultney	David Grim, Samuel Mansfield, and Walter Bowne			Grim, Mansfield, and Bowne not on property
1804	David Grim, Samuel Mansfield, and Walter Bowne of the New York Bread Company	John Hyslop, baker			
1805	Church	William Paulding (99-yr lease)			Hyslop, Barrow, Depeyster, Grim not on property
1807		1786 lease expired	**James Lloyd**		Hyslop not on property
1808			John Hyslop		Hyslop not on property
1809			John Hyslop		Hyslop not on property

[8] A "manufactory" is listed for Lots 15, 16, and the west half of 17 in 1792 (Survey of Streets 1780-1800, Folders 20, 21).

Year	Grantor	Grantee	Tax	Census	Directory
1810			**Wm. Sandford**	**William Sandford (3 white males, 7 white females, 5 slaves)**	**William Sandford, merchant**
1812			John Hyslop, **Wm. Sandford, Mr. Sandford**		Sandford not on property
1813			John Hyslop		Sandford not on property
1815			John Hyslop, **William Cammyer**		
1816				**William Cammyer, 63, baker (5 white males, 5 white females); Thomas Dilks(?), 73, shoemaker (1 white male, 1 white female)**	
1817	Church	Obadiah Holmes, assignment of lease	**William Farrow**		**William Farrow, baker**
1818			John Hyslop		**William Farrow, baker**
1819			Jno. Hyslop, **John McKenzie**		**John McKenzie, baker**
1820			John Hyslop, **Jno. McKenzie**	**John McKenzie (6 white males, 4 white females)**	**John McKenzie, baker**
1821	Jeremiah Drake, Master in Chancery	John Johnston			**John McKenzie, baker**
1822	John and Margaret Johnston	Alexander McKenzie	**John McKenzie**		**John McKenzie, baker**
1823			Alex. McKenzie, **John Bruce, Edward Weir**		**John Bruce, baker; Edward Weir, tailor**
1824			Alex. McKinsey		**John Bruce, baker; Edward Weir, tailor;** McKenzie not on property
1825	Alexander and Jane McKenzie	John Limberger	John Limberger, Nathaniel Pendleton		**John Limberger, baker**
1825	John and Mary Limberger	Michael Van Beuren	John Limberger		
1826			John Limberger		
1827			John Limberger		
1830			John Limberger	**Jno. Limberger (12 white males, 6 white females)**	**John Limberger, baker**
1831			John Limberger		
1834	Church	Nicholas Slakor (lease expired)			
1835			John Limber		

Year	Grantor	Grantee	Tax	Census	Directory
1837	Michael Van Beuren	John Limberger			
1837	John and Margaret Johnston	John Limberger			
1838-1839					**John Limberger, baker**
1840			Estate of John Limberger	Unable to find residents	**Henry Sparks, baker; Sparks and Co.**
1841					**Henry Sparks, baker; Sparks and Co.**
1842					**Henry and Frederick Sparks, bakers**
1843-1844					**Samuel Conlon, fruiterer,** 39 and 74 Vesey, **grocer, 41 Vesey**
1844	Executors of John Limberger	Joseph Harrison			
1845	Joseph Harrison	Peter and Daniel Lynch	P and D Lynch, **Frederick Sparks**		**Frederick Sparks, baker**
1847	Daniel Lynch	Peter Lynch			
1848	Abraham Frazee	George Youngs, assignment of lease			
1850			Peter Lynch	Unable to find residents	
1851					**Peter Lynch, grocer**
1855			**Peter Lynch**		**Peter Lynch, grocer, 41 Vesey, h. 41 Vesey**
1904		1805 lease expired			

Block 85, Lot 16 (Lot 41 of Trinity Church Farm; 35 Vesey until mid-1810s, 39 Vesey afterwards)

Year	Grantor	Grantee	Tax	Census	Directory
1705		Church			
1750	Church	Godfrey Wall, "gardner" (21-yr lease)			
1771		1750 lease expired			
1771	Church	Nicholas Slakor (63-yr lease)			

Year	Grantor	Grantee	Tax	Census	Directory
1786	Church	Ceasar Lispinard (21-yr lease)			
between 1786 and 1794	Church	Samuel Sneeden (lease)			
1787	Corporation of Trinity Church	Hubert Van Wagenen, Vestryman 1787-1806 (41R) (sold at A.L. Bleeker auction)			
1790				Unable to find residents	**Daniel Campbell, labourer**[9]
1794	James Renwick, James Nicholson, John Murray, Jr., James Watson, Matthew Clarkson, Henry Ten Broeck, Jacob Hallett, William W. Gilbert, Nicholas Cruger	Hubert Van Wagonen, Gentleman, Vestryman 1787-1806 (21-year lease)			
1796	Church	John Griswold (10-yr lease)			
1800				**Joseph H. Aikins (2 white males, 1 white female, 1 slave); Mark Lynch (1 white male, 4 white females)**	**Joseph Aikins, shipmaster; Mark Lynch, shipmaster**
1801					**Joseph Aikins, shipmaster**
1803	William Pultney	David Grim, Samuel Mansfield, Walter Bowne			
1805	David Grim, Samuel Mansfield, Water Bowne of the New York Bread Company	Frederick DePeyster, Vestryman 1800-1812, and Philip Grim			Williams and Thorn not on property
1805	Church	Lem Well (99-yr lease)			
1806		1796 lease expired			
1807		1786 lease expired	**Richard Berrian, Charles Deboy**		
1808	Philip and Elizabeth Grim	Frederick DePeyster	**William Williams**		
1809	Frederick and Ann DePeyster	Thomas and Wilkinson Satterthwaite	Stephen Thorn, Jr.		Sands not on property

[9] A "manufactory" is listed for Lots 15, 16, and the west half of 17 in 1792 (Survey of Streets 1780-1800, Folders 20, 21).

Year	Grantor	Grantee	Tax	Census	Directory
1810			**Robert Sands**	**Robert Sands (4 white males, 4 white females, 1 free black)**	**Robert Sands**
1811	Thomas and Catharine Satterthwaite	George A. Bibby			Sands not on property
1812	Ben Ledyard (Master in Chancery), Thomas Satterthwaite et al., defendants	Frederick DePeyster	**Peter B. Van Beuren**		No listing
1813			**G. Van Buskirk, John Darby**		
1814	David Grim, Samuel Mansfield, Walter Bowne of the New York Bread Company	Stephen Thorne, Jr.			
1815	Frederick and Ann DePeyster	James Farquhar	Stephen Thorn, **Mr. Spader**		
1816	Stephen Thorne, Jr.	Hannah Gerardt		**John Gussner(?), 26, tin manufacturer and artillery (4 white males, 5 white females); William Woodruff, no age given, tailor (3 white males)**	Gussner and Woodruff not listed on property
1817			Mrs. Wardell, **Alex. Lefoy, Wm. A. Coffee (?)**		
1818			Mrs. Wardel, **Alex. Lefoy**		No Lamont or Fowler listed on property
1819			Hammell, **P.B. Lamont**		**P.B. Lamont, painter, etc.; Jane Fowler, widow**
1820			Hammell, **P.B. Lamont**	**P.B. Lamont (1 white male, 5 white females); Jane Fowler (2 white males, 3 white females)**	**P.B. Lamont, painter, etc.; Jane Fowler, widow**
1822	Hannah Geraert	William Ovington	Wm. Ovington		No Lamont, Ovington or Bodin listed on property
1823			Wm. Ovington		
1824			Wm. Ovington, **John Bodin**		**Jennet McDonald, boarding house**
1825			William Ovington		**Jennet McDonald, boarding house**
1826			William Ovington		**Jennet McDonald, boarding house**

Year	Grantor	Grantee	Tax	Census	Directory
1827			Wm. Ovington		**Jennet McDonald, boarding house**
1830	William Ovington	John Jacob Astor	William Ovington	**Mrs. McDonald (6 white males, 4 white females)**	**Jennet McDonald, boarding house**
1831	James and Elizabeth Farquhar	Henry Kneeland (trust deed)	William Ovington		**Jennet McDonald, boarding house**
1833	Henry and Margaret Kneeland	Charles Kneeland			**Jennet McDonald, boarding house**
1834	Church	Nicholas Slakor (lease expired)			McDonald not on property
1835	John Jacob Astor	John Limberger	John Limber		
1835	Ogden Haggerty and Elizabeth S. Kneeland	Charles Kneeland			
1835	Henry Kneeland	Charles Kneeland			
1840			Charles Kneeland	Unable to find residents	
1843-1844					**Samuel Conlon, fruiterer, 39** and 74 **Vesey,** grocer, 41 Vesey
1845			Charles Kneeland, **Samuel Conlan**		**Samuel Conlan, grocer**
1846-1847					**Samuel Wilson Conlan, grocer, 39 Vesey, h. 39 Vesey**
1850			Charles Kneeland	**Patrick Rohan, 53, grocery, wife; James Rohan, laborer, unrelated female; Henry Sparks, 50, baker, 2 female family members, unrelated female; 3 other males, all bakers**	
1851	Various Kneeland heirs	Benjamin M. Whitlock			**Patrick Rohen, porter house; Henry Sparkes, baker**
1855			John Jagger		
1904		1805 lease expired			

Block 85, Lot 17 (Lots 39 and 40 of Trinity Church Farm; 31-33 Vesey through the mid-1810s, then 35-37 Vesey afterwards)

Year	Grantor	Grantee	Tax	Census	Directory
1705		Church			
1750	Church	Godfrey Wall, "gardner" (21-yr lease)			
1771		1750 lease expired			
1771	Church	Nicholas Slakor (63-yr lease)			
1782	Church	Philip Linzie (lease) (east half only)			
1786	Church	Samuel Holloway (21-yr lease) (west half only), John V. Blarcum (21-yr lease) (east half only)			
1787	Corporation of Trinity Church	Hubert Van Wagenen, Vestryman 1787-1806 (40R) (sold at A.L. Bleeker auction) (west half only), James Quackenbush (sold at A.L. Bleeker auction) (east half only)			
1790				Unable to find residents	
1792	Samuel Quackenbush, shopkeeper Leah, his wife	Christian Bourdett, blacksmith (west half only)			Richard Moore not listed[10]
1793					**Richard Moore, cooper**
1794	James Renwick, James Nicholson, John Murray, Jr., James Watson, Matthew Clarkson, Henry Ten Broeck, Jacob Hallett, William W. Gilbert, Nicholas Cruger	Hubert Van Wagonen, Gentleman, Vestryman 1787-1806 (west half only) (21-year lease)			**Richard Moore, cooper**
1794	Church	John Torbune (lease) (east half only)			
1794	Church	John Vanderhoof (lease) (east half only)			

[10] A "manufactory" is listed for Lots 15, 16, and the west half of 17 in 1792, and Richard Moore is listed as a tenant on the west half of Lot 17 (Survey of Streets 1780-1800, Folders 20, 21).

Year	Grantor	Grantee	Tax	Census	Directory
1795	James and Rachel McIntosh	John Greenwood			**Richard Moore, cooper**
1796	Church	John Griswold (10-yr lease)			
1797					**Richard Moore, cooper**
1798					**Richard Moore, cooper**
1799					**Richard Moore, cooper**
1800	Christian and Closhey Bourdett	Richard Moore		**Barvit Viesse (1 white male, 2 white females, 1 slave); Richard Moore (4 white males, 3 white females, 1 slave)**	**Richard Moore, cooper; Benoit Viensse, paper ruler**
1801					**Benoit Vieusse, paper ruler;** Richard Moore not listed on property
1802	Richard and Catharine Moore	Richard Riker and Roger Strong			
1803	Richard Riker, Roger Strong, and Richard Moore	David Grim, Samuel Mansfield and Walter Bowne			
1805	Church	Trinity Church endowed Grace Church. Grace leased out lot and used the rent (lease)			No Vieusse or Roberts on property
1805	Church	Lem Wells (99-yr lease)			
1805	David Grim, Samuel Mansfield and Walter Bowne of the New York Bread Company	Frederick DePeyster and Philip Grim			
1806		1796 lease expired			
1807		1786 lease expired	Frederick DePeyster, James Bruen		
1808	Philip and Elizabeth Grim	Frederick DePeyster	Frederick Depajster **(store)**, Mrs. Inglish		John Roberts not on property
1809	Frederick and Ann DePeyster	Thomas and Wilkinson Satterthwaite	Thomas Satterthwaite **(storehouse), John Roberts**		
1810			Thomas Sutterthwaite **(storehouse), John Roberts**	**John Roberts (1 white male, 1 white female)**	**John Roberts;** Satterthwaite and Depeyster not on property

Year	Grantor	Grantee	Tax	Census	Directory
1811	Thomas and Catharine Satterthwaite	George Bibby			
1812	Ben Ledyard (Master in Chancery), Thomas Satterthwaite et al., defendants	Frederick DePayster	Thos. W. Saterthwait (**store**), Stephen Thorn, **William Williams, Mr. Claude**		**Frederick Depeyster; G. Van Buskirk**
1813			Thomas Sutterthwaite (**storehouse**), **John Brown, George Brown, Christopher Wolfe, John Gesner, Samuel Rockwell, Mr. Hood**		Satterthwaite and Depeyster not on property
1814	David Grim, Samuel Mansfield and Walter Bowne of the New York Bread Company	Stephen Thorne, Jr.			**Augustus Cortilli**
1815	Frederick and Ann DePeyster	James Farquhar	Frederick Depeyster, Stephen Thorn, **Doctor Cortilli**		**Augustus Cortilli;** Satterthwaite and Depeyster not on property
1816	Stephen Thorne, Jr.	Hannah Gerardt		**Augustus Cortilli, 40, physician (3 white males, 2 white females)**	**Augustus Cortilli**
1817			Jas. Farquar (**store**), **Newton Platt**		**James Farquhar and Sons, wine merchant**
1818			Jas. Farquar and Son (**store**), **Newton Platt**		
1819			Jas. Farquhar and Son (**store**), Mrs. Gerard, **Alex. McKay**		
1820			James Farquhar and Son (**storehouse**), Wm. Hammell, **John Cos**	**Mary Coe (2 white males, 4 white females)**	**James Farquhar, wine merchant,** home 34 Fourth; **Widow Mary Coe**
1822	Hannah Geraerdt	William Ovington	James Farquhar and Son (**store**), Wm. Ovington		
1823			James Farquhar and Son, Wm. Ovington, **Andrew Mitchell**		

Year	Grantor	Grantee	Tax	Census	Directory
1824			James Farquhar and Son, Wm. Ovington, **Andrew Mitchell**		**Farquhar and Sons, wine merchants**
1825			James Farquhar and Son (**store**), **Alex. Welsh, chairmaker**		**Farquhar and Sons, wine merchants; Alex. Welsh, chair maker,** 33 John, **h. 37 Vesey**
1826			James Farquhar and Son, **Alex. Welsh**		**Farquhar and Sons, wine merchants; Alex. Welsh, chair maker,** 33 John, **h. 37 Vesey**
1827			Estate of James Farquhar, Willam Ovington, **Jeremiah Kershaw**		**Farquhar and Sons, wine merchants;** Welsh and Kershaw not on property
1828-1829					**Farquhar and Sons, wine merchants;** Kershaw and Miller not on property
1830	William Ovington	John Jacob Astor	Estate of James Farquhar, Willam Ovington	**Mrs. Miller (9 white males, 7 white females); Mrs. Dancy (9 white males, 5 white females)**	**Farquhar and Sons, wine merchants; Isaac Miller, portrait painter**
1831	James and Elizabeth Farquhar	Henry Kneeland (trust deed)	Estate of James Farquhar, William Ovington		**Farquhar and Sons, wine merchants**
1832					**Farquhar and Sons, wine merchants**
1833	Henry and Margaret Kneeland	Charles Kneeland			Farquhar no longer listed on property
1834	Church	Nicholas Slakor lease expired			
1835	John Jacob Astor	John Limberger	William B. Astor, John Limber		
1835	Ogden Haggerty and Elizabeth S. Kneeland	Charles Kneeland			
1835	Henry Kneeland	Charles Kneeland			
1837					**Nathaniel Paulding, 35 Vesey**

Year	Grantor	Grantee	Tax	Census	Directory
1839	Executors of John Limberger	Charles Kneeland			**Nathaniel Paulding, 35 Vesey**
1840			Nathaniel Paulding, Charles Kneeland	Unable to find residents	**Nathaniel Paulding, 35 Vesey**
1843					**Patrick Hogan, liquors, 37 Vesey**
1845			Nathaniel Paulding, Charles Kneeland		**Nathaniel Paulding, 35 Vesey; Patrick Hogan, liquors, 37 Vesey**
1847			**Patrick Hogan**		**Nathaniel Paulding, 35 Vesey; Patrick Hogan, liquors, 37 Vesey**
1848					**Nathaniel Paulding, 35 Vesey; Patrick Hogan, liquors, 37 Vesey**
1850			Charles Kneeland, **Patrick Hogan**	Unable to find residents	**Patrick Hogan, liquors, 37 Vesey;** Paulding not on property
1851	Various Kneeland heirs	Benjamin M. Whitlock			**Samuel Westcott, brewer; R. Hazard, agent; A.T. Van Liew, grocer; Patrick Hogan, grocer; Samuel Bennett, agent; James Cumberland, waiter; James Sullivan**
1852-1853					**Patrick Hogan, grocer**
1855			L. and V. Kirby		Hogan no longer on property
1904		1805 lease expired			

Block 85, Lot 18 [the western portion is now part of modern Lot 17] (portions of Lot 38 of Trinity Church Farm; 29 Vesey through the mid-1810s, then 31 Vesey afterwards)

Year	Grantor	Grantee	Tax	Census	Directory
1705		Church			
1750	Church	George Young, silversmith Gardner (21-yr lease)			
1771	Church	Nicholas Slakor (63-yr lease)			
1787	Church	"Sold not accounted for"			
1788	Church	Samuel Holmes (21-yr lease)			
1790				Unable to find residents	
1794	Church	Rob Perin (lease)			
1795	James and Rachel McIntosh	John Greenwood			**John Halliday, tailor**
1796	Church	Joseph Griswold (10-yr lease)			**Widow Catherine Holhaday**
1800				**Catherine Holladay (5 white females)**	
1802	Joshua and Margaret Jones	John Greenwood			
1805	Church	Grace Church (lease)			
1807			**A. Marthy Doret**		
1810			Alex. McKenzie, **Mr. Bogle**; John Vreeland, **Wm. Clapp, Thomas Hood**	**Lewis Float (1 white male, 1 white female); Thomas Hood (1 white male, 2 white females)**	
1812			**John Adcock**		**Alex. McKensie, Chaplain widow; Benj. Elsden; James Trivett**
1813			**Francis Bamulton(?), Peter Garrison**		
1815			**Anthony Hill**		
1816				**Anthony Hill, 42, shoe maker (8 white males, 3 white females)**	
1817			John Greenwood		
1818			John Greenwood, **Benjamin Elsden**		
1819			**Mary Anderson**		

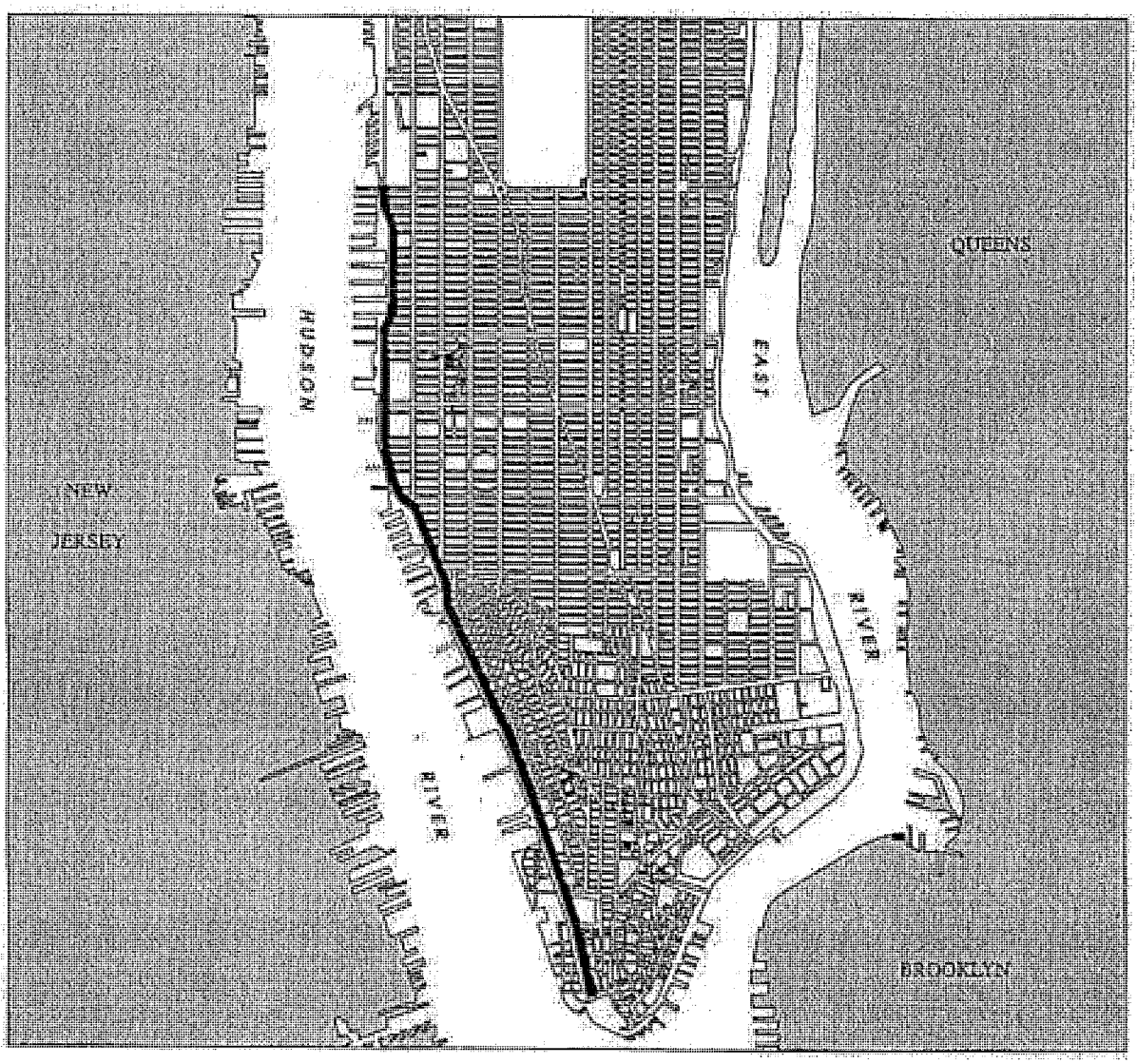
Year	Grantor	Grantee	Tax	Census	Directory
1820			None listed	Unable to find residents	Benj. Elsden, 31 Vesey; Mary Anderson, widow, washerwoman, 33 Vesey
1822			Estate of Jno. Greenwood, **Elias Shipman**		
1823			Estate of Jno. Greenwood		
1824			Estate of Jno. Greenwood		
1825			Isaac Greenwood		Greenwood not on property
1826			Isaac Greenwood		
1827			Isaac Greenwood		
1828-1829					Greenwood not on property
1830			Isaac Greenwood	**Daniel Hogan (1 white male, 3 white females); Mrs. Hassoad (6 white males, 3 white females); Mr. Barry (6 white males, 2 white females); Mr. August (2 white males, 4 white females); Jas. Smith (2 white males, 3 white females, 1 free black female); Henry Monfontaine (3 white males, 9 white females, 1 free black male); Mrs. Williamson (6 white males, 6 white males, 1 free black male, 2 free black females); William Cairns (6 white males, 7 white females); Clarke Greenwood (3 white males, 9 white females)**	**Isaac and Clarke Greenwood, dentists**
1831			Isaac Greenwood		Greenwood not on property
1832-1833					Greenwood not on property
1834	Church	Nicholas Skalor (lease expiration)			
1835			Isaac Greenwood		Greenwood not on property
1840			Isaac Greenwood	Unable to find residents	
1845	William Jones, Sheriff, interest of John S. Brown	John Brown	Isaac Greenwood		**Margaret Henderson, grocer, 31 Vesey**
1850			Isaac Greenwood	Unable to find residents	

Year	Grantor	Grantee	Tax	Census	Directory
1851					**John Higham, porter house; G.B. Louck, exchange; Elihu Ayers, oysters**
1852	Isaac Greenwood, et al.	Abel Thompson (lease)			
1855			Able Thompson		Thompson, Higham, Louck, Ayers not on property

Appendix B-5: **Route 9A Reconstruction Project: Cultural Resources Summary Report**

ROUTE 9A

RECONSTRUCTION PROJECT



CULTURAL RESOURCES SUMMARY REPORT

April 1996

ROUTE 9A
RECONSTRUCTION PROJECT

CULTURAL RESOURCES
SUMMARY REPORT

April 1996

Prepared By:

Vollmer Associates LLP

and

Allee King Rosen & Fleming,Inc.

Prepared For:

New York State Department of Transportation

and

Federal Highway Administration

U.S. Department of Transportation

VOLLMER ASSOCIATES LLP
50 West 23rd Street • New York, New York 10010 • (212) 366-5600 FAX 366-5629

Bechtel Infrastructure Corporation

INTRODUCTION

This report on Cultural Resources for the Route 9A Reconstruction Project is prepared pursuant to the Programmatic Agreement (Attachment A) among the Federal Highway Administration (FHWA), the New York State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation (ACHP), which was signed in March of 1994 and stipulated that the New York State Department of Transportation (NYSDOT) would provide an annual report on activities carried out under this agreement to ACHP, SHPO, and the New York City Landmarks Preservation Commission (LPC). All the reports referenced in this document have been submitted to SHPO for review and approval, and to LPC for information.

The organization of this report follows the stipulations of the Programmatic Agreement. Archeological resources are discussed first. Next, historic properties/structures in the Route 9A Corridor are discussed, followed by historic properties/structures in the Inland Study Area. The status of roadway design is described in the final section.

I. ARCHEOLOGICAL RESOURCES

A. CONTEXTUAL STUDIES

The archeological investigation followed a process developed by FHWA and NYSDOT in consultation with SHPO (letter from Julia Stokes, February 12, 1991; FEIS, p. 6-3). The process identified all potential sites, provided a methodology to focus on those sites with archeological visibility, evaluated effects and disturbance, and determined through fieldwork those eligible and extant sites where effects might be expected. It consisted of the following steps: 1) inventory of known sites; 2) historic context development (contextual studies); 3) agency review of contextual studies and recommendation of sites warranting further consideration; 4)evaluation of impacts (sites within ROW); 5) evaluation of disturbance (site-specific research); 6) agency review of disturbance assessment; 7) stage II evaluation; 8) determinations of eligibility; 9) review of mitigation plan; and 10) mitigation

The inventory identified 506 potential archeological sites* that were documented in a five-volume Archeological Assessment Report and in a Paleo Environmental Study. Identified resources were then grouped into 13 contextual categories as follows:

- Prehistoric Sites (14 sites)
- Dwellings and Tenements (6 sites)
- Energy (38 sites)
- Meat Market (23 sites)

---

* In this instance, the term "site" is used to refer to an architectural footprint as well as its traditional archeological sense. As shown in the list of contextual categories, 81 of the "sites" are unassociated structures.

- Offices and Warehouses (8 sites)
- Land Transportation (17 sites)
- Unassociated Structures (81 sites)
- Lumber and Building Materials (40 sites)
- Manufacturing (27 sites)
- Services (6 sites)
- Piers, Wharves, and Pier Sheds (232 sites)
- Landfill Devices and Sunken Ships (10 sites), and
- 17th Century Foundations and Fortifications (4 sites*)

Each of the contextual studies assessed potential archeological visibility and research value for the sites in that category.

B. REVIEW AND RESULTS OF CONTEXTUAL STUDIES

SHPO reviewed and evaluated all the contextual studies and recommended that sites in six contextual categories required further consideration, if they were to be affected by the Preferred Alternative. When the Preferred Alternative was selected, sites outside the project's area of potential effect (APE) were then eliminated. The remaining sites were evaluated for disturbance and further consideration of archeological visibility and research potential. The results, by category, are summarized below (and shown in detail in Attachment B):

- 14 Prehistoric Sites (13 sites eliminated as outside APE; 1 site, the prehistoric cove, still under consideration;)
- 6 Dwellings and Tenements (5 sites eliminated, SHPO letter 8/12/92; 1 site, Mott House, still under consideration)
- 38 Energy (33 sites eliminated by SHPO 8/31/95; 4 sites eliminated, SHPO letters 8/12/92 and 6/18/93; 1 site, coal conveyor tunnel, still under consideration)
- 23 Meat Market (20 sites eliminated by SHPO 8/12/92; 1 eliminated by SHPO 6/18/93; 2 eliminated by SHPO 8/31/95)
- 8 Offices and Warehouses (8 sites eliminated by SHPO 8/12/92)
- 17 Land Transportation (17 sites eliminated by SHPO 8/12/92)
- 81 Unassociated Structures (81 sites eliminated by SHPO 6/18/93)
- 40 Lumber and Building Materials (29 sites eliminated by SHPO 4/24/91; 4 eliminated as out of APE; 7 sites eliminated by SHPO 8/31/95)
- 27 Manufacturing (3 sites eliminated by SHPO 2/19/93; 4 sites eliminated by SHPO 8/10/93; 1 site eliminated as out of APE; 18 sites eliminated by SHPO 8/31/95; 1 site, Bloomingdale Flint Glass Works, still under consideration);
- 6 Services (6 sites eliminated by SHPO 8/12/92)
- 232 Piers, Wharves, and Pier Sheds (231 sites eliminated by SHPO 8/12/92; 1 site eliminated as out of APE)
- 10 Landfill Devices and Sunken Ships (10 sites eliminated by SHPO 8/12/92), and
- 4 17th Century Foundations and Fortifications (4 sites eliminated as out of APE).

---

* The FEIS listed six sites in this category, two of which were actually included in other categories: one in dwellings and tenements, and one in the pier, wharves, and piersheds.

Four sites that remain for continued evaluation of State and National Register eligibility are as follows:

- Site 135: Mott House: Additional research on the Mott House site suggests that construction activity associated with DeWitt Clinton Park, West 54th Street, and Miller Highway have totally destroyed the site and associated archeological deposits. Therefore, no Stage II archaeological investigations are recommended.
- Site 127: Prehistoric Cove: Soil borings show extensive layers of fill and disturbed soil beneath the surface. The possibility of encountering potentially significant resources is minimal. Therefore, no Stage II archeological investigations are recommended.
- Site 128: Bloomingdale Flint Glass Works: Soil borings show extensive layers of fill and disturbed soil beneath the surface. The possibility of encountering potentially significant resources is minimal. Therefore, no Stage II archeological investigations are recommended.
- Site 490: Coal conveyor tunnel: The coal conveyor tunnel was constructed in 1901 and used to transfer coal to the IRT Company (subsequently Con Edison) power plant until conversion to fuel oil in the 1960's. Although integral to supplying coal to the power house, the extant conveyor tunnel is simply a concrete shell filled with clean sand. All of the conveyor mechanisms have been removed, thus reducing its research potential for the study of coal-powered energy generation. The tunnel is well-documented and drawings exist that detail its form. Further study would not contribute to our understanding of the past technology. Therefore, no Stage II archaeological investigations are recommended. Further, the Route 9A project would not demolish or destroy the tunnel. However, a portion of it may be reused and possibly altered if the project reroutes fuel transfer lines to the Con Edison power plant.

Reports on these four potential sites are expected to be submitted to SHPO for review in spring 1996.

C. FIELD TESTING OF ASSUMPTIONS

The Programmatic Agreement (I.B.2.a., p.3) specifies that FHWA and DOT, based on the comments received from SHPO, determine the need, if any, to verify the assumptions made in the study. When the Programmatic Agreement was written, research investigations were ongoing and the extent of the available documentation for sites that might be of interest was not yet known. Also, the Preferred Alternative had not been selected. FHWA and NYSDOT have now determined that field testing to verify assumptions is not necessary based on results of the total research effort, documented prior disturbance, and the limited effects of the Preferred Alternative.

EXTENT OF DOCUMENTATION

Due to the difficulties of field testing in a heavily traveled roadway in New York City, FHWA and NYSDOT, in consultation with SHPO, agreed—early in the project planning and environmental analysis—to focus their efforts on extensive documentary research. The intent was to define potential resources and their exact physical locations as clearly as possible. In the ensuing years, further documentary research was undertaken to assess research potential, archeological visibility, and site disturbance.

The voluminous amount of documentation that was obtained and taken into consideration has, in part, led to the conclusion that field verification is not necessary. The nature and extent of documentary evidence that the Route 9A Project has accumulated imparts a high level of confidence to this conclusion. This research approach of undertaking more detailed documentation

has been used in New York City with positive results. Further, the level of documentation performed exceeds what is often required for urban sites across the country in order to eliminate the need for field investigation.

The documentary research efforts for the Route 9A project were undertaken using archives and other sources not usually considered or contacted, such as the U.S. Patent Office, the Corning Glass Museum, archives and employees of the Con Edison Company, the Earth Sciences Information Center of the U.S. Geological Survey, employees of Public Service of New Jersey, auction notes from the sales of the Commissioner of Docks, the archives of the Department of Ports and Trades, and the Avery Library and Butler Rare Book Collection at Columbia University. This has yielded extensive data not usually considered. For commercial sites, for example, company archives and papers provided information on the daily operation, eventual physical dismantling of these industries, and the sale of company properties, all of which affected archeological visibility and research potential.

DOCUMENTED PRIOR DISTURBANCE

Because the project is a major transportation corridor, it has been the site of major public works projects over the past century and a half. With this number of public works projects, much of the roadway has been disturbed, and this disturbance has been documented in the archives (including construction specifications, reports, and photographs) of government agencies.

SELECTION OF LEAST IMPACT ALTERNATIVE

The Preferred Alternative that was selected and described in the FEIS involves the least amount of construction and excavation of all the alternatives considered. It is at-grade, with no depressed roadway sections or elevated roadways. Its footprint is quite similar to the existing roadway. The project is a reconstruction, with major changes to the existing footprint occurring only in one location—the area of 23rd and 24th Streets and Thomas F. Smith Park (see Figure 1).

II. HISTORIC PROPERTIES/STRUCTURES—WITHIN THE ROUTE 9A CORRIDOR

The Programmatic Agreement stipulated that NYSDOT and FHWA, in consultation with SHPO, would determine the effects of the project on the 39 historic resources identified along the Route 9A Corridor (see Attachment C). The determination of effect was to consider visual changes, vibrations (both traffic-induced vibrations and vibrations due construction activities), access changes, noise effects, air quality, and traffic-related changes (direction of flow, level of service, National Highway System classification).

On August 10, 1994, representatives of FHWA and NYSDOT met with David Gillespie, Director of the Historic Preservation Field Services Bureau of SHPO, in the NYSDOT offices in Albany, New York. A set of Technical Drawings for the No Build Condition and the Preferred Alternative, which identified historic resources and technical analysis materials for each of the types of potential effects, were presented for SHPO review.

The consultation process continued with a field trip and meeting held on October 13, 1994, with representatives of SHPO, LPC, NYSDOT, and FHWA. The field trip included the resources along the corridor. A matrix assessing each potential type of impact for all of the 39 historic resources was presented, along with documentation for each technical analysis.

Subsequent to that meeting, SHPO (letter from David Gillespie, November 4, 1994) identified the remaining concerns. SHPO agreed that vibration levels would be monitored during construction, and that no preconstruction remedial action would be necessary. At that time, SHPO requested detailed landscape plans at the following locations along the Route 9A Corridor: Battery Park and Pier A; Piers 57, 60, and 61; USS *Intrepid*, USS *Edson*, and the Starrett Lehigh Building. The letter also noted that Battery Park had not been evaluated. NYSDOT submitted to SHPO additional material addressing these issues (letter from Robert Ronayne, February 4, 1995; letter from Robert Ronayne, March 17, 1995; and letter from Douglas Currey, August 4, 1995).

On September 6, 1995, SHPO wrote (letter from Robert D. Kuhn) that no further design consultation was necessary for the Westbeth Building, the American Seaman's Friend Society Building, and Piers 57, 60, and 61. However, SHPO requested further consultation on the proposed landscape treatments/design plans at the Starrett-Lehigh Building, the USS *Intrepid* and USS *Edson*. NYSDOT will consult with SHPO as those designs are developed, beginning in the fall of 1996.

SHPO has not responded regarding Battery Park. FHWA and NYSDOT understand this to mean that SHPO agrees that additional inventory or review of Battery Park for National Register eligibility is unwarranted.

In regard to construction vibrations along the corridor, the Route 9A Reconstruction Project's plan to address any potential impacts consists of first selecting construction methods that minimize the potential to transmit vibrations; second, providing field instrumentation to monitor historic resources along the alignment during construction; and, if necessary, modifying construction procedures to avoid exceeding allowable vibration levels. This methodology has been used successfully in past NYSDOT projects. A *Special Note: Building Condition Survey and Vibration* has been included in the Contract Bid Documents.

III. HISTORIC PROPERTIES/STRUCTURES—WITHIN THE INLAND STUDY AREA

The Programmatic Agreement stipulated that FHWA and NYSDOT, in consultation with SHPO, would identify any areas of potential effect (APEs) and any Historic Districts in the Inland Area, and assess potential effects.

At the August 10, 1994, meeting, traffic analysis results were also presented for the Inland Study area. Links that were identified as candidates for APEs were identified on a table and shown on maps. The traffic analysis results for historic districts were also presented. At the field trip/meeting on October 13, 1994, all candidate APEs were visited and material was submitted describing the general character of the area along each of the identified links (including listed or designated historic properties/structures) ; and screening thresholds for traffic changes in historic districts (including consideration of neighborhood character and economic conditions).

Due to high concentrations of known and potential historic resources, SHPO subsequently recommended (letter from David Gillespie, November 4, 1994) the following locations for monitoring of traffic-related impacts after construction:

- Chambers Street in the TriBeCa South Historic District (between Broadway and West Broadway);
- West 21st Street/Tenth Avenue, the location of the Guardian Angels Church and adjacent to the Chelsea Historic District; and

- West 55th Street and West 54th Street adjacent to the Potamkin Building (at Eleventh Avenue).

NYSDOT has developed a traffic monitoring program that includes these locations. Baseline counts taken in November 1994 and November 1995 will be submitted to SHPO.

IV. STATUS OF ROADWAY DESIGN

Since September 1994, FHWA and NYSDOT have been engaged in developing final highway design plans. For design and construction purposes, the Corridor has been divided into seven segments from south to north (see Figure 2):

- Segment 1—State Street to Albany Street
- Segment 2—Albany Street to Harrison Street
- Segment 3—Harrison Street to Clarkson Street
- Segment 4—Clarkson Street to Horatio Street
- Segment 5—Horatio Street to 25th Street
- Segment 6—25th Street to 42nd Street
- Segment 7—42nd Street to 59th Street

Construction is to begin with Segment 4 in the spring of 1996. NYSDOT (letter from Douglas Currey, August 4, 1995) summarized the cultural resources findings for Segment 4 with regard to both archeological resources and historic structures.

A. ARCHEOLOGICAL RESOURCES

In terms of archeological resources, none of the four sites remaining for continued evaluation are in Segment 4.

B. HISTORIC PROPERTIES/STRUCTURES—WITHIN THE ROUTE 9A CORRIDOR

Two historic resources front the alignment in this segment of the Route 9A Corridor (see Figure 3): the Westbeth Building (a National Historic Landmark) and the American Seaman's Friend Society Building (State and National Register Eligible, 10/3/89). The SHPO letter of September 6, 1995, indicated only one remaining concern relevant to these properties: construction vibrations (discussed above under section III, "Historic Properties/Structures—Within the Inland Study Area").

C. HISTORIC PROPERTIES/STRUCTURES—WITHIN THE INLAND STUDY AREA

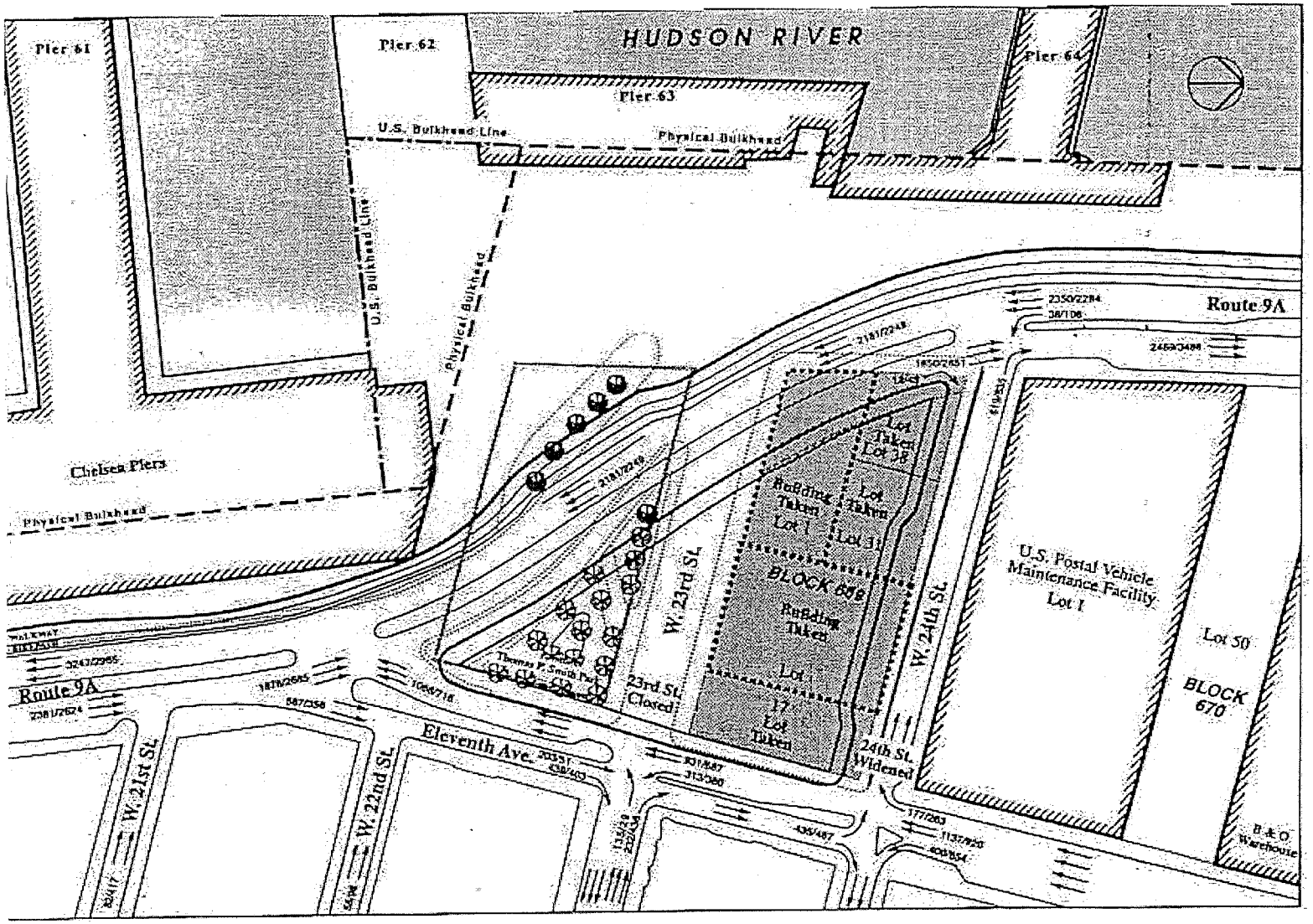
In the inland area (including historic districts), only one link in the Segment 4 area—Clarkson Street between West and Greenwich Streets—was identified as a candidate for further review with SHPO as a possible APE. It was visited during the field trip on October 13, 1994, and was described in the materials presented to SHPO on the same day. The SHPO letter of November 4, 1994, did not identify this link as one of the links requiring any additional consideration.

Legend

- *Building Footprint*
- *Building Taken/Lot Taken*
- *Lot Lines*
- *Existing Tree*
- *Removed Tree*
- *Limits of Park*
- *Existing Alignment and Park*
- *AM/PM Volumes*
- *Number of Lanes*

Preferred Alternative thru Thomas F. Smith Park

ROUTE 9A RECONSTRUCTION PROJECT



Figure

PROJECT AND SEGMENT LOCATIONS

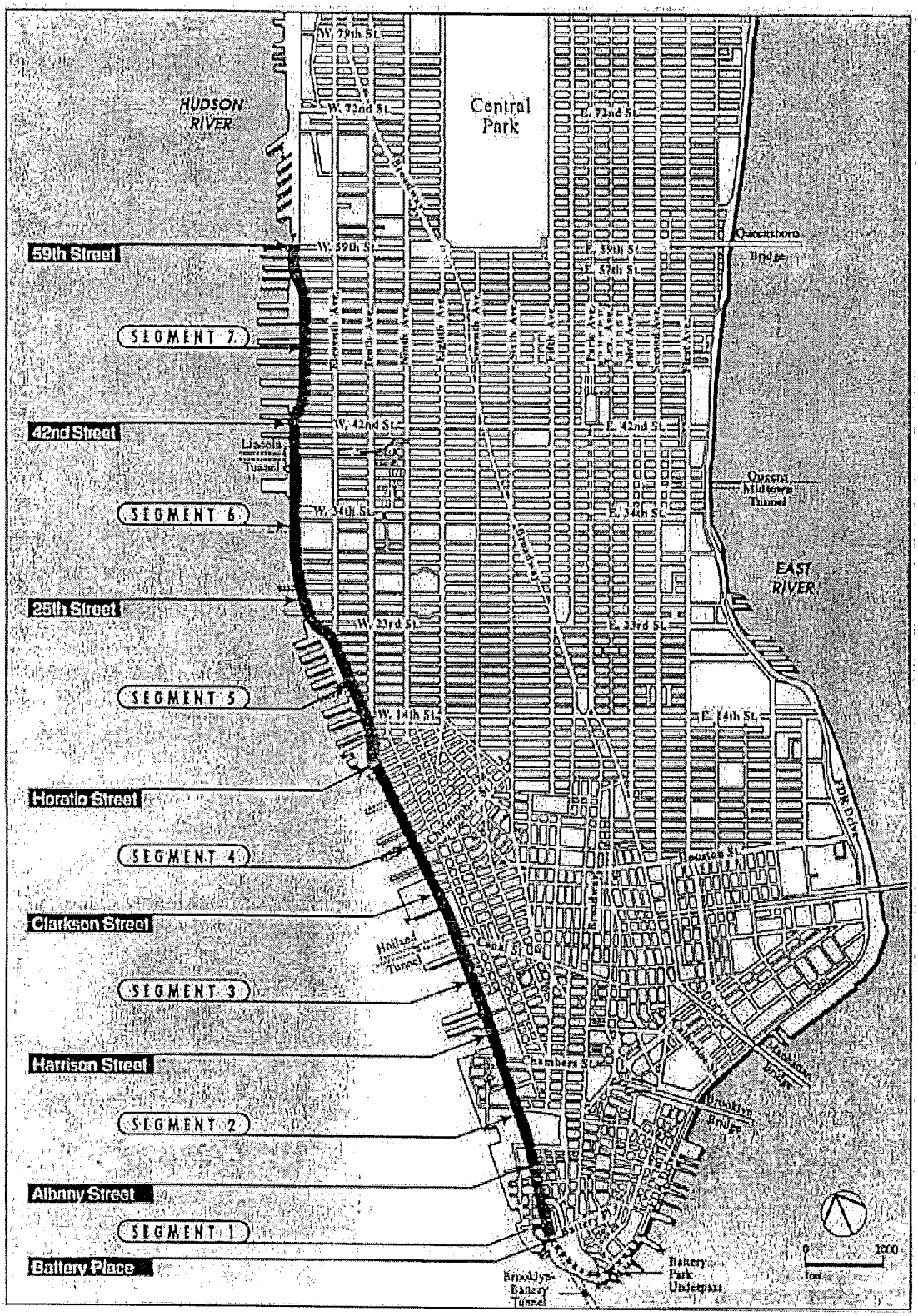
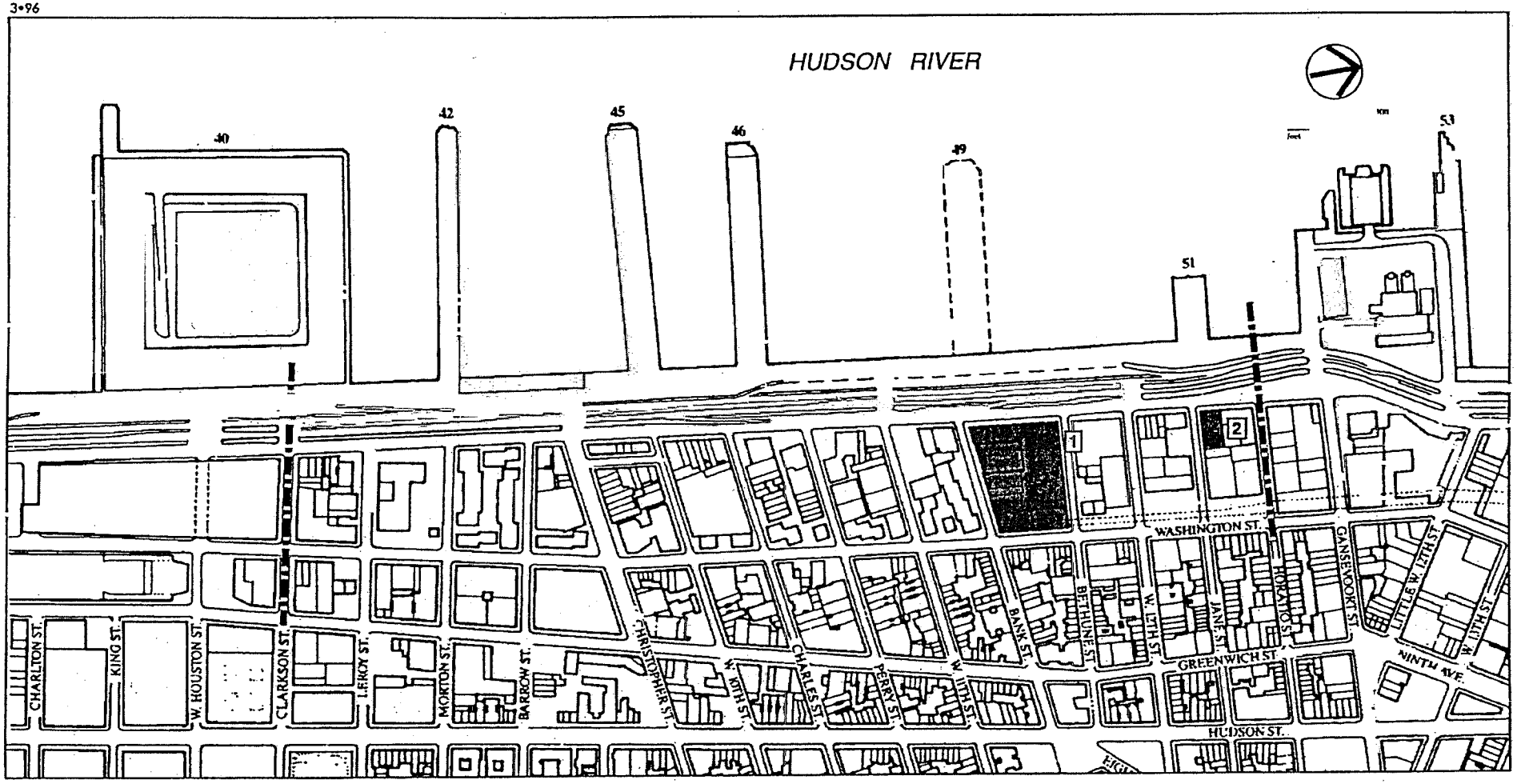


Figure 2

3•96



1 Westbeth Building - S/NR, NHL

2 American Seaman's Friend Society - S/NR eligible

ROUTE 9A RECONSTRUCTION PROJECT

Legend

Segment Boundary
(Segment 4 - Clarkson Street to Horatio Street)

Historic Properties/Structures Fronting the Alignment – Segment 4

Figure 3

Attachments

Attachment A Programmatic Agreement

Attachment B Matrix of Archeological Sites

Attachment C Historic Properties/Structures in the Route 9A Corridor (FEIS Table)

ATTACHMENT A

PROGRAMMATIC AGREEMENT

PROGRAMMATIC AGREEMENT
AMONG THE
FEDERAL HIGHWAY ADMINISTRATION,
THE
NEW YORK STATE HISTORIC PRESERVATION OFFICER,
AND THE
ADVISORY COUNCIL ON HISTORIC PRESERVATION,
REGARDING THE
RECONSTRUCTION OF ROUTE 9A
NEW YORK CITY, NEW YORK

WHEREAS, the Federal Highway Administration (FHWA) has determined that the Route 9A Reconstruction Project (Project) in New York City, New York may have an effect on properties/structures included in or eligible for inclusion in the National Register of Historic Places, and has consulted with the Advisory Council on Historic Preservation (Council) and the New York State Historic Preservation Officer (SHPO) pursuant to Sections 106 and 110(f) of the National Historic Preservation Act (16 U.S.C. 470f) and the Council's implementing regulations, "Protection of Historic Properties" (36 CFR Part 800); and

WHEREAS, the New York State Department of Transportation (DOT) has participated in the consultation and was invited to concur in this Programmatic Agreement;

WHEREAS, the FHWA, the SHPO and the Council agree that the undertaking shall be guided in principal by the methodologies outlined in the Draft Environmental Impact Statement (DEIS) / Supplemental DEIS (SDEIS) and Final Impact Statement (FEIS) for the project;

WHEREAS, the FHWA and DOT have agreed to provide all studies and other documentation to the New York City Landmarks Preservation Commission (LPC) for their information;

NOW, THEREFORE, FHWA, the SHPO and the Council agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of this Project on historic properties/structures.

STIPULATIONS

FHWA WILL ENSURE THAT THE FOLLOWING STIPULATIONS ARE IMPLEMENTED AS PART OF SUBSEQUENT PLANNING, DESIGN AND CONSTRUCTION OF THE SELECTED PROJECT ALTERNATIVE.

ARCHEOLOGICAL RESOURCES

Within the area of potential effect (APE) for archeological resources[1], a comprehensive program for the identification, evaluation, and treatment of archeological resources will be implemented in the manner set forth below.

A. Contextual Studies

To assess the large number of potential archeological sites that may exist within the APE and to refine predictions on locations of potential archeological sensitivity, FHWA and DOT will complete contextual studies for each of the following categories.

1. Prehistoric Sites.
2. Dwellings and Tenements.
3. Energy.
4. Meat Market.
5. Offices and Warehouses.
6. Land Transportation.
7. Unassociated Structures.
8. Lumber and Building Materials.
9. Manufacturing.
10. Services.
11. Piers and Wharves.
12. Landfill Devices and Sunken Ships.
13. 17th Century Fortifications and Foundations at Morris Street.

B. Review and Results of Contextual Studies

1. As the contextual studies for each category are completed, they will be provided to the SHPO for their review and comment.[2]

---

[1] The area of potential effect for archeological properties includes (1) the right-of-way; (2) streets intersecting Route 9A for a 50-foot distance east of the roadway; (3) at locations where construction may occur east of the roadway, e.g. between Battery Place and Joseph P. Ward Street, Chambers Street, between Canal and Spring Streets, between Gansevoort and 13th Streets, between 14th and 15th Streets, and Thomas F. Smith Park; (4) footprints at pedestrian over passes or other special features; and (5) construction staging areas outside of the areas listed in (1)-(4) above.

[2] In this instance and in all similar provisions provided for in this Agreement, unless otherwise noted, where comments are sought from the SHPO and/or LPC, it is understood that the party will be provided 30 days from the receipt of the request to submit comments. If no comments are submitted during this review period, it is understood that the party has no wish to comment and concurs with the recommendations or conclusions for which comments were sought. Extensions, totalling no more than 15 days, will be added to the 30-day review period in cases where timely requests are made for additional documentation deemed necessary to complete a review.

2. For each study, FHWA and DOT, based on comments received from the SHPO, will:

a. Determine the need, if any, to verify the assumptions made in the study. If the need for verification exists, an appropriate field testing methodology will be developed by FHWA and DOT in consultation with the SHPO (See Stipulation I.C. below).

b. Determine which presumed site locations do not require further consideration, Provided the SHPO agrees with these conclusions, such site locations need receive no further consideration under this Agreement.

c. Determine which presumed site locations do require further consideration. These site locations should be treated in accordance with Stipulation I.D. below.

If conclusions reached by FHWA and DOT are not consistent with comments and recommendations received from the SHPO, FHWA and DOT will consult to resolve the objection. If the objection cannot be resolved, the recommendations of the Council will be sought consistent with Stipulation V of this Agreement.

C. Field Testing Assumptions of Contextual Studies

In consultation with the SHPO, FHWA and DOT will develop and undertake a strategy for carrying out field testing. If the results of such field testing demonstrates that assumptions upon which predictions were made in the Contextual Studies are not valid, the Studies, as appropriate, will be revised in a manner acceptable to the SHPO.

The Council will be kept apprised of any such field testing that is carried out and its results and will be provided copies of field reports and any revised Contextual Studies.

D. Further Evaluation of Potential Sites

For those site locations determined to require further consideration pursuant to Stipulation I.B.2.c. and determined by FHWA and DOT, in consultation with the SHPO, to be subject to possible project impacts, field testing will be undertaken to determine site characteristics and the degree of site integrity and disturbance. This field evaluation and testing program will be carried out in consultation with the SHPO and at a level sufficient to be able to determine if sites meet the criteria for listing in the National Register of Historic Places (36 CFR Section 60.4). For each field tested site, FHWA and DOT, in consultation with the SHPO, will apply the National Register criteria and reach one of the following conclusions:

1. The site does not meet the National Register criteria; no further action is required.

2. The site does meet the National Register criteria, in which case the site will be treated in accordance with Stipulation I.E. below.

3. A dispute exists regarding whether the criteria are met, in which case the opinion of the Keeper of the National Register will be sought to resolve the disagreement, and the site treated in accordance with the Keeper's finding.

FHWA and DOT will notify the SHPO, and interested parties of conclusions regarding evaluation of all sites for National Register.

E. Data Recovery

For those sites determined to be eligible for inclusion in the National Register, FHWA and DOT, in consultation with the SHPO, shall develop and conduct a data recovery plan that is consistent with the Secretary of the Interior's Standards and Guidelines for Archeological Documentation(48 FR 44734-37) and the Council's Treatment of Archeological Properties and subsequent amendments (Advisory Council on Historic Preservation, 1980). The plan shall:

1. Be responsive to the relevant historic contextual study developed for this project;

2. Be designed to recover data sufficient to address significant research issues and to test assumptions set forth in the appropriate historic contextual study;

3. Provide adequate flexibility to allow for addressing unanticipated resource, site conditions, and alternative methods and scopes of work, as appropriate. The SHPO shall be kept apprised of any changes to the data recovery plan;

4. Include a process for consultation with the SHPO, LPC and interested parties, as appropriate, throughout the monitoring and data recovery phases; and,

5. Include a schedule of proposed data recovery efforts with reporting requirements.

6. In some cases, the data recovery plan may be implemented through a monitoring program during construction. The use of this method would be subject to approval by SHPO, DOT, and FHWA.

F. Professional Standards

DOT shall ensure that all archeology carried out pursuant to this Agreement is conducted by or under the direct supervision of a person or persons meeting at a minimum the Secretary of the Interior's Professional Qualifications Standards (48 FR 44138-9).

G. Curation

DOT shall develop and implement, in consultation with the SHPO and in accordance with 36 CFR Part 79, a plan for the analysis and curation of material and records from the archeological excavations are curated in accordance with 36 CFR Part 79.

H. Reports

DOT shall ensure that all final archeological reports resulting from the actions pursuant to this Agreement shall be provided to the SHPO, LPC and interested parties, and submission to the National Technical Information Service (NTIS). FHWA and DOT shall ensure that all such reports are responsive to contemporary professional standards, and to the Department of the Interior's Format Standards for Final Reports of Data Recovery Program (42 FR 5377-79).

I. Phasing of Construction Activities and Archeological Field Work

DOT will take all steps practical to ensure that needed archeological field analysis and data recovery can proceed in advance of construction activities. In establishing construction scheduling and staging, FHWA and DOT will fully consider, anticipate, and prepare for archeological work that must be undertaken. FHWA and DOT shall coordinate the site preparation in a manner

which allows maximum exposure of the areas to be tested at the earliest possible date. Further, FHWA and DOT will provide to the SHPO and LPC regularly scheduled status reports that will include notice about schedules, plans, and timing related to phasing archeological work with construction in order that the SHPO can better anticipate review requirements and thereby provide more timely advice.

II. HISTORIC PROPERTIES/STRUCTURES - WITHIN THE ROUTE 9A CORRIDOR

Within the area of potential effects for the Route 9A Corridor (APE) for historic properties/structures[3], a comprehensive program for assessment of effects and treatment of historic properties/structures will be implemented in the manner set forth below.

A. Analysis of Effects

In consultation with the SHPO, FHWA and DOT will determine if, there are any effects on the 39 historic properties/structures listed or determined eligible for listing in the National Register of Historic Places identified on Attachment A. Analysis of effects will be guided by the Criteria of Effect [36 CFR Section 800.9(a)]. A determination of effect will consider if there are physical takings, visual effects, vibrations resulting from construction and anticipated traffic increases, access changes, or noise impacts. These will be evaluated in light of those characteristics which make the properties/structures significant.

1. Findings of No Effect

If, after consultation with the SHPO; FHWA and DOT determines that there will be no effect to a property/structure, this finding will be documented and copies will be provided to the SHPO for review. Any objections and reasons therefore must be provided in writing within 30 days. Specific effects must be identified so that any possible mitigation measures can be considered and developed.

2. Findings of No Adverse Effect

If, after consultation with the SHPO; FHWA and DOT determines that there will be no adverse effect to a property/structure, this finding will be documented and copies will be provided to the SHPO for review. Should the SHPO object within 30 days, FHWA and DOT can either accept a finding of adverse effect for the property/structure or seek Council review pursuant to Stipulation V.

3. Findings of Adverse Effect

If, after consultation with the SHPO; FHWA and DOT determines that there will be adverse effects to a property/structure, FHWA and DOT will develop a treatment plan as set forth in Stipulation II.B.

---

[3]The area of potential effect for historic structures includes the roadway frontage for the selected alternative and those areas where pedestrian bridges will be located.

B. Treatment of Adverse Effects

1. Treatment Measures

If adverse effects to historic properties/structures are identified, FHWA and DOT will consider, depending on the nature of the effect and the significance of the property/structure, mitigation measures including, but not limited to, the following:

a. Avoidance of demolition or taking through project redesign,
b. Use of noise attenuation design features,
c. Landscaping to minimize visual impacts,
d. Monitoring of seismic impacts, with modifications in construction techniques if seismic impacts are detected,
e. Signalization and other traffic control measures to reduce traffic generated impacts,
f. Use of construction materials and design features that will improve visual compatibility with adjacent historic properties/structures,
g. Documentation of existing streetscapes and/or historic properties/structures.

2. Views of Interested Parties

In considering mitigation measures for treatment of adverse effects, FHWA and DOT will take fully into account the views of interested parties, in particular LPC and owners of affected historic properties /structures. A community liaison office will be kept open during design and construction to allow input from the general public. Depending on the level of public interest, FHWA and DOT will institute means to solicit and fully consider the views of the public in arriving at appropriate treatment measures.

3. Development of Treatment Plans

Giving full consideration to the views of the property owners, FHWA and DOT, in consultation with the SHPO, will develop a treatment plan for each historic property/structure adversely affected. The treatment plan will set forth the mitigation measures that will be undertaken and will contain evidence that it has been reviewed and approved by the SHPO. An informational copy of the treatment plan will be provided to the Council. FHWA and DOT will then implement the approved treatment plan.

4. If FHWA, DOT and the SHPO are unable to agree on a treatment plan for an historic property/structure adversely affected, FHWA will complete the steps set forth in Sections 800.5(e) - 800.6 of the Council's regulations to address adverse effects to the property /structure.

III. HISTORIC PROPERTIES/STRUCTURES - WITHIN THE INLAND STUDY AREA

Using traffic data and modeling, FHWA and DOT, in consultation with the SHPO, will identify possible areas, streets, and/or locations within the inland study area where traffic changes are expected to occur as a result of the selected alternative. In determining these areas, DOT will use a criteria, which includes, functional classification changes, congestion, above normal traffic variations, land use, expected noise level changes and level of service changes.

A. Determination of APEs

The above noted parameters will indicate areas that need to be examined to determine if they are areas of potential effect (APEs). These areas will be assessed by FHWA and DOT in consultation with the SHPO. This assessment, which will include onsite reviews, will arrive at one of the following conclusions:

1. No Further Study

The areas and expected traffic condition and effects indicate the areas identified are not APEs and no further study is warranted.

2. Historic District Areas

The areas identified are in a historic district and overall effects on the historic district need to be examined.

3. Areas of Potential Effect

The area and expected traffic conditions are such that an APE is evident. Further evaluation of the APE is warranted to determine if there is a high concentration of historic properties/structures. If there is a low concentration or no historic properties/structures in the APE, no further study is warranted.

4. Additional Study Needed

If the SHPO determine that preliminary evidence is inconclusive, FHWA and DOT will undertake additional studies of properties/structures in the identified area(s) in order that the SHPO can conclude with certainty that an area is of high of low concentration.

B. Analysis of Effect

For those determined APEs that contain a high concentration of historic properties/structures, FHWA and DOT, in consultation with the SHPO, will determine the nature and extent of effects.

1. Historic Districts

a. No Effect - The cumulative affects of the expected traffic conditions on the Historic Districts are negligible and no effect is expected.

b. No Adverse Effect - There are some perceptible changes in the expected traffic conditions, but no adverse effects to the Historic District are evident.

c. Adverse Effect - Specific adverse effects will result from expected traffic conditions that will affect the character and setting of the Historic District. Possible mitigation measures will follow those steps in Stipulation II.B..

2. APEs - High Concentration of Historic Properties/ Structures

a. No Adverse Effect - The effects of the expected traffic conditions are perceptible and evident, but no specific adverse effects are expected on the specific historic properties/structures.

b. Adverse Effect - Specific adverse effects will result from expected traffic conditions that will affect the character and setting of the historic properties/structures. Possible mitigation measures will follow those steps in Stipulation II.B..

3. Views of Interested Parties

In considering mitigation measures for treatment of adverse effects, FHWA and DOT will take fully into account the views of interested parties. For those sites, the steps in Stipulation II.B.2. will be followed.

IV. REPORTING

One year from the date this agreement is concluded, and every year thereafter until project completion, DOT will provide to the Council, the SHPO, and LPC a report on activities carried under this Agreement during the preceding year. At the time the report is submitted the signatories of the Agreement will review implementation of the Agreement and determine whether revisions are needed. If revisions are needed, the parties to this Agreement will consult in accordance with 36 CFR Part 800 to make such revisions.

V. DISPUTE RESOLUTION

Should the Council or the SHPO object within 30 days to any actions proposed pursuant to this agreement, DOT and FHWA shall consult with the objecting party to resolve the objection. If FHWA determines that the objection cannot be resolved, FHWA shall forward all documentation relevant to the dispute to the Council. Within 30 days after receipt of all pertinent documentation, the Council will either:

A. provide FHWA with recommendations, which FHWA will take into account in reaching a final decision regarding the dispute; or

B. notify FHWA that it will comment pursuant to 36 CFR Section 800.6(b), and proceed to comment. Any Council comment provided in response to such a request will taken into account by FHWA in accordance with 36 CFR Section 800.6(c)(2) with reference to the subject of the dispute.

Any recommendation or comment provided by the Council will be understood to pertain only to the subject of the dispute; FHWA's responsibility to carry out all actions under this agreement that are not the subjects of the dispute will remain unchanged.

EXECUTION AND IMPLEMENTATION OF THIS PROGRAMMATIC AGREEMENT EVIDENCES THAT FHWA HAS SATISFIED ITS SECTION 106 RESPONSIBILITIES FOR THE ROUTE 9A RECONSTRUCTION PROJECT.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____ Date: 3-23-94

FEDERAL HIGHWAY ADMINISTRATION

By: _____ Date: 3/15/94

NEW YORK STATE HISTORIC PRESERVATION OFFICER

By: _____ Date: 17 March '94

CONCUR:

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

By: _____ Date: 3/15/94

SEE NEXT SHEET FOR ADDED SIGNATURE IDENTIFICATION

Added After Signatures

Signature Identification

Signatories:

Robert W. Bush, Executive Director
Advisory Council on Historic Preservation

Gene K. Fong, Assistant Division Administrator
Federal Highway Administration

John Winthrop Aldrich, Deputy Commissioner for Historic Preservation
New York State Office of Parks, Recreation and Historic Preservation

Concurrence:

Robert J. Ronayne, Executive Director
Route 9A Reconstruction
New York State Department of Transportation

ATTACHMENT B

MATRIX OF ARCHEOLOGICAL SITES

ROUTE 9A RECONSTRUCTION PROJECT
MATRIX OF ARCHEOLOGICAL SITES

SITE INVENTORY					LOCATION		ELIMINATION FROM FURTHER CONSIDERATION DUE TO				FIELD TESTING
Item No. (1)	Site No.	Notes	Name	Contextual Report	Disturbance Report Generated	Segment	Street	Lack of Arch. Viability	Lack of Research Potential	Well Documented in the Literature	Out of APE (2)	Prior Disturbance	Final Recommendation
1	135.0		Mott House basement at West 54th St; in middle of St	Dwellings & Tenements	YES	7	54th					PENDING	PENDING
2	490.0		Coal conveyor tunnel	Energy	YES	7	58th/59th					PENDING	PENDING
3	328.0		Bloomingdale Flint Glass Works, on or adjacent to this block	Manufacturing	YES	7	46th/47th					PENDING	PENDING
4	137.0		Protected cave, minimal subsurface disturbances Prehistoric	Prehistoric	YES	7	West 46th St					PENDING	PENDING
5	1.0		Fort Amsterdam	17th C. Fortifications & Foundations	NO	1	Battery/State				OUT		NO
6	2.0		Well, Fort Amsterdam	17th C. Fortifications & Foundations	NO	1	Battery/State				OUT		NO
7	170.0		17th Century fortified stockade	17th C. Fortifications & Foundations	NO	1	Morris/Edgar				OUT		NO
8	171.0		Dutch stone foundations	17th C. Fortifications & Foundations	NO	1	Morris/Edgar				OUT		NO
9	172.0	(3)	Dwellings	Dwellings & Tenements	NO	1	Morris/Edgar				OUT		NO
10	234.0		Tenement	Dwellings & Tenements	NO	2	Park Pl/Murray	SHPO 8/12/92	SHPO 8/12/92				NO
11	237.0		Three Tenements	Dwellings & Tenements	NO	2	Park Pl/Murray	SHPO 8/12/92	SHPO 8/12/92				NO
12	238.0		Tenement	Dwellings & Tenements	NO	2	Park Pl/Murray	SHPO 8/12/92	SHPO 8/12/92				NO
13	400.0		Tenement	Dwellings & Tenements	NO	5	23rd/24th	SHPO 8/12/92	SHPO 8/12/92				NO
14	99.0		Coal house, Manhattan Gas Co.	Energy	YES	5	17th/18th					SHPO 8/31/95	NO
15	100.0		Retort house, Manhattan Gas Co.	Energy	YES	5	17th/18th					SHPO 8/31/95	NO
16	175.0		Building associated with coal yard	Energy	YES	5	14th/15th		SHPO 8/31/95				NO
17	347.0		Storage tanks, Manhattan Gas Co.	Energy	YES	5	16th/17th					SHPO 8/31/95	NO
18	348.0		Shed, Manhattan Gas Co.	Energy	NO	5	16th/17th		SHPO 8/12/92		Out		NO
19	349.0		Building, Manhattan Gas Co.	Energy	YES	5	16th/17th					SHPO 8/31/95	NO
20	351.0		Coal house, Manhattan Gas Co.	Energy	YES	5	17th/18th					SHPO 8/31/95	NO
21	352.0		Retort house, Manhattan Gas Co.	Energy	YES	5	17th/18th					SHPO 8/31/95	NO
22	353.0		Retort house, Manhattan Gas Co.	Energy	YES	5	17th/18th					SHPO 8/31/95	NO
23	357.0		Building- Manhattan Gas Co.	Energy	YES	5	12th/13th				Out	SHPO 8/31/95	NO
24	358.0		Shed- Consolidated Gas Co.	Energy	YES	5	12th/13th				Out	SHPO 8/31/95	NO
25	359.0		Two buildings- Manhattan Gas Co.	Energy	YES	5	18th/19th					SHPO 8/31/95	NO
26	360.0		Two story shed- Consolidated Gas Co.	Energy	YES	5	18th/19th					SHPO 8/31/95	NO
27	361.0		Shed- Consolidated Gas Co.	Energy	YES	5	18/19th					SHPO 8/31/95	NO
28	362.0		Two story shed- Consolidated Gas Co.	Energy	NO	5	18th/19th		SHPO 8/12/92		Out		NO
29	364.0		Building- Consolidated Gas Co.	Energy	YES	5	18/19th					SHPO 8/31/95	NO
30	365.0		Building- Consolidated Gas Co.	Energy	YES	5	18/19th					SHPO 8/31/95	NO
31	366.0		One story shed- Consolidated Gas Co.	Energy	YES	5	18/19th					SHPO 8/31/95	NO
32	367.0		Building- Consolidated Gas Co.	Energy	YES	5	18/19th					SHPO 8/31/95	NO
33	368.0		Three story building- Consolidated Gas Co.	Energy	YES	5	18/19th					SHPO 8/31/95	NO
34	369.0		Building- Consolidated Gas Co.	Energy	YES	5	18/19th					SHPO 8/31/95	NO
35	371.0		Building- Manhattan Gas Co.	Energy	YES	5	19th/20th				Out	SHPO 8/31/95	NO
36	373.0		Gas tank- Consolidated Gas Co.	Energy	YES	5	19th/20th					SHPO 8/31/95	NO
37	374.0		Building- Consolidated Gas Co.	Energy	YES	5	19th/20th					SHPO 8/31/95	NO
38	375.0		Building- Manhattan Gas Co.	Energy	YES	5	19th/20th					SHPO 8/31/95	NO
39	122.0		Brick building, Consolidated Gas Co.	Energy	YES	7	44th/45th					SHPO 8/31/95	NO
40	124.0		Brick building, Consolidated Gas Co.	Energy	YES	7	43rd/44th	SHPO 8/31/95	SHPO 8/31/95			SHPO 8/31/95	NO
41	125.0		Brick building, Consolidated Gas Co.	Energy	YES	7	45th/45th	SHPO 8/31/95	SHPO 8/31/95				NO
42	142.0		Brick buildings, Consolidated Gas Co.	Energy	YES	7	44th/45th					SHPO 8/31/95	NO
43	429.0		Building- Consolidated Gas Co.	Energy	YES	7	45th/46th					SHPO 8/31/95	NO

nel 03/27/9

ROUTE 9A RECONSTRUCTION PROJECT
MATRIX OF ARCHEOLOGICAL SITES

SITE INVENTORY					LOCATION		ELIMINATION FROM FURTHER CONSIDERATION DUE TO					FIELD TESTING
Item No. (1)	S/# No.	Notes	Name	Contextual Report	Disturbance Report Generated	Segment	Street	Lack of Arch. Viability	Lack of Research Potential	Was Documented in the Literature	Out of APE (2)	Prior Disturbance	Final Recommendation
44	430.0		Storage tanks, Consolidated Gas Co.	Energy	YES	7	45th/46th					SHPO 8/31/95	NO
45	431.0		Wood building, Consolidated Gas Co.	Energy	NO	7	45th/46th		SHPO 8/12/92		Out		NO
46	432.0		Building, Consolidated Gas Co.	Energy	YES	7	45th/46th					SHPO 8/31/95	NO
47	433.0		Two buildings-Consolidated Gas Co.	Energy	YES	7	45th/46th	SHPO 8/31/95					NO
48	434.0		Two gas storage tanks- Consolidated Gas Co.	Energy	YES	7	46th/46th					SHPO 8/31/95	NO
49	439.0		Wood shed- coal yard	Energy	YES	7	46th/47th	SHPO 8/31/95				SHPO 8/31/95	NO
50	471.0		Coal pockets in M.S.	Energy	NO	7	54th/55th		SHPO 8/12/92		Out		NO
51	80.0		Brick building, shop & dwelling, wagon builder, truckman	Land Transportation	NO	5	14th/15th		SHPO 8/12/92				NO
52	106.0		Building/freight yard	Land Transportation	NO	5	22nd/23rd	SHPO 8/12/92		SHPO 8/12/92			NO
53	107.0		Building/freight yard	Land Transportation	NO	5	22nd/23rd	SHPO 8/12/92		SHPO 8/12/92			NO
54	108.0		Car house	Land Transportation	NO	5	23rd/24th	SHPO 8/12/92	SHPO 8/12/92	SHPO 8/12/92			NO
55	314.0		Unloading platform	Land Transportation	NO	5	Little W. 12th	SHPO 8/12/92			Out		NO
56	381.0		Two buildings/freight yard	Land Transportation	NO	5	22nd/23rd	SHPO 8/12/92		SHPO 8/12/92			NO
57	382.0		Building/freight yard	Land Transportation	NO	5	22nd/23rd	SHPO 8/12/92		SHPO 8/12/92			NO
58	383.0		Building/freight yard	Land Transportation	NO	5	22nd/23rd	SHPO 8/12/92		SHPO 8/12/92			NO
59	384.0		Building/freight yard	Land Transportation	NO	5	22nd/23rd	SHPO 8/12/92		SHPO 8/12/92			NO
60	385.0		Building/freight yard	Land Transportation	NO	5	22nd/23rd	SHPO 8/12/92		SHPO 8/12/92			NO
61	424.0		Brick building/Stable, Depot & Traction Co.	Land Transportation	NO	5	42nd/43rd	SHPO 8/12/92	SHPO 8/12/92	SHPO 8/12/92			NO
62	433.0		Wood building/sales	Land Transportation	NO	7	51st/52nd		SHPO 8/12/92				NO
63	463.0		Motor Car Works	Land Transportation	NO	7	50th/51st		SHPO 8/12/92				NO
64	464.0		Garage	Land Transportation	NO	7	55th/56th		SHPO 8/12/92				NO
65	465.0		Service station	Land Transportation	NO	7	55th/56th		SHPO 8/12/92				NO
66	466.0		Republic Motor Sales Co. Service station	Land Transportation	NO	7	56th/57th		SHPO 8/12/92				NO
67	469.0		Three buildings in M.S./U.S. Army garage	Land Transportation	NO	7	57th/58th		SHPO 8/12/92				NO
68	5.0		Log cribbing	Landfill Devices & Sunken Ships	NO	1	Battery Pl/Greenwich	SHPO 8/12/92			Out		NO
69	165.0		Bulkhead/reliveing platform	Landfill Devices & Sunken Ships	NO	1	Battery Pl.	SHPO 8/12/92			Out		NO
70	14.0		Crib bulkhead	Landfill Devices & Sunken Ships	NO	2	Dey		SHPO 8/12/92				NO
71	19.0		Crib bulkhead (possible)	Landfill Devices & Sunken Ships	NO	2	Vesey		SHPO 8/12/92				NO
72	31.0		Sunken ship (possible)	Landfill Devices & Sunken Ships	NO	2	Warren/West	SHPO 8/12/92					NO
73	34.0		Sunken ship (possible), Chambers St wharf	Landfill Devices & Sunken Ships	NO	2	Chambers	SHPO 8/12/92					NO
74	49.0		Sunken ship (possible)	Landfill Devices & Sunken Ships	NO	3	Canal St	SHPO 8/12/92					NO
75	503.0		Fill retaining devices, possible	Landfill Devices & Sunken Ships	NO	3	Harrison/44th		SHPO 8/12/92				NO
76	156.0		Cast in place concrete bulkhead	Landfill Devices & Sunken Ships	NO	7	44th		SHPO 8/12/92				NO
77	167.0		Timber crib bulkhead	Landfill Devices & Sunken Ships	NO	7	58th/58th		SHPO 8/12/92				NO
78	63.0		Building associated with Lumber yard on southwest	Lumber	NO	4	Bank/Bethune		SHPO 4/24/91		Out		NO
79	65.0		Shed associated with Lumber yard on northwest	Lumber	NO	4	Bank/Bethune		SHPO 4/24/91				NO
80	166.0		Cosgraff's Lumber yard building	Lumber	NO	4	Bank/Bethune		SHPO 4/24/91		Out		NO
81	281.0		Kindling wood factory shed, Clark & Wilkins	Lumber	YES	4	11th/Bank					SHPO 8/31/95	NO
82	282.0		Kindling wood factory building, Clark & Wilkins	Lumber	YES	4	11th/Bank					SHPO 8/31/95	NO
83	285.0		Shed- Cosgraff's Lumber	Lumber	NO	4	Bank/Bethune		SHPO 4/24/91		Out		NO
84	287.0		Cosgraff's Lumber yard, 2 sheds	Lumber	NO	4	Bank/Bethune		SHPO 4/24/91				NO
85	300.0		Shed, Chapman Slate Co.	Lumber	YES	4	12th/Jane					SHPO 8/31/95	NO
86	71.0		Office building associated with Lumber yard on west part of lot	Lumber	NO	5	13th/14th		SHPO 4/24/91				NO

ROUTE 9A RECONSTRUCTION PROJECT
MATRIX OF ARCHEOLOGICAL SITES

SITE INVENTORY					LOCATION		ELIMINATION FROM FURTHER CONSIDERATION DUE TO					FIELD TESTING
Item No. (1)	Site No.	Notes	Name	Contextual Report	Disturbance Report Generated	Segment	Street	Lack of Arch. Viability	Lack of Research Potential	Was Documented in the Literature	Out of APE (2)	Prior Disturbance	Final Recommendation
87	73.0		Two story building associated with Lumber yard on north part of lot	Lumber	NO	5	13th/14th		SHPO 4/24/91				NO
88	74.0		Shed associated with Lumber yard west of previous building	Lumber	NO	5	13th/14th		SHPO 4/24/91				NO
89	75.0		Two buildings in Lumber yard	Lumber	NO	5	13th/14th		SHPO 4/24/91				NO
90	81.0		Shed of J.J. Carrol Lumber Co.	Lumber	NO	5	14th/15th		SHPO 4/24/91				NO
91	101.0		J.P. Ryan Moulding building	Lumber	NO	5	18th/19th				OUT		NO
92	109.0		Building of Rodgers & Son Lumber	Lumber	NO	5	23rd/24th		SHPO 4/24/91				NO
93	327.0		Building, Stewart's limestone yard	Lumber	NO	5	Little W.12th				OUT		NO
94	377.0		Building, J. Lynch Lumber yard	Lumber	NO	5	20th/21st		SHPO 4/24/91		Out		NO
95	378.0		Two buildings, J. Lynch Lumber yard	Lumber	NO	5	20th/21st		SHPO 4/24/91		Out		NO
96	379.0		Building, J. Lynch Lumber yard	Lumber	NO	5	20th/21st		SHPO 4/24/91		OUT		NO
97	380.0		Building, J. Lynch Lumber yard	Lumber	NO	5	20th/21st		SHPO 4/24/91				NO
98	382.0		Shed, Lumber yard	Lumber	NO	5	20th/21st		SHPO 4/24/91				NO
99	383.0		Building- Lumber yard	Lumber	NO	5	21st/22nd		SHPO 4/24/91				NO
100	384.0		Building- Lumber yard	Lumber	NO	5	21st/22nd		SHPO 4/24/91				NO
101	385.0		Building- Lumber yard	Lumber	NO	5	21st/22nd		SHPO 4/24/91				NO
102	386.0		Shed- Lumber yard	Lumber	NO	5	21st/22nd		SHPO 4/24/91				NO
103	387.0		Furniture factory & planing mill	Lumber	YES	5	21st/22nd					SHPO 8/31/95	NO
104	389.0		Building- Lumber yard	Lumber	NO	5	21st/22nd		SHPO 4/24/91				NO
105	390.0		Building- Lumber yard	Lumber	NO	5	21st/22nd		SHPO 4/24/91				NO
106	123.0		Nichols Saw Mill	Lumber	YES	7	44th/45th	SHPO 8/31/95					NO
107	132.0		Saw Mill/Scaffolding Co.	Lumber	NO	7	50th/51st				OUT		NO
108	441.0		Building materials building	Lumber	NO	7	46th/47th		SHPO 4/24/91				NO
109	442.0		Brick Supply Co. building	Lumber	NO	7	47th/48th		SHPO 4/24/91				NO
110	446.0		Brick Lumber yard building	Lumber	NO	7	47th/48th		SHPO 4/24/91				NO
111	447.0		Wood building/Lumber yard	Lumber	NO	7	47th/48th		SHPO 4/24/91				NO
112	450.0		Brick saw mill	Lumber	YES	7	47th/48th	SHPO 8/31/95	SHPO 8/31/95				NO
113	451.0		Planing mill complex buildings	Lumber	YES	7	48th/49th					SHPO 8/31/95	NO
114	141.0		Brick buildings- Lumber yard	Lumber	NO	7	49th/50th		SHPO 4/24/91				NO
115	452.0		Stone works building	Lumber	NO	7	49th/50th				OUT		NO
116	457.0		Colonial sand & Stone Co. building	Lumber	NO	7	50th/51st		SHPO 4/24/91				NO
117	476.0		Sicilian Asphalt Paving Co. building	Lumber	NO	7	54th/57th		SHPO 4/24/91				NO
118	64.0		Two buildings & two sheds housing a Salamander Works	Manufacturing	NO	4	Bank/Bethune		SHPO 8/31/95	SHPO 8/31/95	Out		NO
119	56.0		C. Brooks & Co. varnish factory, extensions	Manufacturing	YES	4	12th/June					SHPO 8/31/95	NO
120	286.0		J.R.O. Leonard Rolling Mill	Manufacturing	YES	4	Bank/Bethune					SHPO 8/31/95	NO
121	288.0		J. Leonard Buildings, rolling mill	Manufacturing	YES	4	Bank/Bethune					SHPO 8/31/95	NO
122	289.0		Building, rolling mill	Manufacturing	YES	4	Bank/Bethune					SHPO 8/31/95	NO
123	290.0		Building shed, rolling mill	Manufacturing	YES	4	Bank/Bethune					SHPO 8/31/95	NO
124	291.0		John Innes Rapid Iron Works, two buildings	Manufacturing	YES	4	Bank/Bethune					SHPO 8/31/95	NO
125	292.0		Building, rolling mill	Manufacturing	YES	4	Bank/Bethune					SHPO 8/31/95	NO
126	296.0		C. Brooks & Co. varnish factory	Manufacturing	YES	4	12th/June					SHPO 8/31/95	NO
127	307.0		Marchand & Co., chemical works	Manufacturing	YES	4	Janet/Iroquois					SHPO 8/31/95	NO
128	499.0		Building, New York Lead Works/Smelting Co.	Manufacturing	YES	4	Janet/Iroquois					SHPO 8/31/95	NO
129	84.0		Coopersage, British Johnson	Manufacturing	NO	6	15th/16th				OUT		NO

ROUTE 9A RECONSTRUCTION PROJECT
MATRIX OF ARCHEOLOGICAL SITES

SITE INVENTORY						LOCATION		ELIMINATION FROM FURTHER CONSIDERATION DUE TO					FIELD TESTING
Item No. (1)	Site No.	Name	Contextual Report	Disturbance Report Generated		Segment	Street	Lack of Arch. Viability	Lack of Research Potential	Well Documented in the Literature	Out of APE (2)	Prior Disturbance	Final Recommendation
130	110.0	Brick buildings, auto repair, glass studio, A&L Lumber	Manufacturing	YES		5	23rd/24th				Out	SHPO 8/31/95	NO
131	305.0	Tin works/wrought iron works building	Manufacturing	YES		5	Horatio/Ganesv.					SHPO 8/31/95	NO
132	316.0	Paint works building	Manufacturing	YES		5	Horatio/Ganesv.					SHPO 8/31/95	NO
133	370.0	Wm. D. Stewart & Co. Pottery/Manhattan pottery	Manufacturing	YES		5	18th/19th	SHPO 8/31/95				SHPO 8/31/95	NO
134	331.0	Building, box factory	Manufacturing	NO		5	20th/21st	SHPO 2/19/93					NO
135	119.0	Brick building of Pickers etc., Higgins Carpet Co.	Manufacturing	YES		7	43rd/44th	SHPO 8/31/95	SHPO 8/31/95			SHPO 8/31/95	NO
136	120.0	Storehouse, Higgins Carpet Co.	Manufacturing	YES		7	43rd/44th	SHPO 8/31/95	SHPO 8/31/95			SHPO 8/31/95	NO
137	121.0	Brick building, Higgins Carpet Co.	Manufacturing	YES		7	43rd/44th	SHPO 8/31/95	SHPO 8/31/95			SHPO 8/31/95	NO
138	130.0	Brick building, Malt House/hygeinic Ice Co.	Manufacturing	YES		7	49th/50th					SHPO 8/31/95	NO
139	134.0	Piano Factory/Soap Works	Manufacturing	NO		7	51st/52nd	SHPO 8/10/93		SHPO 8/10/93			NO
140	460.0	Piano factory building	Manufacturing	NO		7	49th/50th	SHPO 8/10/93		SHPO 8/10/93			NO
141	465.0	Cooperage	Manufacturing	NO		7	50th/51st	SHPO 2/19/93	SHPO 2/19/93				NO
142	470.0	Milton Piano Co. building	Manufacturing	NO		7	54th/55th	SHPO 8/10/93		SHPO 8/10/93			NO
143	480.0	Two story brick building/piano Co.	Manufacturing	NO		7	54th/55th	SHPO 8/10/93		SHPO 8/10/93			NO
144	82.0	Pump house/Meat Market	Meat Market	NO		5	Ganesv/Little W.12th	SHPO 8/12/92			Out		NO
145	83.0	Meat Processing Plant	Meat Market	NO		5	Little W.12th/13th	SHPO 8/12/92			Out		NO
146	85.0	Butchers shop building	Meat Market	NO		5	Little W.12th/13th	SHPO 8/12/92			Out		NO
147	86.0	Meat Market building	Meat Market	NO		5	Little W.12th	SHPO 8/12/92			Out		NO
148	87.0	Meat Market/dance hall building	Meat Market	NO		5	Little W.12th/13th	SHPO 8/12/92					NO
149	88.0	Meat storage building	Meat Market	NO		5	Little W.12th/13th	SHPO 8/12/92					NO
150	93.0	Brick cistern possibly associated with cow stables	Meat Market	NO		5	15th/16th	SHPO 8/12/92					NO
151	97.0	Cow stables on south ends of lots	Meat Market	NO		5	15th/16th	SHPO 8/12/92					NO
152	98.0	Cow stables on north ends of lots	Meat Market	NO		5	15th/16th	SHPO 8/12/92					NO
153	311.0	West Washington Market building	Meat Market	NO		5	Ganesv./Bogart	SHPO 8/12/92					NO
154	312.0	West Washington Market building	Meat Market	NO		5	Ganesv./Bloomfield	SHPO 8/12/92					NO
155	313.0	Meat Market building	Meat Market	NO		5	Little W.12th/13th	SHPO 8/12/92			Out		NO
156	317.0	Market buildings	Meat Market	NO		5	Ganesv.	SHPO 8/12/92			Out		NO
157	339.0	Cow stables	Meat Market	NO		5	15th/16th	SHPO 8/12/92					NO
158	345.0	Cow stables on south ends of lot	Meat Market	NO		5	15th/16th	SHPO 8/12/92					NO
159	504.0	Meat Market building	Meat Market	NO		5	Ganesv.	SHPO 8/12/92			Out		NO
160	505.0	Meat Market building	Meat Market	NO		5	Ganesv.	SHPO 8/12/92			Out		NO
161	506.0	Meat storage building	Meat Market	NO		5	Little W.12th/13th	SHPO 8/12/92			Out		NO
162	138.0	Underground cattle pens	Meat Market	NO		6	33rd/34th		NOT NRE, SHPO 8/18/93				NO
163	435.0	Two slaughterhouses	Meat Market	NO		7	46th/47th	SHPO 8/12/92					NO
164	438.0	Cattle yards	Meat Market	NO		7	46th/47th	SHPO 8/12/92	SHPO 8/12/92				NO
165	451.0	Comm. Beef Oil Manufacturing Co. building	Meat Market	YES		7	48th/49th		SHPO 8/31/95	SHPO 8/31/95		SHPO 8/31/95	NO
166	455.0	Beef Oil Co. buildings	Meat Market	YES		7	48th/49th		SHPO 8/31/95	SHPO 8/31/95		SHPO 8/31/95	NO
167	173.0	U.S. bonded warehouse	Offices & Warehouses	NO		1	Morris/Edgar	SHPO 8/12/92	SHPO 8/12/92				NO
168	174.0	Union Sulphur Co. office building	Offices & Warehouses	NO		1	Ward/Hector	SHPO 8/12/92	SHPO 8/12/92				NO
169	283.0	Building- G.B. Lawton	Offices & Warehouses	NO		4	11th/Bank	SHPO 8/12/92	SHPO 8/12/92		Out		NO
170	296.0	Cregar & Co. storage building	Offices & Warehouses	NO		4	Belmont/13th	SHPO 8/12/92	SHPO 8/12/92				NO
171	31.0	Office building	Offices & Warehouses	NO		5	15th/16th	SHPO 8/12/92	SHPO 8/12/92				NO
172	144.0	Borden Co. building	Offices & Warehouses	NO		7	49th/50th	SHPO 8/12/92	SHPO 8/12/92				NO

ROUTE 9A RECONSTRUCTION PROJECT
MATRIX OF ARCHEOLOGICAL SITES

SITE INVENTORY					LOCATION		ELIMINATION FROM FURTHER CONSIDERATION DUE TO				FIELD TESTING
Item No. (1)	Site No.	Notes	Name	Contextual Report	Disturbance Report Generated	Segment	Street	Lack of Arch. Viability	Lack of Research Potential	Well Documented in the Literature	Out of APE (2)	Prior Disturbance	Final Recommendation
173	174.0		Red Cross warehouse in M.S.	Offices & Warehouses	NO	7	S4thS5th	SHPO 8/12/92	SHPO 8/12/92		Out		NO
174	175.0		Red Cross warehouse in M.S.	Offices & Warehouses	NO	7	S5thS6th	SHPO 8/12/92	SHPO 8/12/92				NO
175	3.0		Pier	Piers, Wharves & Pier Sheds	NO	1	Battery/Washington	SHPO 8/12/92	SHPO 8/12/92		Out		NO
176	4.0		Slip, New Brighton/Staten Island Ferry	Piers, Wharves & Pier Sheds	NO	1	Battery/Wash./West	SHPO 8/12/92	SHPO 8/12/92				NO
177	5.0		New Pier 2	Piers, Wharves & Pier Sheds	NO	1	Battery/Morris	SHPO 8/12/92	SHPO 8/12/92				NO
178	7.0		New Pier 3, Steam Ships for Bremen, N.Y., Havana, Mexico SS Line	Piers, Wharves & Pier Sheds	NO	1	Battery/Morris	SHPO 8/12/92	SHPO 8/12/92				NO
179	9.0		New Pier 4, Steam Ships for Charleston/Pennsylvania Railroad Piers	Piers, Wharves & Pier Sheds	NO	1	Battery/Morris	SHPO 8/12/92	SHPO 8/12/92				NO
180	135.0		New Pier 5, Pennsylvania Railroad Piers	Piers, Wharves & Pier Sheds	NO	1	Morris/Ward	SHPO 8/12/92	SHPO 8/12/92				NO
181	140.0		New Pier 6	Piers, Wharves & Pier Sheds	NO	1	at Ward	SHPO 8/12/92	SHPO 8/12/92				NO
182	141.0		New Pier 7	Piers, Wharves & Pier Sheds	NO	1	Ward/Rector	SHPO 8/12/92	SHPO 8/12/92				NO
183	142.0		New Pier 8, Central Railroad of New Jersey	Piers, Wharves & Pier Sheds	NO	1	Rector	SHPO 8/12/92	SHPO 8/12/92				NO
184	143.0		New Pier 10, Cromwells SS Line	Piers, Wharves & Pier Sheds	NO	1	Rector/Carlisle	SHPO 8/12/92	SHPO 8/12/92				NO
185	144.0		New Pier 11, Metropolitan Line to Boston	Piers, Wharves & Pier Sheds	NO	1	at Carlisle St	SHPO 8/12/92	SHPO 8/12/92				NO
186	169.0	(4) Possible Piers & wharves		Piers, Wharves & Pier Sheds	NO	1	Morris/Rector				OUT		NO
187	177.0		Pier	Piers, Wharves & Pier Sheds	NO	1	at Battery Pl.	SHPO 8/12/92	SHPO 8/12/92				NO
188	178.0		New Pier 1	Piers, Wharves & Pier Sheds	NO	1	Battery/West	SHPO 8/12/92	SHPO 8/12/92				NO
189	179.0		Old Pier 2, Arden	Piers, Wharves & Pier Sheds	NO	1	Battery/Morris	SHPO 8/12/92	SHPO 8/12/92				NO
190	180.0		Old Pier 3, White	Piers, Wharves & Pier Sheds	NO	1	Battery/Morris	SHPO 8/12/92	SHPO 8/12/92				NO
191	181.0		Old Pier 4, White	Piers, Wharves & Pier Sheds	NO	1	Morris/Rector	SHPO 8/12/92	SHPO 8/12/92				NO
192	182.0		Old Pier 5, Schermerhorn	Piers, Wharves & Pier Sheds	NO	1	Morris/Rector	SHPO 8/12/92	SHPO 8/12/92				NO
193	184.0		Old Pier 6, Edgar	Piers, Wharves & Pier Sheds	NO	1	Morris/Rector	SHPO 8/12/92	SHPO 8/12/92				NO
194	185.0		Old Pier 7, Arden	Piers, Wharves & Pier Sheds	NO	1	Morris/Rector	SHPO 8/12/92	SHPO 8/12/92				NO
195	186.0		Old Pier 8, Kermit	Piers, Wharves & Pier Sheds	NO	1	Morris/Rector	SHPO 8/12/92	SHPO 8/12/92				NO
196	187.0		New Pier 9, Cromwells SS Line	Piers, Wharves & Pier Sheds	NO	1	Rector/Carlisle	SHPO 8/12/92	SHPO 8/12/92				NO
197	188.0		Old Pier 9	Piers, Wharves & Pier Sheds	NO	1	at Rector	SHPO 8/12/92	SHPO 8/12/92				NO
198	189.0		Old Pier 10, Schermerhorn	Piers, Wharves & Pier Sheds	NO	1	Rector/Carlisle	SHPO 8/12/92	SHPO 8/12/92				NO
199	190.0		Old Pier 11, Castle	Piers, Wharves & Pier Sheds	NO	1	Rector/Carlisle	SHPO 8/12/92	SHPO 8/12/92				NO
200	191.0		Old Pier 12	Piers, Wharves & Pier Sheds	NO	1	Carlisle/Albany	SHPO 8/12/92	SHPO 8/12/92				NO
201	196.0	Building, Pennsylvania Railroad Co. freight shed		Piers, Wharves & Pier Sheds	NO	1	Battery/Morris	SHPO 8/12/92	SHPO 8/12/92		Out		NO
202	197.0	Pier sheds, two & three stories		Piers, Wharves & Pier Sheds	NO	1	Battery/Morris	SHPO 8/12/92	SHPO 8/12/92				NO
203	198.0	Pier shed - Pennsylvania Railroad freight depot, one story		Piers, Wharves & Pier Sheds	NO	1	Morris/Rector	SHPO 8/12/92	SHPO 8/12/92				NO
204	199.0	Three story pier shed		Piers, Wharves & Pier Sheds	NO	1	Morris/Rector	SHPO 8/12/92	SHPO 8/12/92				NO
205	200.0	Pier sheds		Piers, Wharves & Pier Sheds	NO	1	Rector/Carlisle	SHPO 8/12/92	SHPO 8/12/92				NO
206	201.0	Pier sheds		Piers, Wharves & Pier Sheds	NO	1	Carlisle/Albany	SHPO 8/12/92	SHPO 8/12/92				NO
207	12.0	Old Pier 13, Swartwouts Wharf		Piers, Wharves & Pier Sheds	NO	2	Albany/Cedar	SHPO 8/12/92	SHPO 8/12/92				NO
208	17.0	New Pier 23		Piers, Wharves & Pier Sheds	NO	2	Vesey/Barclay	SHPO 8/12/92	SHPO 8/12/92				NO
209	18.0	New Pier 24, Morning Line for Albany/Fish Market		Piers, Wharves & Pier Sheds	NO	2	Vesey/Barclay	SHPO 8/12/92	SHPO 8/12/92				NO
210	20.0	Pier, may be part of Rhinelders Dock		Piers, Wharves & Pier Sheds	NO	2	Barclay/Park Pl.	SHPO 8/12/92	SHPO 8/12/92				NO
211	21.0	Foundations of abdoned D.L.& W. Railroad footbridge on piles		Piers, Wharves & Pier Sheds	NO	2	Vesey/Barclay	SHPO 8/12/92	SHPO 8/12/92				NO
212	22.0	New Pier 25, part of Hoboken Ferry Complex		Piers, Wharves & Pier Sheds	NO	2	Barclay/Park Pl.	SHPO 8/12/92	SHPO 8/12/92				NO
213	23.0	Two Piers, part of Hoboken Ferry Complex		Piers, Wharves & Pier Sheds	NO	2	Barclay/Park Pl.	SHPO 8/12/92	SHPO 8/12/92				NO
214	24.0	Unnumbered Pier		Piers, Wharves & Pier Sheds	NO	2	at Barclay	SHPO 8/12/92	SHPO 8/12/92				NO
215	25.0	New Pier 27, Steamboats for Albany		Piers, Wharves & Pier Sheds	NO	2	Park Pl./Murray	SHPO 8/12/92	SHPO 8/12/92				NO

ROUTE 9A RECONSTRUCTION PROJECT
MATRIX OF ARCHEOLOGICAL SITES

SITE INVENTORY					LOCATION		ELIMINATION FROM FURTHER CONSIDERATION DUE TO					FIELD TESTING
Item No. (1)	Site No.	Name	Contextual Report	Disturbance Report Generated	Segment	Street	Lack of Archeo. Viability	Lack of Research Potential	Well Documented in the Literature	Out of APE (2)	Prior Disturbance	Final Recommendation
216	27.0	Pier, RhinelLers Dock	Piers, Wharves & Pier Sheds	NO	2	Park Pl/Murray	SHPO 8/12/92	SHPO 8/12/92				NO
217	28.0	New Pier 28, Steamships to Newburgh	Piers, Wharves & Pier Sheds	NO	2	Murray/Warren	SHPO 8/12/92	SHPO 8/12/92				NO
218	30.0	New Pier 29	Piers, Wharves & Pier Sheds	NO	2	Warren/Chambers	SHPO 8/12/92	SHPO 8/12/92				NO
219	32.0	RhinelKers Shipyards (possible)	Piers, Wharves & Pier Sheds	NO	2	Warren/Chambers	SHPO 8/12/92	SHPO 8/12/92				NO
220	33.0	New Pier 30	Piers, Wharves & Pier Sheds	NO	2	Chambers/Reade	SHPO 8/12/92	SHPO 8/12/92				NO
221	35.0	New Pier 31, Erie Railroad Co.	Piers, Wharves & Pier Sheds	NO	2	Reade/Duane	SHPO 8/12/92	SHPO 8/12/92				NO
222	36.0	Unnumbered Pier	Piers, Wharves & Pier Sheds	NO	2	Reade/Duane	SHPO 8/12/92	SHPO 8/12/92				NO
223	37.0	RhinelLers Dock (possible)	Piers, Wharves & Pier Sheds	NO	2	Jay/Harrison	SHPO 8/12/92	SHPO 8/12/92				NO
224	38.0	Pier 34, Rondout & Kingston boats	Piers, Wharves & Pier Sheds	NO	2	at Harrison	SHPO 8/12/92	SHPO 8/12/92				NO
225	145.0	New Pier 12, Philadelphia Steamboats	Piers, Wharves & Pier Sheds	NO	2	Albany/Cedar	SHPO 8/12/92	SHPO 8/12/92				NO
226	146.0	New Pier 13	Piers, Wharves & Pier Sheds	NO	2	Albany/Cedar	SHPO 8/12/92	SHPO 8/12/92				NO
227	147.0	New Pier 14, Hudson Steamboat & Barge Pier	Piers, Wharves & Pier Sheds	NO	2	at Cedar	SHPO 8/12/92	SHPO 8/12/92				NO
228	152.0	Unnumbered Pier	Piers, Wharves & Pier Sheds	NO	2	Albany/Cedar	SHPO 8/12/92	SHPO 8/12/92				NO
229	153.0	New Pier 32	Piers, Wharves & Pier Sheds	NO	2	Duane/Jay	SHPO 8/12/92	SHPO 8/12/92				NO
230	154.0	Old Pier 27	Piers, Wharves & Pier Sheds	NO	2	Duane/Jay	SHPO 8/12/92	SHPO 8/12/92				NO
231	155.0	New Pier 33/Stonington Line for Boston	Piers, Wharves & Pier Sheds	NO	2	at Jay	SHPO 8/12/92	SHPO 8/12/92				NO
232	202.0	Freight station shed	Piers, Wharves & Pier Sheds	NO	2	at Albany	SHPO 8/12/92	SHPO 8/12/92				NO
233	203.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	2	Albany/Cedar	SHPO 8/12/92	SHPO 8/12/92				NO
234	204.0	Pier shed	Piers, Wharves & Pier Sheds	NO	2	Cedar/Liberty	SHPO 8/12/92	SHPO 8/12/92				NO
235	205.0	Old Pier 15, Liberty St Pier	Piers, Wharves & Pier Sheds	NO	2	Liberty/Cortlandt	SHPO 8/12/92	SHPO 8/12/92				NO
236	206.0	Old Pier 16, "Wash"	Piers, Wharves & Pier Sheds	NO	2	Liberty/Cortlandt	SHPO 8/12/92	SHPO 8/12/92				NO
237	207.0	Old Pier 17, "Albany Steamboats"	Piers, Wharves & Pier Sheds	NO	2	Liberty/Cortlandt	SHPO 8/12/92	SHPO 8/12/92				NO
238	208.0	Pier shed foot of Old Pier 16	Piers, Wharves & Pier Sheds	NO	2	Liberty/Cortlandt	SHPO 8/12/92	SHPO 8/12/92				NO
239	209.0	Pier shed foot of Old Pier 17	Piers, Wharves & Pier Sheds	NO	2	Liberty/Cortlandt	SHPO 8/12/92	SHPO 8/12/92				NO
240	210.0	Ferry landing	Piers, Wharves & Pier Sheds	NO	2	Liberty/Cortlandt	SHPO 8/12/92	SHPO 8/12/92				NO
241	211.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	2	Liberty/Cortlandt	SHPO 8/12/92	SHPO 8/12/92				NO
242	212.0	New Pier 14, Powells Hook Ferry/Starins Transportation Line	Piers, Wharves & Pier Sheds	NO	2	Cortlandt/Dey	SHPO 8/12/92	SHPO 8/12/92				NO
243	213.0	Old Pier 18	Piers, Wharves & Pier Sheds	NO	2	Cortlandt/Dey	SHPO 8/12/92	SHPO 8/12/92				NO
244	214.0	New Pier 19/D. L. & W. Railroad Co.	Piers, Wharves & Pier Sheds	NO	2	Cortlandt/Dey	SHPO 8/12/92	SHPO 8/12/92				NO
245	215.0	Two pier sheds on New Pier 18	Piers, Wharves & Pier Sheds	NO	2	Cortlandt/Dey	SHPO 8/12/92	SHPO 8/12/92				NO
246	216.0	Unlabeled pier	Piers, Wharves & Pier Sheds	NO	2	Cortlandt/Dey	SHPO 8/12/92	SHPO 8/12/92				NO
247	217.0	Pier shed	Piers, Wharves & Pier Sheds	NO	2	Cortlandt/Dey	SHPO 8/12/92	SHPO 8/12/92				NO
248	218.0	Two buildings in M.S/D.L.& W. Railroad Co. freight	Piers, Wharves & Pier Sheds	NO	2	Cortlandt/Dey	SHPO 8/12/92	SHPO 8/12/92				NO
249	219.0	Old Pier 22/Vesey St Pier	Piers, Wharves & Pier Sheds	NO	2	Dey/Vesey	SHPO 8/12/92	SHPO 8/12/92				NO
250	220.0	Corporation dock/Old Pier 20	Piers, Wharves & Pier Sheds	NO	2	Dey/Vesey	SHPO 8/12/92	SHPO 8/12/92				NO
251	221.0	Corporation dock/Old Pier 19	Piers, Wharves & Pier Sheds	NO	2	at Dey	SHPO 8/12/92	SHPO 8/12/92				NO
252	222.0	Corporation dock/Old Pier 21	Piers, Wharves & Pier Sheds	NO	2	Fulton/Vesey	SHPO 8/12/92	SHPO 8/12/92				NO
253	223.0	New Pier 20	Piers, Wharves & Pier Sheds	NO	2	Dey/Vesey	SHPO 8/12/92	SHPO 8/12/92				NO
254	224.0	New Pier 21	Piers, Wharves & Pier Sheds	NO	2	Dey/Vesey	SHPO 8/12/92	SHPO 8/12/92				NO
255	225.0	New Pier 22	Piers, Wharves & Pier Sheds	NO	2	Dey/Vesey	SHPO 8/12/92	SHPO 8/12/92				NO
256	226.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	2	Dey/Vesey	SHPO 8/12/92	SHPO 8/12/92				NO
257	227.0	Two pier sheds	Piers, Wharves & Pier Sheds	NO	2	Dey/Vesey	SHPO 8/12/92	SHPO 8/12/92				NO
258	228.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	2	Vesey/Barclay	SHPO 8/12/92	SHPO 8/12/92				NO

ROUTE 9A RECONSTRUCTION PROJECT
MATRIX OF ARCHEOLOGICAL SITES

SITE INVENTORY					LOCATION		ELIMINATION FROM FURTHER CONSIDERATION DUE TO				FIELD TESTING
Item No. (1)	Site No.	Name	Contextual Report	Disturbance Report Generated	Segment	Street	Lack of Arch. Viability	Lack of Research Potential	Well-Documented in the Literature	Out of APE (2)	Prior Disturbance	Final Recommendation
259	229.0	Three sheds, one on each pier of the Hoboken ferry complex	Piers, Wharves & Pier Sheds	NO	2	Barclay/Park PL	SHPO 8/12/92	SHPO 8/12/92				NO
260	230.0	Three small buildings of Hoboken ferry landing	Piers, Wharves & Pier Sheds	NO	2	Barclay/Park PL	SHPO 8/12/92	SHPO 8/12/92				NO
261	231.0	Pier shed-New York City Railroad, Barclay St Station	Piers, Wharves & Pier Sheds	NO	2	Barclay/Park PL	SHPO 8/12/92	SHPO 8/12/92				NO
262	232.0	Pier shed	Piers, Wharves & Pier Sheds	NO	2	Park PL/Murray	SHPO 8/12/92	SHPO 8/12/92				NO
263	233.0	Pier shed-Eastern SS Corporation	Piers, Wharves & Pier Sheds	NO	2	Murray/Warren	SHPO 8/12/92	SHPO 8/12/92				NO
264	234.0	Pier shed	Piers, Wharves & Pier Sheds	NO	2	Chambers/Reade	SHPO 8/12/92	SHPO 8/12/92				NO
265	235.0	Pier shed	Piers, Wharves & Pier Sheds	NO	2	Duane/Jay	SHPO 8/12/92	SHPO 8/12/92				NO
266	236.0	Pier shed	Piers, Wharves & Pier Sheds	NO	1	Reade/Duane	SHPO 8/12/92	SHPO 8/12/92				NO
267	501.0	Old Pier 14, Lukes Wharf	Piers, Wharves & Pier Sheds	NO	2	Cedar/Liberty	SHPO 8/12/92	SHPO 8/12/92				NO
268	40.0	Pier 35, Poughkeepsie steamboats	Piers, Wharves & Pier Sheds	NO	3	at Franklin	SHPO 8/12/92	SHPO 8/12/92				NO
269	41.0	Steamship landing	Piers, Wharves & Pier Sheds	NO	3	Harrison/Franklin	SHPO 8/12/92	SHPO 8/12/92				NO
270	42.0	Pier 36, Morgan's Los Angeles & Texas Railroad & Steamship Co.	Piers, Wharves & Pier Sheds	NO	3	at North Moore	SHPO 8/12/92	SHPO 8/12/92				NO
271	44.0	Laight St Pier, Albany Day Line/Pennsylvania Railroad Co.	Piers, Wharves & Pier Sheds	NO	3	at Laight	SHPO 8/12/92	SHPO 8/12/92				NO
272	45.0	Desbrosses St Pier, public baths	Piers, Wharves & Pier Sheds	NO	3	at Desbrosses	SHPO 8/12/92	SHPO 8/12/92				NO
273	47.0	Pier 40, Coney Island/Norwich Line for Boston	Piers, Wharves & Pier Sheds	NO	3	at Watts	SHPO 8/12/92	SHPO 8/12/92				NO
274	48.0	Pier 41, Empire pier	Piers, Wharves & Pier Sheds	NO	1	Spring/Vandam	SHPO 8/12/92	SHPO 8/12/92				NO
275	112.0	West 25th St Pier	Piers, Wharves & Pier Sheds	NO	3	at 25th	SHPO 8/12/92	SHPO 8/12/92				NO
276	137.0	Pier 37, Old Dominion Line for Norfolk	Piers, Wharves & Pier Sheds	NO	1	at Beach	SHPO 8/12/92	SHPO 8/12/92				NO
277	148.0	Pier 38, Pennsylvania Railroad Co.	Piers, Wharves & Pier Sheds	NO	3	at Hubert	SHPO 8/12/92	SHPO 8/12/92				NO
278	149.0	Jersey City Ferry Complex	Piers, Wharves & Pier Sheds	NO	3	Desbrosses/Watts	SHPO 8/12/92	SHPO 8/12/92				NO
279	150.0	Pier 44, Inman SS Line	Piers, Wharves & Pier Sheds	NO	3	at Vandam	SHPO 8/12/92	SHPO 8/12/92				NO
280	151.0	Pier 45, Corp. of City of New York	Piers, Wharves & Pier Sheds	NO	3	at Charlton	SHPO 8/12/92	SHPO 8/12/92				NO
281	152.0	Pier 46, Corp. of City of New York	Piers, Wharves & Pier Sheds	NO	3	at King	SHPO 8/12/92	SHPO 8/12/92				NO
282	153.0	Pier 47	Piers, Wharves & Pier Sheds	NO	1	at Houston	SHPO 8/12/92	SHPO 8/12/92				NO
283	155.0	Pier 47	Piers, Wharves & Pier Sheds	NO	3	at Canal	SHPO 8/12/92	SHPO 8/12/92				NO
284	156.0	Canal St basin pier	Piers, Wharves & Pier Sheds	NO	1	Canal/Spring	SHPO 8/12/92	SHPO 8/12/92				NO
285	240.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	3	Harrison/Franklin	SHPO 8/12/92	SHPO 8/12/92				NO
286	241.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	3	Franklin/North Moore	SHPO 8/12/92	SHPO 8/12/92		Out		NO
287	242.0	Pier shed in M.S.	Piers, Wharves & Pier Sheds	NO	3	Franklin/North Moore	SHPO 8/12/92	SHPO 8/12/92		Out		NO
288	243.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	3	Franklin/North Moore	SHPO 8/12/92	SHPO 8/12/92		Out		NO
289	244.0	Two structures in M.S./Old Dominion SS Co.	Piers, Wharves & Pier Sheds	NO	3	North Moore/Beach	SHPO 8/12/92	SHPO 8/12/92				NO
290	245.0	Pier shed	Piers, Wharves & Pier Sheds	NO	3	North Moore/Beach	SHPO 8/12/92	SHPO 8/12/92		Out		NO
291	246.0	Building in M.S.	Piers, Wharves & Pier Sheds	NO	3	North Moore/Beach	SHPO 8/12/92	SHPO 8/12/92				NO
292	247.0	Two pier sheds	Piers, Wharves & Pier Sheds	NO	3	Beach/Hubert	SHPO 8/12/92	SHPO 8/12/92		Out		NO
293	248.0	Building in M.S.	Piers, Wharves & Pier Sheds	NO	3	Beach/Hubert	SHPO 8/12/92	SHPO 8/12/92				NO
294	249.0	Pier shed	Piers, Wharves & Pier Sheds	NO	3	Hubert/Laight	SHPO 8/12/92	SHPO 8/12/92		Out		NO
295	250.0	Pier shed	Piers, Wharves & Pier Sheds	NO	3	Laight/Vestry	SHPO 8/12/92	SHPO 8/12/92		Out		NO
296	251.0	Pier shed building in M.S.	Piers, Wharves & Pier Sheds	NO	3	Laight/Vestry	SHPO 8/12/92	SHPO 8/12/92		Out		NO
297	252.0	Building in M.S.	Piers, Wharves & Pier Sheds	NO	3	Vestry/Desbrosses	SHPO 8/12/92	SHPO 8/12/92				NO
298	253.0	Unnumbered pier	Piers, Wharves & Pier Sheds	NO	3	Vestry/Desbrosses	SHPO 8/12/92	SHPO 8/12/92				NO
299	254.0	Pier shed of Pennsylvania Railroad complex	Piers, Wharves & Pier Sheds	NO	3	Vestry/Desbrosses	SHPO 8/12/92	SHPO 8/12/92		Out		NO
300	255.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	3	Desbrosses/Watts	SHPO 8/12/92	SHPO 8/12/92		Out		NO
301	256.0	Old Pier 38	Piers, Wharves & Pier Sheds	NO	3	at Desbrosses	SHPO 8/12/92	SHPO 8/12/92				NO

ROUTE 9A RECONSTRUCTION PROJECT
MATRIX OF ARCHEOLOGICAL SITES

SITE INVENTORY					LOCATION		ELIMINATION FROM FURTHER CONSIDERATION DUE TO				FIELD TESTING
Item No. (1)	Site No.	Name	Contextual Report	Disturbance Report Delivered	Segment	Street	Lack of Arch. Viability	Lack of Research Potential	Well Documented in the Literature	Out of APE (2)	Prior Disturbance	Field Recommendation
302	257.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	3	Desbrosses/Watts	SHPO 8/12/92	SHPO 8/12/92		Out		NO
303	258.0	Dept. of Docks & Ferries building in M.S.	Piers, Wharves & Pier Sheds	NO	3	Watts/Hoboken	SHPO 8/12/92	SHPO 8/12/92		Out		NO
304	259.0	Pier shed	Piers, Wharves & Pier Sheds	NO	3	Hoboken/Canal	SHPO 8/12/92	SHPO 8/12/92		Out		NO
305	260.0	Pier shed	Piers, Wharves & Pier Sheds	NO	3	Canal/Spring	SHPO 8/12/92	SHPO 8/12/92		Out		NO
306	261.0	Ventilator for Hud & Tunnel	Piers, Wharves & Pier Sheds	NO	3	Canal/Spring	SHPO 8/12/92	SHPO 8/12/92				NO
307	263.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	3	Spring/Vandam	SHPO 8/12/92	SHPO 8/12/92		Out		NO
308	264.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	3	Vandam/Charlton	SHPO 8/12/92	SHPO 8/12/92		Out		NO
309	265.0	Pier shed	Piers, Wharves & Pier Sheds	NO	3	Charlton/King	SHPO 8/12/92	SHPO 8/12/92		Out		NO
310	266.0	Building in M.S.	Piers, Wharves & Pier Sheds	NO	3	Charlton/King	SHPO 8/12/92	SHPO 8/12/92				NO
311	267.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	3	King/Houston	SHPO 8/12/92	SHPO 8/12/92		Out		NO
312	268.0	Pier shed	Piers, Wharves & Pier Sheds	NO	3	Houston/Clarkson	SHPO 8/12/92	SHPO 8/12/92		Out		NO
313	492.0	Pier 38/New York & Albany Line	Piers, Wharves & Pier Sheds	NO	3	at Vestry	SHPO 8/12/92	SHPO 8/12/92				NO
314	493.0	Hoboken Ferry Complex	Piers, Wharves & Pier Sheds	NO	3	Watts/Hoboken	SHPO 8/12/92	SHPO 8/12/92				NO
315	494.0	Pier 41/Peoples Line for Albany	Piers, Wharves & Pier Sheds	NO	3	Watts/Hoboken	SHPO 8/12/92	SHPO 8/12/92				NO
316	495.0	Hoboken Ferry landing with Pier sheds/huts	Piers, Wharves & Pier Sheds	NO	3	at Hoboken	SHPO 8/12/92	SHPO 8/12/92				NO
317	496.0	Old Pier 41	Piers, Wharves & Pier Sheds	NO	3	Hoboken/Canal	SHPO 8/12/92	SHPO 8/12/92				NO
318	497.0	Hoboken St Pier/Canal St Station	Piers, Wharves & Pier Sheds	NO	3	at Hoboken	SHPO 8/12/92	SHPO 8/12/92				NO
319	51.0	Pier 49	Piers, Wharves & Pier Sheds	NO	4	at Leroy	SHPO 8/12/92	SHPO 8/12/92				NO
320	52.0	Pier 51	Piers, Wharves & Pier Sheds	NO	4	at Perry St	SHPO 8/12/92	SHPO 8/12/92				NO
321	154.0	Pier 50	Piers, Wharves & Pier Sheds	NO	4	Marion	SHPO 8/12/92	SHPO 8/12/92				NO
322	269.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	4	Clarkson/Leroy	SHPO 8/12/92	SHPO 8/12/92		Out		NO
323	270.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	4	Leroy/Morton	SHPO 8/12/92	SHPO 8/12/92		Out		NO
324	271.0	Pier sheds; coal station	Piers, Wharves & Pier Sheds	NO	4	Morton/Barrow	SHPO 8/12/92	SHPO 8/12/92		Out		NO
325	272.0	Pier shed building in M.S.	Piers, Wharves & Pier Sheds	NO	4	Morton/Barrow	SHPO 8/12/92	SHPO 8/12/92		Out		NO
326	273.0	Barrow St Pier	Piers, Wharves & Pier Sheds	NO	4	at Barrow	SHPO 8/12/92	SHPO 8/12/92				NO
327	274.0	Ferry landing building in M.S.	Piers, Wharves & Pier Sheds	NO	4	Barrow/Christopher	SHPO 8/12/92	SHPO 8/12/92		Out		NO
328	275.0	Hoboken Ferry landing/D.L.& W. Railroad	Piers, Wharves & Pier Sheds	NO	4	Barrow/Christopher	SHPO 8/12/92	SHPO 8/12/92				NO
329	276.0	Old Pier 50	Piers, Wharves & Pier Sheds	NO	4	Christopher/10th	SHPO 8/12/92	SHPO 8/12/92				NO
330	277.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	4	Christopher/10th	SHPO 8/12/92	SHPO 8/12/92		Out		NO
331	278.0	Pier 51/old state prison dock	Piers, Wharves & Pier Sheds	NO	4	10th/Charles	SHPO 8/12/92	SHPO 8/12/92				NO
332	279.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	4	Perry/11th	SHPO 8/12/92	SHPO 8/12/92		Out		NO
333	280.0	Pier 54	Piers, Wharves & Pier Sheds	NO	4	at 11th	SHPO 8/12/92	SHPO 8/12/92				NO
334	284.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	4	11th/Bank	SHPO 8/12/92	SHPO 8/12/92		Out		NO
335	285.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	4	Bank/Bethune	SHPO 8/12/92	SHPO 8/12/92		Out		NO
336	287.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	4	Bethune/12th	SHPO 8/12/92	SHPO 8/12/92		Out		NO
337	288.0	Pier 58	Piers, Wharves & Pier Sheds	NO	4	at 12th	SHPO 8/12/92	SHPO 8/12/92				NO
338	294.0	Pier shed	Piers, Wharves & Pier Sheds	NO	4	Jane/Horatio	SHPO 8/12/92	SHPO 8/12/92		Out		NO
339	306.0	Pier 57	Piers, Wharves & Pier Sheds	NO	4	Jane/Horatio	SHPO 8/12/92	SHPO 8/12/92				NO
340	308.0	Pier shed	Piers, Wharves & Pier Sheds	NO	4	Horatio/Jane/	SHPO 8/12/92	SHPO 8/12/92		Out		NO
341	502.0	Pier 48	Piers, Wharves & Pier Sheds	NO	4	at Clarkson	SHPO 8/12/92	SHPO 8/12/92				NO
342	102.0	Old Pier 61	Piers, Wharves & Pier Sheds	NO	5	at 21st	SHPO 8/12/92	SHPO 8/12/92				NO
343	103.0	West 22nd St Central Railroad of New Jersey ferry platform & pier shed	Piers, Wharves & Pier Sheds	NO	5	at West 22nd St	SHPO 8/12/92	SHPO 8/12/92		Out		NO
344	104.0	West 22nd to West 23rd St Erie Railroad ferry landing	Piers, Wharves & Pier Sheds	NO	5	West 22nd St	SHPO 8/12/92	SHPO 8/12/92		Out		NO

ROUTE 9A RECONSTRUCTION PROJECT
MATRIX OF ARCHEOLOGICAL SITES

SITE INVENTORY					LOCATION		ELIMINATION FROM FURTHER CONSIDERATION DUE TO					FIELD TESTING
Item No. (1)	Site No.	Name	Contextual Report	Disturbance Report Completed	Segment	Street	Lack of Arch. Visibility	Lack of Research Potential	Well Documented in the Literature	Out of APE (2)	Prior Disturbance	Final Recommendation
345	111.0	West 23rd St to West 24th St Pennsylvania Railroad ferry landing	Piers, Wharves & Pier Sheds	NO	5	23rd/24th	SHPO 8/12/92	SHPO 8/12/92		Out		NO
346	112.0	West 23rd St Erie Railroad ferry landing	Piers, Wharves & Pier Sheds	NO	5	at 23rd	SHPO 8/12/92	SHPO 8/12/92		Out		NO
347	113.0	New Pier 62	Piers, Wharves & Pier Sheds	NO	5	21st/22nd	SHPO 8/12/92	SHPO 8/12/92		Out		NO
348	114.0	Pier shed	Piers, Wharves & Pier Sheds	NO	5	13th/14th	SHPO 8/12/92	SHPO 8/12/92		Out		NO
349	115.0	Pier shed	Piers, Wharves & Pier Sheds	NO	5	15th/16th	SHPO 8/12/92	SHPO 8/12/92		Out		NO
350	116.0	Pier shed	Piers, Wharves & Pier Sheds	NO	5	16th/17th	SHPO 8/12/92	SHPO 8/12/92		Out		NO
351	350.0	Pier shed	Piers, Wharves & Pier Sheds	NO	5	17th/18th	SHPO 8/12/92	SHPO 8/12/92		Out		NO
352	354.0	New Pier 59	Piers, Wharves & Pier Sheds	NO	5	at 18th	SHPO 8/12/92	SHPO 8/12/92		Out		NO
353	355.0	New Pier 60	Piers, Wharves & Pier Sheds	NO	5	at 19th	SHPO 8/12/92	SHPO 8/12/92		Out		NO
354	356.0	New Pier 61	Piers, Wharves & Pier Sheds	NO	5	20th/21st	SHPO 8/12/92	SHPO 8/12/92		Out		NO
355	363.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	5	West 18th St	SHPO 8/12/92	SHPO 8/12/92		Out		NO
356	373.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	5	West 19th St	SHPO 8/12/92	SHPO 8/12/92		Out		NO
357	376.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	5	West 20th St	SHPO 8/12/92	SHPO 8/12/92		Out		NO
358	388.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	5	West 21st St	SHPO 8/12/92	SHPO 8/12/92		Out		NO
359	396.0	West 22nd St Pier/Albany Day Line	Piers, Wharves & Pier Sheds	NO	5	at West 22nd St	SHPO 8/12/92	SHPO 8/12/92		Out		NO
360	397.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	5	23rd/24th	SHPO 8/12/92	SHPO 8/12/92		Out		NO
361	398.0	West 24th St Pier	Piers, Wharves & Pier Sheds	NO	5	at West 24th St	SHPO 8/12/92	SHPO 8/12/92				NO
362	399.0	Garage	Piers, Wharves & Pier Sheds	NO	5	23rd/24th	SHPO 8/12/92	SHPO 8/12/92				NO
363	401.0	Building- Consolidated Motor Lines	Piers, Wharves & Pier Sheds	NO	5	23rd/24th	SHPO 8/12/92	SHPO 8/12/92				NO
364	402.0	Pier shed	Piers, Wharves & Pier Sheds	NO	5	24th/25th	SHPO 8/12/92	SHPO 8/12/92		Out		NO
365	500.0	Gansevoort St pier	Piers, Wharves & Pier Sheds	NO	5	at Gansevoort	SHPO 8/12/92	SHPO 8/12/92				NO
366	84.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	6	West 30th St	SHPO 8/12/92	SHPO 8/12/92		Out		NO
367	89.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	6	West 31st St	SHPO 8/12/92	SHPO 8/12/92		Out		NO
368	85.0	Old West 32nd St Pier, New York & Hudson Railroad Co.	Piers, Wharves & Pier Sheds	NO	6	at West 32nd St	SHPO 8/12/92	SHPO 8/12/92				NO
369	105.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	6	West 32nd St	SHPO 8/12/92	SHPO 8/12/92		Out		NO
370	113.0	West 28th St Pier	Piers, Wharves & Pier Sheds	NO	6	at West 28th St	SHPO 8/12/92	SHPO 8/12/92				NO
371	114.0	Old West 30th to 31st St Pier	Piers, Wharves & Pier Sheds	NO	6	West 30th St	SHPO 8/12/92	SHPO 8/12/92				NO
372	115.0	Old West 32nd to 33rd St Pier	Piers, Wharves & Pier Sheds	NO	6	West 32nd St	SHPO 8/12/92	SHPO 8/12/92				NO
373	116.0	Old West 37th St Pier	Piers, Wharves & Pier Sheds	NO	6	at West 37th St	SHPO 8/12/92	SHPO 8/12/92				NO
374	117.0	Old West 41st St Pier	Piers, Wharves & Pier Sheds	NO	6	at West 41st St	SHPO 8/12/92	SHPO 8/12/92				NO
375	118.0	Old West 41st to 42nd St Pier	Piers, Wharves & Pier Sheds	NO	6	West 41st St	SHPO 8/12/92	SHPO 8/12/92				NO
376	154.0	Old West 35th St Pier	Piers, Wharves & Pier Sheds	NO	6	at West 35th St	SHPO 8/12/92	SHPO 8/12/92				NO
377	155.0	Old West 36th St Pier	Piers, Wharves & Pier Sheds	NO	6	at West 36th St	SHPO 8/12/92	SHPO 8/12/92				NO
378	403.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	6	West 25th St	SHPO 8/12/92	SHPO 8/12/92		Out		NO
379	404.0	Two buildings in M.S.	Piers, Wharves & Pier Sheds	NO	6	West 25th St	SHPO 8/12/92	SHPO 8/12/92				NO
380	405.0	West 26th St Pier	Piers, Wharves & Pier Sheds	NO	6	at West 26th St	SHPO 8/12/92	SHPO 8/12/92		Out		NO
381	406.0	Pier shed	Piers, Wharves & Pier Sheds	NO	6	West 26th St	SHPO 8/12/92	SHPO 8/12/92		Out		NO
382	407.0	Pier shed	Piers, Wharves & Pier Sheds	NO	6	West 28th St	SHPO 8/12/92	SHPO 8/12/92		Out		NO
383	408.0	Pier shed	Piers, Wharves & Pier Sheds	NO	6	West 29th St	SHPO 8/12/92	SHPO 8/12/92		Out		NO
384	411.0	Old West 33rd St Pier	Piers, Wharves & Pier Sheds	NO	6	at West 33rd St	SHPO 8/12/92	SHPO 8/12/92				NO
385	412.0	Pier sheds	Piers, Wharves & Pier Sheds	NO	6	West 33rd St	SHPO 8/12/92	SHPO 8/12/92		Out		NO
386	413.0	Shed in M.S.	Piers, Wharves & Pier Sheds	NO	6	West 33rd St	SHPO 8/12/92	SHPO 8/12/92				NO
387	414.0	Old West 34th St Pier	Piers, Wharves & Pier Sheds	NO	6	at West 34th St	SHPO 8/12/92	SHPO 8/12/92				NO

ROUTE 9A RECONSTRUCTION PROJECT
MATRIX OF ARCHEOLOGICAL SITES

SITE INVENTORY					LOCATION		ELIMINATION FROM FURTHER CONSIDERATION DUE TO					FIELD TESTING
Item No. (1)	Site No.	Notes	Name	Contextual Report	Disturbance Report Generated	Segment	Street	Lack of Arch. Viability	Lack of Research Potential	Well Documented in the Literature	Out of APE (2)	Prior Disturbance	Final Recommendation
388	416.0		Cattle yard shed	Piers, Wharves & Pier Sheds	NO	1	West 34th St	SHPO 8/12/92	SHPO 8/12/92			Out	NO
389	416.0		Sheds in M.S.	Piers, Wharves & Pier Sheds	NO	1	West 34th St	SHPO 8/12/92	SHPO 8/12/92				NO
390	417.0		35th St station in pier shed	Piers, Wharves & Pier Sheds	NO	1	West 35th St	SHPO 8/12/92	SHPO 8/12/92			Out	NO
391	418.0		Loading dock/pier shed	Piers, Wharves & Pier Sheds	NO	1	West 36th St	SHPO 8/12/92	SHPO 8/12/92			Out	NO
392	419.0		Pennsylvania Railroad freight station	Piers, Wharves & Pier Sheds	NO	1	West 37th St	SHPO 8/12/92	SHPO 8/12/92			Out	NO
393	420.0		Building in M.S./pier shed	Piers, Wharves & Pier Sheds	NO	1	West 37th St	SHPO 8/12/92	SHPO 8/12/92			Out	NO
394	421.0		Old West 38th St Pier	Piers, Wharves & Pier Sheds	NO	1	at West 38th St	SHPO 8/12/92	SHPO 8/12/92				NO
395	422.0		Old West 39th St Pier	Piers, Wharves & Pier Sheds	NO	1	at West 39th St	SHPO 8/12/92	SHPO 8/12/92				NO
396	423.0		Old West 40th St Pier, Central Railroad of New Jersey	Piers, Wharves & Pier Sheds	NO	1	at West 40th St	SHPO 8/12/92	SHPO 8/12/92				NO
397	425.0		Old West 42nd St Pier, Weehawken Ferry	Piers, Wharves & Pier Sheds	NO	1	at West 42nd St	SHPO 8/12/92	SHPO 8/12/92				NO
398	426.0		Old West 38th St Pier	Piers, Wharves & Pier Sheds	NO	1	at West 38th St	SHPO 8/12/92	SHPO 8/12/92				NO
399	126.0		Pier	Piers, Wharves & Pier Sheds	NO	7	West 45th St	SHPO 8/12/92	SHPO 8/12/92				NO
400	129.0		Pier at the foot of West 47th St	Piers, Wharves & Pier Sheds	NO	7	at West 47th St	SHPO 8/12/92	SHPO 8/12/92				NO
401	161.0		Old West 43rd St Pier	Piers, Wharves & Pier Sheds	NO	7	at West 43rd St	SHPO 8/12/92	SHPO 8/12/92				NO
402	163.0		Pier	Piers, Wharves & Pier Sheds	NO	7	West 46th St	SHPO 8/12/92	SHPO 8/12/92			Out	NO
403	427.0		Old West 42nd to 43rd St Pier	Piers, Wharves & Pier Sheds	NO	7	West 42nd St	SHPO 8/12/92	SHPO 8/12/92				NO
404	428.0		Pier shed	Piers, Wharves & Pier Sheds	NO	7	West 45th St	SHPO 8/12/92	SHPO 8/12/92			Out	NO
405	473.0		Pier sheds	Piers, Wharves & Pier Sheds	NO	7	West 54th St	SHPO 8/12/92	SHPO 8/12/92			Out	NO
406	474.0		Pier	Piers, Wharves & Pier Sheds	NO	7	West 54th St	SHPO 8/12/92	SHPO 8/12/92			Out	NO
407	8.0		Prehistoric Area 1	Prehistoric	NO	1	Morris St					OUT	NO
408	10.0		Prehistoric Area 2	Prehistoric	NO	1	Cortlandt St					OUT	NO
409	11.0		Prehistoric Area 3	Prehistoric	NO	1	Rector St					OUT	NO
410	144.0		Prehistoric Area	Prehistoric	NO	1	Morris St					OUT	NO
411	12.0		Prehistoric Area 5	Prehistoric	NO	2	Albany St					OUT	NO
412	15.0		Prehistoric Area 6	Prehistoric	NO	2	Liberty St					OUT	NO
413	16.0		Prehistoric Area 8	Prehistoric	NO	2	Liberty St					OUT	NO
414	23.0		Prehistoric Area 11 & 11A	Prehistoric	NO	2	Vesey St					OUT	NO
415	29.0		Prehistoric Area 10	Prehistoric	NO	2	Murray St					OUT	NO
416	30.0		Prehistoric Area 7	Prehistoric	NO	3	Vesey St					OUT	NO
417	43.0		Prehistoric Area 17	Prehistoric	NO	3	Hubert St					OUT	NO
418	45.0		Prehistoric Area 9	Prehistoric	NO	3	Laight St					OUT	NO
419	48.0		Prehistoric Area 20	Prehistoric	NO	3	Canal St					OUT	NO
420	176.0		Emigrant depot	Service	NO	1	at Battery Place	SHPO 8/12/92					NO
421	262.0		Dept. of St Cleaning	Service	NO	3	Canal St	SHPO 8/12/92	SHPO 8/12/92	SHPO 8/12/92	Out		NO
422	315.0		Adams House Hotel	Service	NO	5	Bloomfield St	SHPO 8/12/92					NO
423	136.0		Fire Dept. repair shop	Service	NO	7	West 58th St	SHPO 8/12/92					NO
424	148.0		Dept. of St Cleaning buildings	Service	NO	7	West 54th St	SHPO 8/12/92	SHPO 8/12/92	SHPO 8/12/92			NO
425	498.0		Housing station & destruction platform- Dept. of St Cleaning	Service	NO	7	West 55th St	SHPO 8/12/92	SHPO 8/12/92	SHPO 8/12/92			NO
426	404.0		Building on southwest corner of lot	Unassociated Buildings	NO	3	Hoboken St		SHPO 8/18/93		Out		NO
427	410.0		Building fronting Canal St	Unassociated Buildings	NO	3	Hoboken St		SHPO 8/18/93		Out		NO
428	37.0		Sheds	Unassociated Buildings	NO	4	West 12th St		SHPO 8/18/93		Out		NO
429	58.0		Shed	Unassociated Buildings	NO	4	Jane St		SHPO 8/18/93		Out		NO
430	58.0		Building on south half of lot	Unassociated Buildings	NO	4	Jane St		SHPO 8/18/93		Out		NO

SITE INVENTORY					LOCATION		ELIMINATION FROM FURTHER CONSIDERATION DUE TO					FIELD TESTING
Item No. (1)	Site No.	Notes	Name	Contextual Report	Disturbance Report Generated	Segment	Street	Lack of Arch. Visibility	Lack of Research Potential	Not Documented in the Literature	Out of APE (2)	Prior Disturbance	Field Recommendation
431	80.0		Sheds	Unassociated Buildings	NO	4	Horatio St			SHPO 6/18/93			NO
432	184.0		Building on southeast corner	Unassociated Buildings	NO	4	Bank St			SHPO 6/18/93			NO
433	294.0		Shed on eastern side	Unassociated Buildings	NO	4	Bank St			SHPO 6/18/93			NO
434	295.0		Building on northeastern corner	Unassociated Buildings	NO	4	Bank St			SHPO 6/18/93			NO
435	301.0		Sheds	Unassociated Buildings	NO	4	West 12th St			SHPO 6/18/93			NO
436	302.0		Buildings	Unassociated Buildings	NO	4	West 12th St			SHPO 6/18/93			NO
437	303.0		Shed	Unassociated Buildings	NO	4	West 12th St			SHPO 6/18/93			NO
438	305.0		Shed	Unassociated Buildings	NO	4	Jane St			SHPO 6/18/93			NO
439	61.0		Building at intersection of Gansevoort & West Sts	Unassociated Buildings	NO	5	Gansevoort St			SHPO 6/18/93			NO
440	70.0		Building	Unassociated Buildings	NO	5	Little West 12th St			SHPO 6/18/93	Out		NO
441	72.0		Shed north of office building	Unassociated Buildings	NO	5	West 13th St			SHPO 6/18/93			NO
442	76.0		Two sheds	Unassociated Buildings	NO	5	West 13th St			SHPO 6/18/93	Out		NO
443	77.0		Building & shed	Unassociated Buildings	NO	5	West 13th St			SHPO 6/18/93	Out		NO
444	78.0		Building	Unassociated Buildings	NO	5	West 14th St			SHPO 6/18/93			NO
445	79.0		Shed	Unassociated Buildings	NO	5	West 14th St			SHPO 6/18/93			NO
446	82.0		Shed	Unassociated Buildings	NO	5	West 14th St			SHPO 6/18/93			NO
447	83.0		Brick shed on south end of lot	Unassociated Buildings	NO	5	West 14th St			SHPO 6/18/93	Out		NO
448	84.0		Wood shed on rear of lot	Unassociated Buildings	NO	5	West 14th St			SHPO 6/18/93	Out		NO
449	85.0		Shed on middle of lot	Unassociated Buildings	NO	5	West 14th St			SHPO 6/18/93			NO
450	87.0		Shed	Unassociated Buildings	NO	5	West 14th St			SHPO 6/18/93	Out		NO
451	88.0		Shed	Unassociated Buildings	NO	5	West 15th St			SHPO 6/18/93			NO
452	89.0		Shed	Unassociated Buildings	NO	5	West 15th St			SHPO 6/18/93			NO
453	90.0		Shed on middle of lots	Unassociated Buildings	NO	5	West 15th St			SHPO 6/18/93			NO
454	92.0		Storage building on south ends of lots	Unassociated Buildings	NO	5	West 15th St			SHPO 6/18/93			NO
455	95.0		Shed	Unassociated Buildings	NO	5	West 15th St			SHPO 6/18/93			NO
456	96.0		Shed on north half of lot	Unassociated Buildings	NO	5	West 15th St			SHPO 6/18/93			NO
457	316.0		Building in Tenth Avenue	Unassociated Buildings	NO	5	Bloomfield St			SHPO 6/18/93			NO
458	318.0		Buildings	Unassociated Buildings	NO	5	Little West 12th St			SHPO 6/18/93			NO
459	319.0		Shed	Unassociated Buildings	NO	5	Little West 12th St			SHPO 6/18/93			NO
460	320.0		Building	Unassociated Buildings	NO	5	Little West 12th St			SHPO 6/18/93			NO
461	322.0		Shed, southeast part of lot	Unassociated Buildings	NO	5	West 13th St			SHPO 6/18/93			NO
462	323.0		Building, south part of lot	Unassociated Buildings	NO	5	West 13th St			SHPO 6/18/93			NO
463	324.0		Building, north part of lot	Unassociated Buildings	NO	5	West 13th St			SHPO 6/18/93			NO
464	325.0		Shed	Unassociated Buildings	NO	5	West 13th St			SHPO 6/18/93			NO
465	326.0		Two sheds	Unassociated Buildings	NO	5	West 13th St			SHPO 6/18/93			NO
466	327.0		Building	Unassociated Buildings	NO	5	West 13th St			SHPO 6/18/93			NO
467	328.0		Building	Unassociated Buildings	NO	5	West 13th St			SHPO 6/18/93	Out		NO
468	330.0		Shed	Unassociated Buildings	NO	5	West 14th St			SHPO 6/18/93			NO
469	331.0		Shed	Unassociated Buildings	NO	5	West 14th St			SHPO 6/18/93			NO
470	332.0		Shed	Unassociated Buildings	NO	5	West 14th St			SHPO 6/18/93			NO
471	333.0		Building	Unassociated Buildings	NO	5	West 14th St			SHPO 6/18/93			NO
472	334.0		Shed	Unassociated Buildings	NO	5	West 14th St			SHPO 6/18/93			NO
473	335.0		Shed	Unassociated Buildings	NO	5	West 14th St			SHPO 6/18/93			NO

ROUTE 9A RECONSTRUCTION PROJECT
MATRIX OF ARCHEOLOGICAL SITES

SITE INVENTORY					LOCATION		ELIMINATION FROM FURTHER CONSIDERATION DUE TO					FIELD TESTING
Item No. (1)	Site No.	Notes	Name	Contextual Report	Disturbance Report Generated	Segment	Street	Lack of Arch. Visibility	Lack of Research Potential	Well Documented in the Literature	Out of APE (2)	Prior Disturbance	Final Recommendation
474	334.0		Shed	Unassociated Buildings	NO	5	West 14th St					SHPO 6/18/93	NO
475	337.0		Building	Unassociated Buildings	NO	5	West 14th St					SHPO 6/18/93	NO
476	340.0		Shed	Unassociated Buildings	NO	5	West 15th St					SHPO 6/18/93	NO
477	341.0		Shed	Unassociated Buildings	NO	5	West 15th St					SHPO 6/18/93	NO
478	342.0		Shed in northwest corner of lot	Unassociated Buildings	NO	5	West 15th St					SHPO 6/18/93	NO
479	343.0		Three-story building	Unassociated Buildings	NO	5	West 15th St					SHPO 6/18/93	NO
480	344.0		Shed	Unassociated Buildings	NO	5	West 15th St					SHPO 6/18/93	NO
481	432.0		Shed in W.S.	Unassociated Buildings	NO	5	West 38th St					SHPO 6/18/93	NO
482	131.0		Brick building	Unassociated Buildings	NO	7	West 45th St					SHPO 6/18/93	NO
483	436.0		Wood shed	Unassociated Buildings	NO	7	West 46th St					SHPO 6/18/93	NO
484	437.0		Shed	Unassociated Buildings	NO	7	West 46th St					SHPO 6/18/93	NO
485	440.0		Shed	Unassociated Buildings	NO	7	West 46th St					SHPO 6/18/93	NO
486	443.0		Brick & frame building	Unassociated Buildings	NO	7	West 47th St					SHPO 6/18/93	NO
487	444.0		Wood sheds	Unassociated Buildings	NO	7	West 47th St					SHPO 6/18/93	NO
488	445.0		Building	Unassociated Buildings	NO	7	West 47th St					SHPO 6/18/93	NO
489	448.0		Wood sheds	Unassociated Buildings	NO	7	West 47th St					SHPO 6/18/93	NO
490	449.0		Wood building	Unassociated Buildings	NO	7	West 47th St					SHPO 6/18/93	NO
491	452.0		Wood shed	Unassociated Buildings	NO	7	West 48th St					SHPO 6/18/93	NO
492	454.0		Wood shed	Unassociated Buildings	NO	7	West 48th St					SHPO 6/18/93	NO
493	456.0		One story building	Unassociated Buildings	NO	7	West 48th St					SHPO 6/18/93	NO
494	457.0		Wood building	Unassociated Buildings	NO	7	West 48th St					SHPO 6/18/93	NO
495	458.0		Brick building	Unassociated Buildings	NO	7	West 48th St					SHPO 6/18/93	NO
496	459.0		Brick building	Unassociated Buildings	NO	7	West 48th St					SHPO 6/18/93	NO
497	463.0		Wood building	Unassociated Buildings	NO	7	West 49th St					SHPO 6/18/93	NO
498	466.0		Wood shed	Unassociated Buildings	NO	7	West 50th St					SHPO 6/18/93	NO
499	470.0		Brick building	Unassociated Buildings	NO	7	West 50th St					SHPO 6/18/93	NO
500	471.0		Building	Unassociated Buildings	NO	7	West 51st St					SHPO 6/18/93	NO
501	477.0		Brick building	Unassociated Buildings	NO	7	West 54th St					SHPO 6/18/93	NO
502	478.0		Wood shed	Unassociated Buildings	NO	7	West 54th St					SHPO 6/18/93	NO
503	481.0		Building	Unassociated Buildings	NO	7	West 54th St					SHPO 6/18/93	NO
504	483.0		Factory/lofts	Unassociated Buildings	NO	7	West 55th St					SHPO 6/18/93	NO
505	487.0		Three buildings in M.S.	Unassociated Buildings	NO	7	West 56th St					SHPO 6/18/93	NO
506	491.0		Building in 12th Avenue	Unassociated Buildings	NO	7	West 54th St					SHPO 6/18/93	NO

NOTES:

(1) Item Nos. are solely for the purpose of this chart. The Site Inventory Nos. refer to the initial inventory of known sites performed for the project.

(2) Capital letters "OUT" are used to signify that site was eliminated because it was out of the Project's area of potential effect (APE).
Upper and lower case "Out" are used to signify that the site was eliminated on other grounds as well as being out of the Project's APE

(3) Site 172 (Dwellings) was also evaluated and discussed in the FEIS as a potential 17th Century site.

(4) Site 168 (Piers and Wharves) was also evaluated and discussed in the FEIS as a potential 17th Century site.

nel 03/27/9

ATTACHMENT C

HISTORIC PROPERTIES / STRUCTURES IN THE ROUTE 9A CORRIDOR (FEIS Table)

Table C-1
LIST OF IDENTIFIED HISTORIC PROPERTIES/STRUCTURES
IN THE ROUTE 9A CORRIDOR APE *AND NEARBY AREA*

Map Reference Number	Name	Status
*1	Castle Clinton	S/NR, NHL, NYCL
2	Pier A	S/NR, NYCL
*3	Battery Park Control House	S/NR, NYCL
*4	U.S. Custom House	S/NR, NHL, NYCL
*5	Bowling Green Park	S/NR
*6	Bowling Green Fence	S/NR, NYCL
7	International Mercantile Marine Company Building (U.S. Lines Building)	*S/NR*
8	Cunard Building	S/NR Eligible (2/11/91)
9	29 Broadway	S/NR Eligible (2/11/91)
10	61 Broadway	S/NR Eligible (2/11/91)
11	67 Greenwich Street	S/NR Eligible (2/11/91)
12	Brooklyn-Battery Tunnel Blower House	S/NR Eligible (7/21/89)
13	Whitehall Building	S/NR Eligible (7/21/89)
14	Former St. George's Syrian Roman Catholic Church	S/NR Eligible (2/11/91)
15	West Street Building	S/NR Eligible (7/21/89)
16	New York Telephone Company (Barclay-Vesey) Building	S/NR Eligible (8/29/89), NYCL
*17	Tribeca West Historic District	NYCL
*18	Harrison Street Houses	NYCL
19	Tribeca North Historic District	NYCL
*20	416-424 Washington Street	NYCL Pending
*21	Fleming Smith Warehouse	S/NR, NYCL
*22	502-508 Canal Street (502 Canal Street is also 480 Greenwich Street)	S/NR Eligible (3/22/83), NYCL Pending

Table C-1 (Continued)
LIST OF IDENTIFIED HISTORIC PROPERTIES/STRUCTURES
IN THE ROUTE 9A CORRIDOR APE *AND NEARBY AREA*

Map Reference Number	Name	Status
*23	James Brown House	S/NR, NYCL
*24	Greenwich Village Historic District	S/NR, NYCL
25	Westbeth Building (Bell Telephone Laboratories)	S/NR, NHL
26	American Seaman's Friend Society	S/NR Eligible (10/3/89)
27	Pier 57	S/NR Eligible (2/11/91)
28	Merchants Refrigerating Company Warehouse	S/NR
29	Seamen's House YMCA	S/NR Eligible (11/20/89)
30	Piersheds of Piers 60 and 61	S/NR Eligible (2/11/91)
31	Terminal Hotel	S/NR Eligible (11/20/89)
*32	Baltimore & Ohio Railroad Warehouse	S/NR Eligible (11/20/89)
33	Baltimore & Ohio Railroad Transfer Bridge	S/NR Eligible (2/11/91)
34	Starrett-Lehigh Building	S/NR Eligible (11/20/89), NYCL
35	New York Terminal Warehouse Company, Central Stores	S/NR Eligible (11/20/89)
36	Lincoln Tunnel Ventilator Structure, foot of 39th Street (west of Twelfth Avenue)	S/NR Eligible (11/20/89)
37	*Intrepid* Aircraft Carrier	S/NR, NHL
38	USS *Edson*	S/NR, NHL
39	Consolidated Edison Power Plant (originally IRT Power Plant)	S/NR Eligible (11/20/89), NYCL Pending

Notes:

*	*Properties in the nearby area.*
S/NR	Listed on the State and National Registers of Historic Places
S/NR Eligible	Determined eligible for listing on the State and National Registers of Historic Places (and date of determination)
NHL	National Historic Landmark
NYCL	New York City Landmark
NYCL Pending	Site has had public hearing(s) on its designation as a New York City Landmark.

This table has been revised for the FEIS.

Programmatic Agreement among the United States Army Corps of Engineers, the New York State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Development of the Hudson River Park along Manhattan's West Side in New York City, New York

Appendix B-6

March 31, 2000

PROGRAMMATIC AGREEMENT AMONG THE UNITED STATES ARMY CORPS OF ENGINEERS, THE NEW YORK STATE HISTORIC PRESERVATION OFFICER AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION REGARDING THE DEVELOPMENT OF THE HUDSON RIVER PARK ALONG MANHATTAN'S WEST SIDE IN NEW YORK CITY, NEW YORK

WHEREAS, pursuant to Section 10 of the Rivers and Harbors Act (33 U.S.C. §403) and Section 404 of the Clean Water Act (33 U.S.C. §1344), the United States Army Corps of Engineers ("USACE") has been requested to issue permits to facilitate the construction of the Hudson River Park by the Hudson River Park Trust ("Trust"); and

WHEREAS, as set forth in Chapter 592 of the (New York State) Laws of 1998 (the "Hudson River Park Act," annexed hereto as Exhibit 1), the Trust has been designated as the successor in interest to the Hudson River Park Conservancy ("HRPC") and the Empire State Development Corporation and is charged with the continued planning, design, construction and operation of the Hudson River Park project ("Project") ; and

WHEREAS, pursuant to Section 106 of the National Historic Preservation Act, the USACE has determined that the Project along the Hudson River on Manhattan's West Side between Battery Place and West 59th Streets, as described in the Joint Permits Application submitted in March 1998 and as modified and described in the Supplemental Public Notice issued by the USACE on February 18, 1999, may have an effect on properties listed in or eligible for inclusion in the National Register of Historic Places; and

WHEREAS, the USACE has consulted with the State Historic Preservation Officer ("SHPO") and the Advisory Council on Historic Preservation ("ACHP") in accordance with Section 106 of the National Historic Preservation Act (16 U.S.C. 470f), and its implementing regulations, "Protection of Historic and Cultural Properties" (36 C.F.R Part 800), and USACE regulations at 33 C.F.R Part 325, Appendix C; and

WHEREAS, the permit area under Appendix C (1) (g) to 33 C.F.R. §325 and the Area of Potential Effect (APE) as defined by USACE under 36 C.F.R. Part 800 are within the Hudson River, bounded on the south by the north bulkhead of the Battery Park City neighborhood, on the north by a project limit line extending into the river from the foot of West 59th Street, on the west by the U.S. Pierhead Line, and on the east by (and including) the existing bulkhead or the Mean High Water line where no bulkhead is present (Annexed hereto as Exhibit 2 is a map of the APE); and

WHEREAS, the Project's construction is to be phased over an estimated five-year period and only construction in Segments 3, 4, 5, 6 and 7 is within USACE regulatory permitting jurisdiction; and

WHEREAS, identification and evaluation of historic properties within the area of the Project was initially completed by the SHPO during the Section 106 Review for the Route 9A Reconstruction Project; and

WHEREAS, the determination of historic properties for the Route 9A Reconstruction Project ("Route 9A") was memorialized in a March 23, 1994 Programmatic Agreement signed by the ACHP, the Federal Highway Administration, the SHPO and Route 9A Reconstruction Project of the New York State Department of Transportation and annexed hereto as Exhibit 3; and

WHEREAS, the SHPO updated the identification and evaluation of historic properties set forth in the Route 9A Programmatic Agreement for the Project herein by conducting a site inspection and review of the following documentation:

- Scoping document for the preparation of an environmental impact statement for the Project pursuant to the State Environmental Quality Review Act ("SEQRA") and City Environmental Quality Review ("CEQR") and their implementing regulations, issued on June 19, 1996
- Report of Historical Perspectives Incorporated: Existing Conditions Report, Archeological Resources, Hudson River Park Project (seven volumes)

- The Building/Structure Inventory Form for the New York City Hudson River Bulkhead dated March 1997
- Draft Environmental Impact Statement for the Project, dated April 1997, prepared pursuant to both SEQRA and CEQR
- New York City Landmarks Preservation Commission Environmental Review of the Project, dated April 1997
- The *Draft Design Guidelines Master Plan* and *Appendix* for the Project
- The Final Environmental Impact Statement for the Project, dated May 1998 prepared pursuant to both SEQRA and CEQR; and

WHEREAS, the SHPO has identified and the USACE has concurred that the following properties within the Project's APE are listed on or eligible for the National Register of Historic Places (Annexed hereto as Exhibit 4 is a map showing the locations of these properties):

- New York City Hudson River Bulkhead from Battery Place to West 59th Street
- Intrepid Aircraft Carrier
- U.S.S. Edson
- Lincoln Tunnel Ventilator Structure
- Baltimore and Ohio Railroad Float Transfer Bridge
- the Lightship *Frying Pan*
- Piersheds of Piers 60 and 61
- Pier 57
- Holland Tunnel Ventilator Structure
- the *Yankee* (former *Machigonne*); and

WHEREAS, the USACE and SHPO have determined that the Project does not include any activities for Piers 60 and 61, the Lincoln or Holland Tunnel ventilator structures, or any rehabilitation of historic vessels, and further that the Project will have no effect on these historic properties; and

WHEREAS, the USACE and SHPO have determined that with regard to archeological resources in the APE, the Project will have no effect on such resources based upon the documented depth of fill within the APE in relation to the depth of excavation proposed for Project construction; and

WHEREAS, the Trust, the SHPO and USACE have determined that failure to rehabilitate the bulkhead will result in the further deterioration of this resource; and

WHEREAS, the Project includes a number of beneficial activities including:

- Rehabilitation of the Hudson River Bulkhead,
- Repair, rehabilitation and interpretation of the Baltimore and Ohio Railroad Float Transfer Bridge,
- Preservation of the Pier 54 arch,
- Incorporation of available bollards and cleats in Park design,
- Beautification and improvement of pedestrian access in the area around the *Intrepid* Sea-Air-Space Museum and the *U.S.S. Edson*,
- Establishment of three mooring locations for other historic vessels at Piers 25, 54 and 97,
- Installation of interpretive signage and information at major entrances to the Project (identified on page 1-13 of the Project's Final Environmental Impact Statement prepared pursuant to both SEQRA/CEQR) and other areas,
- Facilitation of public access to historic properties within the Project area identified on page 3 of this Agreement, including improved pedestrian crossings of Route 9A; and

WHEREAS, the USACE and SHPO have determined that while the Project is in proximity to the Greenwich Village, Tribeca North, and Chelsea Historic Districts, it is not contiguous to these Districts, and further, that Route 9A represents a significant barrier separating these Districts from the APE; and

WHEREAS, based on the criteria specified in 36 C.F.R. §800.9, and as a consequence of comments made during and subsequent to the consultation meeting held on August 19, 1999, the USACE and SHPO further analyzed the potential for direct and indirect effects on the Greenwich Village, Tribeca North and Chelsea Historic Districts, and as set forth in the SHPO letter dated December 30, 1999 (annexed hereto as Exhibit 5), have determined that no historic properties will be affected within or immediately adjacent to those districts, nor will any individually listed historic properties within those districts be affected; and

WHEREAS, the Project has been designed in coordination with the Route 9A Reconstruction Project, and the location and designs for pedestrian crossings of Route 9A including several pedestrian bridges to be built by the New York State Department of Transportation as part of the Route 9A Reconstruction Project ("Route 9A") will be developed in a manner that will adhere to the Route 9A Programmatic Agreement of March 23, 1994, and the USACE and SHPO have reviewed the 1994 Programmatic Agreement and have determined that that document will govern the location and design of any such bridges; and

WHEREAS, the USACE issued a Public Notice for the Project on June 16, 1998; held two public hearings on the Project's permit applications on July 16, 1998; issued a Supplemental Public Notice on February 18, 1999; and has received written comments and oral testimony as part of its public review and historic preservation processes; and

WHEREAS, prior to the Hudson River Park Act, the State of New York and the City of New York entered into a Memorandum of Understanding in 1992 which created HRPC and established an Advisory Board consisting of local communities, parks and environmental organizations, civic and public interest groups, labor and business organizations, elected officials and other interested citizens to ensure public participation and review; and

WHEREAS, in addition, a voluntary Advisory Historical Working Group was formed and began meeting in 1993 to provide guidance to the project on historical matters, and has over the course of the succeeding six years met for that purpose; and

WHEREAS, HRPC engaged in an extensive community outreach and public participation program, which included the Advisory Board, the Advisory Historical Working Group, and the local Community Boards adjacent to the project and held over 150 community meetings and hosted a month-long Open House and published advertisements in community newspapers to solicit input on the Project and give the public the opportunity to review Project plans as they have progressed, including consideration of historic resources; and

WHEREAS, consistent with the 1992 Memorandum of Understanding, professional landscape architects were selected by each Community Board and engaged by HRPC to serve as the local communities' liaisons to the Project's design process; and

WHEREAS, the public was provided with multiple opportunities to comment on the Project and on the following Project documents, and the public will hereafter be provided with further opportunities to comment on the project pursuant to Stipulation VI of this Agreement:

- *Concept and Financial Plan* for Hudson River Park prepared in 1995
- Scoping document for the preparation of an environmental Impact statement for the Project pursuant to SEQRA and CEQR and their implementing regulations, issued on June 19, 1996
- Draft Environmental Impact Statement for the Project, dated April 1997, prepared pursuant to SEQRA and CEQR
- *Draft Design Guidelines Master Plan* and *Appendix* for the Project, prepared pursuant to SEQRA and CEQR
- Final Environmental Impact Statement for the Project, dated May 1998, prepared pursuant to SEQRA and CEQR
- Initial Public Notice for the Project issued by the USACE on June 16, 1998
- Supplemental Public Notice for the Project issued by the USACE on February 18, 1999; and

WHEREAS, in addition to the above, the Project was the subject of public hearings on the draft scoping document, the Draft Environmental Impact Statement prepared pursuant to

SEQRA and CEQR, the General Project Plan, the Zoning Text Amendment, and the application for permits from the New York State Department of Environmental Conservation; and

WHEREAS, the USACE, the SHPO and the ACHP have agreed to develop this Programmatic Agreement ("Agreement") in accordance with 36 C.F.R. §800.13, with the intention of avoiding, minimizing and/or mitigating any adverse effects on historic resources from the construction of Segment 4 of the Project within the jurisdiction of the USACE; to develop guidance for the implementation of the remaining segments of the Project within the jurisdiction of the USACE; and to develop a process for SHPO review of the remaining segments of the Project; and

WHEREAS, the USACE and SHPO, in consultation with the Trust, considered alternative treatments to the proposed rehabilitation of the bulkhead which recognize its varying types of construction, conditions, materials and proposed programming, and will continue to consider alternative treatments as Segments 3, 5, 6 and 7 of the Project are further planned; and

WHEREAS, in negotiating this Agreement, the ACHP, consistent with the procedures set forth in its Summary of Council Involvement in the American Heritage Rivers Initiative, carefully considered the distinctive features and assets of the Hudson River when evaluating effects of the Project on historic properties; and

WHEREAS, the Trust (and its predecessors in interest) also participated in the consultation and the Trust was invited to concur in this Agreement; and

WHEREAS, the USACE received requests from elected officials, organizations and individuals with an interest in the Federal historic preservation process to participate in the Section 106 review process, and the USACE acknowledged these requests by inviting such interested parties to become consulting parties to this Agreement; and

WHEREAS, such parties include but are not limited to: local residents; local elected officials including Comptroller of the City of New York, State Senators, Members of the State

Assembly, and Members of the City Council; the New York City Landmarks Preservation Commission, the Municipal Art Society, the Historic District Council, the Clean Air Campaign, the Federation to Preserve the Greenwich Village Waterfront and Great Port, and the Society for the Architecture of the City; and

WHEREAS, this Agreement pertains only to Project activities conducted within the APE as defined herein and the boundaries of the APE have been concurred with by the SHPO; and

WHEREAS, this consultation also serves as consultation under §14.09 of the New York State Parks, Recreation and Historic Preservation Act of 1980; and

WHEREAS, the Section 106 review and the State Historic Preservation Process were coordinated with the following environmental review and land use processes:

- State Environmental Quality Review Act
- City Environmental Quality Review
- Zoning Text Amendment to Section 62-412 of the City Zoning Resolution
- Article 15 and Article 25, New York State Department of Environmental Conservation permits
- Certification of Coastal Zone Consistency, New York State Department of State;

WHEREAS, pursuant to 36 C.F.R. Part 800.13, following circulation of the initial Draft Programmatic Agreement, dated August 3, 1999, the USACE and ACHP convened a Section 106 consultation meeting on August 19, 1999, and provided thereafter a period for attendees at that meeting to review and comment on that Draft Agreement; and

WHEREAS, the USACE and ACHP convened a second Section 106 consultation meeting on March 23, 2000, at which time a revised Draft Agreement dated February 14, 2000, which was circulated to the consulting parties on February 14, 2000, was discussed, and such discussion led to a final revision of the Agreement; and

WHEREAS, prospective design decisions for and review of the Project and the implementation of the stipulations set forth in this Agreement shall be guided by the Project's *Design Guidelines Master Plan*, the provisions of the Hudson River Park Act, and the principles set forth in the Secretary of the Interior's Standards, recognizing that there is no specific National Park Service guidance or interpretation of the Standards as they relate to maritime structures such as the Project's bulkhead; and

WHEREAS, in the event that there is later involvement in the Project by any additional federal agency, such agency may fulfill its Section 106 compliance responsibilities by agreeing to the provisions in this Agreement;

NOW, THEREFORE, USACE, ACHP and the SHPO agree that implementation of the undertaking covered by this Agreement shall take into account effects on historic properties and shall be administered in accordance with the following Stipulations to avoid, mitigate and minimize adverse effects and to satisfy the USACE's Section 106 responsibilities. The USACE shall condition any Section 10 and Section 404 permit it may issue regarding the Project to ensure that the following measures are carried out by the Hudson River Park Trust.

STIPULATIONS

The USACE, through the inclusion of the conditions in any Section 10 and 404 Permits issued for the Project shall ensure that the following measures are carried out:

I. RECORDATION:

A. Prior to the initiation of rehabilitation of the bulkhead, the history and appearance of the Hudson River Bulkhead shall be compiled using digitally recorded photos and information provided by the Preservation Architect (described below under II.A) as well as existing documentation. All such documentation will be developed in accordance with Level II guidelines of the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER), and shall be submitted to the SHPO for their review

and acceptance. The SHPO shall advise the Trust what additional recordation documentation, if any, shall be required, and the Trust shall provide such documentation to the SHPO for acceptance.

B. Upon acceptance by the SHPO of such documentation, the Trust shall also provide copies of such documentation to Community Boards 1, 2 and 4, the Landmarks Preservation Commission of the City of New York, and to appropriate local libraries.

C. The documentation submitted to the SHPO shall be utilized in the development of interpretive signage and exhibits for the Project. As described in the *Design Guidelines Master* Plan, interpretive information is to be incorporated, at a minimum, at the major entrances to the Project. Interpretation of historic events and sites for the Park shall be planned in coordination with the SHPO.

II. DESIGN AND TREATMENT OF THE BULKHEAD AND RELIEVING PLATFORMS:

The design and treatment of the bulkhead and relieving platforms as described below was guided by the Secretary of Interior's standards for rehabilitation, with due consideration given to the Trust's requirements regarding public safety, public access, cost, life term, and maintenance. The USACE, SHPO, and ACHP agree that adherence to the treatment plan described below will minimize harm to both the bulkhead's subsurface and above-ground features and preserve its overall integrity.

A. To ensure the appropriate implementation of the design and treatment plan described below, the Trust shall retain the services of a qualified Preservation Architect approved by the SHPO, whose scope of services shall be defined jointly by the Trust and SHPO. The qualifications of such Preservation Architect must be consistent with the Secretary of the Interior's Historic Preservation Professional Qualifications Standards. The Preservation Architect shall be responsible for the evaluation and assessment called for in the following stipulations. Additionally, the Preservation Architect shall be

charged with ensuring that digital photos are taken of both the bulkhead and relieving platforms prior to, during and following any construction.

B. In coordination with the Preservation Architect, the Trust shall rehabilitate the Project's Bulkhead, including both its subsurface and above-ground features, in accordance with the design principles and treatment plans approved by the SHPO. In proceeding with such planning, the Trust shall specifically consider such factors, identified during consultation with the SHPO and other consulting parties, including:

1. the integrity and condition of the resource;
2. the type and extent of existing materials;
3. the type of existing bulkhead construction;
4. the views of the bulkhead from the water;
5. the preference for repair over replacement whenever feasible; and
6. limiting the removal or demolition of bulkhead features only to areas where such activities are necessary to accomplish approved repair or replacement.

Generally, the treatment of the bulkhead shall consist of the following, recognizing that the plans for each segment shall be guided by the conditions specific to that segment:

(i) Large section/lengths of the existing granite Bulkhead coping shall be rehabilitated by using granite salvaged from other sections of the Bulkhead where the Preservation Architect determines that the wall is either in poor condition or where only a small length of the wall remains.

(ii) In areas where the Preservation Architect determines that the existing granite Bulkhead coping is either in deteriorated condition or is of a short length, repairs would be made with cast-in-place concrete.

(iii) All granite removed from the bulkhead shall be evaluated by the Preservation Architect for salvage and reuse in other areas of the Project.

(iv) Areas of the Bulkhead that are already concrete, such as where pierheads were once attached but no longer exist, would be reconstructed using similar cast-in-place concrete. In areas where piers were once located but no longer exist, the Trust shall memorialize such "ghost" piers by identifying the former pier number and any pertinent historical information to which the Trust and SHPO agree and in a manner to be approved by the SHPO.

C. (i) The Trust shall implement Segment 4 in accordance with the approach submitted to and approved by the SHPO, by letter dated April 15, 1998 and with the plans dated April 2, 1999.

(ii) Plans for segments other than Segment 4 will be provided to the SHPO, which will notify the Trust within 15 calendar days if there are any objections to such plans. No comment within these 15 calendar days shall constitute SHPO concurrence with such plans.

(iii) If in the planning for subsequent Project segments, the Trust and the Preservation Architect determine that design modifications are necessary, the Trust shall submit details of such proposed design changes to the SHPO for review and approval.

D. The Trust shall ensure that the Project's lookouts (or balconies) and "get downs" are located only in areas where the Preservation Architect determines that the existing granite Bulkhead coping is either in deteriorated condition or is of a short length. Siting and design of these elements, including massing and materials, shall be reviewed by the SHPO, with the exception of Segment 4, which design already meets this requirement, and which was approved by the SHPO, by letter dated April 15, 1998.

E. Plans for the physical installation of bulkhead railing and bulkhead lighting fixtures shall be developed consistent with code and safety requirements, the goals identified in the

Project's *Design Guidelines Master Plan*, the recommended approaches in the Secretary of Interior's Standards, and in consultation with the SHPO.

F. To ensure the bulkhead's long-term maintenance, the Trust shall conduct an inspection of the entire bulkhead once every five years. In the event that any structural problems are identified, the Trust shall make appropriate repairs following approval by the SHPO.

G. In the event of an unresolved objection between the SHPO and the Trust about the plans for future Project segments, the procedure described below under Section V ("Dispute Resolution") shall govern.

III. TREATMENT OF OTHER HISTORIC PROPERTIES:

A. The Trust shall ensure that treatment of the Baltimore and Ohio Railroad Float Transfer Bridge is completed in accordance with the plans entitled "Historic Railroad Transfer Floatbridge (Pier 66A) Project Description" dated December 16, 1998. This treatment was approved by the SHPO by letter of January 14, 1999. In the event that conditions necessitate any substantial changes to the preliminary design plans, the Trust shall resubmit such plans to the SHPO for review.

B. The Trust shall ensure that Project activities intended to create public access at Pier 57, as described in the USACE permit application, are developed in consultation with the SHPO. In providing for such public access at Pier 57, the Trust shall create a design which shall avoid, minimize and/or mitigate adverse effects to this historic property. Final plans shall be submitted to the SHPO for approval.

C. Upon the Trust's selection of historic vessels to be moored within the Park at Piers 25, 54 and 97, the Trust shall consult with the USACE and SHPO with respect to the placement of such vessels, and in particular with respect to their method of placement.

(i) In identifying historic vessels, the Trust shall consider in particular the method of

their placement at the piers, including the requirements of the New York State Department of Environmental Conservation permit, Special Condition 10.

(ii) In identifying historic vessels and their potential locations, the Trust shall also consider issues of public access and public safety.

D. Following the Trust's selection of historic vessels to be docked at the piers designated above within the Project, the Trust shall consult with the SHPO on all aspects of the mooring activities associated with these vessels for the purpose of avoiding any adverse effects on those historic vessels.

IV. COORDINATION OF REVIEWS:

A. Upon execution of this Agreement and the receipt of a USACE permit if issued, the Trust may proceed with those elements of the construction of Segment 4 which are within the jurisdiction of the USACE.

B. The Trust shall submit design plans to the SHPO for activities within the APE with the potential to affect any of the listed or eligible historic properties identified, unless the SHPO agrees otherwise.

C. The SHPO shall provide comments respecting any Project submissions within 15 calendar days, which comments may include recommended modifications to avoid, minimize, or mitigate adverse effects to historic properties.

(i) If the Trust cannot agree to any such proposed modifications and if further consultation with the SHPO is deemed unproductive by the SHPO, then the SHPO shall adhere to the procedures detailed under Stipulation V ("Dispute Resolution.")

(ii) If the SHPO determines that an adverse effect shall result from any such proposed modification, the Trust, in accordance with 36 C.F.R. §800.5 (e) shall consult with the SHPO to explore alternatives and seek ways to avoid or reduce the effects on historic properties, with implementation of the resulting plan following approval by the SHPO.

D. SHPO comments shall be guided by the *Design Guidelines Master Plan*, the Hudson River Park Act, and the Secretary of Interior's Standards.

E. Substantial design modifications, as determined by the Preservation Architect, to approved plans for activities with the potential to affect adversely any of the listed or eligible properties within the APE identified previously must be submitted to the SHPO, unless the SHPO agrees otherwise.

F. The Trust shall ensure that designers, contractors, owners of historic vessels and any potential lessees of space under the jurisdiction of the Trust are informed of coordination procedures required for the design and treatment of each segment.

G. If, during Project implementation, the Trust, its contractors or the Preservation Architect discover or identify any additional historic properties that may be adversely affected or any unanticipated adverse effects to a historic property, the Trust shall stop such work and shall also notify SHPO and the USACE. The Trust and the SHPO shall then develop a treatment plan for such property or condition, and shall submit such plan to the USACE and ACHP as appropriate for comment within 15 calendar days. No comment within that time period shall constitute concurrence with the proposed plan. The Trust shall also make information regarding additional historic properties or unanticipated adverse effects available to the public as described under Stipulation VI.A. The SHPO must approve all recommended treatment plans; however, all project activities other than those responsible for the above-specified adverse effects may proceed while the treatment plan is being developed or reviewed.

H. Should the Trust request an amendment to its Section 10-Section 404 permit, the USACE shall consult with the SHPO and Trust to assess what, if any, additional conditions or treatment measures related to historic properties are required for any amended permit. Such consultation shall first attempt to determine whether the condition can be addressed through Project modifications or through a permit condition established by the USACE consistent with the terms of this Agreement. Only in the event that the USACE, SHPO and Trust fail to reach agreement will the provisions of Stipulation X below be implemented. In all such cases, the Trust shall notify the public pursuant to Stipulation VI below.

I. To the extent practicable, reviews required under this stipulation shall be coordinated with other local and state administrative reviews.

J. In the event that SHPO receives written comments from the public regarding implementation of the terms of this Agreement, the SHPO shall coordinate with the USACE and Trust, consistent with Stipulation VI.B ("Public Involvement").

V. DISPUTE RESOLUTION:

A. The Trust shall notify the USACE of any instance where the SHPO objects to a proposed treatment, and the Trust and SHPO cannot resolve the objection. The USACE shall consult with the SHPO and Trust to attempt to resolve the objection. If the USACE determines that the objection cannot be resolved, the USACE shall forward all documentation relevant to the dispute to the ACHP. Within 20 calendar days after receipt of such documentation, the ACHP shall either:

(i) Provide the USACE with recommendations, which the USACE shall take into account in reaching a final decision regarding the dispute; or

(ii) Notify the USACE that it shall comment pursuant to 36 C.F.R. 800.6 (b), and proceed to comment. Any ACHP comment provided in response to such a

request shall be taken into account by the USACE in accordance with 36 C.F.R. 800.6 (c)(2) with reference to the subject of the dispute.

B. Any recommendations or comment provided by the ACHP shall be understood to pertain to the subject of the dispute; the USACE's responsibility to carry out all actions under this agreement that are not the subjects of the dispute shall remain unchanged.

VI. PUBLIC INVOLVEMENT:

A. Public Notification:

The Trust shall continue to coordinate with the community consistent with the provisions of the Hudson River Park Act, including meeting regularly with the Hudson River Park Advisory Council, and providing for meaningful public notice, participation, consultation and review in the planning, development and operation of the park, which shall include, but not be limited to (i) consultation with Manhattan Community Boards One, Two and Four, elected officials representing communities neighboring the park, and appropriate community, civic and advocacy organizations and (ii) timely and reasonable notifications to such individuals and groups and appropriate news media of each meeting of the Trust and any public hearings and (iii) in the case of any proposed significant action affecting the park, holding a public hearing on not less than 30 calendar days advance public notice.

B. Public Comments:

If the Trust receives timely and substantive written public objections regarding the treatment of historic properties, or measures taken to implement the terms of this Agreement, the Trust shall consult with the objector regarding such objections.

(i) The Trust shall respond within 30 calendar days to substantive written comments. If the Trust and the objector cannot resolve the matter, or if the matter is such that the Trust believes SHPO involvement is appropriate, the Trust shall notify the

SHPO and provide copies of the objection, and the SHPO, as appropriate, shall advise the Trust of measures, if any, that could resolve the matter.

(ii) If the Trust and the SHPO cannot resolve the issue and the SHPO determines that in the absence of such resolution there would be an adverse effect on the historic resource, the SHPO shall consult with the USACE and ACHP, as appropriate.

VII. COORDINATION OF OTHER FEDERAL REVIEWS:

A. In the event that the Trust applies for federal funds in respect of the Project, the federal funding agency may satisfy its Section 106 responsibilities by agreeing in writing to the terms of this Agreement, and notifying the SHPO and ACHP accordingly.

VIII. MONITORING:

A. During Project construction, the Trust shall submit quarterly status reports to the SHPO and the ACHP to summarize measures it has taken to comply with the terms of this Agreement. Reports shall be submitted until the project is completed. Following Project construction, reports shall be submitted to the SHPO every five years with respect to the bulkhead inspections described above in Section II ("Design and Treatment of the Bulkhead and Relieving Platforms"), Section F.

IX. TERM OF THE AGREEMENT:

A. This Agreement shall remain in force for ten years following its execution unless the USACE, SHPO and ACHP agree otherwise, in accordance with the following Stipulation X or XI.

X. AMENDMENTS TO THE AGREEMENT:

A. This Agreement may be amended at the request of any of the signatories to this Agreement, after providing no less than 30 calendar days written notification to the other signatories. Upon the receipt of a request for an amendment, the USACE shall notify all persons or organizations identified as consulting parties of the request. The signatories to this Agreement shall consult to consider such amendments in a manner consistent with 36 C.F.R. Part 800.

XI. TERMINATION OF THE AGREEMENT:

A. This Agreement may be terminated at the request of any of the signatories to this Agreement, with 30 calendar days written notification to the other signatories. In the event the Agreement is terminated, the USACE, in consultation with the Trust, shall comply with 36 C.F.R. Part 800 on a case-by-case basis for each proposed project activity within the permitted area.

EXECUTION AND IMPLEMENTATION OF THIS PROGRAMMATIC AGREEMENT EVIDENCES THAT USACE HAS SATISFIED ITS SECTION 106 RESPONSIBILITIES FOR THE HUDSON RIVER PARK PROJECT.

UNITED STATES ARMY CORPS OF ENGINEERS

By: William D. Bruce Date: 14 April 2000

NEW YORK STATE HISTORIC PRESERVATION OFFICER

By: J.W. Regan Date: 5 April 00

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: Catherine B. Slatis Date: 5 May 2000

CONCUR:

HUDSON RIVER PARK TRUST

By: Robert Balder Date: 3/31/00

Appendix B-7: Correspondence

OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
NEW YORK STATE
Bernadette Castro
Commissioner

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189

518-237-8643

February 9, 2004

Kevin M. Rampe, President
Lower Manhattan Development Corporation
One Liberty Plaza, 20th Floor
New York, New York 10006

Dear Mr. Rampe:

Re: LMDC
WTC Memorial and Redevelopment Plan
New York, New York
03PR02664

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). The SHPO has reviewed the Final Determination of Eligibility for the World Trade Center Site in accordance with Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations.

The SHPO appreciates the opportunity to attend and participate in the Section 106 Consulting Parties meetings on the Determination of Eligibility and for the World Trade Center Memorial and Redevelopment Plan. The meetings, and the Draft Determination of National Register Eligibility for the World Trade Center Site, which was shared with the SHPO and the Consulting Parties on January 21, 2004, have provided us with a good understanding of the intent of the document and the comments and concerns of the Consulting Parties. As is often the case, the SHPO has chosen to respond expeditiously to your submission in order to make our comments available as early as possible for the consideration of the Consulting Parties and the public.

Based upon this review, the SHPO concurs with the determination that the World Trade Center Site is eligible for the National Register of Historic Places. We recognize the unusual nature of this determination and appreciate the commitment and effort that was given to the evaluation. We are pleased to note that many of the suggestions and recommendations provided by the SHPO and the Consulting Parties were incorporated into the final determination of eligibility. In the opinion of the SHPO, the National Register criteria for evaluation and National Register guidelines were reasonably and appropriately applied to the evaluation of this unprecedented event and unique historic property. In addition to satisfactorily establishing the historical significance of the site, the determination provides sufficient information with regard to boundaries, features, and integrity to provide a basis for proceeding with the Section 106 review process.

An Equal Opportunity/Affirmative Action Agency
printed on recycled paper

Providing additional time for comment on the eligibility by the Consulting Parties is appropriate given the unprecedented nature of the determination, the national significance of the events that took place at the World Trade Center Site, and the growing interest in viewing those events from an historical perspective. Any effort to augment the historical context and factual basis for the determination will be worth the effort. Therefore, the SHPO supports LMDC's decision to extend the comment period on the determination of eligibility for an additional 30-days.

It is also true that the current determination of eligibility provides an adequate basis for moving forward. As such, we feel it is appropriate to proceed with the Section 106 process and concur that it is acceptable to share a proposed Determination of Effect with the Consulting Parties. In the opinion of the SHPO the Section 106 regulations do not preclude such an action, LMDC has provided reasonable justification for this approach, and Section 800.3(g) appears to indicate that the need for such an allowance is both envisioned and accommodated by the regulations.

The SHPO looks forward to continuing to participate in the Section 106 review of the World Trade Center Memorial and Redevelopment Plan. If you have any questions, please feel free to call me at (518) 237-8643 ext. 3255.

Sincerely,

Robert Kuhn
Assistant Director
Field Services Bureau

cc: HUD
FTA
FHWA

NEW YORK STATE
Bernadette Castro
Commissioner

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189

518-237-8643

March 19, 2004

Christopher R. Zeppie
Chief, Environmental Policy Officer
The Port Authority of NY & NJ
Office of Policy & Planning
233 Park Avenue South, 11th Floor
New York, New York 10003

Dear Mr. Zeppie:

Re: PA/FTA
Permanent PATH Terminal Project
Manhattan, New York County
03PR04247

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). The SHPO has reviewed your correspondence of February 25, 2004, with regard to the Permanent World Trade Center PATH Terminal Project in accordance with Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations.

Based upon this review, the SHPO concurs with the Area of Potential Effect (APE) for the purposes of Section 106 review, as that APE is defined in the February 25, 2004, project submission. The SHPO looks forward to consulting with the Federal Transit Administration and the Port Authority of New York and New Jersey on this project.

When responding please be sure to refer to the SHPO project review (PR) number noted above. If you have any questions, please feel free to call me at (518) 237-8643 ext. 3255.

Sincerely,

Robert D. Kuhn

Assistant Director
Field Services Bureau

RDK;bsa
cc: C. Braegelmann, FTA

An Equal Opportunity
printed on recycled paper

OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
NEW YORK STATE
Bernadette Castro
Commissioner

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189 518-237-8643

May 5, 2004

Christopher R. Zeppie
Chief, Environmental Policy Officer
The Port Authority of NY & NJ
Office of Policy & Planning
233 Park Avenue South, 11th Floor
New York, New York 10003

Dear Mr. Zeppie:

Re: PA/FTA
Permanent PATH Terminal Project
Manhattan, New York County
03PR04247

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). The SHPO has reviewed the report for the Permanent World Trade Center PATH Terminal Project in accordance with Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations.

The SHPO has reviewed the report titled, *Phase IA Archaeological Assessment, Permanent World Trade Center Path Terminal, South Pedestrian Passageway*, prepared by Historical Perspectives Inc. and dated April, 2004.

Based upon this review, the SHPO accepts and approves the report and concurs with the recommendations of the report.

When responding please be sure to refer to the SHPO project review (PR) number noted above. If you have any questions, please feel free to call me at (518) 237-8643 ext. 3255.

Sincerely,

Robert D. Kuhn

Assistant Director
Field Services Bureau

RDK:bsa

An Equal Opportunity/Affirmative Action Agency
printed on recycled paper

Appendix C

Transportation

Appendix C-1: PATH Ridership Estimates

A. INTRODUCTION

This memorandum describes the ridreship forecasting that was prepared by the Port Authority of New York and New Jersey (PANYNJ in support of the design and environmental analysis of a Permanent World Trade Center (WTC) PATH Terminal in Lower Manhattan.

The terrorist attacks of September 11, 2001 resulted in unique circumstances for the preparation of these ridership data. Typically, a transit agency/authority would rely upon regional projections prepared by its Metropolitan Planning Organization (MPO). In the case of PANYNJ, the New York Metropolitan Transportation Council (NYMTC) serves as the MPO. However, both PANYNJ's and NYMTC's offices were located in the WTC, meaning that most files were destroyed by the terrorist attacks.

In 2002, NYMTC, PANYNJ, and the Metropolitan Transportation Authority (MTA) met to discuss the status of transit ridership projections for the New York Metropolitan Region. At the time of the terrorist attacks, NYMTC had nearly completed projections for 2020. However, given the major economic implications of the attacks, they planned to revised these projections to account for the effects of the attacks using a horizon year of 2025. At the meeting, NYMTC indicated that this modeling effort would take 3 to 4 years to complete.

Simultaneously, PANYNJ and MTA were planning for their respective projects in Lower Manhattan and the supporting environmental documentation. Given the timeframe of these projects, it would not be feasible to wait for NYMTC projections to move forward. NYMTC agreed that PANYNJ and MTA could proceed with independent ridership estimates absent a regional model.

Since their meeting with NYMTC, PANYNJ and MTA have coordinated to forecast ridership for the Permanent WTC PATH Terminal, South Ferry Terminal, and the Fulton Street Transit Center. Throughout this process, project staff have calibrated the individual analyses, which has resulted in only minor differences in the results. PANYNJ and MTA continue to meet to refine these results and to plan for the design of their individual projects.

PANYNJ has prepared ridership estimates through the 2025 design year of the Permanent WTC PATH Terminal. Since the scoping process for the Permanent WTC PATH Terminal Environmental Impact Statement, which began in September 2003, these projections have been periodically refined to account for programmatic changes in the World Trade Center Memorial and Redevelopment Plan, revisions to the model for the South Ferry and Fulton Street Transit Center projects, and data from the temporary WTC PATH station. The following describes the estimates presented in the FEIS.

B. RIDERSHIP TRENDS

The modeling of future ridership has been guided by a number of trends that were observed with the PATH system prior to September 11, 2001 as well as plans that have put forth more recently.

LOWER MANHATTAN DEVELOPMENT TRENDS

As described in Chapter 4, "Land Use, Neighborhood Character, and Public Policy" and Chapter 5, "Socioeconomic Conditions" of the Draft Environmental Impact Statement, several projects are planned for Lower Manhattan that will be completed by 2025. More than 12,000 residential units, 1.4-million square feet of retail, and 14.9-million square feet of office space is planned south of Canal Street. These projects will result in more than 22,000 new residents and more than 67,000 new workers as compared to today.

Table 1 compares the 2025 residential and employee populations of Lower Manhattan to 2000 estimates. As shown, the area's residential population will increase by 54.9 percent from 2000 to 2025. The employee population will change from 426,000 to 421,673, a decrease of one percent.

Table 1
Projected Housing, Population, and Employment in Lower Manhattan in 2000 and 2025

Estimate	Residential (DU)	Office (sf)	Retail (sf)	Population	
				Residential	Employee
2000 (Pre-September 11, 2001)	27,143	107,512,756	7,450,000	58,618	426,000
Total 2025	44,775	107,812,850	8,570,700	90,775	421,873
Percent Change (2000 to 2025)	65.0%	0.3%	15.0%	54.9%	-1.0%

Notes: Population estimates were generated by multiplying the number of housing units by the 2000 average household size for each subarea. Employment estimates were generated by applying standard employee/square foot ratios to anticipated development.

In addition to the residents and employees who would ride PATH, the planned Memorial, museum, and cultural facilities at the WTC site are expected to generate a substantial number of daily PATH trips. PANYNJ coordinated with LMDC and its consultants to develop estimates of this patronage and to project the number of visitors by PATH. As shown in the Final Generic Environmental Impact Statement for the World Trade Center Memorial and Redevelopment Plan, these facilities would generate 2,526 daily, two-way PATH trips. It is anticipated that the majority of these trips would occur during off-peak periods.

JERSEY CITY DEVELOPMENT TRENDS

While the employee population of Lower Manhattan will decrease slightly between 2000 and 2025, the employee population of Jersey City, New Jersey is expected to increase significantly. Since the early 1990's, the Jersey City waterfront has experienced substantial growth in office space. Since 2000, a total of eleven office buildings have opened accounting for 4.9-million square feet of new space. An additional 7.6-million square feet of office is still planned and is expected to be completed before 2025.

The increased office population in Jersey City coupled with the increase in Lower Manhattan residents by 2025 is expected to generate new "reverse" commuters by PATH. Prior to

September 11, 2001, a shift in PATH ridership was occurring at the WTC station. While commuters to Lower Manhattan continued to increase, there was a more rapid increase in the "reverse" commute. A survey conducted in 1996 showed that 15 percent of PATH riders commuted from Manhattan to New Jersey. However, by 2000 it was observed that "reverse" commuters comprised nearly 20 percent of the AM peak hour ridership. Given the level of anticipated development along the Jersey City waterfront, it is expected that this trend will continue.

The expansion of office space in Jersey City has resulted in two other trends that increase PATH ridership. First, firms located in Lower Manhattan have expanded operations to occupy space in Jersey City; thus, they have offices on both sides of the Hudson River. Their employees rely on PATH for commuting between offices. Second, financial and other similar firms have located in Jersey City for its proximity to the major financial institutions in Lower Manhattan. Their employees and those employed in Lower Manhattan also rely on PATH to travel between meetings. Both of these trends have resulted in increased demand for off-peak PATH service. With the further expansion of office space in Jersey City, future increases are expected to continue.

TRANSIT NETWORK EXPANSION

Three transit expansion projects have the potential to attract new PATH riders by the 2025 design year for the Permanent WTC PATH Terminal: 1) Expansion of PATH to Newark Liberty International Airport; 2) Commuter rail connection between Lower Manhattan, JFK Airport, and Long Island; and 3) Hudson-Bergen Light Rail Extensions.

PATH EXTENSION TO NEWARK LIBERTY INTERNATIONAL AIRPORT

PANYNJ's long-range plan calls for the extension of the PATH system from Newark-Penn Station to Newark Liberty International Airport. This extension would allow for a one-seat ride between Lower Manhattan and the airport. Although some airport passengers currently use PATH to travel between Lower Manhattan and a transfer at Newark-Penn Station to commuter rail, bus, or taxi for access to the airport, It is anticipated that direct PATH service to Newark Liberty International Airport would attract new PATH riders who would divert from automobile, taxi, and commuter rail. It is expected that much of this growth in would occur during off-peak hours.

HUDSON-BERGEN LIGHT RAIL

By winter 2005, New Jersey Transit plans to open Minimum Operating Segment (MOS) 2 of the Hudson-Bergen Light Rail (HBLR) system. This segment will extend service from Hoboken Terminal to the Tonnelle Avenue Park-N-Ride in North Bergen, New Jersey. FTA and New Jersey Transit are also preparing an Environmental Impact Statement for MOS3 of the Hudson-Bergen Light Rail, which would extend service south in Bayonne from 22nd Street to 8th Street and north from Tonnelle Avenue to a terminus in Tenafly.

The Hudson-Bergen Light Rail has transfers to the PATH system at Hoboken and Exchange Place. As the expansions are completed, it is anticipated that some commuters would use HBLR and PATH for their travel to Lower Manhattan. It is expected that these commuters would divert from private automobiles or from New Jersey Transit commuter rail and buses.

JFK AIRPORT ACCESS

PANYNJ, the Lower Manhattan Development Corporation, and the Metropolitan Transportation Authority are currently studying options to provide commuter rail service between Lower Manhattan and Eastern Long Island and John F. Kennedy International Airport. This project has the potential to attract new PATH riders who would travel between New Jersey and JFK Airport via a transfer at the Permanent WTC PATH Terminal to the Lower Manhattan commuter rail terminal. Similar to the anticipated increases from the Newark Liberty International Airport Extension, this new ridership is expected to occur mostly during off-peak periods.

MODE SHIFT AND CONNECTIVITY

A principal goal in the planning for a Permanent WTC PATH Terminal and the Fulton Street Transit Center has been to improve connectivity between PATH and New York City subways. The Permanent WTC PATH Terminal will provide connections to subway lines that were not served by the pre-September 11, 2001 facility. These additional connections will improve regional mobility and may attract riders to Lower Manhattan who previously used Midtown transit services or another mode of travel for access between New Jersey and New York City.

C. RIDERSHIP PROJECTIONS

PANYNJ prepared ridership estimates by year for the weekday AM peak, midday peak, PM peak, and 24-hour periods at the WTC Terminal. As shown in Table 2 and Figure 1, the weekday, 24-hour, two-way ridership at the WTC Terminal will be approximately 161,700 passengers by 2025. Although PATH ridership at the WTC Terminal is currently much lower than before September 11, 2001, trips to and from the Terminal are expected to exceed 2000 levels by 2015. In total, daily PATH ridership will increase by 13.6 percent from 2000 to 2025.

Generally growth in PATH ridership would increase by 0.5 percent per year between 2004 and 2025. However, more rapid increases are anticipated in 2006, 2009, 2015, 2016, and 2025 with the completion of developments on the WTC site and elsewhere in Lower Manhattan. In 2006, the occupation of 7 WTC would occur, resulting in a 3.4 percent increase in daily PATH ridership. In 2009, the completion of Freedom Tower, the WTC Memorial, and cultural facilities on the WTC site will generate a 7.1 percent increase. The completion of Towers 2, 3, 4, and 5 on the WTC site would result in a total 17.5 percent increase in daily ridership between 2014 and 2016. An additional 3.1 percent increase is anticipated between 2024 and 2025 with the completion of projects at Battery Park City.

The two-way ridership for the weekday AM peak period (6 AM to 10 AM) will represent approximately 38 percent of total daily trips at the Terminal with the busiest hour being from 8AM to 9AM. The PM peak period (4PM to 7PM) will serve 31 percent of the total daily ridership with the busiest hour from 5PM to 6PM. The remaining 31 percent of PATH riders would arrive or depart the Terminal during the midday, evening, or overnight periods with the busiest hour occurring in the midday. The following describes peak hour ridership for the AM peak hour, midday peak hour, and PM peak hours since these will be the busiest at the Terminal.

As shown in Table 3 and Figure 2, the weekday, two-way AM peak hour ridership will total 29,001 by 2025 with 5,660 boardings and 23,341 alightings. Boardings will increase by 37.8 percent while alightings will increase by 3.8 percent. The rapid increase in boardings corresponds to the expected rise in "reverse" commuters. The combined change in boardings and alightings represents a 9 percent increase in AM peak hour trips between 2000 and 2025.

Table 2

PATH - World Trade Center Terminal

Weekday Daily Two-Way Ridership by Year (2000 to 2025)

Year	Boarding			Alighting			Total		
	Passengers	Percent Change from Year Prior	Percent Change from 2000	Passengers	Percent Change from Year Prior	Percent Change from 2000	Passengers	Percent Change from Year Prior	Percent Change from 2000
2000	67,000	0.0%	0.0%	75,300	0.0%	0.0%	142,300	0.0%	0.0%
2001	67,000	0.0%	0.0%	75,300	0.0%	0.0%	142,300	0.0%	0.0%
2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2003	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2004*	52,534	-21.6%	-21.6%	59,042	-21.6%	-21.6%	111,576	-21.6%	-21.6%
2005	52,781	0.5%	-21.2%	59,319	0.5%	-21.2%	112,100	0.5%	-21.2%
2006	54,581	3.4%	-18.5%	61,343	3.4%	-18.5%	115,924	3.4%	-18.5%
2007	54,838	0.5%	-18.2%	61,631	0.5%	-18.2%	116,469	0.5%	-18.2%
2008	55,100	0.5%	-17.8%	61,926	0.5%	-17.8%	117,026	0.5%	-17.8%
2009	58,989	7.1%	-12.0%	66,297	7.1%	-12.0%	125,286	7.1%	-12.0%
2010	59,262	0.5%	-11.5%	66,604	0.5%	-11.5%	125,866	0.5%	-11.5%
2011	59,541	0.5%	-11.1%	66,917	0.5%	-11.1%	126,458	0.5%	-11.1%
2012	59,826	0.5%	-10.7%	67,238	0.5%	-10.7%	127,064	0.5%	-10.7%
2013	60,117	0.5%	-10.3%	67,565	0.5%	-10.3%	127,682	0.5%	-10.3%
2014	60,415	0.5%	-9.8%	67,899	0.5%	-9.8%	128,314	0.5%	-9.8%
2015	67,795	12.2%	1.2%	76,193	12.2%	1.2%	143,988	12.2%	1.2%
2016	71,001	4.7%	6.0%	79,796	4.7%	6.0%	150,797	4.7%	6.0%
2017	71,331	0.5%	6.5%	80,168	0.5%	6.5%	151,499	0.5%	6.5%
2018	71,668	0.5%	7.0%	80,547	0.5%	7.0%	152,215	0.5%	7.0%
2019	72,013	0.5%	7.5%	80,934	0.5%	7.5%	152,947	0.5%	7.5%
2020	72,365	0.5%	8.0%	81,330	0.5%	8.0%	153,695	0.5%	8.0%
2021	72,725	0.5%	8.5%	81,734	0.5%	8.5%	154,459	0.5%	8.5%
2022	73,092	0.5%	9.1%	82,147	0.5%	9.1%	155,239	0.5%	9.1%
2023	73,468	0.5%	9.7%	82,569	0.5%	9.7%	156,037	0.5%	9.7%
2024	73,852	0.5%	10.2%	83,001	0.5%	10.2%	156,853	0.5%	10.2%
2025	76,143	3.1%	13.6%	85,575	3.1%	13.6%	161,718	3.1%	13.6%

Note: * 2004 figures are compared to 2000/2001 figures since full service was not restored until November 2003.

Figure 1
PATH - World Trade Center Terminal
Weekday Daily Two-Way Ridership by Year (2000 to 2025)

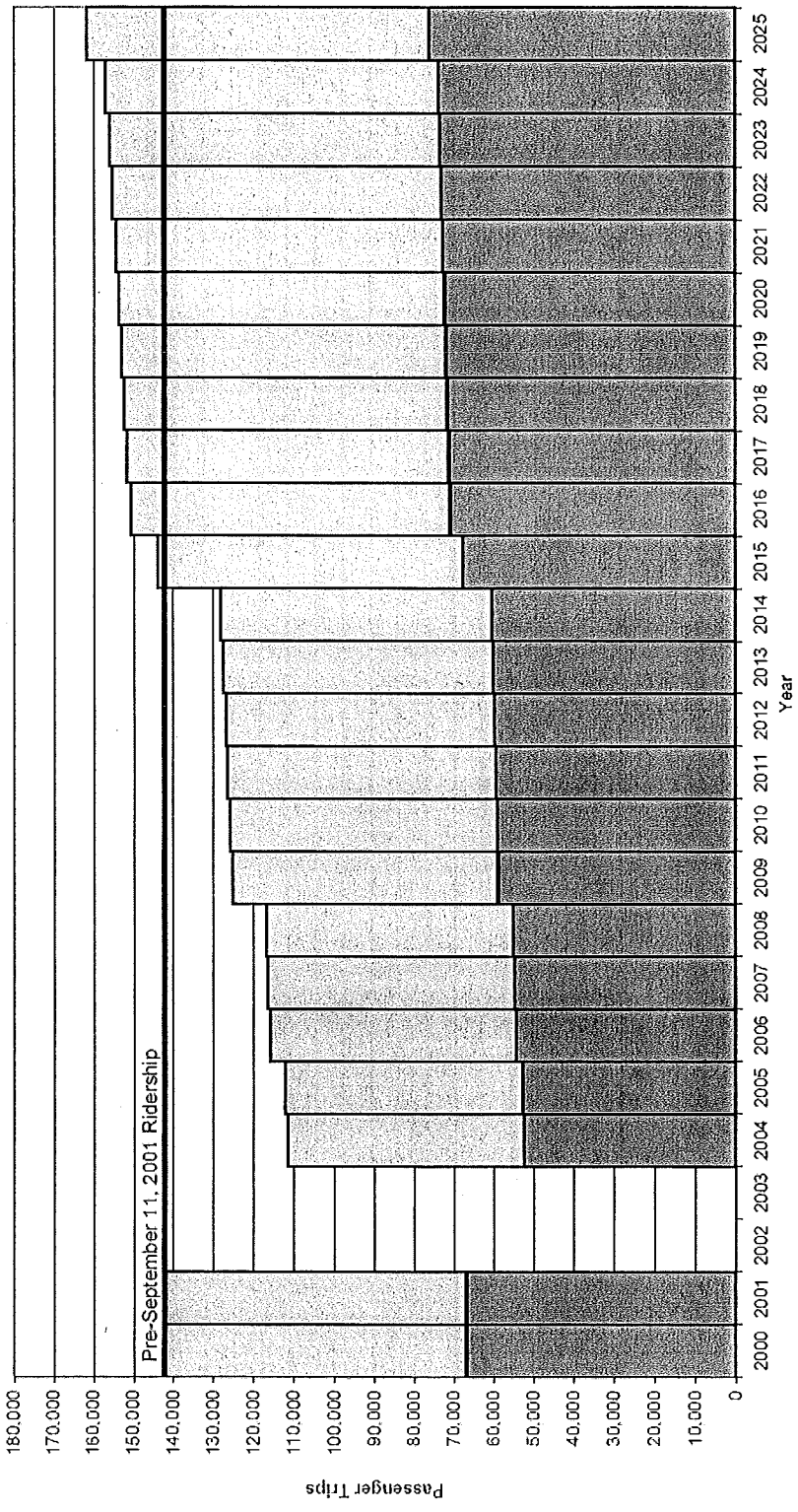


Table 3

PATH - World Trade Center Terminal

AM Peak Hour Two-Way Ridership by Year (2000 to 2025)

Year	Boarding			Alighting			Total		
	Passengers	Percent Change from Year Prior	Percent Change from 2000	Passengers	Percent Change from Year Prior	Percent Change from 2000	Passengers	Percent Change from Year Prior	Percent Change from 2000
2000	4,107	0.0%	0.0%	22,497	0.0%	0.0%	26,604	0.0%	0.0%
2001	4,107	0.0%	0.0%	22,497	0.0%	0.0%	26,604	0.0%	0.0%
2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2003	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2004*	3,209	-21.9%	-21.9%	17,651	-21.5%	-21.5%	20,860	-21.6%	-21.6%
2005	3,289	2.5%	-19.9%	17,669	0.1%	-21.5%	20,958	0.5%	-21.2%
2006	3,396	3.3%	-17.3%	18,276	3.4%	-18.8%	21,672	3.4%	-18.5%
2007	3,481	2.5%	-15.2%	18,294	0.1%	-18.7%	21,775	0.5%	-18.2%
2008	3,567	2.5%	-13.1%	18,312	0.1%	-18.6%	21,879	0.5%	-17.8%
2009	3,749	5.1%	-8.7%	19,674	7.4%	-12.5%	23,423	7.1%	-12.0%
2010	3,839	2.4%	-6.5%	19,692	0.1%	-12.5%	23,531	0.5%	-11.6%
2011	3,932	2.4%	-4.3%	19,710	0.1%	-12.4%	23,642	0.5%	-11.1%
2012	4,028	2.4%	-1.9%	19,728	0.1%	-12.3%	23,756	0.5%	-10.7%
2013	4,126	2.4%	0.5%	19,745	0.1%	-12.2%	23,871	0.5%	-10.3%
2014	4,226	2.4%	2.9%	19,763	0.1%	-12.2%	23,989	0.5%	-9.8%
2015	4,451	5.3%	8.4%	22,468	13.7%	-0.1%	26,919	12.2%	1.2%
2016	4,557	2.4%	11.0%	22,486	0.1%	0.0%	27,043	0.5%	1.7%
2017	4,665	2.4%	13.6%	22,504	0.1%	0.0%	27,169	0.5%	2.1%
2018	4,775	2.4%	16.3%	22,522	0.1%	0.1%	27,297	0.5%	2.6%
2019	4,889	2.4%	19.0%	22,540	0.1%	0.2%	27,429	0.5%	3.1%
2020	5,005	2.4%	21.9%	22,558	0.1%	0.3%	27,563	0.5%	3.6%
2021	5,124	2.4%	24.8%	22,575	0.1%	0.3%	27,699	0.5%	4.1%
2022	5,246	2.4%	27.7%	22,593	0.1%	0.4%	27,839	0.5%	4.6%
2023	5,371	2.4%	30.8%	22,611	0.1%	0.5%	27,982	0.5%	5.2%
2024	5,499	2.4%	33.9%	22,629	0.1%	0.6%	28,128	0.5%	5.7%
2025	5,660	2.9%	37.8%	23,341	3.1%	3.8%	29,001	3.1%	9.0%

Note: * 2004 figures are compared to 2000/2001 figures since full service was not restored until November 2003.

Figure 2
PATH - World Trade Center Terminal
Weekday AM Peak Hour Two-Way Ridership by Year (2000 to 2025)

As shown in Table 4 and Figure 3, the weekday, two-way midday peak hour ridership will total 8,974 by 2025 with 4,097 boardings and 4,877 alightings. Total boardings in the midday peak hour will increase by 34.3 percent while the total alightings will increase by 151.7 percent. The combined change in boardings and alightings results in a 79.9 percent increase in midday peak hour trips between 2000 and 2025. Much of this increase is attributed to the planned Memorial, museum, and cultural facilities at the WTC site as well as inter-office trips between Lower Manhattan and the Jersey City waterfront.

As shown in Table 5 and Figure 4, the weekday, two-way PM peak hour ridership at the WTC Terminal will total 23,362 passengers by 2025 with 17,119 boardings and 6,243 alightings. As compared to 2000 figures, 2025 boardings will increase by 6.3 percent while alightings will increase by 45.7 percent in the PM peak hour. Similar to the AM peak hour, the rapid increase in alightings during the PM peak corresponds to the expected rise in "reverse" commuters that would return to Manhattan from New Jersey. Furthermore, the Memorial, museum, and cultural facilities at the WTC site will attract both boardings and alightings during the PM peak hour. The combined change in boardings and alightings will result in a 14.6 percent increase in PM peak hour trips between 2000 and 2025.

Ridership during non-peak periods will also increase at the WTC PATH Terminal. Total off-peak ridership will increase from 90,324 to 100,381 between 2000 and 2025, resulting in a 11.1 percent change.

Although midday and PM peak hour ridership will increase by a greater percentage than the AM peak hour between 2000 and 2025, the AM peak will continue to be the busiest period of the day at the WTC PATH Terminal. In 2025, AM peak hour ridership will represent 18 percent of the total daily trips at the Terminal as compared to 6 percent for the midday peak and 14 percent for the PM peak. Thus, the planning and design for the Terminal considered the AM hour as the peak crowding condition.

On a daily and a peak hour basis, the Newark-WTC line is expected to be the busiest of the routes serving the WTC Terminal. Table 6 shows the projected distribution of Newark-WTC and Hoboken-WTC trips for the AM, PM, and 24-hour periods. Newark service will comprise 65.5 percent of total trips in the AM peak hour and 53.3 percent in the PM peak. On a daily basis, Newark-WTC trips will represent 61.7 percent of the stations total volume.

Table 4

PATH - World Trade Center Terminal

Midday Peak Hour Two-Way Ridership by Year (2000 to 2025)

Year	Boarding			Alighting			Total		
	Passengers	Percent Change from Year Prior	Percent Change from 2000	Passengers	Percent Change from Year Prior	Percent Change from 2000	Passengers	Percent Change from Year Prior	Percent Change from 2000
2000	3,050	0.0%	0.0%	1,938	0.0%	0.0%	4,988	0.0%	0.0%
2001	3,050	0.0%	0.0%	1,938	0.0%	0.0%	4,988	0.0%	0.0%
2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2003	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2004*	897	-70.6%	-70.6%	425	-78.1%	-78.1%	1,322	-73.5%	-73.5%
2005	919	2.5%	-69.9%	436	2.6%	-77.5%	1,355	2.5%	-72.8%
2006	1,318	43.4%	-56.8%	907	108.0%	-53.2%	2,225	64.2%	-55.4%
2007	1,342	1.8%	-56.0%	918	1.2%	-52.6%	2,260	1.6%	-54.7%
2008	1,366	1.8%	-55.2%	929	1.2%	-52.1%	2,295	1.5%	-54.0%
2009	2,218	62.4%	-27.3%	1,997	115.0%	3.0%	4,215	83.7%	-15.5%
2010	2,243	1.1%	-26.5%	2,009	0.6%	3.7%	4,252	0.9%	-14.8%
2011	2,269	1.2%	-25.6%	2,021	0.6%	4.3%	4,290	0.9%	-14.0%
2012	2,296	1.2%	-24.7%	2,034	0.6%	5.0%	4,330	0.9%	-13.2%
2013	2,323	1.2%	-23.8%	2,047	0.6%	5.6%	4,370	0.9%	-12.4%
2014	2,351	1.2%	-22.9%	2,060	0.6%	6.3%	4,411	0.9%	-11.6%
2015	4,134	75.8%	35.5%	4,180	102.9%	115.7%	8,314	88.5%	66.7%
2016	4,163	0.7%	36.5%	4,194	0.3%	116.4%	8,357	0.5%	67.5%
2017	4,194	0.7%	37.5%	4,208	0.3%	117.1%	8,402	0.5%	68.4%
2018	4,224	0.7%	38.5%	4,223	0.4%	117.9%	8,447	0.5%	69.3%
2019	4,256	0.8%	39.5%	4,238	0.4%	118.7%	8,494	0.6%	70.3%
2020	4,289	0.8%	40.6%	4,253	0.4%	119.5%	8,542	0.6%	71.3%
2021	4,322	0.8%	41.7%	4,269	0.4%	120.3%	8,591	0.6%	72.2%
2022	4,356	0.8%	42.8%	4,285	0.4%	121.1%	8,641	0.6%	73.2%
2023	4,391	0.8%	44.0%	4,301	0.4%	121.9%	8,692	0.6%	74.3%
2024	4,427	0.8%	45.1%	4,318	0.4%	122.8%	8,745	0.6%	75.3%
2025	4,907	10.8%	60.9%	4,877	12.9%	151.7%	9,784	11.9%	96.2%

Note: * 2004 figures are compared to 2000/2001 figures since full service was not restored until November 2003.

Figure 3
PATH - World Trade Center Terminal
Weekday Midday Peak Hour Two-Way Ridership by Year (2000 to 2025)

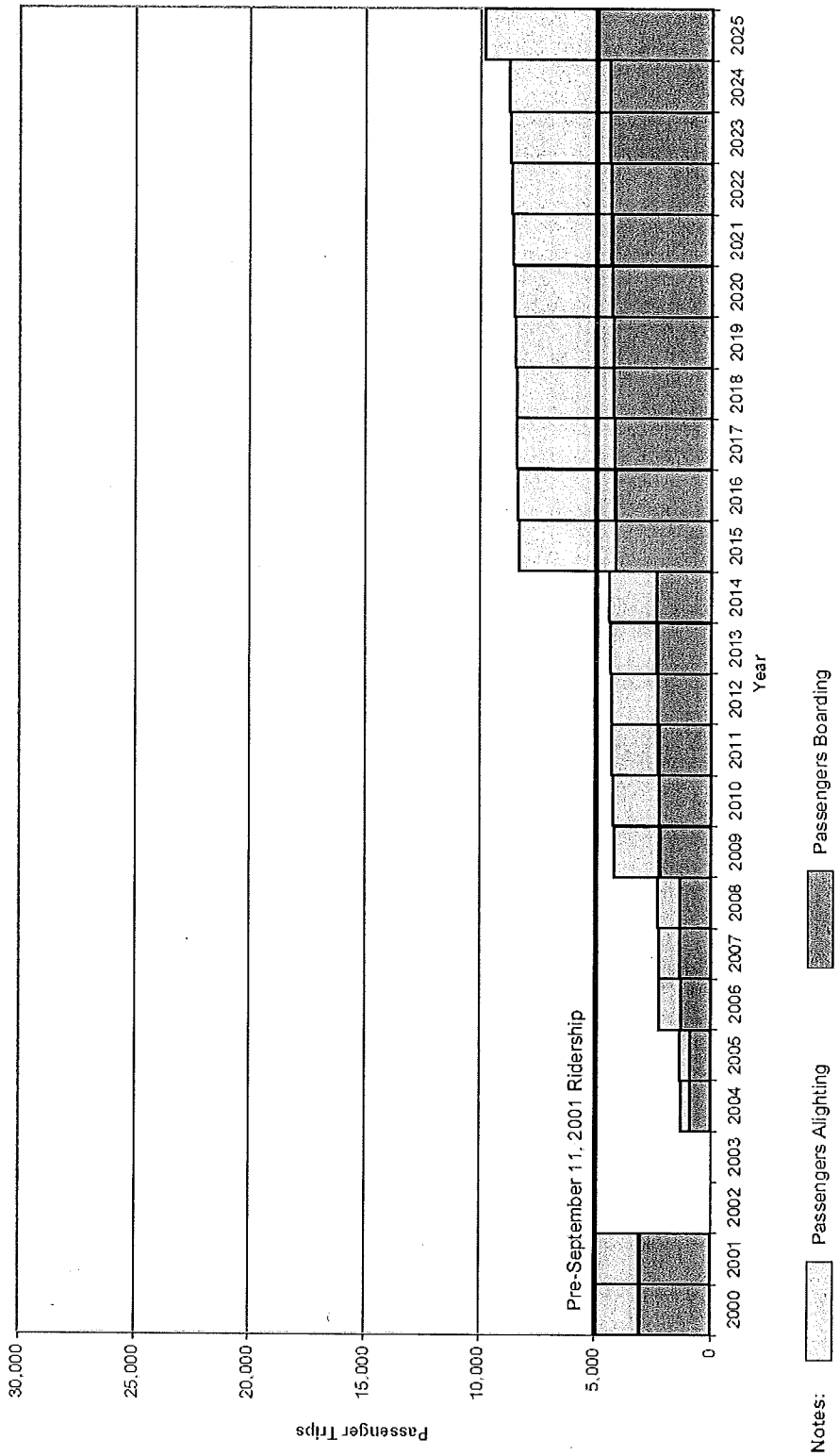


Table 5

PATH - World Trade Center Terminal

PM Peak Hour Two-Way Ridership by Year (2000 to 2025)

Year	Boarding			Alighting			Total		
	Passengers	Percent Change from Year Prior	Percent Change from 2000	Passengers	Percent Change from Year Prior	Percent Change from 2000	Passengers	Percent Change from Year Prior	Percent Change from 2000
2000	16,100	0.0%	0.0%	4,284	0.0%	0.0%	20,384	0.0%	0.0%
2001	16,100	0.0%	0.0%	4,284	0.0%	0.0%	20,384	0.0%	0.0%
2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2003	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2004*	12,192	-24.3%	-24.3%	3,450	-19.5%	-19.5%	15,642	-23.3%	-23.3%
2005	12,204	0.1%	-24.2%	3,536	2.5%	-17.5%	15,740	0.6%	-22.8%
2006	12,729	4.3%	-20.9%	3,652	3.3%	-14.8%	16,381	4.1%	-19.6%
2007	12,742	0.1%	-20.9%	3,742	2.5%	-12.7%	16,484	0.6%	-19.1%
2008	12,754	0.1%	-20.8%	3,835	2.5%	-10.5%	16,589	0.6%	-18.6%
2009	13,948	9.4%	-13.4%	4,136	7.8%	-3.5%	18,084	9.0%	-11.3%
2010	13,960	0.1%	-13.3%	4,234	2.4%	-1.2%	18,194	0.6%	-10.7%
2011	13,973	0.1%	-13.2%	4,334	2.4%	1.2%	18,307	0.6%	-10.2%
2012	13,985	0.1%	-13.1%	4,436	2.4%	3.5%	18,421	0.6%	-9.6%
2013	13,997	0.1%	-13.1%	4,542	2.4%	6.0%	18,539	0.6%	-9.1%
2014	14,009	0.1%	-13.0%	4,649	2.4%	8.5%	18,658	0.6%	-8.5%
2015	16,393	17.0%	1.8%	4,943	6.3%	15.4%	21,336	14.4%	4.7%
2016	16,405	0.1%	1.9%	5,056	2.3%	18.0%	21,461	0.6%	5.3%
2017	16,417	0.1%	2.0%	5,172	2.3%	20.7%	21,589	0.6%	5.9%
2018	16,430	0.1%	2.0%	5,291	2.3%	23.5%	21,721	0.6%	6.6%
2019	16,442	0.1%	2.1%	5,413	2.3%	26.4%	21,855	0.6%	7.2%
2020	16,455	0.1%	2.2%	5,538	2.3%	29.3%	21,993	0.6%	7.9%
2021	16,467	0.1%	2.3%	5,666	2.3%	32.3%	22,133	0.6%	8.6%
2022	16,479	0.1%	2.4%	5,797	2.3%	35.3%	22,276	0.6%	9.3%
2023	16,492	0.1%	2.4%	5,931	2.3%	38.4%	22,423	0.7%	10.0%
2024	16,504	0.1%	2.5%	6,069	2.3%	41.7%	22,573	0.7%	10.7%
2025	17,119	3.7%	6.3%	6,243	2.9%	45.7%	23,362	3.5%	14.6%

Note: * 2004 figures are compared to 2000/2001 figures since full service was not restored until November 2003.

Figure 4
PATH - World Trade Center Terminal
Weekday PM Peak Hour Two-Way Ridership by Year (2000 to 2025)

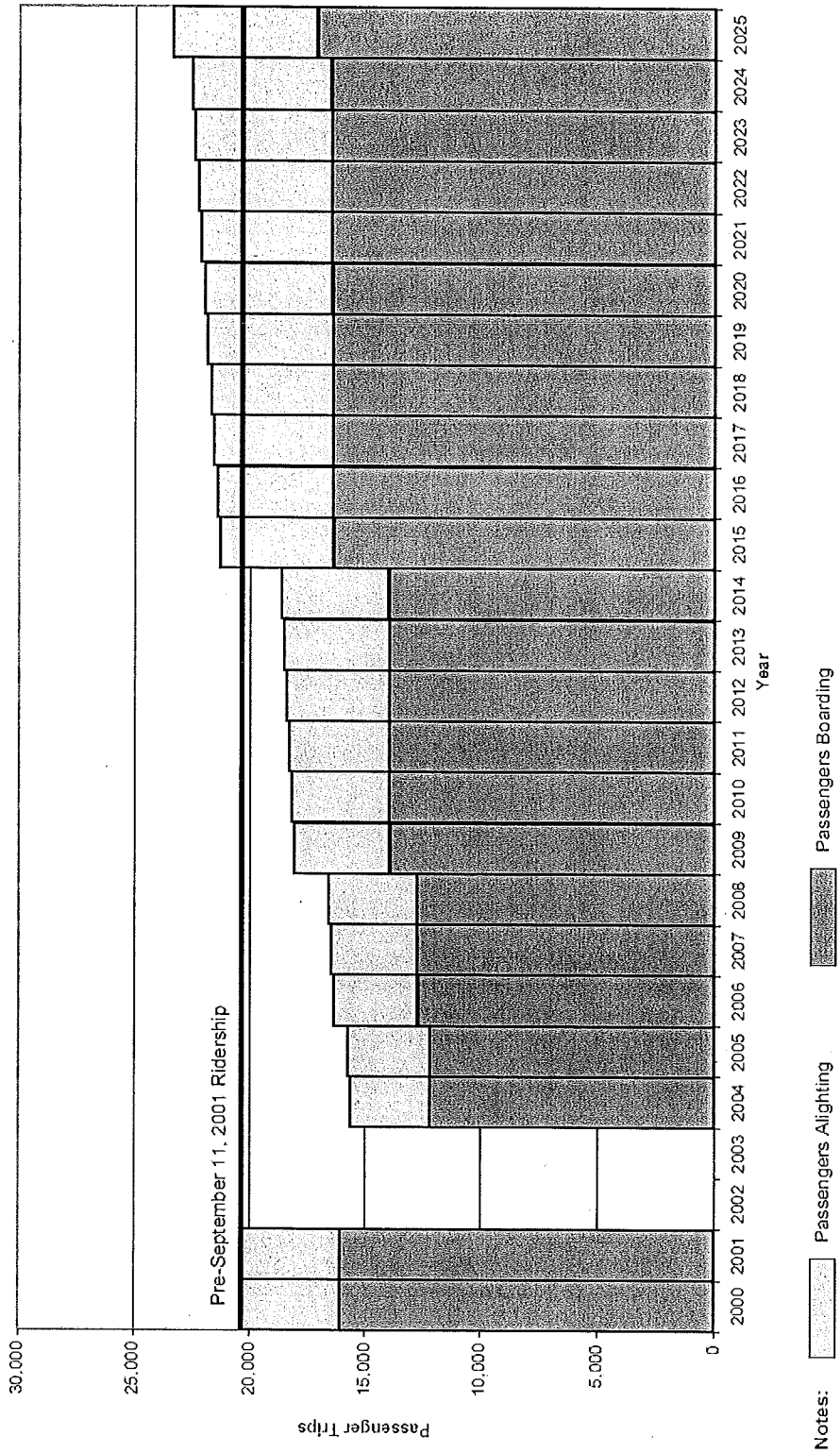


Table 6

Distribution of Newark-WTC and Hoboken-WTC Trips at the WTC Terminal

Route		AM Peak Hour	PM Peak Hour	24-Hour
Boarding	Newark-WTC	69.0%	71.0%	56.0%
	Hoboken-WTC	31.0%	29.0%	44.0%
Alighting	Newark-WTC	65.0%	49.0%	66.0%
	Hoboken-WTC	35.0%	51.0%	34.0%
Total	Newark-WTC	65.5%	53.3%	61.7%
	Hoboken-WTC	34.5%	46.7%	38.3%

*

Appendix C-2: Platform and Track Planning Requirements

A. INTRODUCTION

This document (provided as Appendix C-2 to Chapter 8, "Transportation") has been prepared to address a number of operational and engineering issues related to the track and platform configuration proposed for the Permanent World Trade Center (WTC) PATH Terminal. It reviews the basis for selecting the 5-track, 4-platform configuration that is currently proposed, as well as alternative configurations evaluated in conjunction with project planning.

Besides rebuilding the WTC Terminal, PANYNJ is planning a variety of improvements to enhance the reliability and performance of the overall PATH system. These improvements, including the procurement of new PATH cars and the upgrade of the signal system from fixed-block to Communication Based Train Control (CBTC), will result in the capacity to accommodate system-wide ridership increases, improved running times and dwell times, and enhanced reliability. Therefore, it is important that the planning decisions for Permanent WTC PATH Terminal anticipate this future context to provide adequate level of service (LOS) for the future operational and ridership conditions. (The ridership projections are included as Appendix C-1 to the Final Environmental Impact Statement.)

This assessment of the Terminal track and platform level contains the following sections:

- A description of the pre September 11, 2001 PATH Terminal's track and platform level;
- A description of the system-wide improvements planned independent of the Permanent WTC PATH Terminal;
- A description of PATH's operational and planning requirements for the Permanent WTC PATH Terminal; and
- A description of the Preferred Alternative and other schemes for the track and platform level of the Permanent WTC PATH Terminal.

B. PRE-SEPTEMBER 11, 2001 PATH OPERATIONS

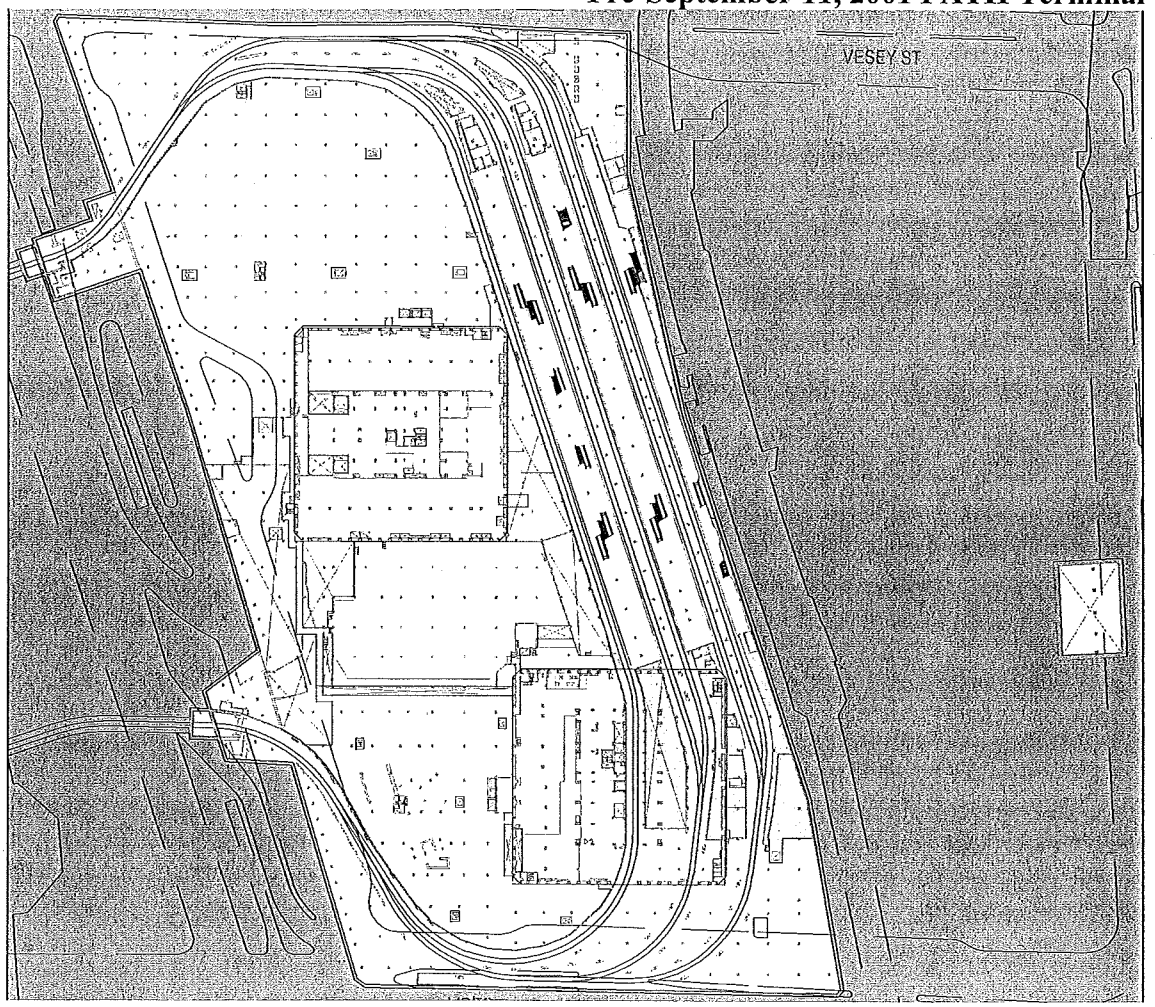
The pre-September 11, 2001 WTC PATH Terminal had three, 10-car platforms and 5 tracks. Platform A served Track 1 and was used in the event of an equipment failure, for train storage, and for alighting trains that terminated revenue service at the WTC Terminal. Platform B served Tracks 2 and 3 and served the Hoboken-WTC Line. Platform C served Tracks 4 and 5 and was used for the Newark-WTC Line. Table 1 provides information on the track and platforms dimensions, and Figure 1 presents the layout of the Pre-September 11, 2001 PATH Terminal.

In the period leading up to September 11, 2001, PATH trains and the WTC Terminal were experiencing significant crowding during peak periods. As a result, patrons would require more than three minutes of clearance time from the platform during peak hours (see Exhibit 1). PANYNJ has considered these crowding constraints in their planning for the future of the PATH system including the construction and operation of the Permanent WTC PATH Terminal.

Table 1
Pre-September 11, 2001 PATH Terminal Platform/Track Layout

Element		Platform A	Platform B	Platform C
Tracks Served		Track 1	Tracks 2 and 3	Tracks 4 and 5
Platform Length		500 feet	500 feet	500 feet
Platform Width		13 to 23 feet	30 feet	31 feet
Platform Operation		Equipment storage and Train alighting	Revenue Service (Hoboken-WTC)	Revenue Service (Newark-WTC)
Vertical Circulation Elements (VCEs)	Stairways	3	2	4
	Escalators	2	4	6

Figure 1
Pre-September 11, 2001 PATH Terminal



C. SYSTEM-WIDE IMPROVEMENT PROGRAM

Over the next several years, PANYNJ expects to implement service improvements on the PATH system that will enhance the throughput and capacity of PATH trains. These improvements include 10-car operation, a signal system upgrade, and fleet replacement as described below.

10-CAR OPERATION

The PANYNJ will continue to prepare the PATH's Newark-WTC Line for 10-car operation, a program that pre-dates the terrorist attacks of September 11, 2001. PATH also eventually plans to lengthen its Hoboken-WTC train consists from 7 to 8 cars.

Since September 11, 2001, PANYNJ lengthened the platforms at the Exchange Place station in tandem with the emergency repairs to the system that were required to restore service following the attacks. However, to fully implement 10-car operations, additional rolling stock must be acquired and the Harrison and Grove Street stations must be rehabilitated to lengthen platforms. It is anticipated that these improvements would be funded as part of the 2008 to 2013 Capital Plan with implementation by 2015.

This program will substantially increase the capacity of the Newark-WTC Line to meet growing ridership. A consequence of this improved capacity and increased ridership on the Newark-WTC Line, is that more people will use the WTC Terminal's platforms during peak travel periods.

SIGNAL SYSTEM UPGRADE

PANYNJ will continue a program to modernize its signal system. Currently, PATH operates with a fixed-block signal system but plans to upgrade to a CBTC system. The CBTC system is more flexible than the fixed-block system because it continuously updates train positions, distances, and travel speeds. This allows the system to recover more quickly from delays, because a train can follow a "delayed" train more closely without having to come to a complete stop. CBTC results in a more efficient operation that produces regular travel speed because it:

- Allows for consistent trip times in closer conformance to the operating schedule;
- Allows for a precise strategy for stopping accuracy;
- Optimizes headways, which increases capacity by allowing the trains to closely follow the safe braking distance; and
- Improves ride quality.

Under both the fixed-block and CBTC signal systems, PATH's capacity is controlled by the track junction at Exchange Place and the throughput of the Hudson River tunnels. Before September 11, 2001, PATH operated 31 trains in each direction (16 Newark-WTC trains and 15 Hoboken-WTC trains) through the World Trade Center tunnels (Tunnels E and F) in the AM peak hour; thus, trains had approximately 116-second headways. With the CBTC system, it is possible that headways could decrease to 90 seconds through the tunnels, resulting in up to 40 trains per hour. However, PATH's anticipated 2025 operating plan will result in fewer than 40 trains per hour. In the AM peak hour, PATH will operate a total of 36 trains—19 on the Newark-WTC Line and 17 on the Hoboken-WTC Line.

Perhaps the greater benefit of CBTC is the enhancement of operational flexibility to maintain PATH's on time performance. Although before September 11, 2001, the system delivered 180 second headways during peak periods, CBTC will ensure that service is reliable on a daily basis.

PATH will begin planning the implementation of CBTC concurrent with its contracts for fleet replacement. This arrangement will ensure consistency in the design of signal and train systems. It is anticipated that CBTC would be in place sometime between 2010 and 2015.

CBTC in conjunction with the 10-car train program will have the ability to increase the throughput of the PATH system, resulting in more passengers and a higher frequency of service at the WTC Terminal than before September 11, 2001. As such, platforms at the WTC Terminal will need to clear more swiftly in the future in order to maintain safe and efficient operations.

FLEET REPLACEMENT

PATH currently maintains a fleet of 327 cars, much of which are more than 30 or more years old. In order to meet future ridership needs, PATH must maximize its peak hour service plan with a high degree of reliability. However, as the fleet ages, equipment failures increase; thereby, reducing PATH's ability to adhere to scheduled headways. Furthermore, PATH plans to implement 10-car train service cannot be realized without an expansion of its fleet.

On June 17, 2004, PANYNJ announced a request for proposals to design and fabricate 246 new rail cars and to rehabilitate or replace an additional 94 cars. The new cars will have improved lighting, air conditioning and heating; cantilevered seats with room for passengers to store items under them; prerecorded station announcements; better signs; and three doors on each side. This proposal allows PATH an option to purchase additional rolling stock to meet future demands.

Three-door cars will decrease the boarding/alighting times of trains by 50 percent, which will improve dwell times and could reduce the overall travel time on PATH routes. However, the new cars are not expected to improve the platform clearance time for passengers since they will not directly affect platform area or the provision or operation of stairways and escalators. Furthermore, since the WTC Terminal is a terminal station, passenger circulation at this facility is not highly influenced by the dwell times of trains.

D. OPERATIONAL AND PLANNING REQUIREMENTS FOR THE PERMANENT WTC PATH TERMINAL

The planning and design of a Permanent WTC PATH Terminal has been guided by PATH operations criteria and by accepted industry practices. In light of the increased capacity associated with the PATH system improvements described above, it is necessary that the WTC Terminal be designed to provide for increased passenger flow levels. To meet the demand projections for the 2025 design year and beyond, the station's platform and vertical circulation must be enhanced compared to the pre-September 11, 2001 and the temporary WTC PATH facilities. Furthermore, the Terminal's design must not preclude 10-car PATH trains or the desired headways that could be achieved with CBTC.

TRACK REQUIREMENTS

PATH Operations staff reviewed several iterations of the Terminal's design and specified minimum configurations for their daily operation. Given that the WTC facility is a Terminal for two PATH routes—Newark-WTC and Hoboken-WTC—and that it supports overnight train storage, five tracks are needed for daily operation as described below.

FAILURE MANAGEMENT

In order to maintain reliable operations for its customers, PATH must plan for system failures that result in service disruptions. Disruptions can occur for a number of operational and maintenance reasons such as police actions, medical emergencies, equipment failures, routine maintenance and construction; and special operations.

In the event of car equipment failure, PATH must have facilities to layover trains if they become fully disabled. Because PATH's WTC facility is a terminal station, trains dwell at the station in order to maintain the scheduled headways. Thus, each of the Hoboken-WTC and Newark-WTC routes require two active tracks such that an incoming train can arrive before an outgoing train departs. However, if a train becomes disabled, an additional track is needed to serve the next or multiple incoming trains.

TRAIN STORAGE

During overnight hours, PATH stores trains at five locations: Newark-South Street Yard, Harrison Yard, Journal Square Yard, 33rd Street third-track, and WTC. PATH stores its Newark-WTC trains at Harrison and Newark Yards; Journal Square-33rd Street trains and Hoboken-33rd Street trains are stored at Harrison, Journal Square, and 33rd Street. Hoboken-WTC trains are stored at Journal Square and at the WTC Terminal.

Because of system-wide limitations and to allow for a more efficient operation during the start of early morning service, PATH uses four of the five tracks at the WTC for overnight storage of 6 Hoboken-WTC trains. The Terminal's fifth track is retained for revenue service on the Newark-WTC Line. Beginning at approximately 5:40 AM each morning, PATH begins revenue service on the Hoboken-WTC Line by bringing the train stored at Journal Square into the WTC Terminal. Trains are then moved from storage at the WTC to revenue service every 10 minutes following the departure of the first train until all 7 consists are operational. This plan allows PATH to more efficiently manage its labor hours and decreases the time that Hoboken-WTC trains are in non-revenue operation. If all trains were stored at Newark, Harrison, or Journal Square, PATH would need to move trains from these yards each morning, which increases operational cost without revenue benefits since trains would not carry passengers on the first run.

The use of the WTC facility for overnight storage during winter months allows PATH to establish AM peak Hoboken-WTC service without first removing snow or ice from the trains and tracks. PATH also stores trains in the Hudson River tunnels and at other enclosed locations not used for overnight revenue service to reduce potential weather-delays on other routes.

With the expansion of train consists on the Newark-WTC Line to 10 cars, space at PATH's outlying yards will be reduced in the future. Therefore, the need for train storage at the WTC Terminal would be even greater.

HEADWAY REQUIREMENTS

PATH Operations staff projected preliminary peak period headways at the Permanent WTC PATH Terminal to assist in the design of the Terminal's facilities. PATH frequently reviews its service schedule and adjusts headways as appropriate to ensure that efficient and convenient operations can be achieved. In scheduling trains, PATH considers five principal concepts:

- ***Adjusting capacity to demand:*** The basic objective is to achieve a service frequency that allows boardings at the terminal and all intermediate stations along the route on the first arriving train.
- ***Productive distribution of service:*** This strategy uses schedule and frequency coordination between routes to facilitate service and avoid overcrowding at key transfer points.
- ***Coordinate with Connecting Service:*** To the extent possible, PATH schedules are coordinated with commuter rail services to provide for convenient and predictable commuting during peak periods.
- ***Increase vehicle and crew utilization efficiency:*** Efficient vehicle and crew utilization provides opportunities to increase the number of passenger train trips during service hours and to minimize crew deadheading and light train movements.
- ***Minimize overall passenger trip time, and enhance convenience:*** Schedules strive to minimize passenger travel and wait time, and to lower passenger anxiety.

In order to plan the system-wide schedule, PATH must balance these planning principles for its four routes—Newark-WTC, Hoboken-WTC, Journal Square-33rd Street, and Hoboken-33rd Street. Thus, PATH must consider operations at points of constraint on the system such as the junctions where lines converge at Journal Square, Pavonia-Newport, and Exchange Place; the interchange west of Exchange Place; and where lines meet to enter the Hudson River tunnels.

In preparing its future schedule, PATH has relied upon the 2025 ridership projections and has made assumptions regarding the implementation of the system-wide improvements identified previously. Table 2 shows the scheduled AM peak hour service from 1995 to 2025.

PATH currently operates 7-car trains on both the Hoboken-WTC and Newark-WTC Lines. By 2006, PATH will operate 8-car trains on the Newark-WTC Line and 10-car service will be introduced in approximately 2015. Although the date is not set, PATH plans to implement 8-car service on the Hoboken-WTC Line sometime before 2025.

PATH projects that between 16 and 19 trains on the Newark-WTC route in the AM peak hour from 2004 to 2025. The number of trains will fluctuate during this period to reflect the increased capacity that results from 8-car and 10-car operation. By 2025, 19 trains per hour will serve the route on average 180-second headway.

On the Hoboken-WTC route, PATH will increase service concurrent with development efforts in Lower Manhattan including the opening of 7 World Trade Center, the build out of the WTC Memorial and Redevelopment Plan, and the completion of Site 26 at Battery Park City. As a result, PATH plans to operate 17 Hoboken-WTC trains on average 210-second to 240-second headways in 2025.

Table 2
PATH AM Peak Hour Train Schedule

Year	Newark-WTC	Hoboken-WTC	Comments
1995	18	16	Pre-September 11, 2001 Schedule
1996	18	16	
1997	17	16	
1998	17	16	
1999	17	15	

Table 2
PATH AM Peak Hour Train Schedule

Year	Newark-WTC	Hoboken-WTC	Comments
2000	17	15	
2001	16	15	
2002	N/A	N/A	Suspension of PATH service to WTC from September 11, 2001 to November 23, 2003
2003	N/A	N/A	
2004	16	10	7-car service on Hoboken-WTC Line and 8-car service on Newark-WTC Line
2005	17	10	
2006	17	12	Opening of 7 WTC
2007	17	12	
2008	17	12	
2009	19	15	Opening of Freedom Tower, WTC Memorial, and other uses on WTC site
2010	19	15	
2011	19	15	
2012	19	15	
2013	19	15	
2014	19	15	
2015	17	15	Implement 10-car service on Newark-WTC Line
2016	17	15	
2017	17	15	
2018	17	15	
2019	17	15	
2020	17	15	
2021	17	15	
2022	17	15	
2023	18	15	Continued occupation of office towers at WTC and Battery Park City
2024	18	15	
2025	19	17	

Note: Future projections are based on an average load of 83 passengers per car.

PLATFORM PLANNING REQUIREMENTS

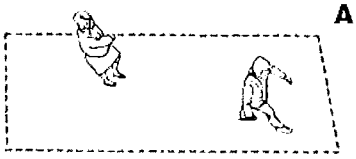
As part of the planning process for the Permanent WTC PATH Terminal, PANYNJ established design criteria for the various vertical and horizontal elements of the facility. The Terminal's platforms, fare zone, pedestrian corridors, and vertical elements are being designed for a level-of-service (LOS) C/D, which represents the breakpoint between LOS C and LOS D. Planning for operations at a peak LOS C/D is a common industry practice for new transit facilities. There are specific quantitative units of measure for each LOS as noted in the Transit Cooperative Research Program (TCRP) Report 100, *Transit Capacity and Quality of Service Manual*, 2nd Edition (*TCQSM*). The *TCQSM* was developed by transit industry professionals under the auspices of the Transit Cooperative Research Board under the sponsorship of the Federal Transit Administration. A general description of LOS standards presented in the *TCQSM* is shown in Figures 2 and 3.

Figure 2
Level of Service (LOS) for Walking Pedestrians

LEVEL OF SERVICE A — **A**

Pedestrian Space: ≥ 130 sq ft/ped *Flow Rate:* ≤ 2 ped/min/ft

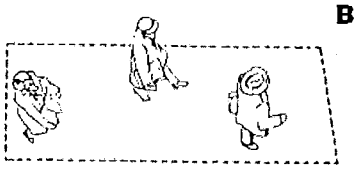
At walkway LOS A, pedestrians basically move in desired paths without altering their movements in response to other pedestrians. Walking speeds are freely selected, and conflicts between pedestrians are unlikely.



LEVEL OF SERVICE B — **B**

Pedestrian Space: ≥ 40 sq ft/ped *Flow Rate:* ≤ 7 ped/min/ft

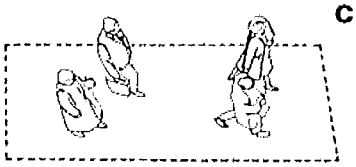
At LOS B, sufficient area is provided to allow pedestrians to freely select walking speeds, to bypass other pedestrians, and to avoid crossing conflicts with others. At this level, pedestrians begin to be aware of other pedestrians, and to respond to their presence in the selection of their walking path.



LEVEL OF SERVICE C — **C**

Pedestrian Space: ≥ 24 sq ft/ped *Flow Rate:* ≤ 10 ped/min/ft

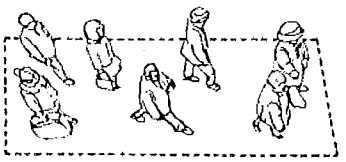
At LOS C, sufficient space is available to select normal walking speeds, and to bypass other pedestrians in primarily unidirectional streams. Where reverse-direction or crossing movements exist, minor conflicts will occur, and speeds and volume will be somewhat lower.



LEVEL OF SERVICE D — **D**

Pedestrian Space: ≥ 15 sq ft/ped *Flow Rate:* ≤ 15 ped/min/ft

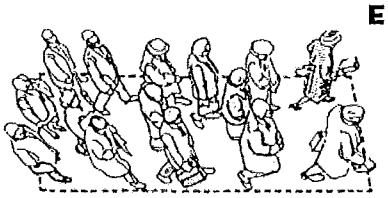
At LOS D, freedom to select individual walking speed and to bypass other pedestrians is restricted. Where crossing or reverse-flow movements exist, the probability of conflict is high, and its avoidance requires frequent changes in speed and position. The LOS provides reasonably fluid flow; however, considerable friction and interaction between pedestrians is likely to occur.



LEVEL OF SERVICE E — **E**

Pedestrian Space: ≥ 6 sq ft/ped *Flow Rate:* ≤ 25 ped/min/ft

At LOS E, virtually all pedestrians would have their normal walking speed restricted, requiring frequent adjustment of gait. At the lower range of this LOS, forward movement is possible only by "shuffling." Insufficient space is provided for passing of slower pedestrians. Cross- or reverse-flow movements are possible only with extreme difficulties. Design volumes approach the limit of walkway capacity, with resulting stoppages and interruptions to flow.



LEVEL OF SERVICE F — **F**

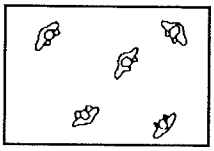
Pedestrian Space: ≥ 40 sq ft/ped *Flow Rate:* ≤ 7 ped/min/ft

At LOS F, all walking speeds are severely restricted, and forward progress is made only by "shuffling." There is frequent, unavoidable contact with other pedestrians. Cross- and reverse-flow movements are virtually impossible. Flow is sporadic and unstable. Space is more characteristic of queued pedestrians than of moving pedestrians.

Figure 3
Level of Service (LOS) for Standing Pedestrians

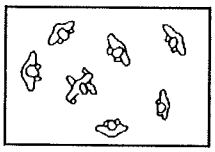
LEVEL OF SERVICE A

Average Pedestrian Area Occupancy: 13 sq ft/person or more
Average Inter-Person Spacing: 4 ft, or more
Description: Standing and free circulation through the queuing area is possible without disturbing others within the queue.



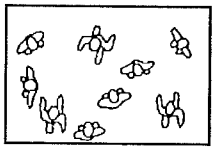
LEVEL OF SERVICE B

Average Pedestrian Area Occupancy: 10 to13 sq ft/person
Average Inter-Person Spacing: 3.5 to 4.0 ft
Description: Standing and partially restricted circulation to avoid disturbing others within the queue is possible.



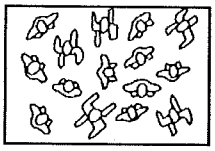
LEVEL OF SERVICE C

Average Pedestrian Area Occupancy: 7 to 10 sq ft/person
Average Inter-Person Spacing: 3.0 to 3.5 ft
Description: Standing and restricted circulation through the queuing area by disturbing others within the queue is possible; this density is within the range of personal comfort.



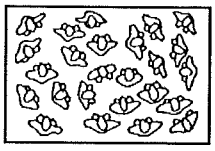
LEVEL OF SERVICE D

Average Pedestrian Area Occupancy: 3 to 7 sq ft/person
Average Inter-Person Spacing: 2 to 3 ft
Description: Standing without touching is possible; circulation is severely restricted within the queue and forward movement is only possible as a group; long term waiting at this density is discomforting.



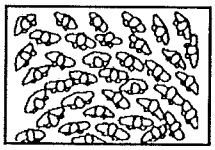
LEVEL OF SERVICE E

Average Pedestrian Area Occupancy: 2 to 3 sq ft/person
Average Inter-Person Spacing: 2 ft or less
Description: Standing in physical contact with others is unavoidable; circulation within the queue is not possible; queuing at this density can only be sustained for a short period without serious discomfort.



LEVEL OF SERVICE F

Average Pedestrian Area Occupancy: 2 sq ft/person or less
Average Inter-Person Spacing: Close contact with other persons
Description: Virtually all persons within the queue are standing in direct physical contact with those surrounding them; this density is extremely discomforting; no movement is possible within the queue; the potential for panic exists in large crowds at this density.



PLATFORMS

All elements of the platform must support safe customer circulation and access to the trains. As such the design of the platform must meet the National Fire Protection Association's (NFPA) evacuation criteria as well as PATH's criteria for clearance and crowding, which was concurred by the Federal Transit Administration (FTA).

The planning and design of the Terminal must consider the operation of the platforms during both the AM and PM periods since their use varies depending on the peak direction of travel. Although PATH has a roughly 20 percent population of reverse commuters, the peak direction of travel is exiting the WTC Terminal in the AM peak and entering the Terminal in the PM.

Platform Clearance

In the AM peak hour, trains unload passengers to the platform who must then ascend to mezzanine level. For this condition, the principal design criterion is the targeted time period within which all passengers exiting a train alight from the platform. As stairways and escalators become congested, passengers queue at the foot before they can ascend. Therefore, to avoid a lengthening of this back-up, it is important that all passengers clear the platform before arrival of the next train.

Platform clearance is measured as the combined time to unload the train, exit the platform and ascend to the mezzanine level, and the time for boarding passengers to enter the train. The basis for this analysis is the planning criteria cited in the *TCQSM.*. The Manual states that a platform (and vertical circulation) should be planned to ensure full clearance before the next train arrives. However given that passengers may not use or may not be able to use all available exits, a safety factor of 20 to 30 percent should be applied. Thus, a platform should clear fully within 70 to 80 percent of the scheduled headway.

As described above, PATH would operate 19 Newark-WTC trains by 2025 on 180-second headways during the majority of the peak hour. Applying the platform planning criteria defined above, a single, dedicated platform on the Newark-WTC Line must clear between 126 and 144 seconds after the arrival of a train. On the Hoboken-WTC Line, PATH would operate 17 trains during the AM peak hour with an average headway of 210 to 240 seconds. Thus, a single, dedicated platform on the Hoboken Line must clear within 147 to 168 seconds.

Platform Crowding

For the PM peak period, the platform design must consider queuing capacity since large numbers of passengers wait on the platform to board the next arriving train. Ideally, PATH's operations will provide for continuous boarding of dwelled trains at the Terminal throughout the peak hour. Under this operation, Train 1 would arrive at the platform, would alight passengers, and would dwell to allow for boarding. Train 2 would arrive on the opposite side of the platform near the end of Train 1's dwell period. Train 1 would depart, and passengers would then board Train 2. This operation allows passengers to wait on the trains rather than on the platform, improving station circulation.

The planning of the platforms must also consider failure management. If under the above-described scenario, Train 1 misses its headway due to system delays, equipment problems, or other operational issues, boarding passengers would queue on the platform awaiting its arrival. As the delay in service increases so would the number of passengers waiting on the platform. Eventually, the platform would fail to meet LOS C/D standards, and as crowding continues, the

safe circulation of customers would be compromised. When Train 1 arrives, additional platform area is needed for arriving passengers to clear the platform while those queued board the train.

As shown in Figures 3 and 4, the LOS C/D standard for a standing patron is 7 square feet while the LOS C/D standard for a circulation patron is 15 pedestrians per square feet per minute. Given ridership levels in 2025, PANYNJ projects that a minimum 16,355 square feet of platform area is required for the Newark-WTC service in the event of a missed headway while 10,385 square feet of area is required for the Hoboken-WTC service.

Other Design Considerations

A limiting factor in the platform design is the need to have the full-length of the train directly parallel to the platform edge. This can only be achieved when the platform is on a tangent. If a platform is placed on a horizontal curve, it introduces areas where the gap between the platform and the train exceeds Americans with Disabilities Act (ADA) standards and introduces the requirement of a mechanical extension of the platform edge to address the gap if the gap would exceed 3 inches. This is not desired from a maintenance or operations perspective since other agencies, such as New York City Transit, have experienced difficulty in the operation of mechanical platform extensions.

To meet ADA requirements, the width of the platform must include an 18-inch safety strip along the platform edge, and a minimum of 44 inches must be provided between the safety strip and the nearest stairway or escalator.

To maximize pedestrian flows, platforms should be designed with minimum obstructions and should be organized to reduce passenger decisions that cause unnecessary hesitation. Visual obstructions should be minimized and alcoves or other hidden areas on the platform avoided for orientation, safety, and security reasons. The platform area should not contain any support or non-transit functions (e.g., vending or concessions) that may obstruct, inhibit, or impede customer circulation.

Platform access points from the mezzanine level should be situated to encourage balanced train loading and unloading since customers tend to board vehicles near the points where stairways and escalators intersect the platform. Furthermore, stairways and escalators should be designed in banks of two or more units to allow for more usable platform width and to maintain circulation space outside of the vertical circulation queuing areas. Queuing areas adjacent to stairways and escalators should operate at LOS C/D or better during peak conditions. This requires that a 7 to 10 square foot area be provided per passenger.

As mentioned above, the station must be designed for failure management, meaning that it must be designed to accommodate a condition when a train is out of service in the peak period. Although an out-of-service train may not carry passengers, it would require safe access from a platform by PATH personnel. Furthermore, it is desirable to have passenger access and egress from all tracks to maximize operational flexibility during equipment or service outages.

To be consistent with the goals and objectives of the project, the Permanent Terminal must be planned around the temporary WTC PATH station, which will continue to operate during construction. Thus, the design of the Permanent platforms, tracks, and vertical circulation elements cannot preclude adequate capacity and operations within the temporary station. In planning for a Permanent Terminal, PANYNJ must consider the existing envelop of the temporary station, and the limitations that is poses on the movement or removal of its tracks, platforms, and vertical circulation elements.

VERTICAL CIRCULATION REQUIREMENTS

Vertical Circulation Elements (VCEs) are the devices, such as elevators, escalators, and stairways, used to transport customers between different levels of the Terminal. VCEs are also critical for emergency egress.

VCEs are generally sized in modular units of width corresponding to the width of the escalator planned for use in the Terminal. This unit represents the outer dimension of either a 48-inch-wide escalator (nominal) or a two-lane stair. The width of the interchangeable (stair/escalator) module may change as planning progresses, but the two-lane stair and escalator must fit within these dimensions. Furthermore, structural, mechanical, and spatial provisions must be made during design to allow for future interchangeability of stairs and escalators.

Adequate queuing and run-off space would be provided for all public stairs and escalators. Elevators would be provided with a queuing area to permit passengers disembarking the elevator to exit without interference from those waiting. To the maximum extent possible, the queuing and run-off areas for VCEs would not overlap. Therefore, the Terminal's planning has been guided by a minimum 30-foot distance between VCE units that face the same direction and a minimum 40-foot clearance for VCEs that face each other. The Terminal's VCEs would also be positioned to encourage right-hand circulation and to minimize conflicting passenger movements and cross flows.

Since reverse commuting would represent approximately 20 percent of peak hour trips, PATH would dedicate at least one VCE to the down direction in the AM peak period and one in the up direction in the PM peak. (This operation was also implemented before September 11, 2001.) At this time, PATH plans to operate this reverse-flow escalator at the north end of each platform.

Failure management is also a consideration in the design of VCEs. Besides the expectation that one VCE be dedicated to the reverse commute, station planning accounts for a condition in which one of the VCEs may be out-of-service for maintenance purposes in the peak hour.

Stairs

Public stairs are intended for normal passenger circulation when there is a reasonable rise between levels. However, stairs should not be used for normal public access (as distinguished from emergency egress) where the vertical rise exceeds 36 feet. Stairs have been planned along the normal and direct path of passenger circulation and would be visible and easily identifiable as a means of access to the levels they connect. Where feasible, stairs would be paired with escalators to facilitate efficient and economical passenger movement.

Wherever practicable, all stairs have been planned on the same modular width applied to escalators, including installation and construction tolerances, and designed to facilitate replacement with an escalator in the future. Where use of an escalator width as a modular dimension is not possible or appropriate, the minimum width of a stair would be 5 feet or more based on passenger demand, LOS, and/or emergency egress requirements.

Adequate queuing and run-off space would be provided at the top and bottom of all stairs. Where a stair is paired with an escalator, the queuing and run-off areas would coincide with that of the adjacent escalator. Where a stair is not adjacent to or does not align with an escalator, the queuing and run-off area would be equal the width of the stair or 10 feet, whichever is greater.

The following LOS performance standards have been used for planning and design of stairs:

- A stairway flow of LOS C (10 to 15 square feet per person with an average flow volume of 7 to 10 persons per foot of width per minute)
- LOS C (7 to 10 square feet per person with an average interperson spacing of 3 to 3½ feet for queuing areas.

Stairs provided for emergency egress purposes would comply with applicable codes and NFPA 130 criteria.

Escalators

Where the vertical rise between levels cannot be accommodated by a ramp, the primary mode of vertical circulation for a rise of up to 12 feet would be by stairs. For a rise of 12 feet or greater, the primary mode of vertical circulation would be by escalator.

Escalators would be located along the normal and direct path of passenger circulation and would be visible and easily identifiable as a means of access to the levels they connect. Where feasible, escalators would be paired with stairs to facilitate efficient and economical passenger movement. All escalators would be two lanes wide (40 inches wide at step).

A minimum of 30 feet of queuing and run-off space, as measured from the upper and lower escalator working points, clear to any obstruction at the top and bottom of each escalator would be provided. Where escalators are located in sequence and there are no pedestrian cross flows or other obstructions to customer movement (e.g., at intermediate landings independent of intervening customer circulation elements), the required combined queuing and run-off space may be reduced by 25 percent. The width of the queuing and run-off space would correspond to the modular width of the escalator.

The following LOS performance standards have been used for escalator planning.

- 48 inches nominal (two lane) escalator at a processing rate of 70 persons per minute (ppm); and
- LOS C (7 to 10 square feet per person with an average interperson spacing of 3 to 3½ feet for queuing areas.

The LOS C/D processing rate of 70 ppm for a 100-foot per minute escalator is an average rate for a 15-minute period. A 100-foot per minute escalator can attain a capacity of more than 70 ppm but such a rate would not be sustained for extended periods. A higher speed escalator could be used within the Terminal, which would result in greater capacity, but these escalators may reduce the LOS of queuing areas since customers must orient themselves to the higher speed.

Elevators

Elevators are intended for the use of the general public. They are provided to assist the mobility impaired, customers with baggage, packages, or who may be otherwise burdened, and to provide an enhanced quality of general customer service.

Elevators would be placed to provide effective redundancy along the accessible path from the Terminal entrance to the platform for customer convenience and to maintain accessibility in the event of breakdown or routine maintenance. Therefore, a minimum of two elevators would be provided connecting the street-level entrance(s) and the mezzanine area and a minimum of two elevators would be provided connecting the mezzanine to the platforms.

Elevators would be located as closely as possible to the direct path of travel between entry and platform in order to minimize travel distances when using the elevator, and they would be located to be visible for surveillance purposes. Where feasible, elevators would be located in a consistent manner on the platform from station to station to facilitate wayfinding and customer orientation. In general, elevators would be centered along the length of the platform adjacent to the middle cars of the train. Elevators would also be located to not obstruct general passenger circulation or visually obscure other VCEs along the path from the turnstiles to the platform.

Elevators would be of a size to comply with ADA requirements and accommodate emergency services and emergency personnel with a stretcher. Consideration has been given to local ridership characteristics in selecting elevator sizes (e.g., a high percentage of bicycle commuters, or customers with baggage may dictate the selection of larger elevators). The elevator landing depth (the queuing and discharge space at the elevator door) would be a minimum clear distance to any obstruction equal to 1½-times the depth of the car or ten feet, whichever is greater, by the width of the elevator. Elevator landings would be positioned so that the elevator queuing area does not impede general circulation, has adequate queuing space, and is not hidden from view. Queuing space would not overlap with queuing areas from other VCEs,

Queuing areas would be LOS C (i.e., 7 to 10 square feet per person, average interperson spacing of 3 to 3½ feet). Elevators are not considered a factor in stair, escalator, or platform sizing.

E. ALTERNATIVE PLATFORM AND TRACK CONFIGURATIONS

Given the operational and design requirements described above, PANYNJ reviewed several schemes for the Terminal's platform/track level. The following presents the 5-track, 4-platform configuration, which is the Preferred Alternative in the Final Environmental Impact Statement, as well as alternative schemes that were considered during project planning.

PREFERRED ALTERNATIVE

The Preferred Alternative would have four platforms (Platforms A through D) and 5 tracks (Tracks 1 through 5) as shown in Figure 4.

Platform A would effectively be a lengthening and rehabilitation of the temporary WTC PATH station platform that is adjacent to the east slurry wall. It is constrained to its east by the slurry wall and to its west by Track 1. Due to the narrowness of Platform A, it would not provide sufficient capacity to board and alight trains during peak hours. However, it is being retained as part of the Permanent Terminal for five functions: 1) as a failure management egress platform; 2) for access to trains stored on Track 1 during overnight hours; 3) as a service platform; 4) for use to alight trains that would end revenue service at the WTC Terminal; and 5) for staging the movement of trains to Harrison and Journal Square for inspection and repair.

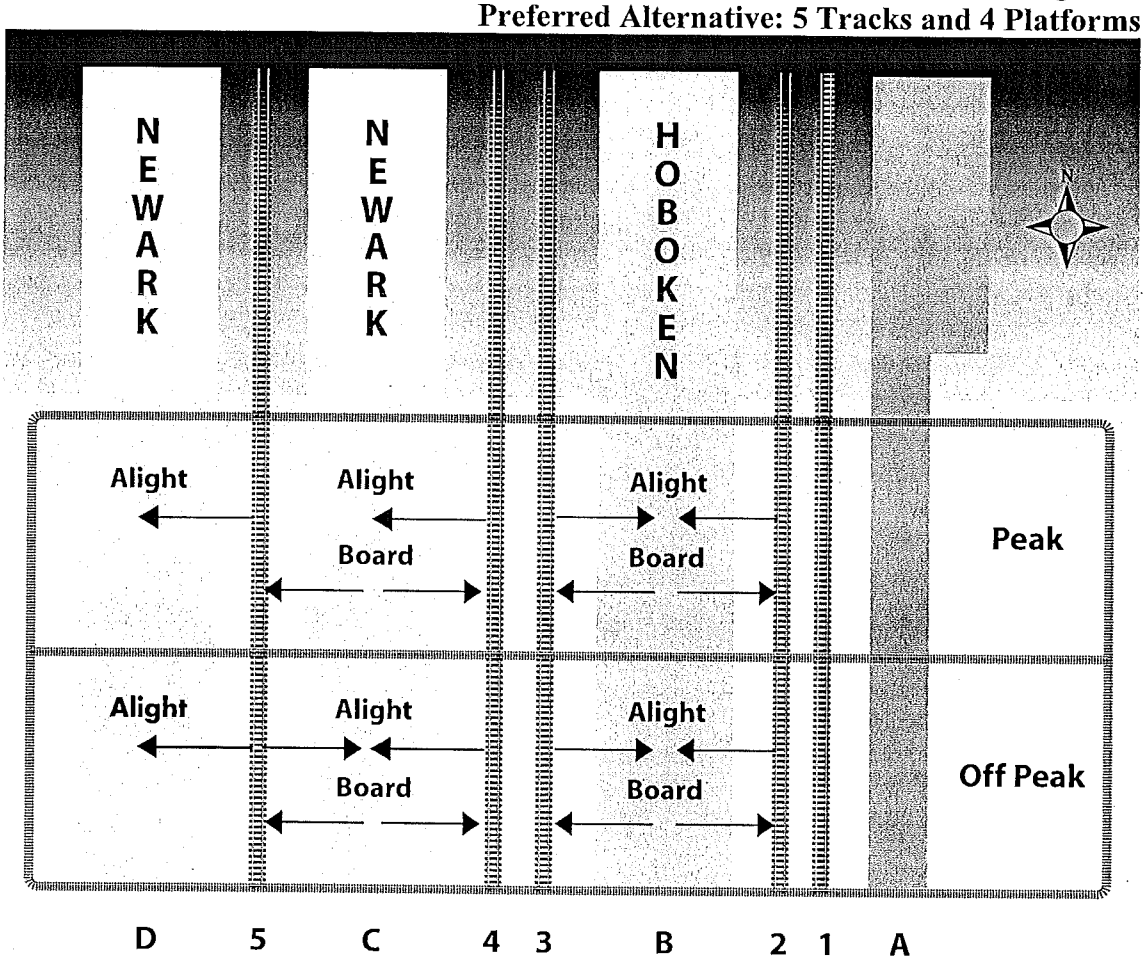
Platform B would serve Hoboken-WTC trains on Tracks 2 and 3. Platforms C and D would serve Newark-WTC trains on Tracks 4 and 5. PATH would allow both boarding and alighting to Track 4 from Platform C and dedicated boarding to Track 5. Alighting from Track 5 would be to Platform D.

Platform A would range in width from 13 to 23 feet; however, the number of location of VCEs on Platform A is not known at this time. Platforms B and D would be 30 feet wide, and Platform C would be 31 feet. These total widths account for the safety zone along each edge of the platform and the ADA mandated distance between the VCEs and the safety zone. Platforms B and C would have 10 VCEs and Platform D would have 12 VCEs. Certain structural elements

that support the levels above would touch down within Platforms B and C. As planned, these elements would intersect the platform between two vertical circulation elements, which would not allow for the collocation of three VCE elements within two of the four VCE cores on Platforms B and C. Because these structural elements do not intersect Platform D, its 4 VCE cores can each contain 3 VCE elements for a total of 12 VCEs.

Using the headway and LOS C/D design criteria defined above, an analysis was conducted of the platform clearance time for the Preferred Alternative in the AM peak period. The analysis also accounted for the system-wide improvements that would enhance the capacity of PATH trains. Thus, 10-car train sets with 3-door per car were assumed for the Newark-WTC route, and 8-car consists with 3-door cars were assumed for the Hoboken-WTC Line. (3-door cars improve train boarding and alighting as compared to the existing 2-door cars.).

Figure 4
Preferred Alternative: 5 Tracks and 4 Platforms



As noted above, Platforms B and C would have 10 VCEs (2 stairways and 8 escalators). Seven of the 8 escalators would operate in the peak direction of travel (up in the AM peak) while one escalator would serve the reverse commute. Stairs could accommodate travel in both directions. Platform D would have 12 VCEs (8 escalators and 4 stairways). Because Platform D would be used solely for alighting trains, all VCEs could serve upward movement.

As shown in Appendix C-1, the AM peak hour is expected to be the busiest hour of the day at the WTC PATH Terminal with approximately 66 percent of the riders entering or exiting the station via the Newark-WTC Line and 33 percent via the Hoboken-WTC Line. The Newark-WTC Line would carry a total 19,077 riders at the WTC Terminal in the 2025 AM peak hour with a total of 3,905 riders boarding trains and 15,172 alighting. The Hoboken-WTC Line would carry a total of 9,924 riders with 1,755 boardings and 8,169 alightings.

The AM peak hour headway on the Hoboken-WTC Line would be 210 seconds. Thus, Platform B must clear within 147 to 168 seconds to meet the *TCQSM* criteria. For the Newark-WTC service, PATH would alternate train alighting between Platforms C and D. Thus, trains would alight to either platform every 360 seconds, resulting in a maximum required clearance time would be 252 to 288 seconds for each platform.

Table 3 summarizes the factors used in the platform clearance analysis while the results are presented in Table 4. As shown in Table 4, Platform B would require 148 seconds for clearance, Platform C would require 213 seconds, and Platform D would require 136 seconds. Thus, under the proposed AM peak hour headways, all three platforms would meet the criteria set forth in the *TCQSM.*

Table 3
Preferred Alterantive: Platform Clearance Analysis Assumptions

Factor		Platform B	Platform C	Platform D
PATH Service		Hoboken-WTC	Newark-WTC	
AM Peak Hour Surge Factor		0.79	0.79	
Headway between Trains		210 seconds	360 seconds	360 seconds
Train Length		8-car	10-car	10-car
Doors per Car per Side		3	3	3
Door Capacity (Passengers/Minute)		120	120	120
VCEs	Stairways	2	2	4
	Escalators (Peak Direction)	7	7	7
	Escalators (Reverse Direction)	1	1	1
Notes: Newark-WTC trains would operate on 180-second headways; however, since trains would be served by both Platform C and Platform D, trains would arrive at each platform every 6 minutes.				

Table 4
Preferred Alternative: Platform Clearance Analysis Results

Factor	Platform B	Platform C	Platform D
Train Headway at Platform	210 seconds	360 seconds	360 seconds
Required Platform Clearance	147 – 168 seconds	252 – 288 seconds	252 – 288 seconds
Estimated Platform Clearance (AM Peak Hour)	148 seconds	213 seconds	136 seconds
Meets or Fails Criteria?	Meets	Meets	Meets

As described above, PM peak hour conditions require that the usable area of the platform accommodate passengers waiting to board a train. A platform crowding analysis was prepared for the Preferred Alternative using the assumptions presented in Table 5.

Table 6 presents the results of the platform crowding analysis. Based on the LOS C/D design criteria defined above, a total of 10,385 square feet of area is required on the Hoboken-WTC platform and a total of 16,355 square feet is required on the Newark-WTC platforms to accommodate peak crowds in the event of a missed headway. Accounting for the unusable areas of the platform (e.g., spaces occupied by VCEs and the safety buffer along the platform edge), each would provide for an effective area of 10,416 square feet.

On the Hoboken-WTC Line (Platform B), there would be sufficient capacity to meet LOS C/D criteria event of a missed headway.

Table 5
Preferred Alterantive: Platform Crowding Analysis Assumptions

Factor		Platform B	Platform C	Platform D
PATH Service		Hoboken-WTC	Newark-WTC	
PM Peak Hour Surge Factor		0.81	0.81	
Platform Length		504 feet	504 feet	504 feet
Platform Width		30 feet	30 feet	30 feet
Effective Platform Circulation Area		10,416 SF	10,416 SF	10,416 SF
VCEs	Stairways	2	2	4
	Escalators (Peak Direction)	7	7	7
	Escalators (Reverse Direction)	1	1	1
LOS C/D Criteria	Standing Passengers	7 square feet		
	Circulating Passengers	15 square feet		

Notes: The effective area is the total dimension of the platform less areas occupied by VCEs, a one-foot buffer around VCEs, and an 18-inch safety strip along the platform edge. Although the number of VCEs varies by platform, the area they occupy is the same for all platforms.

Table 6
Preferred Alternative: Platform Crowding Analysis Results

Analysis Factor			Platform B	Platform C	Platform D
Required Area	Boarding Passengers	Passengers	1,027	1,096	N/A
		Area	7,190	7,670 SF	N/A
	Alighting Passengers	Passengers	213	N/A	579
		Area	3,195	N/A	8,685 SF
	Total Required Area		10,385 SF	7,670 SF	8,685 SF
Effective Area			10,416 SF	10,920 SF	10,416 SF
Meets or Fails LOS C/D Criteria?			Meets	Meets	Meets

Notes: *The analysis assumes that in the event of extended headways that the first arriving train would arrive on Track 5 and would alight to Platform D. Thus, Platform C would not require the circulation area for alighting passengers in the event of a missed headway.

There would be sufficient capacity on the Newark-WTC Line because PATH could alight trains to Platform D and board from Platform C. As shown in Table 6, a total of 8,685 square feet is required for boarding passengers and 7,670 square feet is required for alighting passengers. It is assumed that in the event of a missed headway, PATH would manage crowding by using Track 5 (Platforms C and D) for the next arriving train. As a result, the effective width of Platform C

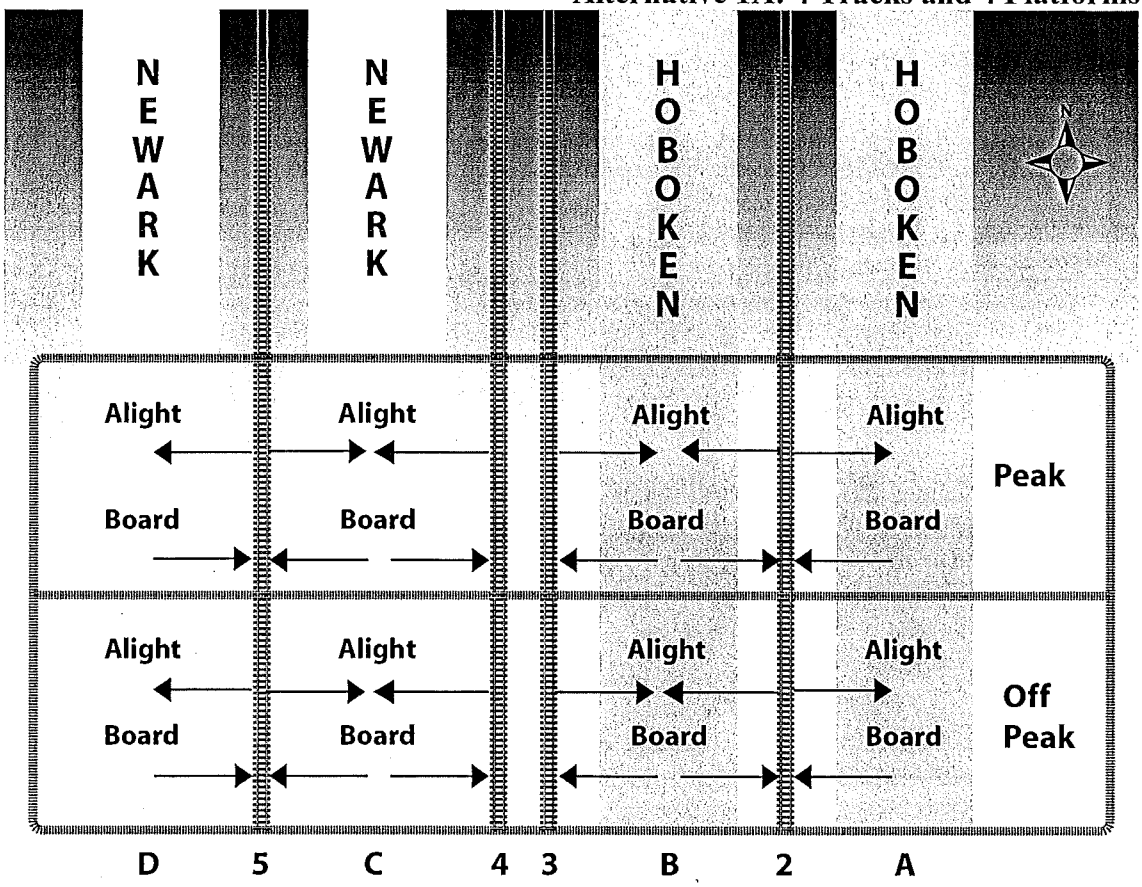
would be sufficient to support the 7,818 square feet required for boarding passengers and effective area of Platform D would be sufficient to support the 7,446 square feet required for alighting passengers.

Because the Preferred Alternative would provide 5 tracks, it would meet the minimum operating requirements of PATH. Furthermore, the 4 platform configuration would provide for adequate capacity to support platform clearance in the AM peak period as well as platform crowding in the PM peak period. As such, the Preferred Alternative would meet the planning and design criteria set forth in the *TCQSM*.

ALTERNATIVES 1A AND 1B: 4 TRACKS / 4 PLATFORMS

PANYNJ considered two options that would result in 4 platforms and 4 tracks, which are shown in Figures 5 and 6.

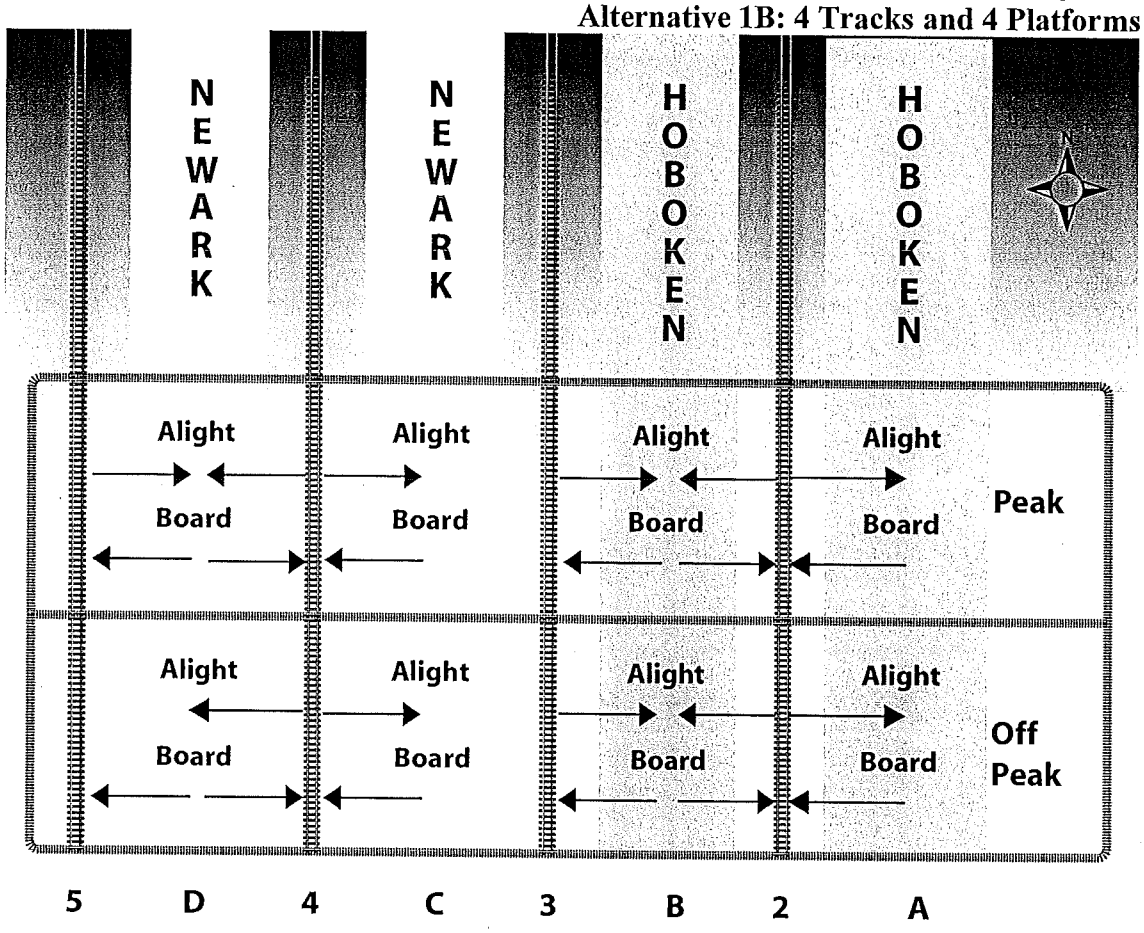
Figure 5
Alternative 1A: 4 Tracks and 4 Platforms



Under Alternative 1A, the existing Track 1 would be removed and Platform A widened. PATH would operate Hoboken-WTC service from Platforms A and B (Tracks 2 and 3) and Newark-WTC service from Platforms C and D (Tracks 4 and 5). Alternative 1B would also result in the removal of Track 1 and the widening of Platform A. PANYNJ would realign the other tracks such that Platforms A and B would be separated by Track 2; Platforms B and C by Track 3, and

Platforms C and D by Track 4. Track 5 would be located immediately west of Platform D. This configuration would allow for dedicated boarding or alighting from Platforms A, B, C and D.

Figure 6
Alternative 1B: 4 Tracks and 4 Platforms



Both of these alternatives would meet or exceed the platform clearance and platform crowding criteria. However, because they would have 4 tracks, they would not meet PATH's operational needs. Therefore, Alternatives 1A and 1B were eliminated from further consideration.

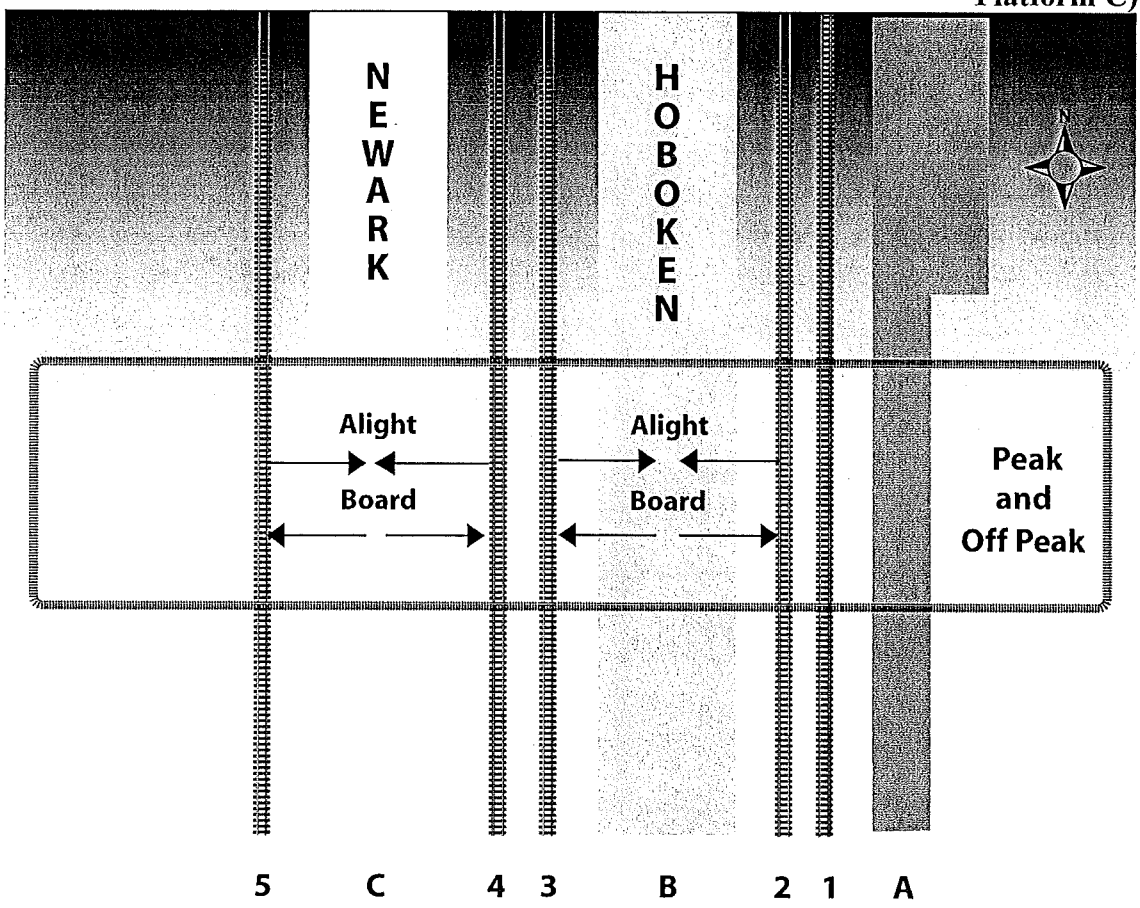
ALTERNATIVE 2A: 5 TRACKS / 3 PLATFORMS (NO SERVICE ON PLATFORM A AND 30-FOOT PLATFORM C)

Figure 7 shows the layout of the 5-Track, 3-Platform scheme for the Terminal's platform level. Under this scenario, PATH would operate the station similar to the Pre-September 11, 2001 condition. Platform A would serve as failure management and service platform; Platform B would serve Hoboken-WTC trains from Tracks 2 and 3, and Platform C would serve Newark-WTC trains from Tracks 4 and 5.

Because this plan would result in five tracks, it would meet PATH's operating requirements. However, given the projected 2025 ridership on the Newark-WTC Line, a single, dedicated

platform for this service would not be sufficient to meet the platform clearance or platform crowding criteria identified above.

Figure 7
Alternative 2A: 5 Tracks and 3 Platforms (No Service on Platform A and 30-foot Platform C)



As shown in Table 7, Platform C would require 213 seconds to clear in the AM peak hour. Because trains would arrive on both Tracks 4 and 5 and would board and alight from Platform C, the platform must clear within 126 to 144 seconds (70 to 80 percent of the 180-second headway on the Newark-WTC Line). Therefore, Platform C would fail to meet the *TCQSM* criteria. Platform B would have the same clearance time as under the Preferred Alternative and would thus meet the platform clearance criteria.

Furthermore under Alternative 2A, Platform C would fail to meet platform crowding criteria in the PM peak hour as shown in Table 8. Because trains would both board and alight to Platform C, a total of 16,355 square feet of usable area would be required in the event of a missed headway. However, the effective area of the platform would be 10,416 SF, which would not be sufficient to support peak period volumes. Platform B would have the same platform crowding conditions as under the Preferred Alternative and would thus meet the LOS C/D criteria.

Table 7
Alternative 2A: Platform Clearance Analysis Results

Factor	Platform B	Platform C
Train Headway at Platform	210 seconds	180 seconds
Required Platform Clearance	147 – 168 seconds	126 – 144 seconds
Estimated Platform Clearance (AM Peak Hour)	148 seconds	213 seconds
Meets or Fails Criteria?	Meets	Fails

Table 8
Alternative 2A: Platform Crowding Analysis Results

Analysis Factor			Platform B	Platform C
Required Area	Boarding Passengers	Passengers	1,027	1,096
		Area	7,190	7,670 SF
	Alighting Passengers	Passengers	213	579
		Area	3,195	8,685 SF
	Total Required Area		10,385 SF	16,355 SF
Effective Area			10,416 SF	10,920 SF
Meets or Fails LOS C/D Criteria?			Meets	Fails

Platform clearance could be improved by adding stairways and/or escalators to the proposed scheme. The current 30-foot width of the platform constrains the addition of elements within the planned VCE cores (i.e., 4 VCEs per core rather than 3 VCEs per core) since adequate clearance would not be provided between the VCE and the platform edge. A fifth VCE core could be added to the platform, but this would reduce the effective area of the platform by approximately 800 square feet; further degrading platform crowding conditions in the PM peak hour.

Platform crowding could be reduced under Alternative 2A with the lengthening or widening of Platform C. However, site conditions limit the benefit of a longer or wider platform as follows:

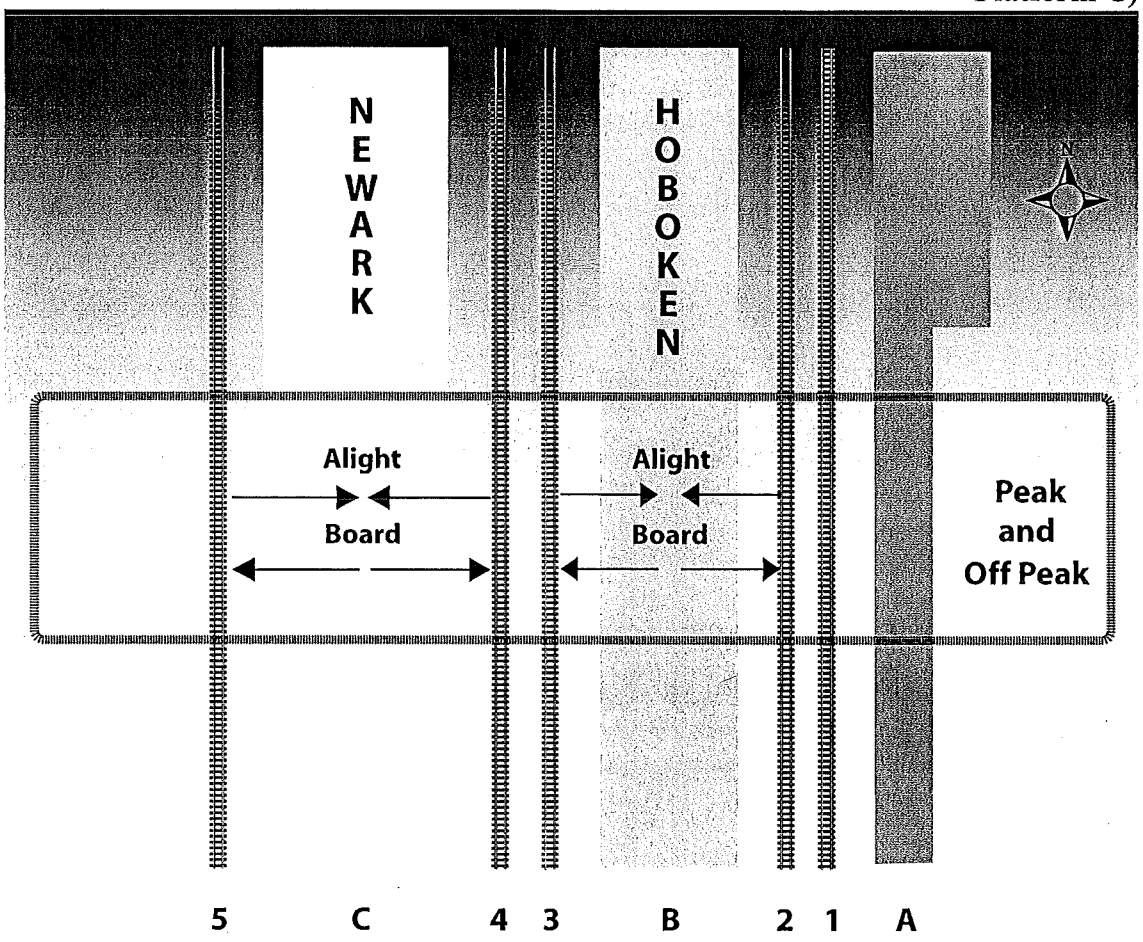
- The platforms may no longer be on a tangent. As noted earlier, this would create a gap between the train and the platform, which would not meet ADA criteria.
- The ability to extend the platform to the north is limited by both the east-west pedestrian concourse and the fare zone control at the mezzanine level.
- Platform C could be widened to the west, which would require the realignment of the existing Track 5. For safe operations, PATH would need to close Platform C of the temporary WTC PATH station, while Track 5 is reconstructed and the platform widened. In this case, PATH would operate both Newark-WTC and Hoboken-WTC trains from Platform B. However, given current ridership demand and headways, Platform B would not be sufficient to fully support both routes.

In the long-term Alternative 2A would support PATH's operational requirements since it would have five tracks, but a single platform for the Newark-WTC service would fail to meet platform clearance and platform crowding criteria. Although these criteria could be achieved by adding VCEs and widening Platform C, associated construction activities may limit or suspend temporary WTC PATH service. Thus, Alternative 2A would fail to meet the goals and objectives of the Project and was eliminated from further consideration.

ALTERNATIVE 2D: 5 TRACKS / 3 PLATFORMS (NO SERVICE ON PLATFORM A AND 42-FOOT PLATFORM C)

As shown in Figure 10, Alternative 2C would have nearly the same configuration and operation as Alternative 2A; however, Platform C would be 13-feet wider (44-feet total). Because the platform would be wider than under the Preferred Alternative, additional queuing area would be provided for boarding passengers and 3 additional VCEs (for a total of 13 VCEs) would be accommodated.

Figure 10
Alternative 2D: 5 Tracks and 3 Platforms (No Service on Platform A and 44-foot Platform C)



Because this plan would result in five tracks, it would meet PATH's operating requirements. Furthermore, this alternative would provide for adequate vertical circulation and queuing area to meet both platform clearance and platform crowding criteria.

As shown in Table 9, Platform C would require 138 seconds to clear in the AM peak hour. Because trains would arrive on both Tracks 4 and 5 and would board and alight from Platform C, the platform must clear within 126 to 144 seconds (70 to 80 percent of the 180-second headway on the Newark-WTC Line). Therefore, Platform C would meet the *TCQSM* criteria. Platform B

would have the same clearance time as under the Preferred Alternative and would also meet the platform clearance criteria.

Furthermore under Alternative 2D, Platform C would meet platform crowding criteria in the PM peak hour as shown in Table 8. Because trains would both board and alight to Platform C, a total of 16,355 square feet of usable area would be required in the event of a missed headway. Since the effective area of a 44-foot platform would be 16,734 SF, it would be sufficient to support peak period volumes. Platform B would have the same platform crowding conditions as under the Preferred Alternative and would thus meet the LOS C/D criteria.

Table 9
Alternative 2D: Platform Clearance Analysis Results

Factor	Platform B	Platform C
Train Headway at Platform	210 seconds	180 seconds
Required Platform Clearance	147 – 168 seconds	126 – 144 seconds
Estimated Platform Clearance (AM Peak Hour)	148 seconds	138 seconds
Meets or Fails Criteria?	Meets	Meets

Table 10
Alternative 2D: Platform Crowding Analysis Results

Analysis Factor			Platform B	Platform C
Required Area	Boarding Passengers	Passengers	1,027	1,096
		Area	7,190	7,670 SF
	Alighting Passengers	Passengers	213	579
		Area	3,195	8,685 SF
	Total Required Area		10,385 SF	16,355 SF
Effective Area			10,416 SF	16,734 SF
Meets or Fails LOS C/D Criteria?			Meets	Meets

Unlike Alternatives 2A, 2B, and 2C, this alternative would meet the *TCQSM* criteria for platform clearance and crowding. However, this 3-platform scheme would limit operational flexibility.

A 44-foot platform would meet PATH's projected 2025 ridership projections, but it would not facilitate the dedicated off-loading of passengers, which would reduce conflicts ("passenger friction"). As experienced at the WTC prior to September 11, 2001, the passenger friction on Platform C could jeopardize dwell times for trains to load and leave the Terminal, particularly if there are further substantial increases in the reverse commuting volumes. This would have the effect of increasing headways and reducing overall train throughput at the WTC Terminal.

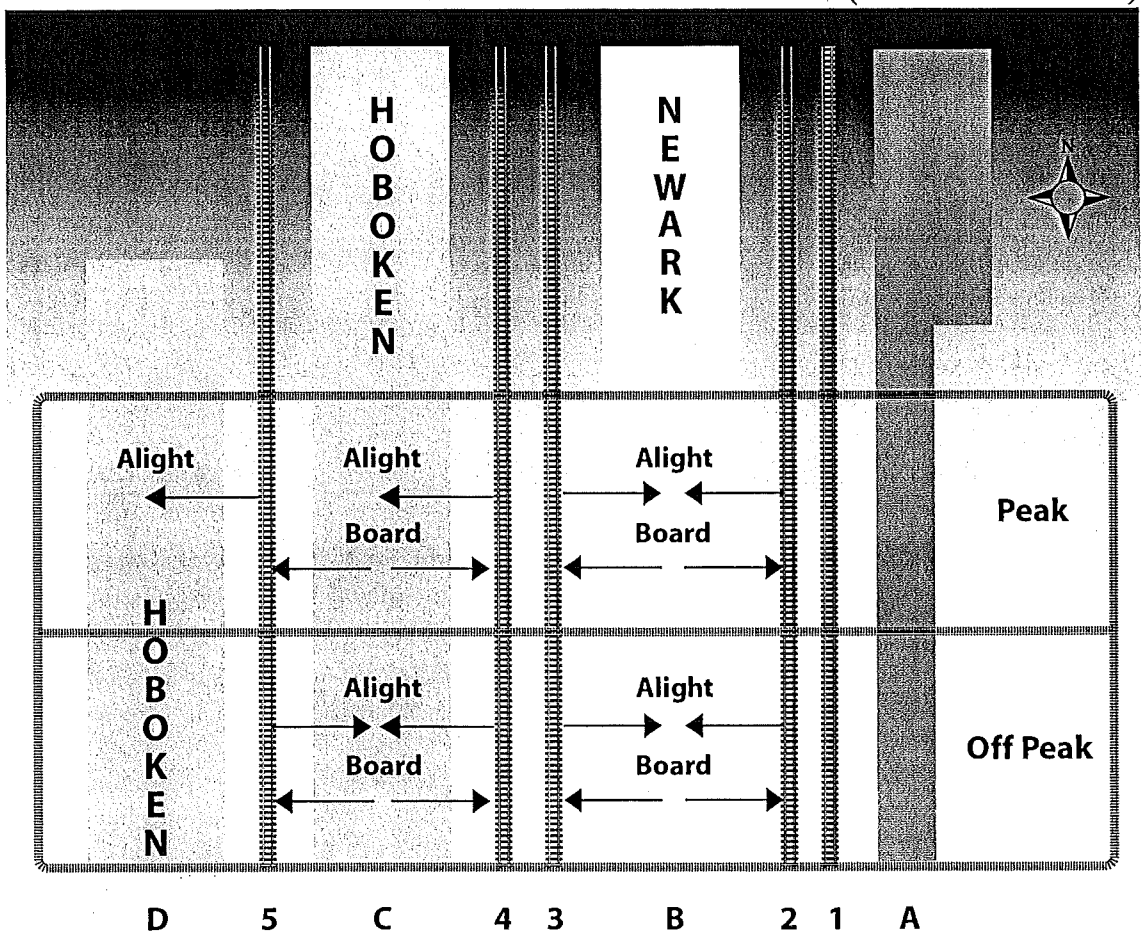
Furthermore, in order to provide temporary PATH service during construction of the Permanent Terminal, the existing track geometry must be adequately maintained to enable continuous train operations. Any major changes to this geometry, particularly those that push the tracks further west would cause outages on the existing Track 5. Moving the track 13 feet to the west of the existing Track 5 would also result in a tighter curve between the PATH projections and the station platform, which poses operational disadvantages as compared to the Preferred Alternative.

Since a 4-platform scheme provides for better operations and because the widening of Platform C may substantially limit the operation of the temporary WTC PATH station, Alternative 2D was considered to be inconsistent with the project's goals and objectives and was, therefore, eliminated from further consideration.

ALTERNATIVE 3: 5 TRACKS / 4 PLATFORMS (PLATFORM D IS 8-CAR)

As shown in Figure 11, this alternative would not result in a change in the layout of the tracks or Platforms A, B, or C as compared to the Preferred Alternative. However, Platform D would be reduced to an 8-car length. Under this alternative, PATH would operate Newark-WTC service from Platform B and Hoboken-WTC service from Platforms C and D. While, this option would improve operations for the Hoboken-WTC Line, it would fail to meet the capacity needs for Newark-WTC riders.

Figure 11
Alternative 3: 5 Tracks and 4 Platforms (Platform D is 8-Car)



Given the volume of riders on the Newark-WTC Line, this option was considered inadequate to serve future demand and was eliminated from further consideration. ✳

Appendix C-3: Vehicular Traffic and Parking

CONTENTS

Table 1	2006 No Action Traffic Level of Service
Table 2	2006 Construction (Terminal with Liberty Plaza Connection) Traffic Level of Service
Table 3a	2006 No Action vs. 2006 PATH Construction Traffic Level of Service: AM Peak Hour
Table 3b	2006 No Action vs. 2006 PATH Construction Traffic Level of Service: Midday Peak Hour
Table 3c	2006 No Action vs. 2006 PATH Construction Traffic Level of Service: PM Peak Hour
Figure A1	2006 AM Baseline Traffic Volumes
Figure A2	2006 Midday Baseline Traffic Volumes
Figure A3	2006 PM Baseline Traffic Volumes
Figure A4	2006 AM Baseline with PATH Construction Volumes
Figure A5	2006 Midday Baseline with PATH Construction Volumes
Figure A6	2006 PM Baseline with PATH Construction Volumes

PERMANENT WTC PATH TERMINAL EIS
2006 NO ACTION TRAFFIC LEVELS OF SERVICE

INTERSECTION & APPROACH		AM (8:15 - 9:15AM) Mvt.	V/C	Control Delay	LOS	Midday (12:00PM - 1:00PM) Mvt.	V/C	Control Delay	LOS	PM (5:00 - 6:00PM) Mvt.	V/C	Control Delay	LOS
SIGNALIZED INTERSECTIONS													
West Street (NYS Rt. 9A) at Canal Street													
West Street (NYS Rt. 9A)	NB	T	0.65	2.4	A	T	0.45	1.7	A	T	0.63	2.5	A
	SB	T	0.57	1.8	A	T	0.39	1.5	A	T	0.67	2.6	A
Canal Street	WB	L	0.20	43.1	D	L	0.34	44.1	D	L	0.19	39.6	D
		LR	0.45	50.1	D	LR	0.84	70.7	E	LR	0.37	43.4	D
		R	0.53	53.3	D	R	0.63	56.0	E	R	0.42	45.5	D
Overall Intersection		-	**0.63**	**4.2**	A	-	**0.53**	**8.2**	A	-	**0.61**	**4.4**	A
West Street (NYS Rt. 9A) at Canal Street													
West Street (NYS Rt. 9A)	NB	TR	0.89	19.3	B	TR	0.59	11.8	B	TR	0.81	15.7	B
		R	0.41	11.3	B	R	0.41	11.4	B	R	0.23	9.1	A
	SB	L	1.02	103.7	F	L	1.01	72.5	E	L	1.01	73.8	E
		T	0.98	16.6	B	T	0.95	15.6	B	T	0.99	18.4	B
Overall Intersection		-	**0.95**	**29.1**	C	-	**0.77**	**21.9**	C	-	**0.90**	**22.6**	C
West Street (NYS Rt. 9A) at Chambers Street													
West Street (NYS Rt. 9A)	NB	TR	0.93	26.7	C	TR	0.65	16.8	B	TR	0.76	19.0	B
	SB	L	0.68	13.6	B	L	0.67	12.2	B	L	0.84	20.6	C
		TR	0.62	16.3	B	TR	0.53	15.0	B	TR	0.83	21.0	C
Chambers Street	EB	LTR	0.63	47.6	D	LTR	0.34	39.2	D	LTR	0.30	38.1	D
	WB	LT	0.73	52.8	D	LT	0.48	41.8	D	LT	0.72	54.3	D
		R	0.43	25.8	C	R	0.47	27.1	C	R	0.67	33.1	C
Overall Intersection		-	**0.88**	**24.4**	C	-	**0.66**	**17.9**	B	-	**0.81**	**22.5**	C
West Street (NYS Rt. 9A) at Vesey Street													
West Street (NYS Rt. 9A)	NB	TR	1.00	149.0	F	TR	0.99	60.4	E	TR	1.05	63.3	E
	SB	L	0.08	9.0	A	L	0.09	6.7	A	L	0.02	7.6	A
		TR	1.06	57.5	E	TR	1.05	56.7	E	TR	1.04	65.9	E
Vesey Street	EB	L	0.67	54.4	D	L	0.55	47.1	D	L	0.76	61.6	E
		TR	0.20	34.7	C	TR	0.21	34.8	C	TR	0.19	34.5	C
	WB	L	0.00	32.3	C	L	0.01	32.4	C	L	0.00	32.3	C
		TR	0.04	32.8	C	TR	0.04	32.8	C	TR	0.01	32.4	C
Overall Intersection		-	**0.98**	**102.2**	F	-	**0.93**	**57.1**	E	-	**0.98**	**63.7**	E
West Street (NYS Rt. 9A) at Liberty Street													
West Street (NYS Rt. 9A)	NB	TR	0.79	7.6	A	TR	0.58	5.1	A	TR	0.63	5.4	A
	SB	TR	0.72	6.6	A	TR	0.62	5.4	A	TR	0.94	19.0	B
Liberty Street	EB	L	0.56	42.3	D	L	0.40	38.3	D	L	0.38	37.8	D
		R	0.12	33.6	C	R	0.08	32.9	C	R	0.22	35.3	D
Overall Intersection		-	**0.72**	**9.2**	A	-	**0.56**	**7.1**	A	-	**0.78**	**14.4**	B
West Street (NYS Rt.9A) at Brooklyn Battery Tunnel													
West Street (NYS Rt.9A)	NB	T	1.05	151.5	F	T	1.00	141.7	F	T	1.07	111.8	F
		R	1.10	112.5	F	R	1.07	76.7	E	R	1.09	110.4	F
	SB	TR	1.02	68.8	E	TR	0.92	59.5	E	TR	1.03	92.2	F
Brooklyn Battery Tunnel	EB	R	0.64	27.4	C	R	0.21	22.2	C	R	0.18	13.6	B
	WB	L	1.47	410.6	F	L	1.05	199.7	F	L	1.09	221.6	F
		R	1.08	225.1	F	R	1.01	161.9	F	R	0.91	151.4	F
Overall Intersection		-	**1.32**	**231.2**	F	-	**1.07**	**126.5**	F	-	**1.09**	**130.0**	F
Church Street at Vesey Street													
Church Street	NB	LT	0.89	19.6	B	LT	0.67	15.6	B	LT	0.63	10.1	B
		R	0.36	9.3	A	R	0.68	22.9	C	R	0.24	6.9	A
Vesey Street	EB	LT	0.03	19.0	B	LT	0.00	18.7	B	LT	0.02	18.9	B
Overall Intersection		-	**0.56**	**18.6**	B	-	**0.42**	**17.2**	B	-	**0.40**	**9.8**	A
Church Street at Fulton Street													
Church Street	NB	T	0.86	23.2	C	T	0.78	19.8	B	T	0.62	14.9	B
Fulton Street	WB	R	0.14	19.6	B	R	0.61	32.5	C	R	0.24	20.9	C
Overall Intersection		-	**0.57**	**23.0**	C	-	**0.72**	**21.7**	C	-	**0.47**	**15.6**	B

PERMANENT WTC PATH TERMINAL EIS
2006 NO ACTION TRAFFIC LEVELS OF SERVICE

		AM (8:15 - 9:15AM)				Midday (12:00PM - 1:00PM)				PM (5:00 - 6:00PM)			
				Control				Control				Control	
INTERSECTION & APPROACH		Mvt.	V/C	Delay	LOS	Mvt.	V/C	Delay	LOS	Mvt.	V/C	Delay	LOS
SIGNALIZED INTERSECTIONS													
Church Street at Dey Street													
Church Street	NB	T	0.74	13.0	B	T	0.68	11.6	B	T	0.55	9.1	A
Dey Street	WB	R	0.00	24.2	C	R	0.00	24.2	C	R	0.00	24.2	C
Overall Intersection		-	**0.53**	**13.0**	**B**	-	**0.48**	**11.6**	**B**	-	**0.39**	**9.1**	**A**
Church Street at Cortlandt Street													
Church Street	NB	T	0.61	10.3	B	T	0.45	8.4	A	T	0.34	7.4	A
Cortlandt Street	WB	R	0.89	50.4	D	R	1.01	76.7	E	R	0.93	58.0	E
Overall Intersection		-	**0.72**	**22.3**	**C**	-	**0.67**	**35.5**	**D**	-	**0.57**	**29.0**	**C**
Church Street at Liberty Street													
Church Street	NB	T	0.58	9.8	A	T	0.49	8.8	A	T	0.34	7.4	A
		R	0.15	6.6	A	R	0.21	7.2	A	R	0.11	6.2	A
Liberty Street	EB	LT	0.07	18.7	B	LT	0.02	18.2	B	LT	0.00	18.1	B
Overall Intersection		-	**0.38**	**10.1**	**B**	-	**0.30**	**8.8**	**A**	-	**0.20**	**7.2**	**A**

(i): Control delay is measured in seconds per vehicle.
(ii): Level of service (LOS) for signalized intersections is based upon average control delay per vehicle (sec/veh) for each lane group as listed in the 2000 Highway Capacity Manual -- TRB.
(iii): Level of service (LOS) for unsignalized intersections is based upon control delay per vehicle (sec/veh) for each minor-approach as listed in the 2000 Highway Capacity Manual -- TRB.
(iv): Overall intersection V/C ratio is the critical lane groups' V/C ratio, not the weighted average of all the movements.

PERMANENT WTC PATH TERMINAL EIS
2006 CONSTRUCTION TRAFFIC LEVELS OF SERVICE

		AM (8:15 - 9:15AM)				Midday (12:00PM - 1:00PM)				PM (5:00 - 6:00PM)			
				Control				Control				Control	
INTERSECTION & APPROACH	Mvt.		V/C	Delay	LOS	Mvt.	V/C	Delay	LOS	Mvt.	V/C	Delay	LOS
SIGNALIZED INTERSECTIONS													
West Street (NYS Rt. 9A) at Canal Street													
West Street (NYS Rt. 9A)	NB	T	0.66	2.4	A	T	0.45	1.7	A	T	0.63	2.5	A
	SB	T	0.57	1.8	A	T	0.39	1.5	A	T	0.67	2.6	A
Canal Street	WB	L	0.20	43.2	D	L	0.34	44.3	D	L	0.20	39.8	D
		LR	0.45	50.1	D	LR	0.84	70.7	E	LR	0.37	43.4	D
		R	0.53	53.3	D	R	0.63	56.0	E	R	0.42	45.5	D
Overall Intersection		-	**0.63**	**4.2**	A	-	**0.54**	**8.2**	A	-	**0.61**	**4.4**	A
West Street (NYS Rt. 9A) at Canal Street													
West Street (NYS Rt. 9A)	NB	TR	0.90	19.4	B	TR	0.59	11.9	B	TR	0.81	15.8	B
		R	0.41	11.3	B	R	0.42	11.4	B	R	0.23	9.2	A
	SB	L	1.02	103.7	F	L	1.01	72.5	E	L	1.01	73.8	E
		T	0.98	17.2	B	T	0.96	16.4	B	T	1.00	19.2	B
Overall Intersection		-	**0.95**	**29.4**	C	-	**0.77**	**22.2**	C	-	**0.90**	**23.0**	C
West Street (NYS Rt. 9A) at Chambers Street													
West Street (NYS Rt. 9A)	NB	TR	0.93	26.9	C	TR	0.66	16.9	B	TR	0.76	19.1	B
	SB	L	0.68	13.6	B	L	0.67	12.2	B	L	0.84	20.6	C
		TR	0.62	16.3	B	TR	0.54	15.1	B	TR	0.83	21.1	C
Chambers Street	EB	LTR	0.63	47.6	D	LTR	0.34	39.2	D	LTR	0.30	38.1	D
	WB	LT	0.73	52.8	D	LT	0.48	41.8	D	LT	0.72	54.3	D
		R	0.43	25.8	C	R	0.47	27.1	C	R	0.67	33.1	C
Overall Intersection		-	**0.88**	**24.5**	C	-	**0.66**	**17.9**	B	-	**0.81**	**22.5**	C
West Street (NYS Rt. 9A) at Vesey Street													
West Street (NYS Rt. 9A)	NB	TR	1.00	149.6	F	TR	0.99	61.7	E	TR	1.05	64.0	E
	SB	L	0.11	9.8	A	L	0.12	7.6	A	L	0.05	8.3	A
		TR	1.06	58.0	E	TR	1.05	57.4	E	TR	1.05	66.5	E
Vesey Street	EB	L	0.67	54.4	D	L	0.55	47.1	D	L	0.76	61.6	E
		TR	0.20	34.7	C	TR	0.21	34.8	C	TR	0.19	34.5	C
	WB	L	0.02	32.7	C	L	0.04	32.9	C	L	0.02	32.7	C
		TR	0.04	32.8	C	TR	0.04	32.8	C	TR	0.01	32.4	C
Overall Intersection		-	**0.98**	**102.6**	F	-	**0.94**	**58.0**	E	-	**0.98**	**64.2**	E
West Street (NYS Rt. 9A) at Liberty Street													
West Street (NYS Rt. 9A)	NB	TR	0.79	7.6	A	TR	0.58	5.1	A	TR	0.63	5.4	A
	SB	LTR	0.77	7.6	A	LTR	0.67	6.0	A	LTR	1.01	51.3	D
Liberty Street	EB	L	0.56	42.3	D	L	0.40	38.3	D	L	0.38	37.8	D
		R	0.12	33.6	C	R	0.08	32.9	C	R	0.22	35.3	D
Overall Intersection		-	**0.72**	**9.6**	A	-	**0.59**	**7.4**	A	-	**0.83**	**32.3**	C
West Street (NYS Rt.9A) at Brooklyn Battery Tunnel													
West Street (NYS Rt.9A)	NB	T	1.05	151.5	F	T	1.00	141.7	F	T	1.07	111.8	F
		R	1.10	112.5	F	R	1.07	76.7	E	R	1.09	110.4	F
	SB	TR	1.02	68.8	E	TR	0.92	59.5	E	TR	1.03	92.2	F
Brooklyn Battery Tunnel	EB	R	0.64	27.4	C	R	0.21	22.2	C	R	0.18	13.6	B
	WB	L	1.47	410.6	F	L	1.05	199.7	F	L	1.09	221.6	F
		R	1.08	225.7	F	R	1.01	162.7	F	R	0.92	153.2	F
Overall Intersection		-	**1.32**	**231.4**	F	-	**1.07**	**126.7**	F	-	**1.09**	**130.3**	F
Church Street at Vesey Street													
Church Street	NB	LT	0.89	20.1	C	LT	0.67	15.7	B	LT	0.64	10.2	B
		R	0.36	9.3	A	R	0.68	22.9	C	R	0.24	6.9	A
Vesey Street	EB	LT	0.05	19.2	B	LT	0.02	18.9	B	LT	0.04	19.1	B
Overall Intersection		-	**0.57**	**19.0**	B	-	**0.43**	**17.3**	B	-	**0.41**	**10.0**	A
Church Street at Fulton Street													
Church Street	NB	T	0.86	23.5	C	T	0.79	19.9	B	T	0.62	15.0	B
Fulton Street	WB	R	0.14	19.6	B	R	0.61	32.5	C	R	0.24	20.9	C
Overall Intersection		-	**0.58**	**23.3**	C	-	**0.72**	**21.8**	C	-	**0.47**	**15.7**	B

PERMANENT WTC PATH TERMINAL EIS
2006 CONSTRUCTION TRAFFIC LEVELS OF SERVICE

		AM (8:15 - 9:15AM)				Midday (12:00PM - 1:00PM)				PM (5:00 - 6:00PM)			
				Control				Control				Control	
INTERSECTION & APPROACH	Mvt.	V/C	Delay	LOS	Mvt.	V/C	Delay	LOS	Mvt.	V/C	Delay	LOS
SIGNALIZED INTERSECTIONS												
Church Street at Dey Street												
Church Street NB	T	0.75	13.1	B	T	0.68	11.7	B	T	0.55	9.2	A
Dey Street WB	R	0.00	24.2	C	R	0.00	24.2	C	R	0.00	24.2	C
Overall Intersection	-	**0.53**	**13.1**	**B**	-	**0.49**	**11.7**	**B**	-	**0.40**	**9.2**	**A**
Church Street at Cortlandt Street												
Church Street NB	T	0.61	10.3	B	T	0.45	8.4	A	T	0.34	7.4	A
Cortlandt Street WB	R	0.89	50.8	D	R	1.01	77.4	E	R	0.94	58.5	E
Overall Intersection	-	**0.72**	**22.4**	**C**	-	**0.67**	**35.7**	**D**	-	**0.58**	**29.1**	**C**
Church Street at Liberty Street												
Church Street NB	T	0.58	9.8	A	T	0.49	8.8	A	T	0.34	7.4	A
	R	0.15	6.6	A	R	0.21	7.2	A	R	0.11	6.2	A
Liberty Street EB	LT	0.08	18.8	B	LT	0.03	18.3	B	LT	0.01	18.2	B
Overall Intersection	-	**0.38**	**10.2**	**B**	-	**0.31**	**8.9**	**A**	-	**0.21**	**7.3**	**A**

(i): Control delay is measured in seconds per vehicle.
(ii): Level of service (LOS) for signalized intersections is based upon average control delay per vehicle (sec/veh) for each lane group as listed in the 2000 Highway Capacity Manual -- TRB.
(iii): Level of service (LOS) for unsignalized intersections is based upon control delay per vehicle (sec/veh) for each minor-approach as listed in the 2000 Highway Capacity Manual -- TRB.
(iv): Overall intersection V/C ratio is the critical lane groups' V/C ratio, not the weighted average of all the movements.

PERMANENT WTC PATH TERMINAL EIS
AM COMPARISON OF 2006 NO ACTION vs 2006 PATH CONSTRUCTION

			2006 NO ACTION (8:15 - 9:15 AM)				CONSTRUCTION (8:15 - 9:15 AM)				MITIGATED (8:15 - 9:15 AM)				Mitigation Measures
				Control				Control				Control			
INTERSECTION & APPROACH		Mvt.	V/C	Delay	LOS		Mvt.	V/C	Delay	LOS	Mvt.	V/C	Delay	LOS	
SIGNALIZED INTERSECTIONS															
West Street (NYS Rt. 9A) at Canal Street															
West Street (NYS Rt. 9A)	NB	T	0.65	2.4	A		T	0.66	2.4	A					- Mitigation not required.
	SB	T	0.57	1.8	A		T	0.57	1.8	A					
Canal Street	WB	L	0.20	43.1	D		L	0.20	43.2	D					
		LR	0.45	50.1	D		LR	0.45	50.1	D					
		R	0.53	53.3	D		R	0.53	53.3	D					
Overall Intersection		-	**0.63**	**4.2**	A		-	**0.63**	**4.2**	A					
West Street (NYS Rt. 9A) at Canal Street															
West Street (NYS Rt. 9A)	NB	TR	0.89	19.3	B		TR	0.90	19.4	B					- Mitigation not required.
		R	0.41	11.3	B		R	0.41	11.3	B					
	SB	L	1.02	103.7	F		L	1.02	103.7	F					
		T	0.98	16.6	B		T	0.98	17.2	B					
Overall Intersection		-	**0.95**	**29.1**	C		-	**0.95**	**29.4**	C					
West Street (NYS Rt. 9A) at Chambers Street															
West Street (NYS Rt. 9A)	NB	TR	0.93	26.7	C		TR	0.93	26.9	C					- Mitigation not required.
	SB	L	0.68	13.6	B		L	0.68	13.6	B					
		TR	0.62	16.3	B		TR	0.62	16.3	B					
Chambers Street	EB	LTR	0.63	47.6	D		LTR	0.63	47.6	D					
	WB	LT	0.73	52.8	D		LT	0.73	52.8	D					
		R	0.43	25.8	C		R	0.43	25.8	C					
Overall Intersection		-	**0.88**	**24.4**	C		-	**0.88**	**24.5**	C					
West Street (NYS Rt. 9A) at Vesey Street															
West Street (NYS Rt. 9A)	NB	TR	1.00	149.0	F		TR	1.00	149.6	F					- Mitigation not required.
	SB	L	0.08	9.0	A		L	0.11	9.8	A					
		TR	1.06	57.5	E		TR	1.06	58.0	E					
Vesey Street	EB	L	0.67	54.4	D		L	0.67	54.4	D					
		TR	0.20	34.7	C		TR	0.20	34.7	C					
	WB	L	0.00	32.3	C		L	0.02	32.7	C					
		TR	0.04	32.8	C		TR	0.04	32.8	C					
Overall Intersection		-	**0.98**	**102.2**	F		-	**0.98**	**102.6**	F					
West Street (NYS Rt. 9A) at Liberty Street															
West Street (NYS Rt. 9A)	NB	TR	0.79	7.6	A		TR	0.79	7.6	A					- Mitigation not required.
	SB	TR	0.72	6.6	A		LTR	0.77	7.6	A					
Liberty Street	EB	L	0.56	42.3	D		L	0.56	42.3	D					
		R	0.12	33.6	C		R	0.12	33.6	C					
Overall Intersection		-	**0.72**	**9.2**	A		-	**0.72**	**9.6**	A					
West Street (NYS Rt.9A) at Brooklyn Battery Tunnel															
West Street (NYS Rt.9A)	NB	T	1.05	151.5	F		T	1.05	151.5	F					- Mitigation not required.
		R	1.10	112.5	F		R	1.10	112.5	F					
	SB	TR	1.02	68.8	E		TR	1.02	68.8	E					
Brooklyn Battery Tunnel	EB	R	0.64	27.4	C		R	0.64	27.4	C					
	WB	L	1.47	410.6	F		L	1.47	410.6	F					
		R	1.08	225.1	F		R	1.08	225.7	F					
Overall Intersection		-	**1.32**	**231.2**	F		-	**1.32**	**231.4**	F					
Church Street at Vesey Street															
Church Street	NB	LT	0.89	19.6	B		LT	0.89	20.1	C					- Mitigation not required.
		R	0.36	9.3	A		R	0.36	9.3	A					
Vesey Street	EB	LT	0.03	19.0	B		LT	0.05	19.2	B					
Overall Intersection		-	**0.56**	**18.6**	B		-	**0.57**	**19.0**	B					
Church Street at Fulton Street															
Church Street	NB	T	0.86	23.2	C		T	0.86	23.5	C					- Mitigation not required.
Fulton Street	WB	R	0.14	19.6	B		R	0.14	19.6	B					
Overall Intersection		-	**0.57**	**23.0**	C		-	**0.58**	**23.3**	C					

PERMANENT WTC PATH TERMINAL EIS
AM COMPARISON OF 2006 NO ACTION vs 2006 PATH CONSTRUCTION

		2006 NO ACTION (8:15 - 9:15 AM)				CONSTRUCTION (8:15 - 9:15 AM)				MITIGATED (8:15 - 9:15 AM)				Mitigation Measures
				Control				Control				Control		
INTERSECTION & APPROACH	Mvt.	V/C	Delay	LOS	Mvt.	V/C	Delay	LOS	Mvt.	V/C	Delay	LOS		
SIGNALIZED INTERSECTIONS														
Church Street at Dey Street														
Church Street NB	T	0.74	13.0	B	T	0.75	13.1	B					-	Mitigation not required.
Dey Street WB	R	0.00	24.2	C	R	0.00	24.2	C						
Overall Intersection	-	**0.53**	**13.0**	**B**	-	**0.53**	**13.1**	**B**						
Church Street at Cortlandt Street														
Church Street NB	T	0.61	10.3	B	T	0.61	10.3	B					-	Mitigation not required.
Cortlandt Street WB	R	0.89	50.4	D	R	0.89	50.8	D						
Overall Intersection	-	**0.72**	**22.3**	**C**	-	**0.72**	**22.4**	**C**						
Church Street at Liberty Street														
Church Street NB	T	0.58	9.8	A	T	0.58	9.8	A					-	Mitigation not required.
	R	0.15	6.6	A	R	0.15	6.6	A						
Liberty Street EB	LT	0.07	18.7	B	LT	0.08	18.8	B						
Overall Intersection	-	**0.38**	**10.1**	**B**	-	**0.38**	**10.2**	**B**						

(i): Control delay is measured in seconds per vehicle.
(ii): Level of service (LOS) for signalized intersections is based upon average control delay per vehicle (sec/veh) for each lane group as listed in the 2000 Highway Capacity Manual -- TRB.
(iii): Level of service (LOS) for unsignalized intersections is based upon control delay per vehicle (sec/veh) for each minor-approach as listed in the 2000 Highway Capacity Manual -- TRB.
(iv): Overall intersection V/C ratio is the critical lane groups' V/C ratio, not the weighted average of all the movements.

PERMANENT WTC PATH TERMINAL EIS
MIDDAY COMPARISON OF 2006 NO ACTION vs 2006 PATH CONSTRUCTION

INTERSECTION & APPROACH		2006 NO ACTION (12:00 - 1:00 PM) Mvt.	V/C	Control Delay	LOS	CONSTRUCTION (12:00 - 1:00 PM) Mvt.	V/C	Control Delay	LOS	MITIGATED (12:00 - 1:00 PM) Mvt.	V/C	Control Delay	LOS	Mitigation Measures
SIGNALIZED INTERSECTIONS														
West Street (NYS Rt. 9A) at Canal Street														
West Street (NYS Rt. 9A)	NB	T	0.45	1.7	A	T	0.45	1.7	A					- Mitigation not required.
	SB	T	0.39	1.5	A	T	0.39	1.5	A					
Canal Street	WB	L	0.34	44.1	D	L	0.34	44.3	D					
		LR	0.84	70.7	E	LR	0.84	70.7	E					
		R	0.63	56.0	E	R	0.63	56.0	E					
Overall Intersection		-	**0.53**	**8.2**	A	-	**0.54**	**8.2**	A					
West Street (NYS Rt. 9A) at Canal Street														
West Street (NYS Rt. 9A)	NB	TR	0.59	11.8	B	TR	0.59	11.9	B					- Mitigation not required.
		R	0.41	11.4	B	R	0.42	11.4	B					
	SB	L	1.01	72.5	E	L	1.01	72.5	E					
		T	0.95	15.6	B	T	0.96	16.4	B					
Overall Intersection		-	**0.77**	**21.9**	C	-	**0.77**	**22.2**	C					
West Street (NYS Rt. 9A) at Chambers Street														
West Street (NYS Rt. 9A)	NB	TR	0.65	16.8	B	TR	0.66	16.9	B					- Mitigation not required.
	SB	L	0.67	12.2	B	L	0.67	12.2	B					
		TR	0.53	15.0	B	TR	0.54	15.1	B					
Chambers Street	EB	LTR	0.34	39.2	D	LTR	0.34	39.2	D					
	WB	LT	0.48	41.8	D	LT	0.48	41.8	D					
		R	0.47	27.1	C	R	0.47	27.1	C					
Overall Intersection		-	**0.66**	**17.9**	B	-	**0.66**	**17.9**	B					
West Street (NYS Rt. 9A) at Vesey Street														
West Street (NYS Rt. 9A)	NB	TR	0.99	60.4	E	TR	0.99	61.7	E					- Mitigation not required.
	SB	L	0.09	6.7	A	L	0.12	7.6	A					
		TR	1.05	56.7	E	TR	1.05	57.4	E					
Vesey Street	EB	L	0.55	47.1	D	L	0.55	47.1	D					
		TR	0.21	34.8	C	TR	0.21	34.8	C					
	WB	L	0.01	32.4	C	L	0.04	32.9	C					
		TR	0.04	32.8	C	TR	0.04	32.8	C					
Overall Intersection		-	**0.93**	**57.1**	E	-	**0.94**	**58.0**	E					
West Street (NYS Rt. 9A) at Liberty Street														
West Street (NYS Rt. 9A)	NB	TR	0.58	5.1	A	TR	0.58	5.1	A					- Mitigation not required.
	SB	TR	0.62	5.4	A	LTR	0.67	6.0	A					
Liberty Street	EB	L	0.40	38.3	D	L	0.40	38.3	D					
		R	0.08	32.9	C	R	0.08	32.9	C					
	-	-	0.56	7.1	A	-	**0.59**	**7.4**	A					
West Street (NYS Rt.9A) at Brooklyn Battery Tunnel														
West Street (NYS Rt.9A)	NB	T	1.00	141.7	F	T	1.00	141.7	F					- Mitigation not required.
		R	1.07	76.7	E	R	1.07	76.7	E					
	SB	TR	0.92	59.5	E	TR	0.92	59.5	E					
Brooklyn Battery Tunnel	EB	R	0.21	22.2	C	R	0.21	22.2	C					
	WB	L	1.05	199.7	F	L	1.05	199.7	F					
		R	1.01	161.9	F	R	1.01	162.7	F					
Overall Intersection		-	**1.07**	**126.5**	F	-	**1.07**	**126.7**	F					
Church Street at Vesey Street														
Church Street	NB	LT	0.67	15.6	B	LT	0.67	15.7	B					- Mitigation not required.
		R	0.68	22.9	C	R	0.68	22.9	C					
Vesey Street	EB	LT	0.00	18.7	B	LT	0.02	18.9	B					
Overall Intersection		-	**0.42**	**17.2**	B	-	**0.43**	**17.3**	B					
Church Street at Fulton Street														
Church Street	NB	T	0.78	19.8	B	T	0.79	19.9	B					- Mitigation not required.
Fulton Street	WB	R	0.61	32.5	C	R	0.61	32.5	C					
Overall Intersection		-	**0.72**	**21.7**	C	-	**0.72**	**21.8**	C					

PERMANENT WTC PATH TERMINAL EIS
MIDDAY COMPARISON OF 2006 NO ACTION vs 2006 PATH CONSTRUCTION

		2006 NO ACTION (12:00 - 1:00 PM)				CONSTRUCTION (12:00 - 1:00 PM)				MITIGATED (12:00 - 1:00 PM)				Mitigation Measures
INTERSECTION & APPROACH		Mvt.	V/C	Control Delay	LOS	Mvt.	V/C	Control Delay	LOS	Mvt.	V/C	Control Delay	LOS	
SIGNALIZED INTERSECTIONS														
Church Street at Dey Street														
Church Street	NB	T	0.68	11.6	B	T	0.68	11.7	B					- Mitigation not required.
Dey Street	WB	R	0.00	24.2	C	R	0.00	24.2	C					
Overall Intersection		-	**0.48**	**11.6**	**B**	-	**0.49**	**11.7**	**B**					
Church Street at Cortlandt Street														
Church Street	NB	T	0.45	8.4	A	T	0.45	8.4	A					- Mitigation not required.
Cortlandt Street	WB	R	1.01	76.7	E	R	1.01	77.4	E					
Overall Intersection		-	**0.67**	**35.5**	**D**	-	**0.67**	**35.7**	**D**					
Church Street at Liberty Street														
Church Street	NB	T	0.49	8.8	A	T	0.49	8.8	A					- Mitigation not required.
		R	0.21	7.2	A	R	0.21	7.2	A					
Liberty Street	EB	LT	0.02	18.2	B	LT	0.03	18.3	B					
Overall Intersection		-	**0.30**	**8.8**	**A**	-	**0.31**	**8.9**	**A**					

(i): Control delay is measured in seconds per vehicle.
(ii): Level of service (LOS) for signalized intersections is based upon average control delay per vehicle (sec/veh) for each lane group as listed in the 2000 Highway Capacity Manual -- TRB.
(iii): Level of service (LOS) for unsignalized intersections is based upon control delay per vehicle (sec/veh) for each minor-approach as listed in the 2000 Highway Capacity Manual -- TRB.
(iv): Overall intersection V/C ratio is the critical lane groups' V/C ratio, not the weighted average of all the movements.

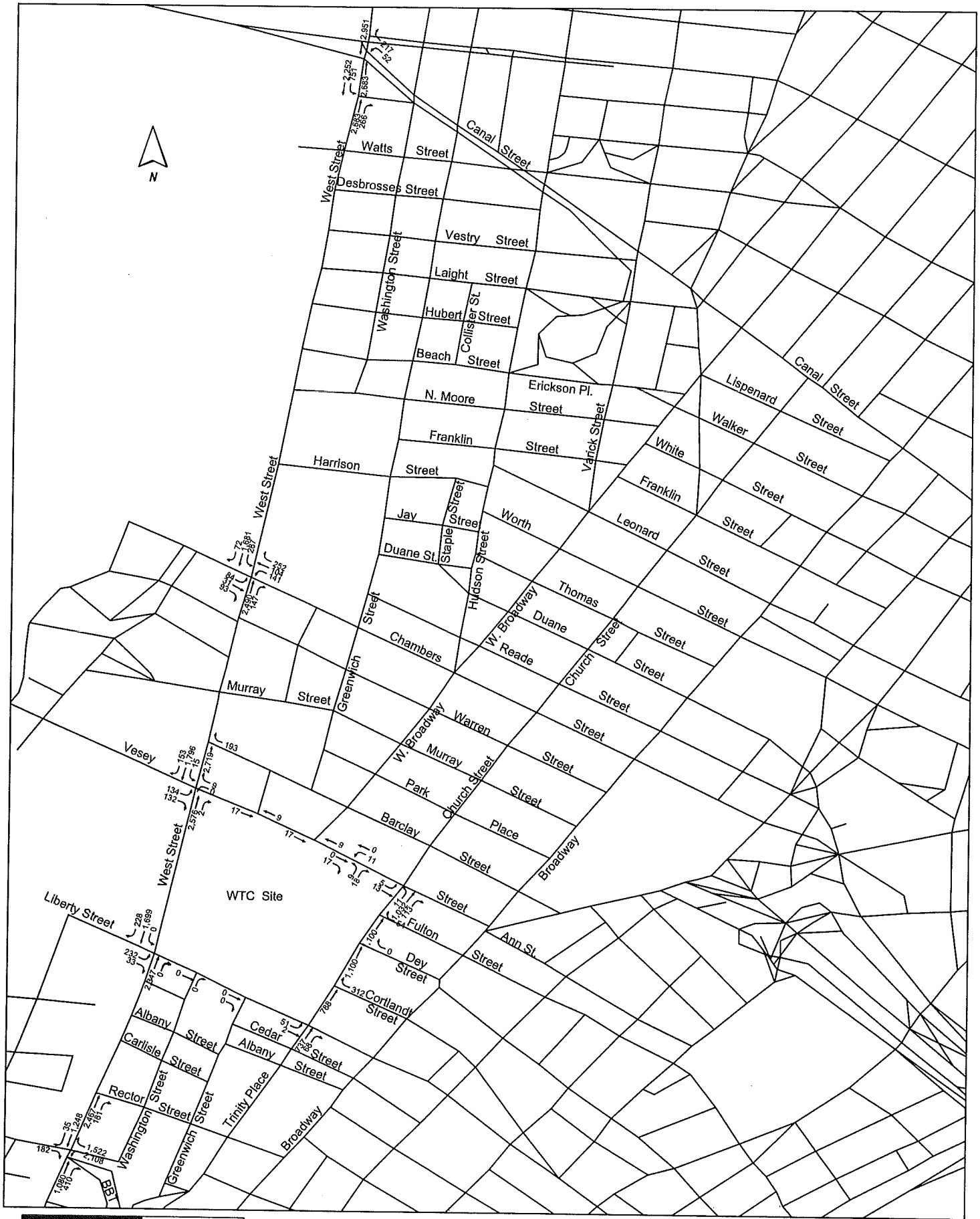
PERMANENT WTC PATH TERMINAL EIS
PM COMPARISON OF 2006 NO ACTION vs 2006 PATH CONSTRUCTION

		2006 NO ACTION (5:00 - 6:00 PM)				CONSTRUCTION (5:00 - 6:00 PM)				MITIGATED (5:00 - 6:00 PM)					Mitigation Measures
				Control				Control				Control			
INTERSECTION & APPROACH	Mvt.	V/C	Delay	LOS		Mvt.	V/C	Delay	LOS	Mvt.	V/C	Delay	LOS		
SIGNALIZED INTERSECTIONS															
West Street (NYS Rt. 9A) at Canal Street															
West Street (NYS Rt. 9A) NB	T	0.63	2.5	A		T	0.63	2.5	A					-	Mitigation not required.
SB	T	0.67	2.6	A		T	0.67	2.6	A						
Canal Street WB	L	0.19	39.6	D		L	0.20	39.8	D						
	LR	0.37	43.4	D		LR	0.37	43.4	D						
	R	0.42	45.5	D		R	0.42	45.5	D						
Overall Intersection	-	**0.61**	**4.4**	**A**		-	**0.61**	**4.4**	**A**						
West Street (NYS Rt. 9A) at Canal Street															
West Street (NYS Rt. 9A) NB	TR	0.81	15.7	B		TR	0.81	15.8	B					-	Mitigation not required.
	R	0.23	9.1	A		R	0.23	9.2	A						
SB	L	1.01	73.8	E		L	1.01	73.8	E						
	T	0.99	18.4	B		T	1.00	19.2	B						
Overall Intersection	-	**0.90**	**22.6**	**C**		-	**0.90**	**23.0**	**C**						
West Street (NYS Rt. 9A) at Chambers Street															
West Street (NYS Rt. 9A) NB	TR	0.76	19.0	B		TR	0.76	19.1	B					-	Mitigation not required.
SB	L	0.84	20.6	C		L	0.84	20.6	C						
	TR	0.83	21.0	C		TR	0.83	21.1	C						
Chambers Street EB	LTR	0.30	38.1	D		LTR	0.30	38.1	D						
WB	LT	0.72	54.3	D		LT	0.72	54.3	D						
	R	0.67	33.1	C		R	0.67	33.1	C						
Overall Intersection	-	**0.81**	**22.5**	**C**		-	**0.81**	**22.5**	**C**						
West Street (NYS Rt. 9A) at Vesey Street															
West Street (NYS Rt. 9A) NB	TR	1.05	63.3	E		TR	1.05	64.0	E					-	Mitigation not required.
SB	L	0.02	7.6	A		L	0.05	8.3	A						
	TR	1.04	65.9	E		TR	1.05	66.5	E						
Vesey Street EB	L	0.76	61.6	E		L	0.76	61.6	E						
	TR	0.19	34.5	C		TR	0.19	34.5	C						
WB	L	0.00	32.3	C		L	0.02	32.7	C						
	TR	0.01	32.4	C		TR	0.01	32.4	C						
Overall Intersection	-	**0.98**	**63.7**	**E**		-	**0.98**	**64.2**	**E**						
West Street (NYS Rt. 9A) at Liberty Street															
West Street (NYS Rt. 9A) NB	TR	0.63	5.4	A		TR	0.63	5.4	A	TR	0.59	2.7	A	-	Modify signal timing (Shift 5 s from EB/WB phase to NB/SB phase)
SB	TR	0.94	19.0	A		LTR	1.01	51.3	D	TR	0.95	17.0	B		
Liberty Street EB	L	0.38	37.8	D		L	0.38	37.8	D	L	0.45	43.4	D		
	R	0.22	35.3	D		R	0.22	35.3	D	R	0.26	40.3	D		
	-	0.78	14.4	B		-	0.83	32.3	C	-	0.83	12.5	B		
West Street (NYS Rt.9A) at Brooklyn Battery Tunnel															
West Street (NYS Rt.9A) NB	T	1.07	111.8	F		T	1.07	111.8	F					-	Mitigation not required.
	R	1.09	110.4	F		R	1.09	110.4	F						
SB	TR	1.03	92.2	F		TR	1.03	92.2	F						
Brooklyn Battery Tunnel EB	R	0.18	13.6	B		R	0.18	13.6	B						
WB	L	1.09	221.6	F		L	1.09	221.6	F						
	R	0.91	151.4	F		R	0.92	153.2	F						
Overall Intersection	-	**1.09**	**130.0**	**F**		-	**1.09**	**130.3**	**F**						
Church Street at Vesey Street															
Church Street NB	LT	0.63	10.1	B		LT	0.64	10.2	B					-	Mitigation not required.
	R	0.24	6.9	A		R	0.24	6.9	A						
Vesey Street EB	LT	0.02	18.9	B		LT	0.04	19.1	B						
Overall Intersection	-	**0.40**	**9.8**	**A**		-	**0.41**	**10.0**	**A**						
Church Street at Fulton Street															
Church Street NB	T	0.62	14.9	B		T	0.62	15.0	B					-	Mitigation not required.
Fulton Street WB	R	0.24	20.9	C		R	0.24	20.9	C						
Overall Intersection	-	**0.47**	**15.6**	**B**		-	**0.47**	**15.7**	**B**						

PERMANENT WTC PATH TERMINAL EIS
PM COMPARISON OF 2006 NO ACTION vs 2006 PATH CONSTRUCTION

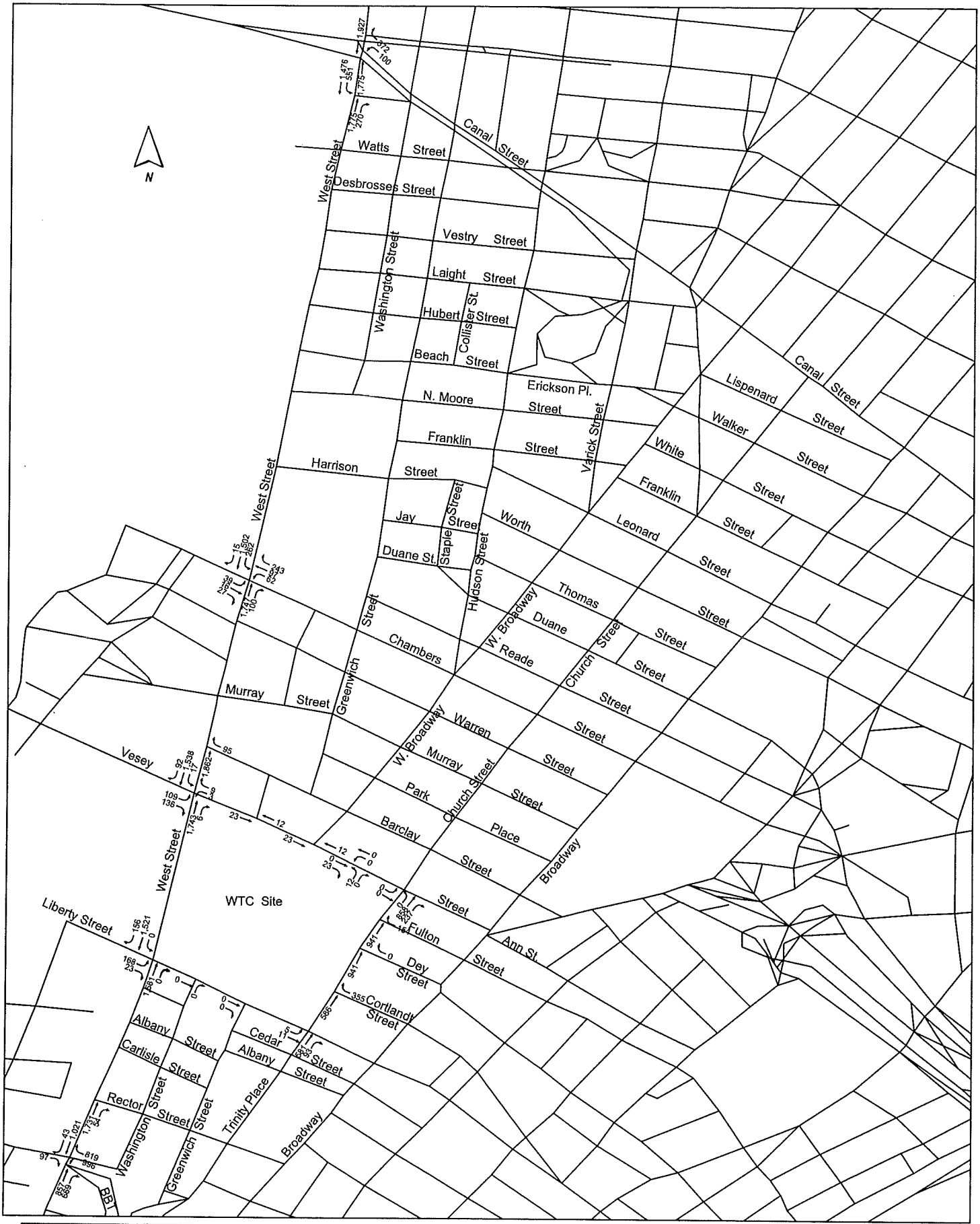
INTERSECTION & APPROACI		2006 NO ACTION (5:00 - 6:00 PM)				CONSTRUCTION (5:00 - 6:00 PM)				MITIGATED (5:00 - 6:00 PM)				Mitigation Measures
		Mvt.	V/C	Control Delay	LOS	Mvt.	V/C	Control Delay	LOS	Mvt.	V/C	Control Delay	LOS	
SIGNALIZED INTERSECTIONS														
Church Street at Dey Street														
Church Street	NB	T	0.55	9.1	A	T	0.55	9.2	A					- Mitigation not required.
Dey Street	WB	R	0.00	24.2	C	R	0.00	24.2	C					
Overall Intersection		-	**0.39**	**9.1**	A	-	**0.40**	**9.2**	A					
Church Street at Cortlandt Street														
Church Street	NB	T	0.34	7.4	A	T	0.34	7.4	A					- Mitigation not required.
Cortlandt Street	WB	R	0.93	58.0	E	R	0.94	58.5	E					
Overall Intersection		-	**0.57**	**29.0**	C	-	**0.58**	**29.1**	C					
Church Street at Liberty Street														
Church Street	NB	T	0.34	7.4	A	T	0.34	7.4	A					- Mitigation not required.
		R	0.11	6.2	A	R	0.11	6.2	A					
Liberty Street	EB	LT	0.00	18.1	B	LT	0.01	18.2	B					
Overall Intersection		-	**0.20**	**7.2**	A	-	**0.21**	**7.3**	A					

(i): Control delay is measured in seconds per vehicle.
(ii): Level of service (LOS) for signalized intersections is based upon average control delay per vehicle (sec/veh) for each lane group as listed in the 2000 Highway Capacity Manual -- TRB.
(iii): Level of service (LOS) for unsignalized intersections is based upon control delay per vehicle (sec/veh) for each minor-approach as listed in the 2000 Highway Capacity Manual -- TRB.
(iv): Overall intersection V/C ratio is the critical lane groups' V/C ratio, not the weighted average of all the movements.



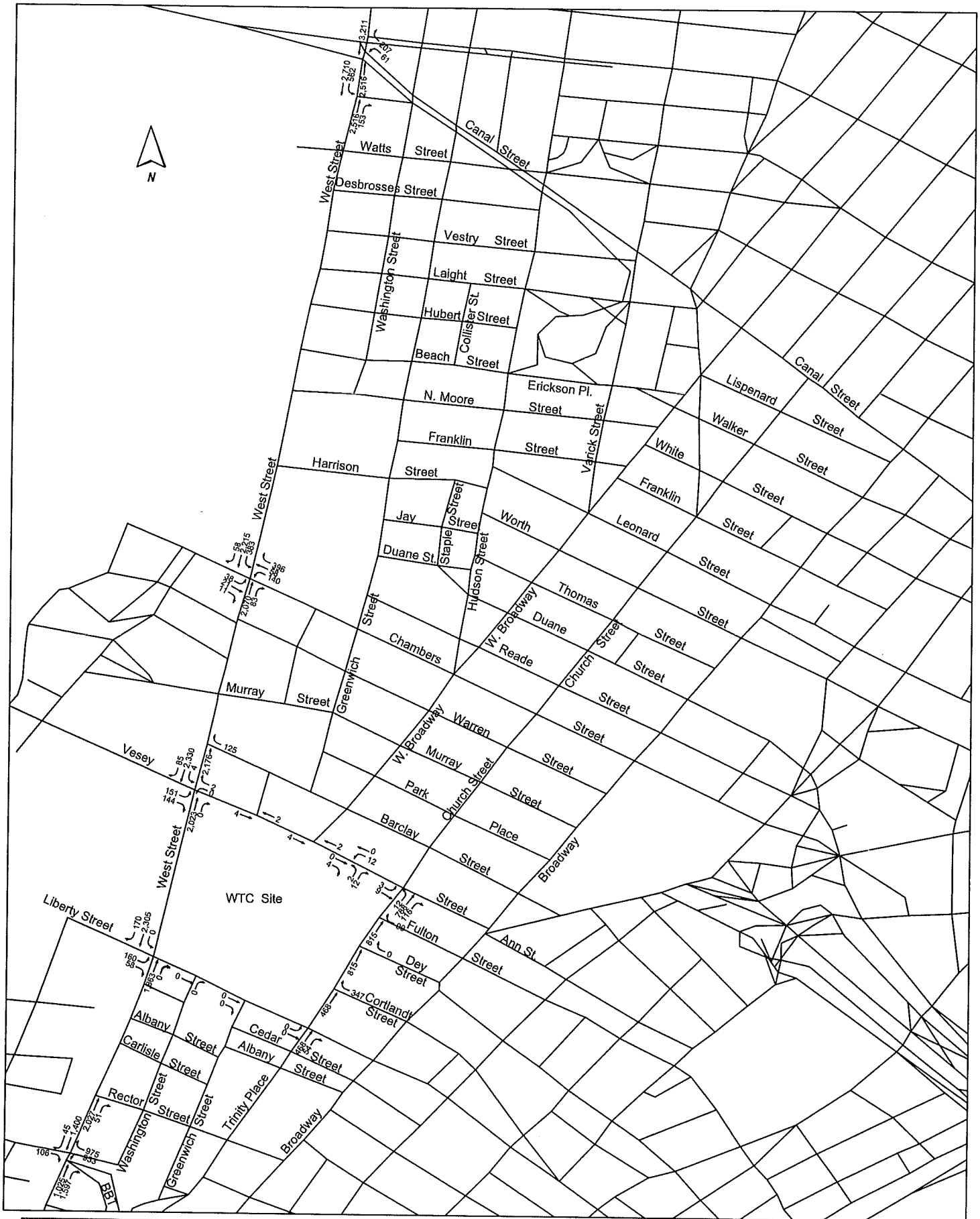
Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
2006 AM Baseline Traffic Volumes
Figure A1



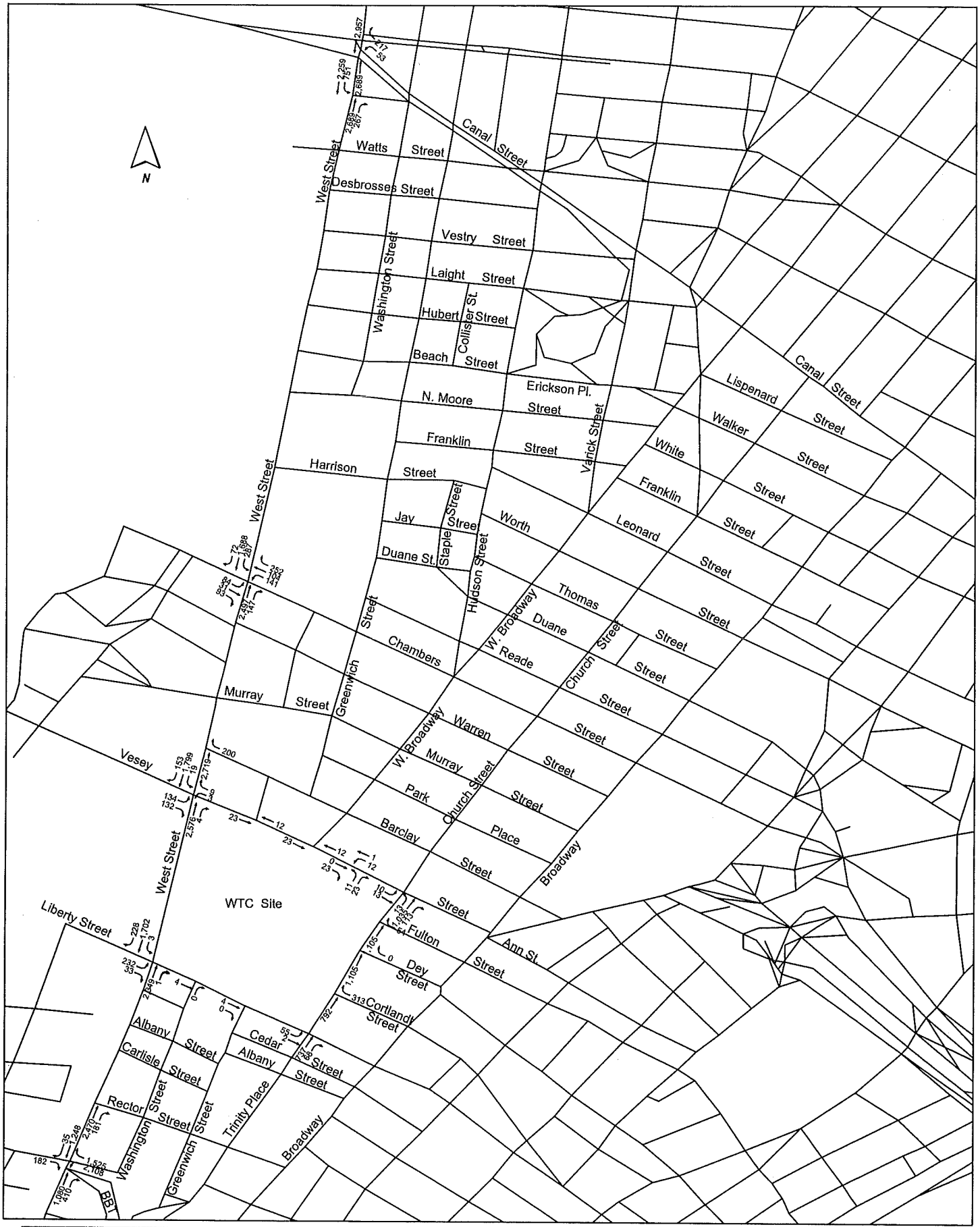
Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
2006 Midday Baseline Traffic Volumes
Figure A2



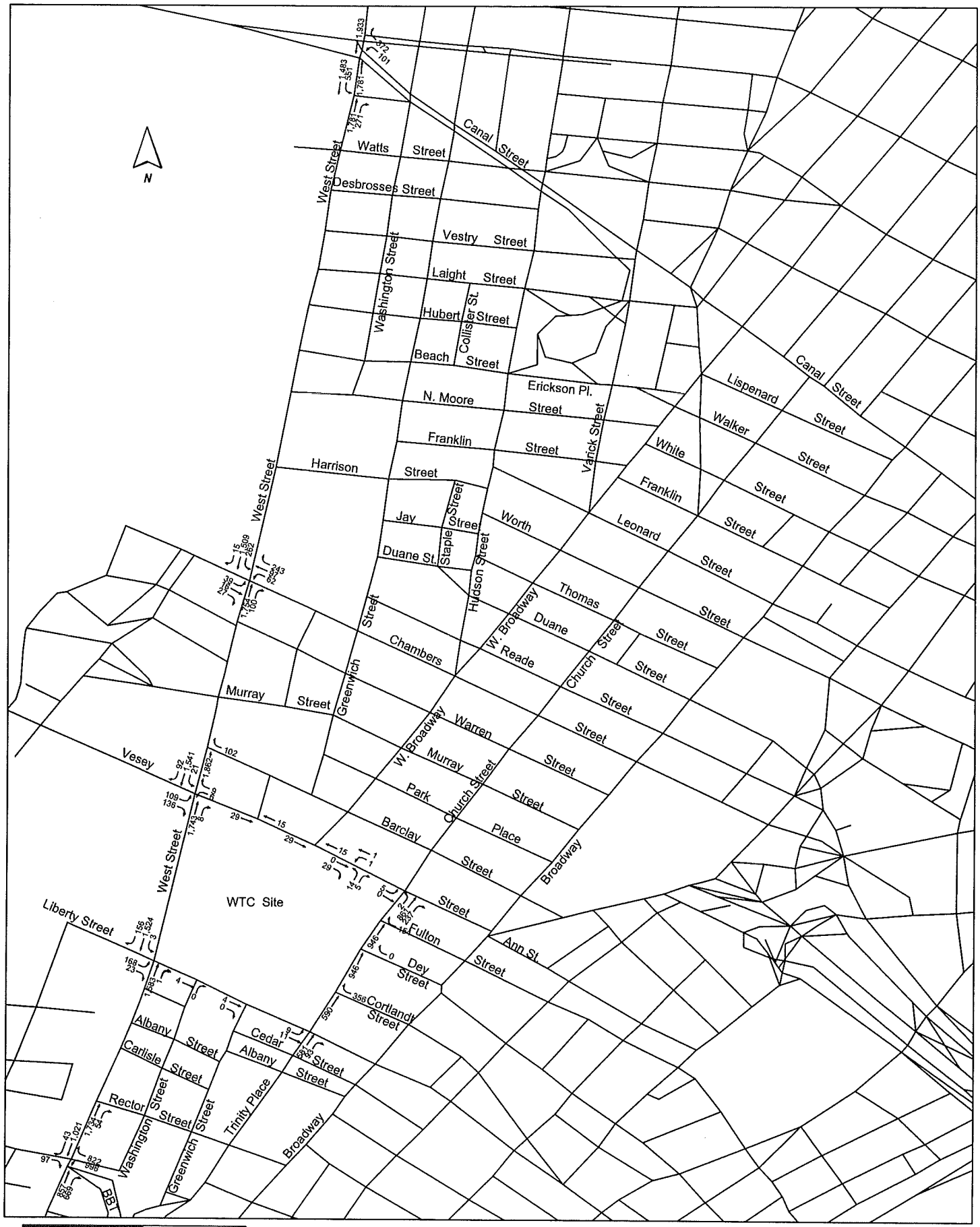
Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
2006 PM Baseline Traffic Volumes
Figure A3



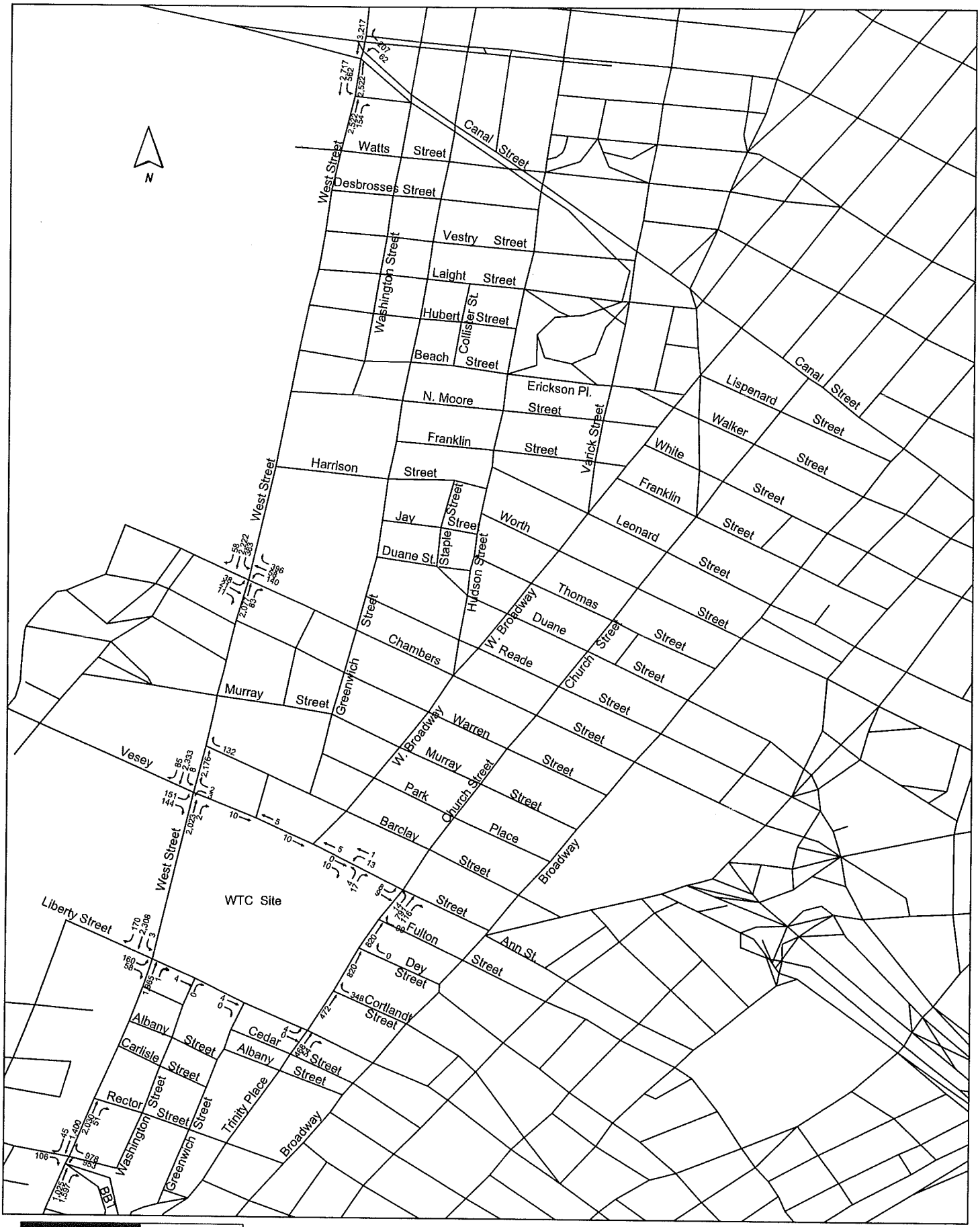
Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
2006 AM Baseline with PATH Construction Volumes
Figure A4



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
2006 Midday Baseline with PATH Construction Volumes
Figure A5



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
2006 PM Baseline with PATH Construction Volumes
Figure A6

Appendix C-4: Pedestrians

CONTENTS

Table 1	2006 Construction Period Pedestrian Level of Service
Table 2	2009 Opening Year Pedestrian Level-of-Service
Table 3	2025 Design Year Pedestrian Level-of-Service
Figure 1	2000 Pre-9/11 Conditions AM Peak 15-Minute Volumes
Figure 2	2000 Pre-9/11 Conditions AM Peak Hour Volumes
Figure 3	2000 Pre-9/11 Conditions Midday Peak 15-Minute Volumes
Figure 4	2000 Pre-9/11 Conditions Midday Peak Hour Volumes
Figure 5	2000 Pre-9/11 Conditions PM Peak 15-Minute Volumes
Figure 6	2000 Pre-9/11 Conditions PM Peak Hour Volumes
Figure 7	2003 Existing Conditions AM Peak 15-Minute Volumes
Figure 8	2003 Existing Conditions AM Peak Hour Volumes
Figure 9	2003 Existing Conditions Midday Peak 15-Minute Volumes
Figure 10	2003 Existing Conditions Midday Peak Hour Volumes
Figure 11	2003 Existing Conditions PM Peak 15-Minute Volumes
Figure 12	2003 Existing Conditions PM Peak Hour Volumes
Figure 13	2006 Construction Conditions AM Peak 15-Minute Volumes
Figure 14	2006 Construction Conditions AM Peak Hour Volumes
Figure 15	2006 Construction Conditions Midday Peak 15-Minute Volumes
Figure 16	2006 Construction Conditions Midday Peak Hour Volumes
Figure 17	2006 Construction Conditions PM Peak 15-Minute Volumes
Figure 18	2006 Construction Conditions PM Peak Hour Volumes
Figure 19	2009 Projected Pre-9/11 (No Build) Conditions AM Peak 15-Minute Volumes
Figure 20	2009 Projected Pre-9/11 (No Build) Conditions AM Peak Hour Volumes
Figure 21	2009 Projected Pre-9/11 (No Build) Conditions Midday Peak 15-Minute Volumes
Figure 22	2009 Projected Pre-9/11 (No Build) Conditions Midday Peak Hour Volumes
Figure 23	2009 Projected Pre-9/11 (No Build) Conditions PM Peak 15-Minute Volumes
Figure 24	2009 Projected Pre-9/11 (No Build) Conditions PM Peak Hour Volumes
Figure 25	2009 Proposed Action Conditions AM Peak 15-Minute Volumes
Figure 26	2009 Proposed Action Conditions AM Peak Hour Volumes
Figure 27	2009 Proposed Action Conditions Midday Peak 15-Minute Volumes
Figure 28	2009 Proposed Action Conditions Midday Peak Hour Volumes
Figure 29	2009 Proposed Action Conditions PM Peak 15-Minute Volumes
Figure 30	2009 Proposed Action Conditions PM Peak Hour Volumes
Figure 31	2025 Projected Pre-9/11 (No Build) Conditions AM Peak 15-Minute Volumes
Figure 32	2025 Projected Pre-9/11 (No Build) Conditions AM Peak Hour Volumes
Figure 33	2025 Projected Pre-9/11(No Build) Conditions Midday Peak 15-Minute Volumes
Figure 34	2025 Projected Pre-9/11 (No Build) Conditions Midday Peak Hour Volumes

Figure 35 2025 Projected Pre-9/11 (No Build) Conditions PM Peak 15-Minute Volumes
Figure 36 2025 Projected Pre-9/11 (No Build) Conditions PM Peak Hour Volumes
Figure 37 2025 Proposed Action Conditions AM Peak 15-Minute Volumes
Figure 38 2025 Proposed Action Conditions AM Peak Hour Volumes
Figure 39 2025 Proposed Action Conditions Midday Peak 15-Minute Volumes
Figure 40 2025 Proposed Action Conditions Midday Peak Hour Volumes
Figure 41 2025 Proposed Action Conditions PM Peak 15-Minute Volumes
Figure 42 2025 Proposed Action Conditions PM Peak Hour Volumes

Table 1
2006 Construction Period
No Action and Preferred Alternatives
Pedestrian Level of Service

Location 6:	Church Street and Vesey Street
Location 7:	Church Street and Fulton Street
Location 8:	Church Street and Dey Street
Location 9:	Church Street and Cortlandt Street
Location 10:	Church Street and Liberty Street

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 6: CHURCH STREET AT VESEY STREET
COMPARISON OF 2006 AM PEAK HOUR NO ACTION vs. PATH CONSTRUCTION vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2006 NO ACTION CONDITIONS Northwest Corner	2006 PATH CONSTRUCTION CONDITIONS Northwest Corner	2006 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 49.5 sq.ft./ped.	*Pedestrian Space* 49.5 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 14.8	North Crosswalk 14.8		
West Crosswalk 91.5	West Crosswalk 91.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 54 sq.ft./ped.	*North Crosswalk* 54 sq.ft./ped.		
West Crosswalk 5 sq.ft./ped.	*West Crosswalk* 5 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* B		
West Crosswalk F	*West Crosswalk* F		
2006 NO ACTION CONDITIONS Northeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Northeast Corner**	**2006 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 56.8 sq.ft./ped.	*Pedestrian Space* 56.8 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 14.8	North Crosswalk 14.8		
East Crosswalk 13.0	East Crosswalk 13.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 54 sq.ft./ped.	*North Crosswalk* 54 sq.ft./ped.		
East Crosswalk 38 sq.ft./ped.	*East Crosswalk* 38 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* B		
East Crosswalk C	*East Crosswalk* C		
2006 NO ACTION CONDITIONS Southwest Corner	**2006 PATH CONSTRUCTION CONDITIONS Southwest Corner**	**2006 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 20.7 sq.ft./ped.	*Pedestrian Space* 20.7 sq.ft./ped.		
Pedestrian LOS D	*Pedestrian LOS* D		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 26.0	South Crosswalk 26.0		
West Crosswalk 91.5	West Crosswalk 91.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 26 sq.ft./ped.	*South Crosswalk* 26 sq.ft./ped.		
West Crosswalk 5 sq.ft./ped.	*West Crosswalk* 5 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* C		
West Crosswalk F	*West Crosswalk* F		
2006 NO ACTION CONDITIONS Southeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 47.3 sq.ft./ped.	*Pedestrian Space* 47.3 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 26.0	South Crosswalk 26.0		
East Crosswalk 13.0	East Crosswalk 13.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 26 sq.ft./ped.	*South Crosswalk* 26 sq.ft./ped.		
East Crosswalk 38 sq.ft./ped.	*East Crosswalk* 38 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* C		
East Crosswalk C	*East Crosswalk* C		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS

STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE

LOCATION 6: CHURCH STREET AT VESEY STREET

COMPARISON OF 2006 MD PEAK HOUR NO ACTION vs. PATH CONSTRUCTION vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2006 NO ACTION CONDITIONS Northwest Corner	2006 PATH CONSTRUCTION CONDITIONS Northwest Corner	2006 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 153.6 sq.ft./ped.	*Pedestrian Space* 153.6 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 14.0	North Crosswalk 14.0		
West Crosswalk 23.2	West Crosswalk 23.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 57 sq.ft./ped.	*North Crosswalk* 57 sq.ft./ped.		
West Crosswalk 18 sq.ft./ped.	*West Crosswalk* 18 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* B		
West Crosswalk D	*West Crosswalk* D		
2006 NO ACTION CONDITIONS Northeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Northeast Corner**	**2006 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 48.9 sq.ft./ped.	*Pedestrian Space* 48.9 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 14.0	North Crosswalk 14.0		
East Crosswalk 16.8	East Crosswalk 16.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 57 sq.ft./ped.	*North Crosswalk* 57 sq.ft./ped.		
East Crosswalk 29 sq.ft./ped.	*East Crosswalk* 29 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* B		
East Crosswalk C	*East Crosswalk* C		
2006 NO ACTION CONDITIONS Southwest Corner	**2006 PATH CONSTRUCTION CONDITIONS Southwest Corner**	**2006 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 105.8 sq.ft./ped.	*Pedestrian Space* 105.8 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 10.9	South Crosswalk 10.9		
West Crosswalk 23.2	West Crosswalk 23.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 63 sq.ft./ped.	*South Crosswalk* 63 sq.ft./ped.		
West Crosswalk 18 sq.ft./ped.	*West Crosswalk* 18 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* B		
West Crosswalk D	*West Crosswalk* D		
2006 NO ACTION CONDITIONS Southeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 64.5 sq.ft./ped.	*Pedestrian Space* 64.5 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 10.9	South Crosswalk 10.9		
East Crosswalk 16.8	East Crosswalk 16.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 63 sq.ft./ped.	*South Crosswalk* 63 sq.ft./ped.		
East Crosswalk 29 sq.ft./ped.	*East Crosswalk* 29 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* B		
East Crosswalk C	*East Crosswalk* C		

NOTE: ▒▒ Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 6: CHURCH STREET AT VESEY STREET
COMPARISON OF 2006 PM PEAK HOUR NO ACTION vs. PATH CONSTRUCTION vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2006 NO ACTION CONDITIONS Northwest Corner	2006 PATH CONSTRUCTION CONDITIONS Northwest Corner	2006 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 47.8 sq.ft./ped.	*Pedestrian Space 47.8 sq.ft./ped.*		
Pedestrian LOS B	*Pedestrian LOS B*		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 12.5	North Crosswalk 12.5		
West Crosswalk 83.3	West Crosswalk 83.3		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 64 sq.ft./ped.	*North Crosswalk 64 sq.ft./ped.*		
West Crosswalk 5 sq.ft./ped.	*West Crosswalk 5 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk B*		
West Crosswalk F	*West Crosswalk F*		
2006 NO ACTION CONDITIONS Northeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Northeast Corner**	**2006 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 54.6 sq.ft./ped.	*Pedestrian Space 54.6 sq.ft./ped.*		
Pedestrian LOS B	*Pedestrian LOS B*		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 12.5	North Crosswalk 12.5		
East Crosswalk 15.1	East Crosswalk 15.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 64 sq.ft./ped.	*North Crosswalk 64 sq.ft./ped.*		
East Crosswalk 33 sq.ft./ped.	*East Crosswalk 33 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk B*		
East Crosswalk C	*East Crosswalk C*		
2006 NO ACTION CONDITIONS Southwest Corner	**2006 PATH CONSTRUCTION CONDITIONS Southwest Corner**	**2006 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 27.2 sq.ft./ped.	*Pedestrian Space 27.2 sq.ft./ped.*		
Pedestrian LOS C	*Pedestrian LOS C*		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 36.0	South Crosswalk 36.0		
West Crosswalk 83.3	West Crosswalk 83.3		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 19 sq.ft./ped.	*South Crosswalk 19 sq.ft./ped.*		
West Crosswalk 5 sq.ft./ped.	*West Crosswalk 5 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk D	*South Crosswalk D*		
West Crosswalk F	*West Crosswalk F*		
2006 NO ACTION CONDITIONS Southeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 34.9 sq.ft./ped.	*Pedestrian Space 34.9 sq.ft./ped.*		
Pedestrian LOS C	*Pedestrian LOS C*		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 36.0	South Crosswalk 36.0		
East Crosswalk 15.1	East Crosswalk 15.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 19 sq.ft./ped.	*South Crosswalk 19 sq.ft./ped.*		
East Crosswalk 33 sq.ft./ped.	*East Crosswalk 33 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk D	*South Crosswalk D*		
East Crosswalk C	*East Crosswalk C*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 7: CHURCH STREET AT FULTON STREET
COMPARISON OF 2006 AM PEAK HOUR NO ACTION vs. PATH CONSTRUCTION vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2006 NO ACTION CONDITIONS Northeast Corner	2006 PATH CONSTRUCTION CONDITIONS Northeast Corner	2006 MITIGATED CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 63.3 sq.ft./ped.	*Pedestrian Space* 63.3 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 9.2	North Crosswalk 9.2		
East Crosswalk 23.5	East Crosswalk 23.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 84 sq.ft./ped.	*North Crosswalk* 84 sq.ft./ped.		
East Crosswalk 18 sq.ft./ped.	*East Crosswalk* 18 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* B		
East Crosswalk D	*East Crosswalk* D		
2006 NO ACTION CONDITIONS Southeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 56.7 sq.ft./ped.	*Pedestrian Space* 56.7 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 27.7	South Crosswalk 27.7		
East Crosswalk 23.5	East Crosswalk 23.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 24 sq.ft./ped.	*South Crosswalk* 24 sq.ft./ped.		
East Crosswalk 18 sq.ft./ped.	*East Crosswalk* 18 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk D	*South Crosswalk* D		
East Crosswalk D	*East Crosswalk* D		

NOTE: ▒▒ Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 7: CHURCH STREET AT FULTON STREET
COMPARISON OF 2006 MD PEAK HOUR NO ACTION vs. PATH CONSTRUCTION vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2006 NO ACTION CONDITIONS Northeast Corner	2006 PATH CONSTRUCTION CONDITIONS Northeast Corner	2006 MITIGATED CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 72.6 sq.ft./ped.	*Pedestrian Space* 74.0 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 7.2	North Crosswalk 6.7		
East Crosswalk 22.0	East Crosswalk 19.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 107 sq.ft./ped.	*North Crosswalk* 115 sq.ft./ped.		
East Crosswalk 19 sq.ft./ped.	*East Crosswalk* 21 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* B		
East Crosswalk D	*East Crosswalk* D		
2006 NO ACTION CONDITIONS Southeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 89.9 sq.ft./ped.	*Pedestrian Space* 89.9 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 6.4	South Crosswalk 6.4		
East Crosswalk 22.0	East Crosswalk 22.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 103 sq.ft./ped.	*South Crosswalk* 103 sq.ft./ped.		
East Crosswalk 19 sq.ft./ped.	*East Crosswalk* 19 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* B		
East Crosswalk D	*East Crosswalk* D		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 7: CHURCH STREET AT FULTON STREET
COMPARISON OF 2006 PM PEAK HOUR NO ACTION vs. PATH CONSTRUCTION vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2006 NO ACTION CONDITIONS Northeast Corner	2006 PATH CONSTRUCTION CONDITIONS Northeast Corner	2006 MITIGATED CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 51.4 sq.ft./ped.	*Pedestrian Space* 53.0 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 6.9	North Crosswalk 6.5		
East Crosswalk 31.6	East Crosswalk 28.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 111 sq.ft./ped.	*North Crosswalk* 119 sq.ft./ped.		
East Crosswalk 13 sq.ft./ped.	*East Crosswalk* 15 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* B		
East Crosswalk E	*East Crosswalk* E		
2006 NO ACTION CONDITIONS Southeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 46.7 sq.ft./ped.	*Pedestrian Space* 46.7 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 21.4	South Crosswalk 21.4		
East Crosswalk 31.6	East Crosswalk 31.6		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 31 sq.ft./ped.	*South Crosswalk* 31 sq.ft./ped.		
East Crosswalk 13 sq.ft./ped.	*East Crosswalk* 13 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* C		
East Crosswalk E	*East Crosswalk* E		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS

STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE

LOCATION 8: CHURCH STREET AT DEY STREET

COMPARISON OF 2006 AM PEAK HOUR NO ACTION vs. PATH CONSTRUCTION vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2006 NO ACTION CONDITIONS Northeast Corner	2006 PATH CONSTRUCTION CONDITIONS Northeast Corner	2006 MITIGATED CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 99.9 sq.ft./ped.	*Pedestrian Space* 99.9 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 14.1	North Crosswalk 14.1		
East Crosswalk 13.4	East Crosswalk 13.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 57 sq.ft./ped.	*North Crosswalk* 57 sq.ft./ped.		
East Crosswalk 27 sq.ft./ped.	*East Crosswalk* 27 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* B		
East Crosswalk C	*East Crosswalk* C		
2006 NO ACTION CONDITIONS Southeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 50.9 sq.ft./ped.	*Pedestrian Space* 50.9 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 39.8	South Crosswalk 39.8		
East Crosswalk 13.4	East Crosswalk 13.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 15 sq.ft./ped.	*South Crosswalk* 15 sq.ft./ped.		
East Crosswalk 27 sq.ft./ped.	*East Crosswalk* 27 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk D	*South Crosswalk* D		
East Crosswalk C	*East Crosswalk* C		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 8: CHURCH STREET AT DEY STREET
COMPARISON OF 2006 MD PEAK HOUR NO ACTION vs. PATH CONSTRUCTION vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2006 NO ACTION CONDITIONS Northeast Corner	2006 PATH CONSTRUCTION CONDITIONS Northeast Corner	2006 MITIGATED CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 113.6 sq.ft./ped.	*Pedestrian Space* 113.6 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 5.4	North Crosswalk 5.4		
East Crosswalk 15.7	East Crosswalk 15.7		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 149 sq.ft./ped.	*North Crosswalk* 149 sq.ft./ped.		
East Crosswalk 23 sq.ft./ped.	*East Crosswalk* 23 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk A	*North Crosswalk* A		
East Crosswalk D	*East Crosswalk* D		
2006 NO ACTION CONDITIONS Southeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 70.7 sq.ft./ped.	*Pedestrian Space* 70.7 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 16.0	South Crosswalk 16.0		
East Crosswalk 15.7	East Crosswalk 15.7		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 38 sq.ft./ped.	*South Crosswalk* 38 sq.ft./ped.		
East Crosswalk 23 sq.ft./ped.	*East Crosswalk* 23 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* C		
East Crosswalk D	*East Crosswalk* D		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 8: CHURCH STREET AT DEY STREET
COMPARISON OF 2006 PM PEAK HOUR NO ACTION vs. PATH CONSTRUCTION vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2006 NO ACTION CONDITIONS Northeast Corner	2006 PATH CONSTRUCTION CONDITIONS Northeast Corner	2006 MITIGATED CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 90.6 sq.ft./ped.	*Pedestrian Space* 90.6 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 13.1	North Crosswalk 13.1		
East Crosswalk 16.1	East Crosswalk 16.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 62 sq.ft./ped.	*North Crosswalk* 62 sq.ft./ped.		
East Crosswalk 22 sq.ft./ped.	*East Crosswalk* 22 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* B		
East Crosswalk D	*East Crosswalk* D		
2006 NO ACTION CONDITIONS Southeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 42.8 sq.ft./ped.	*Pedestrian Space* 42.8 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 34.6	South Crosswalk 34.6		
East Crosswalk 16.1	East Crosswalk 16.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 17 sq.ft./ped.	*South Crosswalk* 17 sq.ft./ped.		
East Crosswalk 22 sq.ft./ped.	*East Crosswalk* 22 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk D	*South Crosswalk* D		
East Crosswalk D	*East Crosswalk* D		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 9: CHURCH STREET AT CORTLANDT STREET
COMPARISON OF 2006 AM PEAK HOUR NO ACTION vs. PATH CONSTRUCTION vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2006 NO ACTION CONDITIONS Northeast Corner	2006 PATH CONSTRUCTION CONDITIONS Northeast Corner	2006 MITIGATED CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space *183.9* sq.ft./ped.	*Pedestrian Space* *183.9* sq.ft./ped.		
Pedestrian LOS *A*	*Pedestrian LOS* *A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *8.6*	North Crosswalk *8.6*		
East Crosswalk *7.7*	East Crosswalk *7.7*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk *91* sq.ft./ped.	*North Crosswalk* *91* sq.ft./ped.		
East Crosswalk *73* sq.ft./ped.	*East Crosswalk* *73* sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk *B*	*North Crosswalk* *B*		
East Crosswalk *B*	*East Crosswalk* *B*		
2006 NO ACTION CONDITIONS Southeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space *251.1* sq.ft./ped.	*Pedestrian Space* *251.1* sq.ft./ped.		
Pedestrian LOS *A*	*Pedestrian LOS* *A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *5.7*	South Crosswalk *5.7*		
East Crosswalk *7.7*	East Crosswalk *7.7*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk *88* sq.ft./ped.	*South Crosswalk* *88* sq.ft./ped.		
East Crosswalk *73* sq.ft./ped.	*East Crosswalk* *73* sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk *B*	*South Crosswalk* *B*		
East Crosswalk *B*	*East Crosswalk* *B*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 9: CHURCH STREET AT CORTLANDT STREET
COMPARISON OF 2006 MD PEAK HOUR NO ACTION vs. PATH CONSTRUCTION vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2006 NO ACTION CONDITIONS Northeast Corner	2006 PATH CONSTRUCTION CONDITIONS Northeast Corner	2006 MITIGATED CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 80.2 sq.ft./ped.	*Pedestrian Space* 80.2 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 11.3	North Crosswalk 11.3		
East Crosswalk 22.9	East Crosswalk 22.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 69 sq.ft./ped.	*North Crosswalk* 69 sq.ft./ped.		
East Crosswalk 25 sq.ft./ped.	*East Crosswalk* 25 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* B		
East Crosswalk C	*East Crosswalk* C		
2006 NO ACTION CONDITIONS Southeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 88.0 sq.ft./ped.	*Pedestrian Space* 88.0 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 12.7	South Crosswalk 12.7		
East Crosswalk 22.9	East Crosswalk 22.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 39 sq.ft./ped.	*South Crosswalk* 39 sq.ft./ped.		
East Crosswalk 25 sq.ft./ped.	*East Crosswalk* 25 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* C		
East Crosswalk C	*East Crosswalk* C		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 9: CHURCH STREET AT CORTLANDT STREET
COMPARISON OF 2006 PM PEAK HOUR NO ACTION vs. PATH CONSTRUCTION vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2006 NO ACTION CONDITIONS Northeast Corner	2006 PATH CONSTRUCTION CONDITIONS Northeast Corner	2006 MITIGATED CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 79.2 sq.ft./ped.	*Pedestrian Space* 79.2 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 14.1	North Crosswalk 14.1		
East Crosswalk 21.0	East Crosswalk 21.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 55 sq.ft./ped.	*North Crosswalk* 55 sq.ft./ped.		
East Crosswalk 27 sq.ft./ped.	*East Crosswalk* 27 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* B		
East Crosswalk C	*East Crosswalk* C		
2006 NO ACTION CONDITIONS Southeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 96.5 sq.ft./ped.	*Pedestrian Space* 96.5 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 10.7	South Crosswalk 10.7		
East Crosswalk 21.0	East Crosswalk 21.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 47 sq.ft./ped.	*South Crosswalk* 47 sq.ft./ped.		
East Crosswalk 27 sq.ft./ped.	*East Crosswalk* 27 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* B		
East Crosswalk C	*East Crosswalk* C		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 10: CHURCH STREET AT LIBERTY STREET
COMPARISON OF 2006 AM PEAK HOUR NO ACTION vs. PATH CONSTRUCTION vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2006 NO ACTION CONDITIONS Northwest Corner	2006 PATH CONSTRUCTION CONDITIONS Northwest Corner	2006 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 34.0 sq.ft./ped.	*Pedestrian Space* 34.0 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 108.2	North Crosswalk 108.2		
West Crosswalk 84.6	West Crosswalk 84.6		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 7 sq.ft./ped.	*North Crosswalk* 7 sq.ft./ped.		
West Crosswalk 5 sq.ft./ped.	*West Crosswalk* 5 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* E		
West Crosswalk F	*West Crosswalk* F		
2006 NO ACTION CONDITIONS Northeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Northeast Corner**	**2006 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 19.6 sq.ft./ped.	*Pedestrian Space* 19.6 sq.ft./ped.		
Pedestrian LOS D	*Pedestrian LOS* D		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 108.2	North Crosswalk 108.2		
East Crosswalk 15.9	East Crosswalk 15.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 7 sq.ft./ped.	*North Crosswalk* 7 sq.ft./ped.		
East Crosswalk 28 sq.ft./ped.	*East Crosswalk* 28 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* E		
East Crosswalk C	*East Crosswalk* C		
2006 NO ACTION CONDITIONS Southwest Corner	**2006 PATH CONSTRUCTION CONDITIONS Southwest Corner**	**2006 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 12.0 sq.ft./ped.	*Pedestrian Space* 12.0 sq.ft./ped.		
Pedestrian LOS E	*Pedestrian LOS* E		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 31.0	South Crosswalk 31.0		
West Crosswalk 84.6	West Crosswalk 84.6		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 29 sq.ft./ped.	*South Crosswalk* 29 sq.ft./ped.		
West Crosswalk 5 sq.ft./ped.	*West Crosswalk* 5 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* C		
West Crosswalk F	*West Crosswalk* F		
2006 NO ACTION CONDITIONS Southeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 62.8 sq.ft./ped.	*Pedestrian Space* 62.8 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 31.0	South Crosswalk 31.0		
East Crosswalk 15.9	East Crosswalk 15.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 29 sq.ft./ped.	*South Crosswalk* 29 sq.ft./ped.		
East Crosswalk 28 sq.ft./ped.	*East Crosswalk* 28 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* C		
East Crosswalk C	*East Crosswalk* C		

NOTE: ▭ Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 10: CHURCH STREET AT LIBERTY STREET
COMPARISON OF 2006 MD PEAK HOUR NO ACTION vs. PATH CONSTRUCTION vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2006 NO ACTION CONDITIONS Northwest Corner	2006 PATH CONSTRUCTION CONDITIONS Northwest Corner	2006 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 249.8 sq.ft./ped.	*Pedestrian Space* 249.8 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 20.2	North Crosswalk 20.2		
West Crosswalk 17.1	West Crosswalk 17.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 38 sq.ft./ped.	*North Crosswalk* 38 sq.ft./ped.		
West Crosswalk 26 sq.ft./ped.	*West Crosswalk* 26 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* C		
West Crosswalk C	*West Crosswalk* C		
2006 NO ACTION CONDITIONS Northeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Northeast Corner**	**2006 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 88.9 sq.ft./ped.	*Pedestrian Space* 88.9 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 20.2	North Crosswalk 20.2		
East Crosswalk 7.4	East Crosswalk 7.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 38 sq.ft./ped.	*North Crosswalk* 38 sq.ft./ped.		
East Crosswalk 59 sq.ft./ped.	*East Crosswalk* 59 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* C		
East Crosswalk B	*East Crosswalk* B		
2006 NO ACTION CONDITIONS Southwest Corner	**2006 PATH CONSTRUCTION CONDITIONS Southwest Corner**	**2006 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 68.1 sq.ft./ped.	*Pedestrian Space* 68.1 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 12.6	South Crosswalk 12.6		
West Crosswalk 10.3	West Crosswalk 10.3		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 71 sq.ft./ped.	*South Crosswalk* 71 sq.ft./ped.		
West Crosswalk 43 sq.ft./ped.	*West Crosswalk* 43 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* B		
West Crosswalk B	*West Crosswalk* B		
2006 NO ACTION CONDITIONS Southeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 164.3 sq.ft./ped.	*Pedestrian Space* 164.3 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 12.7	South Crosswalk 12.7		
East Crosswalk 7.4	East Crosswalk 7.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 71 sq.ft./ped.	*South Crosswalk* 71 sq.ft./ped.		
East Crosswalk 59 sq.ft./ped.	*East Crosswalk* 59 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* B		
East Crosswalk B	*East Crosswalk* B		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 10: CHURCH STREET AT LIBERTY STREET
COMPARISON OF 2006 PM PEAK HOUR NO ACTION vs. PATH CONSTRUCTION vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2006 NO ACTION CONDITIONS Northwest Corner	2006 PATH CONSTRUCTION CONDITIONS Northwest Corner	2006 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 79.2 sq.ft./ped.	*Pedestrian Space* 79.2 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 66.7	North Crosswalk 66.7		
West Crosswalk 52.0	West Crosswalk 52.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 11 sq.ft./ped.	*North Crosswalk* 11 sq.ft./ped.		
West Crosswalk 8 sq.ft./ped.	*West Crosswalk* 8 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* E		
West Crosswalk E	*West Crosswalk* E		
2006 NO ACTION CONDITIONS Northeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Northeast Corner**	**2006 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 15.5 sq.ft./ped.	*Pedestrian Space* 15.5 sq.ft./ped.		
Pedestrian LOS D	*Pedestrian LOS* D		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 66.7	North Crosswalk 66.7		
East Crosswalk 21.1	East Crosswalk 21.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 11 sq.ft./ped.	*North Crosswalk* 11 sq.ft./ped.		
East Crosswalk 21 sq.ft./ped.	*East Crosswalk* 21 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* E		
East Crosswalk D	*East Crosswalk* D		
2006 NO ACTION CONDITIONS Southwest Corner	**2006 PATH CONSTRUCTION CONDITIONS Southwest Corner**	**2006 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 11.6 sq.ft./ped.	*Pedestrian Space* 11.6 sq.ft./ped.		
Pedestrian LOS E	*Pedestrian LOS* E		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 18.6	South Crosswalk 18.6		
West Crosswalk 52.0	West Crosswalk 52.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 48 sq.ft./ped.	*South Crosswalk* 48 sq.ft./ped.		
West Crosswalk 8 sq.ft./ped.	*West Crosswalk* 8 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* B		
West Crosswalk E	*West Crosswalk* E		
2006 NO ACTION CONDITIONS Southeast Corner	**2006 PATH CONSTRUCTION CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 75.3 sq.ft./ped.	*Pedestrian Space* 75.3 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 18.6	South Crosswalk 18.6		
East Crosswalk 21.1	East Crosswalk 21.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 48 sq.ft./ped.	*South Crosswalk* 48 sq.ft./ped.		
East Crosswalk 21 sq.ft./ped.	*East Crosswalk* 21 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* B		
East Crosswalk D	*East Crosswalk* D		

NOTE: [ ] Indicate Significant Impact.

Table 2
2009 Opening Year
No Action and Preferred Alternatives
Pedestrian Level of Service

Location 1:	Route 9A and Vesey Street
Location 2:	Route 9A and Liberty Street
Location 3:	West Broadway and Vesey Street
Location 4:	Greenwich Street and Liberty Street
Location 6:	Church Street and Vesey Street
Location 7:	Church Street and Fulton Street
Location 8:	Church Street and Dey Street
Location 9:	Church Street and Cortlandt Street
Location 10:	Church Street and Liberty Street
Location 11:	Greenwich Street and Fulton Street
Location 12:	Greenwich Street and Cortlandt Street Midblock

PATH TERMINAL EIS

STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE

LOCATION 1: WEST STREET (RTE 9A) AT VESEY STREET

COMPARISON OF 2009 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space* 203.7 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 4.5	North Crosswalk 84.4		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 632 sq.ft./ped.	*North Crosswalk* 28 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk A	*North Crosswalk* C		
West Crosswalk ####	*West Crosswalk* ####		

2009 PRE 9/11 CONDITIONS Northeast Corner	2009 POST 9/11 CONDITIONS Northeast Corner	2009 MITIGATED CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 193.6 sq.ft./ped.	*Pedestrian Space* 21.8 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* D		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 4.5	North Crosswalk 84.4		
East Crosswalk 0.0	East Crosswalk 17.8		
Surge Pedestrian Spece	*Surge Pedestrian Space*		
North Crosswalk 632 sq.ft./ped.	*North Crosswalk* 28 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 51 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk A	*North Crosswalk* C		
East Crosswalk ####	*East Crosswalk* B		

2009 PRE 9/11 CONDITIONS Southwest Corner	2009 POST 9/11 CONDITIONS Southwest Corner	2009 MITIGATED CONDITIONS Southwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space* #### sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 17.6	South Crosswalk 7.5		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 175 sq.ft./ped.	*South Crosswalk* 284 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk A	*South Crosswalk* A		
West Crosswalk ####	*West Crosswalk* ####		

2009 PRE 9/11 CONDITIONS Southeast Corner	2009 POST 9/11 CONDITIONS Southeast Corner	2009 MITIGATED CONDITIONS Southeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 230.8 sq.ft./ped.	*Pedestrian Space* -11.5 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 17.6	South Crosswalk 7.5		
East Crosswalk 0.0	East Crosswalk 17.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 175 sq.ft./ped.	*South Crosswalk* 284 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 51 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk A	*South Crosswalk* A		
East Crosswalk ####	*East Crosswalk* B		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 1: WEST STREET (RTE 9A) AT VESEY STREET
COMPARISON OF 2009 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED BUILD CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space ### sq.ft./ped.	*Pedestrian Space 203.1 sq.ft./ped.*		
Pedestrian LOS A	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 3.2	North Crosswalk 81.1		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 903 sq.ft./ped.	*North Crosswalk 29 sq.ft./ped.*		
West Crosswalk ### sq.ft./ped.	*West Crosswalk ### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk A	*North Crosswalk C*		
West Crosswalk ###	*West Crosswalk ###*		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED BUILD CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 308.7 sq.ft./ped.	*Pedestrian Space 10.6 sq.ft./ped.*		
Pedestrian LOS A	*Pedestrian LOS E*		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 3.2	North Crosswalk 81.1		
East Crosswalk 0.0	East Crosswalk 84.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 903 sq.ft./ped.	*North Crosswalk 29 sq.ft./ped.*		
East Crosswalk ### sq.ft./ped.	*East Crosswalk 11 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk A	*North Crosswalk C*		
East Crosswalk ###	*East Crosswalk E*		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED BUILD CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space ### sq.ft./ped.	*Pedestrian Space 366.7 sq.ft./ped.*		
Pedestrian LOS A	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 12.2	South Crosswalk 43.4		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 254 sq.ft./ped.	*South Crosswalk 49 sq.ft./ped.*		
West Crosswalk ### sq.ft./ped.	*West Crosswalk ### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk A	*South Crosswalk B*		
West Crosswalk ###	*West Crosswalk ###*		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED BUILD CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 321.6 sq.ft./ped.	*Pedestrian Space -12.3 sq.ft./ped.*		
Pedestrian LOS A	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 12.2	South Crosswalk 43.4		
East Crosswalk 0.0	East Crosswalk 84.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 254 sq.ft./ped.	*South Crosswalk 49 sq.ft./ped.*		
East Crosswalk ### sq.ft./ped.	*East Crosswalk 11 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk A	*South Crosswalk B*		
East Crosswalk ###	*East Crosswalk E*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 1: WEST STREET (RTE 9A) AT VESEY STREET
COMPARISON OF 2009 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED BUILD CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space 232.5 sq.ft./ped.*		
Pedestrian LOS A	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 3.8	North Crosswalk 70.6		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 759 sq.ft./ped.	*North Crosswalk 33 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk A	*North Crosswalk C*		
West Crosswalk ####	*West Crosswalk ####*		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED BUILD CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 264.4 sq.ft./ped.	*Pedestrian Space 35.8 sq.ft./ped.*		
Pedestrian LOS A	*Pedestrian LOS C*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 3.8	North Crosswalk 70.6		
East Crosswalk 0.0	East Crosswalk 19.3		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 759 sq.ft./ped.	*North Crosswalk 33 sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk 47 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk A	*North Crosswalk C*		
East Crosswalk ####	*East Crosswalk B*		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED BUILD CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS A	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 14.8	South Crosswalk 7.1		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 209 sq.ft./ped.	*South Crosswalk 298 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk A	*South Crosswalk A*		
West Crosswalk ####	*West Crosswalk ####*		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED BUILD CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 251.0 sq.ft./ped.	*Pedestrian Space -15.4 sq.ft./ped.*		
Pedestrian LOS A	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 14.8	South Crosswalk 7.1		
East Crosswalk 0.0	East Crosswalk 19.3		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 209 sq.ft./ped.	*South Crosswalk 298 sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk 47 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk A	*South Crosswalk A*		
East Crosswalk ####	*East Crosswalk B*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 2: WEST STREET (RTE 9A) AT LIBERTY STREET
COMPARISON OF 2009 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 114.6 sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS B	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 38.2	North Crosswalk 1.9		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 32 sq.ft./ped.	*North Crosswalk 1112 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk A*		
West Crosswalk ####	*West Crosswalk ####*		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 50.2 sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS B	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 38.2	North Crosswalk 1.9		
East Crosswalk 0.0	East Crosswalk 0.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 32 sq.ft./ped.	*North Crosswalk 1112 sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk 888 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk A*		
East Crosswalk ####	*East Crosswalk A*		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 285.1 sq.ft./ped.	*Pedestrian Space 208.6 sq.ft./ped.*		
Pedestrian LOS A	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 9.6	South Crosswalk 100.6		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 127 sq.ft./ped.	*South Crosswalk 25 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk C*		
West Crosswalk ####	*West Crosswalk ####*		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 367.2 sq.ft./ped.	*Pedestrian Space -14.8 sq.ft./ped.*		
Pedestrian LOS A	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 9.6	South Crosswalk 100.6		
East Crosswalk 0.0	East Crosswalk 0.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 127 sq.ft./ped.	*South Crosswalk 25 sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk 888 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk C*		
East Crosswalk ####	*East Crosswalk A*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 2: WEST STREET (RTE 9A) AT LIBERTY STREET
COMPARISON OF 2009 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED BUILD CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 170.1 sq.ft./ped.	*Pedestrian Space* #### sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 27.3	North Crosswalk 3.1		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 45 sq.ft./ped.	*North Crosswalk* 695 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* A		
West Crosswalk ####	*West Crosswalk* ####		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED BUILD CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 78.3 sq.ft./ped.	*Pedestrian Space* #### sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 27.3	North Crosswalk 3.1		
East Crosswalk 0.0	East Crosswalk 6.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 45 sq.ft./ped.	*North Crosswalk* 695 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 118 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* A		
East Crosswalk ####	*East Crosswalk* B		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED BUILD CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 406.9 sq.ft./ped.	*Pedestrian Space* 312.1 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 6.8	South Crosswalk 68.5		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 178 sq.ft./ped.	*South Crosswalk* 36 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk A	*South Crosswalk* C		
West Crosswalk ####	*West Crosswalk* ####		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED BUILD CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 523.5 sq.ft./ped.	*Pedestrian Space* -11.2 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 6.8	South Crosswalk 68.5		
East Crosswalk 0.0	East Crosswalk 6.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 178 sq.ft./ped.	*South Crosswalk* 36 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 118 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk A	*South Crosswalk* C		
East Crosswalk ####	*East Crosswalk* B		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 2: WEST STREET (RTE 9A) AT LIBERTY STREET
COMPARISON OF 2009 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED BUILD CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 108.6 sq.ft./ped.	*Pedestrian Space* #### sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 38.1	North Crosswalk 3.3		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 32 sq.ft./ped.	*North Crosswalk* 641 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* A		
West Crosswalk ####	*West Crosswalk* ####		

2009 PRE 9/11 CONDITIONS Northeast Corner	2009 POST 9/11 CONDITIONS Northeast Corner	2009 MITIGATED BUILD CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 56.9 sq.ft./ped.	*Pedestrian Space* #### sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 38.1	North Crosswalk 3.3		
East Crosswalk 0.0	East Crosswalk 1.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 32 sq.ft./ped.	*North Crosswalk* 641 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 488 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* A		
East Crosswalk ####	*East Crosswalk* A		

2009 PRE 9/11 CONDITIONS Southwest Corner	2009 POST 9/11 CONDITIONS Southwest Corner	2009 MITIGATED BUILD CONDITIONS Southwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 295.6 sq.ft./ped.	*Pedestrian Space* 206.5 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 9.5	South Crosswalk 104.3		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 128 sq.ft./ped.	*South Crosswalk* 24 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* D		
West Crosswalk ####	*West Crosswalk* ####		

2009 PRE 9/11 CONDITIONS Southeast Corner	2009 POST 9/11 CONDITIONS Southeast Corner	2009 MITIGATED BUILD CONDITIONS Southeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 263.8 sq.ft./ped.	*Pedestrian Space* -20.6 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 12.4	South Crosswalk 104.3		
East Crosswalk 0.0	East Crosswalk 1.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 98 sq.ft./ped.	*South Crosswalk* 24 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 488 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* D		
East Crosswalk ####	*East Crosswalk* A		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 3: W. BROADWAY AT VESEY STREET
COMPARISON OF 2009 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 88.7 sq.ft./ped.	*Pedestrian Space* -6.7 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 108.9		
West Crosswalk 16.6	West Crosswalk 36.7		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 7 sq.ft./ped.		
West Crosswalk 52 sq.ft./ped.	*West Crosswalk* 18 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* E		
West Crosswalk B	*West Crosswalk* D		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 105.8 sq.ft./ped.	*Pedestrian Space* 22.9 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* D		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 108.9		
East Crosswalk 36.5	East Crosswalk 32.7		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 7 sq.ft./ped.		
East Crosswalk 30 sq.ft./ped.	*East Crosswalk* 20 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* E		
East Crosswalk C	*East Crosswalk* D		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -11.7 sq.ft./ped.	*Pedestrian Space* -3.6 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 28.9		
West Crosswalk 16.6	West Crosswalk 36.7		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* 23 sq.ft./ped.		
West Crosswalk 52 sq.ft./ped.	*West Crosswalk* 18 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* D		
West Crosswalk B	*West Crosswalk* D		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -11.7 sq.ft./ped.	*Pedestrian Space* -14.1 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 28.9		
East Crosswalk 34.9	East Crosswalk 32.7		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* 23 sq.ft./ped.		
East Crosswalk 26 sq.ft./ped.	*East Crosswalk* 20 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* D		
East Crosswalk C	*East Crosswalk* D		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 3: W. BROADWAY AT VESEY STREET
COMPARISON OF 2009 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 96.1 sq.ft./ped.	*Pedestrian Space -9.5 sq.ft./ped.*		
Pedestrian LOS B	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 84.1		
West Crosswalk 14.9	West Crosswalk 73.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 9 sq.ft./ped.*		
West Crosswalk 58 sq.ft./ped.	*West Crosswalk 9 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk E*		
West Crosswalk B	*West Crosswalk E*		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 127.5 sq.ft./ped.	*Pedestrian Space 32.7 sq.ft./ped.*		
Pedestrian LOS B	*Pedestrian LOS C*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 84.1		
East Crosswalk 29.8	East Crosswalk 41.7		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 9 sq.ft./ped.*		
East Crosswalk 37 sq.ft./ped.	*East Crosswalk 16 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk E*		
East Crosswalk C	*East Crosswalk D*		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -8.3 sq.ft./ped.	*Pedestrian Space -7.2 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 61.0		
West Crosswalk 14.9	West Crosswalk 73.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk 11 sq.ft./ped.*		
West Crosswalk 58 sq.ft./ped.	*West Crosswalk 9 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk E*		
West Crosswalk B	*West Crosswalk E*		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -8.3 sq.ft./ped.	*Pedestrian Space -11.1 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 61.0		
East Crosswalk 14.9	East Crosswalk 41.7		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk 11 sq.ft./ped.*		
East Crosswalk 58 sq.ft./ped.	*East Crosswalk 16 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk E*		
East Crosswalk B	*East Crosswalk D*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 3: W. BROADWAY AT VESEY STREET
COMPARISON OF 2009 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 62.1 sq.ft./ped.	*Pedestrian Space* -15.9 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 96.8		
West Crosswalk 20.9	West Crosswalk 45.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 7 sq.ft./ped.		
West Crosswalk 41 sq.ft./ped.	*West Crosswalk* 14 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* E		
West Crosswalk B	*West Crosswalk* E		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 100.0 sq.ft./ped.	*Pedestrian Space* 38.0 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 96.8		
East Crosswalk 36.0	East Crosswalk 29.7		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 7 sq.ft./ped.		
East Crosswalk 31 sq.ft./ped.	*East Crosswalk* 22 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* E		
East Crosswalk C	*East Crosswalk* D		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -4.4 sq.ft./ped.	*Pedestrian Space* -10.4 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 30.9		
West Crosswalk 20.9	West Crosswalk 45.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* 21 sq.ft./ped.		
West Crosswalk 41 sq.ft./ped.	*West Crosswalk* 14 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* D		
West Crosswalk B	*West Crosswalk* E		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -4.4 sq.ft./ped.	*Pedestrian Space* -3.5 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 30.9		
East Crosswalk 36.0	East Crosswalk 29.7		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* 21 sq.ft./ped.		
East Crosswalk 31 sq.ft./ped.	*East Crosswalk* 22 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* D		
East Crosswalk C	*East Crosswalk* D		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 4: GREENWICH STREET AT LIBERTY STREET
COMPARISON OF 2009 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 0.0 sq.ft./ped.	*Pedestrian Space* 277.2 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 5.0		
West Crosswalk 1.2	West Crosswalk 20.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 149 sq.ft./ped.		
West Crosswalk 250 sq.ft./ped.	*West Crosswalk* 24 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* A		
West Crosswalk A	*West Crosswalk* D		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 0.0 sq.ft./ped.	*Pedestrian Space* 260.3 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 5.0		
East Crosswalk 5.0	East Crosswalk 10.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 149 sq.ft./ped.		
East Crosswalk 105 sq.ft./ped.	*East Crosswalk* 48 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* A		
East Crosswalk B	*East Crosswalk* B		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 304.1 sq.ft./ped.	*Pedestrian Space* -11.6 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 35.2		
West Crosswalk 1.2	West Crosswalk 20.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* 16 sq.ft./ped.		
West Crosswalk 250 sq.ft./ped.	*West Crosswalk* 24 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* D		
West Crosswalk A	*West Crosswalk* D		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 120.9 sq.ft./ped.	*Pedestrian Space* 95.6 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 35.2		
East Crosswalk 5.0	East Crosswalk 10.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* 16 sq.ft./ped.		
East Crosswalk 105 sq.ft./ped.	*East Crosswalk* 48 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* D		
East Crosswalk B	*East Crosswalk* B		

NOTE: Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 4: GREENWICH STREET AT LIBERTY STREET
COMPARISON OF 2009 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 0.0 sq.ft./ped.	*Pedestrian Space 134.1 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 6.0		
West Crosswalk 1.1	West Crosswalk 44.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 125 sq.ft./ped.*		
West Crosswalk 275 sq.ft./ped.	*West Crosswalk 11 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk B*		
West Crosswalk A	*West Crosswalk E*		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 0.0 sq.ft./ped.	*Pedestrian Space 150.6 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 6.0		
East Crosswalk 3.6	East Crosswalk 20.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 125 sq.ft./ped.*		
East Crosswalk 145 sq.ft./ped.	*East Crosswalk 26 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk B*		
East Crosswalk A	*East Crosswalk C*		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 334.1 sq.ft./ped.	*Pedestrian Space -9.0 sq.ft./ped.*		
Pedestrian LOS A	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 25.2		
West Crosswalk 1.1	West Crosswalk 44.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk 23 sq.ft./ped.*		
West Crosswalk 275 sq.ft./ped.	*West Crosswalk 11 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk D*		
West Crosswalk A	*West Crosswalk E*		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 166.9 sq.ft./ped.	*Pedestrian Space 92.2 sq.ft./ped.*		
Pedestrian LOS A	*Pedestrian LOS B*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 25.2		
East Crosswalk 3.6	East Crosswalk 20.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk 23 sq.ft./ped.*		
East Crosswalk 145 sq.ft./ped.	*East Crosswalk 26 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk D*		
East Crosswalk A	*East Crosswalk C*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 4: GREENWICH STREET AT LIBERTY STREET
COMPARISON OF 2009 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 0.0 sq.ft./ped.	*Pedestrian Space 288.5 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 3.7		
West Crosswalk 1.0	West Crosswalk 20.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 202 sq.ft./ped.*		
West Crosswalk 305 sq.ft./ped.	*West Crosswalk 25 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk A*		
West Crosswalk A	*West Crosswalk C*		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 0.0 sq.ft./ped.	*Pedestrian Space 302.4 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 3.7		
East Crosswalk 2.9	East Crosswalk 9.6		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 202 sq.ft./ped.*		
East Crosswalk 183 sq.ft./ped.	*East Crosswalk 54 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk A*		
East Crosswalk A	*East Crosswalk B*		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 370.6 sq.ft./ped.	*Pedestrian Space -6.0 sq.ft./ped.*		
Pedestrian LOS A	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 34.1		
West Crosswalk 1.0	West Crosswalk 20.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk 17 sq.ft./ped.*		
West Crosswalk 305 sq.ft./ped.	*West Crosswalk 25 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk D*		
West Crosswalk A	*West Crosswalk C*		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 210.9 sq.ft./ped.	*Pedestrian Space 100.7 sq.ft./ped.*		
Pedestrian LOS A	*Pedestrian LOS B*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 34.1		
East Crosswalk 2.9	East Crosswalk 9.6		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk 17 sq.ft./ped.*		
East Crosswalk 183 sq.ft./ped.	*East Crosswalk 54 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk D*		
East Crosswalk A	*East Crosswalk B*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS

STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE

LOCATION 6: CHURCH STREET AT VESEY STREET

COMPARISON OF 2009 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 76.1 sq.ft./ped.	*Pedestrian Space* 30.5 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 18.0	North Crosswalk 47.1		
West Crosswalk 40.5	West Crosswalk 44.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 41 sq.ft./ped.	*North Crosswalk* 18 sq.ft./ped.		
West Crosswalk 14 sq.ft./ped.	*West Crosswalk* 17 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* D		
West Crosswalk E	*West Crosswalk* D		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 55.3 sq.ft./ped.	*Pedestrian Space* 21.5 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* D		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 18.0	North Crosswalk 47.1		
East Crosswalk 15.4	East Crosswalk 32.3		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 41 sq.ft./ped.	*North Crosswalk* 18 sq.ft./ped.		
East Crosswalk 22 sq.ft./ped.	*East Crosswalk* 13 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* D		
East Crosswalk D	*East Crosswalk* E		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 18.1 sq.ft./ped.	*Pedestrian Space* 86.6 sq.ft./ped.		
Pedestrian LOS D	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 21.4	South Crosswalk 35.4		
West Crosswalk 40.5	West Crosswalk 44.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 31 sq.ft./ped.	*South Crosswalk* 21 sq.ft./ped.		
West Crosswalk 14 sq.ft./ped.	*West Crosswalk* 17 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* D		
West Crosswalk E	*West Crosswalk* D		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 63.6 sq.ft./ped.	*Pedestrian Space* 33.0 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 21.4	South Crosswalk 35.4		
East Crosswalk 15.4	East Crosswalk 32.3		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 31 sq.ft./ped.	*South Crosswalk* 21 sq.ft./ped.		
East Crosswalk 22 sq.ft./ped.	*East Crosswalk* 13 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* D		
East Crosswalk D	*East Crosswalk* E		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS

STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE

LOCATION 6: CHURCH STREET AT VESEY STREET

COMPARISON OF 2009 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 52.1 sq.ft./ped.	*Pedestrian Space* 37.6 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 20.7	North Crosswalk 32.5		
West Crosswalk 58.2	West Crosswalk 34.6		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 36 sq.ft./ped.	*North Crosswalk* 26 sq.ft./ped.		
West Crosswalk 9 sq.ft./ped.	*West Crosswalk* 22 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* C		
West Crosswalk E	*West Crosswalk* D		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 37.5 sq.ft./ped.	*Pedestrian Space* 33.2 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 20.7	North Crosswalk 32.5		
East Crosswalk 25.6	East Crosswalk 29.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 36 sq.ft./ped.	*North Crosswalk* 26 sq.ft./ped.		
East Crosswalk 13 sq.ft./ped.	*East Crosswalk* 14 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* C		
East Crosswalk E	*East Crosswalk* E		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 13.2 sq.ft./ped.	*Pedestrian Space* 108.0 sq.ft./ped.		
Pedestrian LOS E	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 23.4	South Crosswalk 32.8		
West Crosswalk 58.2	West Crosswalk 34.6		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 28 sq.ft./ped.	*South Crosswalk* 23 sq.ft./ped.		
West Crosswalk 10 sq.ft./ped.	*West Crosswalk* 22 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* D		
West Crosswalk E	*West Crosswalk* D		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 43.8 sq.ft./ped.	*Pedestrian Space* 38.7 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 23.4	South Crosswalk 32.8		
East Crosswalk 25.6	East Crosswalk 29.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 28 sq.ft./ped.	*South Crosswalk* 23 sq.ft./ped.		
East Crosswalk 13 sq.ft./ped.	*East Crosswalk* 14 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* D		
East Crosswalk E	*East Crosswalk* E		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 6: CHURCH STREET AT VESEY STREET
COMPARISON OF 2009 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 71.5 sq.ft./ped.	*Pedestrian Space* 16.4 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* D		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 14.2	North Crosswalk 40.7		
West Crosswalk 43.9	West Crosswalk 69.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 52 sq.ft./ped.	*North Crosswalk* 21 sq.ft./ped.		
West Crosswalk 13 sq.ft./ped.	*West Crosswalk* 11 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* D		
West Crosswalk E	*West Crosswalk* E		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 64.2 sq.ft./ped.	*Pedestrian Space* 28.1 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 14.2	North Crosswalk 40.7		
East Crosswalk 15.5	East Crosswalk 34.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 52 sq.ft./ped.	*North Crosswalk* 21 sq.ft./ped.		
East Crosswalk 22 sq.ft./ped.	*East Crosswalk* 12 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* D		
East Crosswalk D	*East Crosswalk* E		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 18.1 sq.ft./ped.	*Pedestrian Space* 57.1 sq.ft./ped.		
Pedestrian LOS D	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 28.0	South Crosswalk 48.0		
West Crosswalk 43.9	West Crosswalk 69.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 24 sq.ft./ped.	*South Crosswalk* 16 sq.ft./ped.		
West Crosswalk 13 sq.ft./ped.	*West Crosswalk* 11 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk D	*South Crosswalk* D		
West Crosswalk E	*West Crosswalk* E		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 51.1 sq.ft./ped.	*Pedestrian Space* 29.5 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 28.0	South Crosswalk 48.0		
East Crosswalk 15.5	East Crosswalk 34.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 24 sq.ft./ped.	*South Crosswalk* 16 sq.ft./ped.		
East Crosswalk 22 sq.ft./ped.	*East Crosswalk* 12 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk D	*South Crosswalk* D		
East Crosswalk D	*East Crosswalk* E		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 7: CHURCH STREET AT FULTON STREET
COMPARISON OF 2009 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -10.2 sq.ft./ped.	*Pedestrian Space* -3.7 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 23.9	North Crosswalk 12.2		
West Crosswalk 0.0	West Crosswalk 11.3		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 32 sq.ft./ped.	*North Crosswalk* 62 sq.ft./ped.		
West Crosswalk ##### sq.ft./ped.	*West Crosswalk* 40 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* B		
West Crosswalk #####	*West Crosswalk* C		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 42.4 sq.ft./ped.	*Pedestrian Space* 73.0 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 23.9	North Crosswalk 12.2		
East Crosswalk 33.1	East Crosswalk 24.7		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 32 sq.ft./ped.	*North Crosswalk* 62 sq.ft./ped.		
East Crosswalk 13 sq.ft./ped.	*East Crosswalk* 15 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* B		
East Crosswalk E	*East Crosswalk* D		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -10.5 sq.ft./ped.	*Pedestrian Space* -6.4 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 86.7	South Crosswalk 17.0		
West Crosswalk 0.0	West Crosswalk 11.3		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 8 sq.ft./ped.	*South Crosswalk* 44 sq.ft./ped.		
West Crosswalk ##### sq.ft./ped.	*West Crosswalk* 40 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* B		
West Crosswalk #####	*West Crosswalk* C		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 27.7 sq.ft./ped.	*Pedestrian Space* 505.6 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 86.7	South Crosswalk 17.0		
East Crosswalk 33.1	East Crosswalk 24.7		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 8 sq.ft./ped.	*South Crosswalk* 44 sq.ft./ped.		
East Crosswalk 13 sq.ft./ped.	*East Crosswalk* 15 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* B		
East Crosswalk E	*East Crosswalk* D		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 7: CHURCH STREET AT FULTON STREET
COMPARISON OF 2009 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -18.9 sq.ft./ped.	*Pedestrian Space -8.2 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *24.2*	North Crosswalk *25.5*		
West Crosswalk *0.0*	West Crosswalk *21.3*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 32 sq.ft./ped.	*North Crosswalk 29 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 21 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk C*		
West Crosswalk ####	*West Crosswalk D*		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 48.1 sq.ft./ped.	*Pedestrian Space 59.0 sq.ft./ped.*		
Pedestrian LOS B	*Pedestrian LOS B*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *24.2*	North Crosswalk *25.5*		
East Crosswalk *31.0*	East Crosswalk *23.9*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 32 sq.ft./ped.	*North Crosswalk 29 sq.ft./ped.*		
East Crosswalk 14 sq.ft./ped.	*East Crosswalk 16 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk C*		
East Crosswalk E	*East Crosswalk D*		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -17.6 sq.ft./ped.	*Pedestrian Space -8.6 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *46.6*	South Crosswalk *25.5*		
West Crosswalk *0.0*	West Crosswalk *21.3*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 14 sq.ft./ped.	*South Crosswalk 29 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 21 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk C*		
West Crosswalk ####	*West Crosswalk D*		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 49.2 sq.ft./ped.	*Pedestrian Space 442.4 sq.ft./ped.*		
Pedestrian LOS B	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *46.6*	South Crosswalk *25.5*		
East Crosswalk *31.0*	East Crosswalk *23.9*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 14 sq.ft./ped.	*South Crosswalk 29 sq.ft./ped.*		
East Crosswalk 14 sq.ft./ped.	*East Crosswalk 16 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk C*		
East Crosswalk E	*East Crosswalk D*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 7: CHURCH STREET AT FULTON STREET
COMPARISON OF 2009 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -24.1 sq.ft./ped.	*Pedestrian Space -12.6 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *22.8*	North Crosswalk *14.9*		
West Crosswalk *0.0*	West Crosswalk *10.6*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 34 sq.ft./ped.	*North Crosswalk 50 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 42 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk B*		
West Crosswalk ####	*West Crosswalk B*		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 37.0 sq.ft./ped.	*Pedestrian Space 56.2 sq.ft./ped.*		
Pedestrian LOS C	*Pedestrian LOS B*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *22.8*	North Crosswalk *14.9*		
East Crosswalk *44.5*	East Crosswalk *34.1*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 34 sq.ft./ped.	*North Crosswalk 50 sq.ft./ped.*		
East Crosswalk 9 sq.ft./ped.	*East Crosswalk 11 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk B*		
East Crosswalk E	*East Crosswalk E*		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -19.5 sq.ft./ped.	*Pedestrian Space -8.7 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *76.7*	South Crosswalk *28.6*		
West Crosswalk *0.0*	West Crosswalk *10.6*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 9 sq.ft./ped.	*South Crosswalk 26 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 42 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk C*		
West Crosswalk ####	*West Crosswalk B*		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 30.2 sq.ft./ped.	*Pedestrian Space 339.4 sq.ft./ped.*		
Pedestrian LOS C	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *76.7*	South Crosswalk *28.6*		
East Crosswalk *44.5*	East Crosswalk *34.1*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 9 sq.ft./ped.	*South Crosswalk 26 sq.ft./ped.*		
East Crosswalk 9 sq.ft./ped.	*East Crosswalk 11 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk C*		
East Crosswalk E	*East Crosswalk E*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 8: CHURCH STREET AT DEY STREET
COMPARISON OF 2009 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -10.7 sq.ft./ped.	*Pedestrian Space* -4.4 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CORSSWALK ANALYSIS:	**CORSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 86.0	North Crosswalk 13.2		
West Crosswalk 0.0	West Crosswalk 0.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 9 sq.ft./ped.	*North Crosswalk* 56 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* 0 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* B		
West Crosswalk ####	*West Crosswalk* F		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 18.1 sq.ft./ped.	*Pedestrian Space* -11.6 sq.ft./ped.		
Pedestrian LOS D	*Pedestrian LOS* F		
CORSSWALK ANALYSIS:	**CORSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 86.0	North Crosswalk 13.2		
East Crosswalk 23.0	East Crosswalk 16.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 9 sq.ft./ped.	*North Crosswalk* 57 sq.ft./ped.		
East Crosswalk 17 sq.ft./ped.	*East Crosswalk* 31 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* B		
East Crosswalk D	*East Crosswalk* C		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -9.1 sq.ft./ped.	*Pedestrian Space* -6.6 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CORSSWALK ANALYSIS:	**CORSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 55.0	South Crosswalk 16.8		
West Crosswalk 0.0	West Crosswalk 0.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 11 sq.ft./ped.	*South Crosswalk* 58 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* 0 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* B		
West Crosswalk ####	*West Crosswalk* F		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 25.9 sq.ft./ped.	*Pedestrian Space* 97.7 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* B		
CORSSWALK ANALYSIS:	**CORSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 55.0	South Crosswalk 16.8		
East Crosswalk 23.0	East Crosswalk 16.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 11 sq.ft./ped.	*South Crosswalk* 58 sq.ft./ped.		
East Crosswalk 16 sq.ft./ped.	*East Crosswalk* 31 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* B		
East Crosswalk D	*East Crosswalk* C		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 8: CHURCH STREET AT DEY STREET
COMPARISON OF 2009 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -14.9 sq.ft./ped.	*Pedestrian Space* -12.8 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CORSSWALK ANALYSIS:	**CORSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 49.5	North Crosswalk 15.6		
West Crosswalk 0.0	West Crosswalk 0.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 16 sq.ft./ped.	*North Crosswalk* 47 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* 0 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk D	*North Crosswalk* B		
West Crosswalk ####	*West Crosswalk* F		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 33.2 sq.ft./ped.	*Pedestrian Space* -7.9 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* F		
CORSSWALK ANALYSIS:	**CORSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 49.5	North Crosswalk 15.6		
East Crosswalk 26.9	East Crosswalk 18.7		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 16 sq.ft./ped.	*North Crosswalk* 48 sq.ft./ped.		
East Crosswalk 14 sq.ft./ped.	*East Crosswalk* 27 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk D	*North Crosswalk* B		
East Crosswalk E	*East Crosswalk* C		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -16.5 sq.ft./ped.	*Pedestrian Space* -15.7 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CORSSWALK ANALYSIS:	**CORSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 41.9	South Crosswalk 29.4		
West Crosswalk 0.0	West Crosswalk 0.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 14 sq.ft./ped.	*South Crosswalk* 33 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* 0 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* C		
West Crosswalk ####	*West Crosswalk* F		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 32.0 sq.ft./ped.	*Pedestrian Space* 70.2 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* B		
CORSSWALK ANALYSIS:	**CORSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 41.9	South Crosswalk 29.4		
East Crosswalk 26.9	East Crosswalk 18.7		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 14 sq.ft./ped.	*South Crosswalk* 33 sq.ft./ped.		
East Crosswalk 13 sq.ft./ped.	*East Crosswalk* 27 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* C		
East Crosswalk E	*East Crosswalk* C		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 8: CHURCH STREET AT DEY STREET
COMPARISON OF 2009 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space -14.6 sq.ft./ped.	*Pedestrian Space -16.6 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 77.3	North Crosswalk 17.2		
West Crosswalk 0.0	West Crosswalk 0.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 10 sq.ft./ped.	*North Crosswalk 43 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 0 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk B*		
West Crosswalk ####	*West Crosswalk F*		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 22.9 sq.ft./ped.	*Pedestrian Space -5.8 sq.ft./ped.*		
Pedestrian LOS D	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 77.3	North Crosswalk 17.2		
East Crosswalk 27.7	East Crosswalk 20.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 10 sq.ft./ped.	*North Crosswalk 43 sq.ft./ped.*		
East Crosswalk 14 sq.ft./ped.	*East Crosswalk 24 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk B*		
East Crosswalk E	*East Crosswalk C*		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space -23.5 sq.ft./ped.	*Pedestrian Space -15.3 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 46.0	South Crosswalk 29.1		
West Crosswalk 0.0	West Crosswalk 0.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 13 sq.ft./ped.	*South Crosswalk 34 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 0 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk C*		
West Crosswalk ####	*West Crosswalk F*		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 31.9 sq.ft./ped.	*Pedestrian Space 66.3 sq.ft./ped.*		
Pedestrian LOS C	*Pedestrian LOS B*		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 46.0	South Crosswalk 29.1		
East Crosswalk 27.7	East Crosswalk 20.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 13 sq.ft./ped.	*South Crosswalk 34 sq.ft./ped.*		
East Crosswalk 13 sq.ft./ped.	*East Crosswalk 24 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk C*		
East Crosswalk E	*East Crosswalk C*		

NOTE: ▭ Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 9: CHURCH STREET AT CORTLANDT STREET
COMPARISON OF 2009 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northeast Corner	2009 POST 9/11 CONDITIONS Northeast Corner	2009 MITIGATED CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 93.0 sq.ft./ped.	*Pedestrian Space* 118.9 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 17.5	North Crosswalk 23.8		
East Crosswalk 13.3	East Crosswalk 7.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 45 sq.ft./ped.	*North Crosswalk* 27 sq.ft./ped.		
East Crosswalk 43 sq.ft./ped.	*East Crosswalk* 63 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* C		
East Crosswalk B	*East Crosswalk* B		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -7.8 sq.ft./ped.	*Pedestrian Space* -6.8 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 13.1	South Crosswalk 10.9		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 38 sq.ft./ped.	*South Crosswalk* 83 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* B		
West Crosswalk ####	*West Crosswalk* ####		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 125.5 sq.ft./ped.	*Pedestrian Space* -10.9 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 13.1	South Crosswalk 10.9		
East Crosswalk 13.3	East Crosswalk 7.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 38 sq.ft./ped.	*South Crosswalk* 83 sq.ft./ped.		
East Crosswalk 43 sq.ft./ped.	*East Crosswalk* 63 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* B		
East Crosswalk B	*East Crosswalk* B		

NOTE: ▒▒ Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 9: CHURCH STREET AT CORTLANDT STREET
COMPARISON OF 2009 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northeast Corner	2009 POST 9/11 CONDITIONS Northeast Corner	2009 MITIGATED CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 39.1 sq.ft./ped.	*Pedestrian Space* 63.5 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 25.4	North Crosswalk 33.1		
East Crosswalk 39.3	East Crosswalk 22.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 31 sq.ft./ped.	*North Crosswalk* 19 sq.ft./ped.		
East Crosswalk 14 sq.ft./ped.	*East Crosswalk* 22 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* D		
East Crosswalk E	*East Crosswalk* D		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -11.6 sq.ft./ped.	*Pedestrian Space* -16.0 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 34.3	South Crosswalk 19.2		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 15 sq.ft./ped.	*South Crosswalk* 47 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* B		
West Crosswalk ####	*West Crosswalk* ####		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 38.4 sq.ft./ped.	*Pedestrian Space* -7.7 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 34.3	South Crosswalk 19.2		
East Crosswalk 39.3	East Crosswalk 22.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 15 sq.ft./ped.	*South Crosswalk* 47 sq.ft./ped.		
East Crosswalk 14 sq.ft./ped.	*East Crosswalk* 22 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* B		
East Crosswalk E	*East Crosswalk* D		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 9: CHURCH STREET AT CORTLANDT STREET
COMPARISON OF 2009 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northeast Corner	2009 POST 9/11 CONDITIONS Northeast Corner	2009 MITIGATED CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 48.3 sq.ft./ped.	*Pedestrian Space* 58.3 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 18.2	North Crosswalk 40.6		
East Crosswalk 36.1	East Crosswalk 21.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 43 sq.ft./ped.	*North Crosswalk* 16 sq.ft./ped.		
East Crosswalk 16 sq.ft./ped.	*East Crosswalk* 24 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* D		
East Crosswalk D	*East Crosswalk* D		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -11.3 sq.ft./ped.	*Pedestrian Space* -13.7 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 18.1	South Crosswalk 17.5		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 28 sq.ft./ped.	*South Crosswalk* 51 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* B		
West Crosswalk ####	*West Crosswalk* ####		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 52.2 sq.ft./ped.	*Pedestrian Space* -9.3 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 18.1	South Crosswalk 17.5		
East Crosswalk 36.1	East Crosswalk 21.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 28 sq.ft./ped.	*South Crosswalk* 51 sq.ft./ped.		
East Crosswalk 16 sq.ft./ped.	*East Crosswalk* 24 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* B		
East Crosswalk D	*East Crosswalk* D		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 10: CHURCH STREET AT LIBERTY STREET
COMPARISON OF 2009 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 26.6 sq.ft./ped.	*Pedestrian Space* 2.4 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 104.6	North Crosswalk 102.8		
West Crosswalk 119.7	West Crosswalk 75.6		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 7 sq.ft./ped.	*North Crosswalk* 7 sq.ft./ped.		
West Crosswalk 6 sq.ft./ped.	*West Crosswalk* 7 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* E		
West Crosswalk F	*West Crosswalk* E		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 23.6 sq.ft./ped.	*Pedestrian Space* -4.1 sq.ft./ped.		
Pedestrian LOS D	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 104.6	North Crosswalk 102.8		
East Crosswalk 6.3	East Crosswalk 17.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 7 sq.ft./ped.	*North Crosswalk* 7 sq.ft./ped.		
East Crosswalk 105 sq.ft./ped.	*East Crosswalk* 35 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* E		
East Crosswalk B	*East Crosswalk* C		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space -2.0 sq.ft./ped.	*Pedestrian Space* 47.8 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 109.2	South Crosswalk 25.8		
West Crosswalk 119.7	West Crosswalk 75.6		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 8 sq.ft./ped.	*South Crosswalk* 22 sq.ft./ped.		
West Crosswalk 6 sq.ft./ped.	*West Crosswalk* 7 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* D		
West Crosswalk F	*West Crosswalk* E		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 31.4 sq.ft./ped.	*Pedestrian Space* -6.3 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 109.2	South Crosswalk 25.8		
East Crosswalk 6.3	East Crosswalk 17.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 8 sq.ft./ped.	*South Crosswalk* 22 sq.ft./ped.		
East Crosswalk 105 sq.ft./ped.	*East Crosswalk* 35 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* D		
East Crosswalk B	*East Crosswalk* C		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS

STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE

LOCATION 10: CHURCH STREET AT LIBERTY STREET

COMPARISON OF 2009 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 28.6 sq.ft./ped.	*Pedestrian Space* 66.1 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 53.4	North Crosswalk 25.3		
West Crosswalk 31.1	West Crosswalk 16.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 13 sq.ft./ped.	*North Crosswalk* 27 sq.ft./ped.		
West Crosswalk 21 sq.ft./ped.	*West Crosswalk* 32 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* C		
West Crosswalk D	*West Crosswalk* C		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 35.8 sq.ft./ped.	*Pedestrian Space* -9.9 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 54.3	North Crosswalk 25.3		
East Crosswalk 11.0	East Crosswalk 7.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 14 sq.ft./ped.	*North Crosswalk* 27 sq.ft./ped.		
East Crosswalk 60 sq.ft./ped.	*East Crosswalk* 81 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* C		
East Crosswalk B	*East Crosswalk* B		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 24.6 sq.ft./ped.	*Pedestrian Space* 177.0 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 19.0	South Crosswalk 13.0		
West Crosswalk 31.1	West Crosswalk 16.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 47 sq.ft./ped.	*South Crosswalk* 44 sq.ft./ped.		
West Crosswalk 21 sq.ft./ped.	*West Crosswalk* 32 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* B		
West Crosswalk D	*West Crosswalk* C		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 108.0 sq.ft./ped.	*Pedestrian Space* -7.8 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 19.0	South Crosswalk 13.0		
East Crosswalk 11.0	East Crosswalk 7.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 47 sq.ft./ped.	*South Crosswalk* 44 sq.ft./ped.		
East Crosswalk 60 sq.ft./ped.	*East Crosswalk* 81 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* B		
East Crosswalk B	*East Crosswalk* B		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 10: CHURCH STREET AT LIBERTY STREET
COMPARISON OF 2009 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 53.2 sq.ft./ped.	*Pedestrian Space* 24.7 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 137.3	North Crosswalk 69.1		
West Crosswalk 44.3	West Crosswalk 43.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 6 sq.ft./ped.	*North Crosswalk* 10 sq.ft./ped.		
West Crosswalk 15 sq.ft./ped.	*West Crosswalk* 12 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk F	*North Crosswalk* E		
West Crosswalk E	*West Crosswalk* E		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 0.5 sq.ft./ped.	*Pedestrian Space* -15.3 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 137.3	North Crosswalk 69.1		
East Crosswalk 23.8	East Crosswalk 21.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 6 sq.ft./ped.	*North Crosswalk* 10 sq.ft./ped.		
East Crosswalk 28 sq.ft./ped.	*East Crosswalk* 28 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk F	*North Crosswalk* E		
East Crosswalk C	*East Crosswalk* C		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 13.7 sq.ft./ped.	*Pedestrian Space* 77.4 sq.ft./ped.		
Pedestrian LOS E	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 37.5	South Crosswalk 16.4		
West Crosswalk 44.3	West Crosswalk 43.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 24 sq.ft./ped.	*South Crosswalk* 35 sq.ft./ped.		
West Crosswalk 15 sq.ft./ped.	*West Crosswalk* 12 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk D	*South Crosswalk* C		
West Crosswalk E	*West Crosswalk* E		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 42.1 sq.ft./ped.	*Pedestrian Space* -9.9 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 37.5	South Crosswalk 16.4		
East Crosswalk 23.8	East Crosswalk 21.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 24 sq.ft./ped.	*South Crosswalk* 35 sq.ft./ped.		
East Crosswalk 28 sq.ft./ped.	*East Crosswalk* 28 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk D	*South Crosswalk* C		
East Crosswalk C	*East Crosswalk* C		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 11: GREENWICH STREET AT FULTON STREET
COMPARISON OF 2009 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space -4.0 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 22.1		
West Crosswalk 0.0	West Crosswalk 43.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 30 sq.ft./ped.*		
West Crosswalk 0 sq.ft./ped.	*West Crosswalk 10 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk C*		
West Crosswalk ####	*West Crosswalk E*		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space 68.8 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS B*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 22.1		
East Crosswalk 0.0	East Crosswalk 19.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 30 sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk 23 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk C*		
East Crosswalk ####	*East Crosswalk D*		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space -5.9 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 24.5		
West Crosswalk 0.0	West Crosswalk 43.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk 28 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 10 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk C*		
West Crosswalk ####	*West Crosswalk E*		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space 501.8 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 24.5		
East Crosswalk 0.0	East Crosswalk 19.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk 28 sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk 23 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk C*		
East Crosswalk ####	*East Crosswalk D*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 11: GREENWICH STREET AT FULTON STREET
COMPARISON OF 2009 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space -7.6 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 45.2		
West Crosswalk 0.0	West Crosswalk 74.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 15 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 6 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk E*		
West Crosswalk ####	*West Crosswalk E*		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space 44.9 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS B*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 45.2		
East Crosswalk 0.0	East Crosswalk 21.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 15 sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk 21 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk E*		
East Crosswalk ####	*East Crosswalk D*		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space -8.9 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 21.4		
West Crosswalk 0.0	West Crosswalk 74.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk 32 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 6 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk C*		
West Crosswalk ####	*West Crosswalk E*		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space 514.2 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 21.4		
East Crosswalk 0.0	East Crosswalk 21.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk 32 sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk 21 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk C*		
East Crosswalk ####	*East Crosswalk D*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 11: GREENWICH STREET AT FULTON STREET
COMPARISON OF 2009 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space* -10.3 sq.ft./ped.		
Pedestrian LOS ####	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 34.6		
West Crosswalk 0.0	West Crosswalk 61.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 20 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* 7 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* D		
West Crosswalk ####	*West Crosswalk* E		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space* 58.1 sq.ft./ped.		
Pedestrian LOS ####	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 34.6		
East Crosswalk 0.0	East Crosswalk 16.6		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 20 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 24 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* D		
East Crosswalk ####	*East Crosswalk* C		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space* -6.0 sq.ft./ped.		
Pedestrian LOS ####	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 39.8		
West Crosswalk 0.0	West Crosswalk 61.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* 17 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* 7 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* D		
West Crosswalk ####	*West Crosswalk* E		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space* 398.6 sq.ft./ped.		
Pedestrian LOS ####	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 39.8		
East Crosswalk 0.0	East Crosswalk 18.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* 17 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 24 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* D		
East Crosswalk ####	*East Crosswalk* C		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS

STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE

LOCATION 10: CHURCH STREET AT LIBERTY STREET without Liberty Plaza Connection

COMPARISON OF 2009 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 26.6 sq.ft./ped.	*Pedestrian Space* 2.4 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 104.6	North Crosswalk 102.8		
West Crosswalk 119.7	West Crosswalk 75.6		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 7 sq.ft./ped.	*North Crosswalk* 7 sq.ft./ped.		
West Crosswalk 6 sq.ft./ped.	*West Crosswalk* 7 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* E		
West Crosswalk F	*West Crosswalk* E		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 23.6 sq.ft./ped.	*Pedestrian Space* -4.1 sq.ft./ped.		
Pedestrian LOS D	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 104.6	North Crosswalk 102.8		
East Crosswalk 6.3	East Crosswalk 17.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 7 sq.ft./ped.	*North Crosswalk* 7 sq.ft./ped.		
East Crosswalk 105 sq.ft./ped.	*East Crosswalk* 35 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* E		
East Crosswalk B	*East Crosswalk* C		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -2.0 sq.ft./ped.	*Pedestrian Space* 47.8 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 109.2	South Crosswalk 25.8		
West Crosswalk 119.7	West Crosswalk 75.6		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 8 sq.ft./ped.	*South Crosswalk* 22 sq.ft./ped.		
West Crosswalk 6 sq.ft./ped.	*West Crosswalk* 7 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* D		
West Crosswalk F	*West Crosswalk* E		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 31.4 sq.ft./ped.	*Pedestrian Space* -6.3 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 109.2	South Crosswalk 25.8		
East Crosswalk 6.3	East Crosswalk 17.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 8 sq.ft./ped.	*South Crosswalk* 22 sq.ft./ped.		
East Crosswalk 105 sq.ft./ped.	*East Crosswalk* 35 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* D		
East Crosswalk B	*East Crosswalk* C		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS

STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE

LOCATION 10: CHURCH STREET AT LIBERTY STREET without Liberty Plaza Connection

COMPARISON OF 2009 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 28.6 sq.ft./ped.	*Pedestrian Space* 66.1 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 53.4	North Crosswalk 25.3		
West Crosswalk 31.1	West Crosswalk 16.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 13 sq.ft./ped.	*North Crosswalk* 27 sq.ft./ped.		
West Crosswalk 21 sq.ft./ped.	*West Crosswalk* 32 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* C		
West Crosswalk D	*West Crosswalk* C		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 35.8 sq.ft./ped.	*Pedestrian Space* -9.9 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 54.3	North Crosswalk 25.3		
East Crosswalk 11.0	East Crosswalk 7.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 14 sq.ft./ped.	*North Crosswalk* 27 sq.ft./ped.		
East Crosswalk 60 sq.ft./ped.	*East Crosswalk* 81 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* C		
East Crosswalk B	*East Crosswalk* B		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 24.6 sq.ft./ped.	*Pedestrian Space* 177.0 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 19.0	South Crosswalk 13.0		
West Crosswalk 31.1	West Crosswalk 16.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 47 sq.ft./ped.	*South Crosswalk* 44 sq.ft./ped.		
West Crosswalk 21 sq.ft./ped.	*West Crosswalk* 32 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* B		
West Crosswalk D	*West Crosswalk* C		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 108.0 sq.ft./ped.	*Pedestrian Space* -7.8 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 19.0	South Crosswalk 13.0		
East Crosswalk 11.0	East Crosswalk 7.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 47 sq.ft./ped.	*South Crosswalk* 44 sq.ft./ped.		
East Crosswalk 60 sq.ft./ped.	*East Crosswalk* 81 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* B		
East Crosswalk B	*East Crosswalk* B		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 10: CHURCH STREET AT LIBERTY STREET without Liberty Plaza Connection
COMPARISON OF 2009 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 53.2 sq.ft./ped.	*Pedestrian Space* 24.7 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 137.3	North Crosswalk 69.1		
West Crosswalk 44.3	West Crosswalk 43.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 6 sq.ft./ped.	*North Crosswalk* 10 sq.ft./ped.		
West Crosswalk 15 sq.ft./ped.	*West Crosswalk* 12 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk F	*North Crosswalk* E		
West Crosswalk E	*West Crosswalk* E		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 0.5 sq.ft./ped.	*Pedestrian Space* -15.3 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 137.3	North Crosswalk 69.1		
East Crosswalk 23.8	East Crosswalk 21.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 6 sq.ft./ped.	*North Crosswalk* 10 sq.ft./ped.		
East Crosswalk 28 sq.ft./ped.	*East Crosswalk* 28 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk F	*North Crosswalk* E		
East Crosswalk C	*East Crosswalk* C		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 13.7 sq.ft./ped.	*Pedestrian Space* 77.4 sq.ft./ped.		
Pedestrian LOS E	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 37.5	South Crosswalk 16.4		
West Crosswalk 44.3	West Crosswalk 43.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 24 sq.ft./ped.	*South Crosswalk* 35 sq.ft./ped.		
West Crosswalk 15 sq.ft./ped.	*West Crosswalk* 12 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk D	*South Crosswalk* C		
West Crosswalk E	*West Crosswalk* E		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 42.1 sq.ft./ped.	*Pedestrian Space* -9.9 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 37.5	South Crosswalk 16.4		
East Crosswalk 23.8	East Crosswalk 21.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 24 sq.ft./ped.	*South Crosswalk* 35 sq.ft./ped.		
East Crosswalk 28 sq.ft./ped.	*East Crosswalk* 28 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk D	*South Crosswalk* C		
East Crosswalk C	*East Crosswalk* C		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 12: GREENWICH STREET MIDBLOCK
COMPARISON OF 2009 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space -1.7 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 30.6		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 67 sq.ft./ped.*		
West Crosswalk 0 sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk B*		
West Crosswalk ####	*West Crosswalk ####*		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS ####*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 0.0		
East Crosswalk 0.0	East Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk #### sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk ####*		
East Crosswalk ####	*East Crosswalk ####*		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS ####*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 0.0		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk #### sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk ####*		
West Crosswalk ####	*West Crosswalk ####*		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS ####*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 0.0		
East Crosswalk 0.0	East Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk #### sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk ####*		
East Crosswalk ####	*East Crosswalk ####*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 12: GREENWICH STREET MIDBLOCK
COMPARISON OF 2009 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space -12.6 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 43.5		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 61 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk B*		
West Crosswalk ####	*West Crosswalk ####*		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS ####*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 0.0		
East Crosswalk 0.0	East Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk #### sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk ####*		
East Crosswalk ####	*East Crosswalk ####*		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS ####*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 0.0		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk #### sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk ####*		
West Crosswalk ####	*West Crosswalk ####*		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS ####*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 0.0		
East Crosswalk 0.0	East Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk #### sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk ####*		
East Crosswalk ####	*East Crosswalk ####*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 12: GREENWICH STREET MIDBLOCK
COMPARISON OF 2009 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2009 PRE 9/11 CONDITIONS Northwest Corner	2009 POST 9/11 CONDITIONS Northwest Corner	2009 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space -11.9 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 54.1		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 49 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk B*		
West Crosswalk ####	*West Crosswalk ####*		
2009 PRE 9/11 CONDITIONS Northeast Corner	**2009 POST 9/11 CONDITIONS Northeast Corner**	**2009 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS ####*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 0.0		
East Crosswalk 0.0	East Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk #### sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk ####*		
East Crosswalk ####	*East Crosswalk ####*		
2009 PRE 9/11 CONDITIONS Southwest Corner	**2009 POST 9/11 CONDITIONS Southwest Corner**	**2009 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS ####*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 0.0		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk #### sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk ####*		
West Crosswalk ####	*West Crosswalk ####*		
2009 PRE 9/11 CONDITIONS Southeast Corner	**2009 POST 9/11 CONDITIONS Southeast Corner**	**2009 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS ####*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 0.0		
East Crosswalk 0.0	East Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk #### sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk ####*		
East Crosswalk ####	*East Crosswalk ####*		

NOTE: [ ] Indicate Significant Impact.

Table 3
2025 Design Year
No Action and Preferred Alternatives
Pedestrian Level of Service

Location 1:	Route 9A and Vesey Street
Location 2:	Route 9A and Liberty Street
Location 3:	West Broadway and Vesey Street
Location 4:	Greenwich Street and Liberty Street
Location 6:	Church Street and Vesey Street
Location 7:	Church Street and Fulton Street
Location 8:	Church Street and Dey Street
Location 9:	Church Street and Cortlandt Street
Location 10:	Church Street and Liberty Street
Location 11:	Greenwich Street and Fulton Street
Location 12:	Greenwich Street and Cortlandt Street Midblock

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 1: WEST STREET (RTE 9A) AT VESEY STREET
COMPARISON OF 2025 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2006 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space* 191.7 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 4.8	North Crosswalk 89.3		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 593 sq.ft./ped.	*North Crosswalk* 26 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk A	*North Crosswalk* C		
West Crosswalk ####	*West Crosswalk* ####		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2006 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 180.2 sq.ft./ped.	*Pedestrian Space* 16.8 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* D		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 4.8	North Crosswalk 89.3		
East Crosswalk 0.0	East Crosswalk 25.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 593 sq.ft./ped.	*North Crosswalk* 26 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 36 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk A	*North Crosswalk* C		
East Crosswalk ####	*East Crosswalk* C		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2006 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space* #### sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 19.1	South Crosswalk 9.6		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 162 sq.ft./ped.	*South Crosswalk* 222 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk A	*South Crosswalk* A		
West Crosswalk ####	*West Crosswalk* ####		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 212.2 sq.ft./ped.	*Pedestrian Space* -8.9 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 19.1	South Crosswalk 9.6		
East Crosswalk 0.0	East Crosswalk 25.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 162 sq.ft./ped.	*South Crosswalk* 222 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 36 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk A	*South Crosswalk* A		
East Crosswalk ####	*East Crosswalk* C		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 2: WEST STREET (RTE 9A) AT LIBERTY STREET
COMPARISON OF 2025 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 105.3 sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS B	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *41.1*	North Crosswalk *3.9*		
West Crosswalk *0.0*	West Crosswalk *0.0*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 30 sq.ft./ped.	*North Crosswalk 556 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk A*		
West Crosswalk ####	*West Crosswalk ####*		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 45.0 sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS B	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *41.1*	North Crosswalk *3.9*		
East Crosswalk *0.0*	East Crosswalk *0.5*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 30 sq.ft./ped.	*North Crosswalk 556 sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk 1395 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk A*		
East Crosswalk ####	*East Crosswalk A*		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 262.9 sq.ft./ped.	*Pedestrian Space 185.0 sq.ft./ped.*		
Pedestrian LOS A	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *10.3*	South Crosswalk *111.7*		
West Crosswalk *0.0*	West Crosswalk *0.0*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 118 sq.ft./ped.	*South Crosswalk 22 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk D*		
West Crosswalk ####	*West Crosswalk ####*		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 339.1 sq.ft./ped.	*Pedestrian Space -13.9 sq.ft./ped.*		
Pedestrian LOS A	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *10.3*	South Crosswalk *111.7*		
East Crosswalk *0.0*	East Crosswalk *0.5*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 118 sq.ft./ped.	*South Crosswalk 22 sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk 1395 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk D*		
East Crosswalk ####	*East Crosswalk A*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 2: WEST STREET (RTE 9A) AT LIBERTY STREET
COMPARISON OF 2025 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 157.4 sq.ft./ped.	*Pedestrian Space* #### sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 29.2	North Crosswalk 17.4		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 42 sq.ft./ped.	*North Crosswalk* 124 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* B		
West Crosswalk ####	*West Crosswalk* ####		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 71.1 sq.ft./ped.	*Pedestrian Space* #### sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 29.2	North Crosswalk 17.4		
East Crosswalk 0.0	East Crosswalk 4.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 42 sq.ft./ped.	*North Crosswalk* 124 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 178 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* B		
East Crosswalk ####	*East Crosswalk* A		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 377.9 sq.ft./ped.	*Pedestrian Space* 174.4 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 7.3	South Crosswalk 117.3		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 165 sq.ft./ped.	*South Crosswalk* 21 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk A	*South Crosswalk* D		
West Crosswalk ####	*West Crosswalk* ####		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 486.6 sq.ft./ped.	*Pedestrian Space* -12.9 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 7.3	South Crosswalk 117.3		
East Crosswalk 0.0	East Crosswalk 4.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 165 sq.ft./ped.	*South Crosswalk* 21 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 178 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk A	*South Crosswalk* D		
East Crosswalk ####	*East Crosswalk* A		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 2: WEST STREET (RTE 9A) AT LIBERTY STREET
COMPARISON OF 2025 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 99.3 sq.ft./ped.	*Pedestrian Space* #### sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 40.9	North Crosswalk 4.5		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 30 sq.ft./ped.	*North Crosswalk* 476 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* A		
West Crosswalk ####	*West Crosswalk* ####		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 51.6 sq.ft./ped.	*Pedestrian Space* #### sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 40.9	North Crosswalk 4.5		
East Crosswalk 0.0	East Crosswalk 1.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 30 sq.ft./ped.	*North Crosswalk* 476 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 751 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* A		
East Crosswalk ####	*East Crosswalk* A		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 272.9 sq.ft./ped.	*Pedestrian Space* 188.2 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 10.2	South Crosswalk 114.2		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 119 sq.ft./ped.	*South Crosswalk* 22 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* D		
West Crosswalk ####	*West Crosswalk* ####		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 336.9 sq.ft./ped.	*Pedestrian Space* -21.4 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 10.2	South Crosswalk 114.2		
East Crosswalk 0.0	East Crosswalk 1.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 119 sq.ft./ped.	*South Crosswalk* 22 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 751 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* D		
East Crosswalk ####	*East Crosswalk* A		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 3: W. BROADWAY AT VESEY STREET
COMPARISON OF 2025 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2006 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 82.5 sq.ft./ped.	*Pedestrian Space* -8.9 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 126.2		
West Crosswalk 17.8	West Crosswalk 43.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 6 sq.ft./ped.		
West Crosswalk 49 sq.ft./ped.	*West Crosswalk* 15 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* F		
West Crosswalk B	*West Crosswalk* E		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2006 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 98.2 sq.ft./ped.	*Pedestrian Space* 17.4 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* D		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 126.2		
East Crosswalk 39.2	East Crosswalk 43.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 6 sq.ft./ped.		
East Crosswalk 28 sq.ft./ped.	*East Crosswalk* 15 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* F		
East Crosswalk C	*East Crosswalk* D		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2006 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -11.7 sq.ft./ped.	*Pedestrian Space* -6.6 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 38.6		
West Crosswalk 17.8	West Crosswalk 43.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* 17 sq.ft./ped.		
West Crosswalk 49 sq.ft./ped.	*West Crosswalk* 15 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* D		
West Crosswalk B	*West Crosswalk* E		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -11.7 sq.ft./ped.	*Pedestrian Space* -9.4 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 38.6		
East Crosswalk 37.4	East Crosswalk 43.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* 17 sq.ft./ped.		
East Crosswalk 24 sq.ft./ped.	*East Crosswalk* 15 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* D		
East Crosswalk C	*East Crosswalk* D		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 3: W. BROADWAY AT VESEY STREET
COMPARISON OF 2025 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2006 MITIGATED BUILD CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 88.8 sq.ft./ped.	*Pedestrian Space* -10.3 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 123.4		
West Crosswalk 18.0	West Crosswalk 91.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 6 sq.ft./ped.		
West Crosswalk 54 sq.ft./ped.	*West Crosswalk* 7 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* F		
West Crosswalk B	*West Crosswalk* E		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2006 MITIGATED BUILD CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 118.3 sq.ft./ped.	*Pedestrian Space* 16.8 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* D		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 123.4		
East Crosswalk 31.9	East Crosswalk 74.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 6 sq.ft./ped.		
East Crosswalk 35 sq.ft./ped.	*East Crosswalk* 9 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* F		
East Crosswalk C	*East Crosswalk* E		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2006 MITIGATED BUILD CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -8.3 sq.ft./ped.	*Pedestrian Space* -6.6 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 96.3		
West Crosswalk 37.4	West Crosswalk 91.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* 7 sq.ft./ped.		
West Crosswalk 54 sq.ft./ped.	*West Crosswalk* 7 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* E		
West Crosswalk B	*West Crosswalk* E		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2006 MITIGATED BUILD CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -8.3 sq.ft./ped.	*Pedestrian Space* -9.4 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 38.6		
East Crosswalk 30.5	East Crosswalk 43.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* 17 sq.ft./ped.		
East Crosswalk 29 sq.ft./ped.	*East Crosswalk* 15 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* D		
East Crosswalk C	*East Crosswalk* D		

NOTE: ▒▒ Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 3: W. BROADWAY AT VESEY STREET
COMPARISON OF 2025 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2006 MITIGATED BUILD CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 57.1 sq.ft./ped.	*Pedestrian Space* -14.5 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 110.8		
West Crosswalk 22.4	West Crosswalk 48.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 6 sq.ft./ped.		
West Crosswalk 39 sq.ft./ped.	*West Crosswalk* 13 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* E		
West Crosswalk C	*West Crosswalk* E		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2006 MITIGATED BUILD CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 92.5 sq.ft./ped.	*Pedestrian Space* 29.3 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 110.8		
East Crosswalk 38.6	East Crosswalk 38.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 6 sq.ft./ped.		
East Crosswalk 29 sq.ft./ped.	*East Crosswalk* 17 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* E		
East Crosswalk C	*East Crosswalk* D		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2006 MITIGATED BUILD CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -4.4 sq.ft./ped.	*Pedestrian Space* -9.4 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 39.0		
West Crosswalk 22.4	West Crosswalk 48.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* 17 sq.ft./ped.		
West Crosswalk 39 sq.ft./ped.	*West Crosswalk* 13 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* D		
West Crosswalk C	*West Crosswalk* E		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2006 MITIGATED BUILD CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -4.4 sq.ft./ped.	*Pedestrian Space* -7.3 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 39.0		
East Crosswalk 36.9	East Crosswalk 38.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* 17 sq.ft./ped.		
East Crosswalk 24 sq.ft./ped.	*East Crosswalk* 17 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* D		
East Crosswalk C	*East Crosswalk* D		

NOTE: ▒▒ Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 4: GREENWICH STREET AT LIBERTY STREET
COMPARISON OF 2025 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 0.0 sq.ft./ped.	*Pedestrian Space* 64.2 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 41.3		
West Crosswalk 1.1	West Crosswalk 67.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 18 sq.ft./ped.		
West Crosswalk 286 sq.ft./ped.	*West Crosswalk* 7 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* D		
West Crosswalk A	*West Crosswalk* E		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 0.0 sq.ft./ped.	*Pedestrian Space* 57.2 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 41.3		
East Crosswalk 3.1	East Crosswalk 30.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 18 sq.ft./ped.		
East Crosswalk 171 sq.ft./ped.	*East Crosswalk* 17 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* D		
East Crosswalk A	*East Crosswalk* D		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 347.2 sq.ft./ped.	*Pedestrian Space* -8.4 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 60.3		
West Crosswalk 1.1	West Crosswalk 67.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* 9 sq.ft./ped.		
West Crosswalk 286 sq.ft./ped.	*West Crosswalk* 7 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* E		
West Crosswalk A	*West Crosswalk* E		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 196.1 sq.ft./ped.	*Pedestrian Space* 43.0 sq.ft./ped.		
Pedestrian LOS A	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 60.3		
East Crosswalk 3.1	East Crosswalk 30.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* 9 sq.ft./ped.		
East Crosswalk 171 sq.ft./ped.	*East Crosswalk* 17 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* E		
East Crosswalk A	*East Crosswalk* D		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 6: CHURCH STREET AT VESY STREET
COMPARISON OF 2025 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 70.6 sq.ft./ped.	*Pedestrian Space* 25.3 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 19.4	North Crosswalk 50.5		
West Crosswalk 43.4	West Crosswalk 55.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 38 sq.ft./ped.	*North Crosswalk* 17 sq.ft./ped.		
West Crosswalk 13 sq.ft./ped.	*West Crosswalk* 14 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* D		
West Crosswalk E	*West Crosswalk* E		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 50.7 sq.ft./ped.	*Pedestrian Space* 17.6 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* D		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 19.4	North Crosswalk 50.5		
East Crosswalk 16.6	East Crosswalk 38.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 38 sq.ft./ped.	*North Crosswalk* 17 sq.ft./ped.		
East Crosswalk 21 sq.ft./ped.	*East Crosswalk* 11 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* D		
East Crosswalk D	*East Crosswalk* E		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 16.2 sq.ft./ped.	*Pedestrian Space* 69.4 sq.ft./ped.		
Pedestrian LOS D	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 23.1	South Crosswalk 44.1		
West Crosswalk 43.4	West Crosswalk 55.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 29 sq.ft./ped.	*South Crosswalk* 17 sq.ft./ped.		
West Crosswalk 13 sq.ft./ped.	*West Crosswalk* 14 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* D		
West Crosswalk E	*West Crosswalk* E		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 58.6 sq.ft./ped.	*Pedestrian Space* 25.5 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 23.1	South Crosswalk 44.1		
East Crosswalk 16.6	East Crosswalk 38.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 29 sq.ft./ped.	*South Crosswalk* 17 sq.ft./ped.		
East Crosswalk 21 sq.ft./ped.	*East Crosswalk* 11 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* D		
East Crosswalk D	*East Crosswalk* E		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 6: CHURCH STREET AT VESY STREET
COMPARISON OF 2025 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 48.1 sq.ft./ped.	*Pedestrian Space* 24.9 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 22.2	North Crosswalk 39.7		
West Crosswalk 62.4	West Crosswalk 52.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 33 sq.ft./ped.	*North Crosswalk* 21 sq.ft./ped.		
West Crosswalk 9 sq.ft./ped.	*West Crosswalk* 14 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* D		
West Crosswalk E	*West Crosswalk* E		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 34.4 sq.ft./ped.	*Pedestrian Space* 25.2 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 22.2	North Crosswalk 39.7		
East Crosswalk 27.4	East Crosswalk 36.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 33 sq.ft./ped.	*North Crosswalk* 21 sq.ft./ped.		
East Crosswalk 12 sq.ft./ped.	*East Crosswalk* 11 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* D		
East Crosswalk E	*East Crosswalk* E		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 11.8 sq.ft./ped.	*Pedestrian Space* 73.7 sq.ft./ped.		
Pedestrian LOS E	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 25.1	South Crosswalk 43.1		
West Crosswalk 62.4	West Crosswalk 52.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 26 sq.ft./ped.	*South Crosswalk* 17 sq.ft./ped.		
West Crosswalk 9 sq.ft./ped.	*West Crosswalk* 14 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* D		
West Crosswalk E	*West Crosswalk* E		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 40.4 sq.ft./ped.	*Pedestrian Space* 28.3 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 25.1	South Crosswalk 43.1		
East Crosswalk 27.4	East Crosswalk 36.2		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 26 sq.ft./ped.	*South Crosswalk* 17 sq.ft./ped.		
East Crosswalk 12 sq.ft./ped.	*East Crosswalk* 11 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* D		
East Crosswalk E	*East Crosswalk* E		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 6: CHURCH STREET AT VESY STREET
COMPARISON OF 2025 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 66.1 sq.ft./ped.	*Pedestrian Space* 14.2 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* E		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 15.2	North Crosswalk 43.3		
West Crosswalk 47.1	West Crosswalk 78.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 48 sq.ft./ped.	*North Crosswalk* 20 sq.ft./ped.		
West Crosswalk 12 sq.ft./ped.	*West Crosswalk* 10 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* D		
West Crosswalk E	*West Crosswalk* E		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 59.2 sq.ft./ped.	*Pedestrian Space* 25.0 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 15.2	North Crosswalk 43.3		
East Crosswalk 16.7	East Crosswalk 40.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 48 sq.ft./ped.	*North Crosswalk* 20 sq.ft./ped.		
East Crosswalk 20 sq.ft./ped.	*East Crosswalk* 10 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* D		
East Crosswalk D	*East Crosswalk* E		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 16.4 sq.ft./ped.	*Pedestrian Space* 47.9 sq.ft./ped.		
Pedestrian LOS D	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 30.1	South Crosswalk 56.5		
West Crosswalk 47.1	West Crosswalk 78.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 22 sq.ft./ped.	*South Crosswalk* 13 sq.ft./ped.		
West Crosswalk 12 sq.ft./ped.	*West Crosswalk* 10 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk D	*South Crosswalk* E		
West Crosswalk E	*West Crosswalk* E		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 46.7 sq.ft./ped.	*Pedestrian Space* 24.1 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 30.1	South Crosswalk 56.5		
East Crosswalk 16.7	East Crosswalk 40.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 22 sq.ft./ped.	*South Crosswalk* 13 sq.ft./ped.		
East Crosswalk 20 sq.ft./ped.	*East Crosswalk* 10 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk D	*South Crosswalk* E		
East Crosswalk D	*East Crosswalk* E		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 7: CHURCH STREET AT FULTON STREET
COMPARISON OF 2025 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2006 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -10.2 sq.ft./ped.	*Pedestrian Space* -5.3 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 25.6	North Crosswalk 23.9		
West Crosswalk 0.0	West Crosswalk 26.7		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 30 sq.ft./ped.	*North Crosswalk* 31 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* 17 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* C		
West Crosswalk ####	*West Crosswalk* D		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2006 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 38.9 sq.ft./ped.	*Pedestrian Space* 51.4 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 25.6	North Crosswalk 23.9		
East Crosswalk 35.5	East Crosswalk 26.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 30 sq.ft./ped.	*North Crosswalk* 31 sq.ft./ped.		
East Crosswalk 12 sq.ft./ped.	*East Crosswalk* 14 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* C		
East Crosswalk E	*East Crosswalk* E		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2006 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -10.5 sq.ft./ped.	*Pedestrian Space* -5.5 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 92.9	South Crosswalk 17.6		
West Crosswalk 0.0	West Crosswalk 26.7		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 7 sq.ft./ped.	*South Crosswalk* 43 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* 17 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* B		
West Crosswalk ####	*West Crosswalk* D		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -10.5 sq.ft./ped.	*Pedestrian Space* 470.5 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 92.9	South Crosswalk 17.6		
East Crosswalk 0.0	East Crosswalk 26.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 7 sq.ft./ped.	*South Crosswalk* 43 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 14 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* B		
East Crosswalk ####	*East Crosswalk* E		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 7: CHURCH STREET AT FULTON STREET
COMPARISON OF 2025 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2006 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -18.9 sq.ft./ped.	*Pedestrian Space* -8.1 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 26.0	North Crosswalk 55.2		
West Crosswalk 0.0	West Crosswalk 53.1		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 30 sq.ft./ped.	*North Crosswalk* 14 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* 8 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* E		
West Crosswalk ####	*West Crosswalk* E		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2006 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 44.4 sq.ft./ped.	*Pedestrian Space* 34.8 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 26.0	North Crosswalk 55.2		
East Crosswalk 33.3	East Crosswalk 24.6		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 30 sq.ft./ped.	*North Crosswalk* 14 sq.ft./ped.		
East Crosswalk 13 sq.ft./ped.	*East Crosswalk* 15 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* E		
East Crosswalk E	*East Crosswalk* D		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2006 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -19.4 sq.ft./ped.	*Pedestrian Space* #### sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* ####		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 28.5	South Crosswalk 0.0		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 23 sq.ft./ped.	*South Crosswalk* #### sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk D	*South Crosswalk* ####		
West Crosswalk ####	*West Crosswalk* ####		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -19.4 sq.ft./ped.	*Pedestrian Space* 413.9 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 28.5	South Crosswalk 28.5		
East Crosswalk 0.0	East Crosswalk 24.6		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 23 sq.ft./ped.	*South Crosswalk* 26 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 15 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk D	*South Crosswalk* C		
East Crosswalk ####	*East Crosswalk* D		

NOTE: Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 7: CHURCH STREET AT FULTON STREET
COMPARISON OF 2025 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2006 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -24.0 sq.ft./ped.	*Pedestrian Space* -10.9 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 24.6	North Crosswalk 24.1		
West Crosswalk 0.0	West Crosswalk 25.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 31 sq.ft./ped.	*North Crosswalk* 31 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* 18 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* C		
West Crosswalk ####	*West Crosswalk* D		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2006 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 34.1 sq.ft./ped.	*Pedestrian Space* 46.8 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 24.6	North Crosswalk 24.1		
East Crosswalk 47.8	East Crosswalk 36.6		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 31 sq.ft./ped.	*North Crosswalk* 31 sq.ft./ped.		
East Crosswalk 9 sq.ft./ped.	*East Crosswalk* 10 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* C		
East Crosswalk E	*East Crosswalk* E		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2006 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -19.5 sq.ft./ped.	*Pedestrian Space* #### sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* ####		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 82.1	South Crosswalk 0.0		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 8 sq.ft./ped.	*South Crosswalk* #### sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* ####		
West Crosswalk ####	*West Crosswalk* ####		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2006 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -19.5 sq.ft./ped.	*Pedestrian Space* 335.8 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* A		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 82.1	South Crosswalk 25.8		
East Crosswalk 0.0	East Crosswalk 36.6		
Surge Pedestrian Spece	*Surge Pedestrian Space*		
South Crosswalk 8 sq.ft./ped.	*South Crosswalk* 29 sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* 10 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* C		
East Crosswalk ####	*East Crosswalk* E		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 8: CHURCH STREET AT DEY STREET
COMPARISON OF 2025 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -10.7 sq.ft./ped.	*Pedestrian Space -4.4 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 92.3	North Crosswalk 19.0		
West Crosswalk 0.0	West Crosswalk 0.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 9 sq.ft./ped.	*North Crosswalk 39 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 0 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk C*		
West Crosswalk ####	*West Crosswalk F*		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 15.8 sq.ft./ped.	*Pedestrian Space -13.0 sq.ft./ped.*		
Pedestrian LOS D	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 92.3	North Crosswalk 19.1		
East Crosswalk 24.6	East Crosswalk 17.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 9 sq.ft./ped.	*North Crosswalk 39 sq.ft./ped.*		
East Crosswalk 16 sq.ft./ped.	*East Crosswalk 28 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk C*		
East Crosswalk D	*East Crosswalk C*		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -9.1 sq.ft./ped.	*Pedestrian Space -7.1 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 59.0	South Crosswalk 19.6		
West Crosswalk 0.0	West Crosswalk 0.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 10 sq.ft./ped.	*South Crosswalk 50 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 0 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk B*		
West Crosswalk ####	*West Crosswalk F*		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 23.2 sq.ft./ped.	*Pedestrian Space 86.1 sq.ft./ped.*		
Pedestrian LOS D	*Pedestrian LOS B*		
CROSSWALK ANALYSIS:	**CORSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 59.0	South Crosswalk 19.6		
East Crosswalk 24.6	East Crosswalk 17.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 10 sq.ft./ped.	*South Crosswalk 50 sq.ft./ped.*		
East Crosswalk 15 sq.ft./ped.	*East Crosswalk 28 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk B*		
East Crosswalk E	*East Crosswalk C*		

NOTE: ▒ Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 8: CHURCH STREET AT DEY STREET
COMPARISON OF 2025 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -14.9 sq.ft./ped.	*Pedestrian Space -13.6 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *53.1*	North Crosswalk *30.3*		
West Crosswalk *0.0*	West Crosswalk *0.2*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 15 sq.ft./ped.	*North Crosswalk 24 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 0 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk D	*North Crosswalk C*		
West Crosswalk ####	*West Crosswalk F*		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 30.3 sq.ft./ped.	*Pedestrian Space -10.0 sq.ft./ped.*		
Pedestrian LOS C	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *53.1*	North Crosswalk *30.4*		
East Crosswalk *28.9*	East Crosswalk *19.0*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 15 sq.ft./ped.	*North Crosswalk 25 sq.ft./ped.*		
East Crosswalk 13 sq.ft./ped.	*East Crosswalk 26 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk D	*North Crosswalk C*		
East Crosswalk E	*East Crosswalk C*		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -16.6 sq.ft./ped.	*Pedestrian Space -15.4 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *44.8*	South Crosswalk *36.6*		
West Crosswalk *0.0*	West Crosswalk *0.2*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 13 sq.ft./ped.	*South Crosswalk 27 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 0 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk C*		
West Crosswalk ####	*West Crosswalk F*		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 29.3 sq.ft./ped.	*Pedestrian Space 61.1 sq.ft./ped.*		
Pedestrian LOS C	*Pedestrian LOS B*		
CROSSWALK ANALYSIS:	**CORSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *44.8*	South Crosswalk *36.6*		
East Crosswalk *28.9*	East Crosswalk *19.0*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 13 sq.ft./ped.	*South Crosswalk 27 sq.ft./ped.*		
East Crosswalk 12 sq.ft./ped.	*East Crosswalk 26 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk C*		
East Crosswalk E	*East Crosswalk C*		

NOTE: ▒▒ Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 8: CHURCH STREET AT DEY STREET
COMPARISON OF 2025 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -14.6 sq.ft./ped.	*Pedestrian Space* -19.3 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 82.8	North Crosswalk 21.7		
West Crosswalk 0.0	West Crosswalk 0.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 10 sq.ft./ped.	*North Crosswalk* 34 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* 0 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* C		
West Crosswalk ####	*West Crosswalk* F		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 20.6 sq.ft./ped.	*Pedestrian Space* -5.2 sq.ft./ped.		
Pedestrian LOS D	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 82.8	North Crosswalk 21.7		
East Crosswalk 29.6	East Crosswalk 21.9		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 10 sq.ft./ped.	*North Crosswalk* 35 sq.ft./ped.		
East Crosswalk 13 sq.ft./ped.	*East Crosswalk* 23 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* C		
East Crosswalk E	*East Crosswalk* D		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -23.5 sq.ft./ped.	*Pedestrian Space* -16.5 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 49.4	South Crosswalk 29.7		
West Crosswalk 0.0	West Crosswalk 0.8		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 12 sq.ft./ped.	*South Crosswalk* 33 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* 0 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* C		
West Crosswalk ####	*West Crosswalk* F		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 29.2 sq.ft./ped.	*Pedestrian Space* 63.0 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CORSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 49.4	South Crosswalk 29.7		
East Crosswalk 29.6	East Crosswalk 21.9		
Surge Pedestrien Space	*Surge Pedestrian Space*		
South Crosswalk 12 sq.ft./ped.	*South Crosswalk* 33 sq.ft./ped.		
East Crosswalk 12 sq.ft./ped.	*East Crosswalk* 23 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk* C		
East Crosswalk E	*East Crosswalk* D		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 9: CHURCH STREET AT CORTLANDT STREET
COMPARISON OF 2025 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -7.4 sq.ft./ped.	*Pedestrian Space* -6.1 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 17.5	North Crosswalk 25.9		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 45 sq.ft./ped.	*North Crosswalk* 25 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* C		
West Crosswalk ####	*West Crosswalk* ####		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 85.7 sq.ft./ped.	*Pedestrian Space* 97.0 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 18.8	North Crosswalk 25.9		
East Crosswalk 14.3	East Crosswalk 11.3		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 41 sq.ft./ped.	*North Crosswalk* 25 sq.ft./ped.		
East Crosswalk 40 sq.ft./ped.	*East Crosswalk* 44 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk B	*North Crosswalk* C		
East Crosswalk C	*East Crosswalk* B		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -7.8 sq.ft./ped.	*Pedestrian Space* -5.7 sq.ft./ped.		
Pedestrian LOS F	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 14.1	South Crosswalk 15.0		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 36 sq.ft./ped.	*South Crosswalk* 60 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* B		
West Crosswalk ####	*West Crosswalk* ####		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 116.1 sq.ft./ped.	*Pedestrian Space* -10.7 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 14.1	South Crosswalk 15.0		
East Crosswalk 14.3	East Crosswalk 11.3		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 36 sq.ft./ped.	*South Crosswalk* 60 sq.ft./ped.		
East Crosswalk 40 sq.ft./ped.	*East Crosswalk* 44 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk* B		
East Crosswalk C	*East Crosswalk* B		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 9: CHURCH STREET AT CORTLANDT STREET
COMPARISON OF 2025 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -10.7 sq.ft./ped.	*Pedestrian Space -12.9 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *27.2*	North Crosswalk *41.1*		
West Crosswalk *0.0*	West Crosswalk *0.0*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 29 sq.ft./ped.	*North Crosswalk 16 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk D*		
West Crosswalk ####	*West Crosswalk ####*		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 36.0 sq.ft./ped.	*Pedestrian Space 53.2 sq.ft./ped.*		
Pedestrian LOS C	*Pedestrian LOS B*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *27.2*	North Crosswalk *41.1*		
East Crosswalk *42.2*	East Crosswalk *24.7*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 29 sq.ft./ped.	*North Crosswalk 16 sq.ft./ped.*		
East Crosswalk 13 sq.ft./ped.	*East Crosswalk 20 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk D*		
East Crosswalk E	*East Crosswalk D*		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -11.6 sq.ft./ped.	*Pedestrian Space -14.5 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *36.7*	South Crosswalk *28.4*		
West Crosswalk *0.0*	West Crosswalk *0.0*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 14 sq.ft./ped.	*South Crosswalk 32 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk C*		
West Crosswalk ####	*West Crosswalk ####*		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 35.3 sq.ft./ped.	*Pedestrian Space -8.3 sq.ft./ped.*		
Pedestrian LOS C	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *36.7*	South Crosswalk *28.4*		
East Crosswalk *42.2*	East Crosswalk *24.7*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 14 sq.ft./ped.	*South Crosswalk 32 sq.ft./ped.*		
East Crosswalk 13 sq.ft./ped.	*East Crosswalk 20 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk E	*South Crosswalk C*		
East Crosswalk E	*East Crosswalk D*		

NOTE: Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 9: CHURCH STREET AT CORTLANDT STREET
COMPARISON OF 2025 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -10.8 sq.ft./ped.	*Pedestrian Space -14.1 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *19.5*	North Crosswalk *38.3*		
West Crosswalk *0.0*	West Crosswalk *0.0*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 40 sq.ft./ped.	*North Crosswalk 17 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk D*		
West Crosswalk ####	*West Crosswalk ####*		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 44.6 sq.ft./ped.	*Pedestrian Space 56.3 sq.ft./ped.*		
Pedestrian LOS B	*Pedestrian LOS B*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *19.5*	North Crosswalk *38.3*		
East Crosswalk *38.7*	East Crosswalk *25.3*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 40 sq.ft./ped.	*North Crosswalk 17 sq.ft./ped.*		
East Crosswalk 15 sq.ft./ped.	*East Crosswalk 20 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk D*		
East Crosswalk E	*East Crosswalk D*		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space -11.3 sq.ft./ped.	*Pedestrian Space -15.5 sq.ft./ped.*		
Pedestrian LOS F	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *19.3*	South Crosswalk *20.5*		
West Crosswalk *0.0*	West Crosswalk *0.0*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 26 sq.ft./ped.	*South Crosswalk 44 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk B*		
West Crosswalk ####	*West Crosswalk ####*		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space 48.1 sq.ft./ped.	*Pedestrian Space -8.9 sq.ft./ped.*		
Pedestrian LOS B	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *19.3*	South Crosswalk *20.5*		
East Crosswalk *38.7*	East Crosswalk *25.3*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 26 sq.ft./ped.	*South Crosswalk 44 sq.ft./ped.*		
East Crosswalk 15 sq.ft./ped.	*East Crosswalk 20 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk C	*South Crosswalk B*		
East Crosswalk E	*East Crosswalk D*		

NOTE: Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 10: CHURCH STREET AT LIBERTY STREET
COMPARISON OF 2025 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 23.8 sq.ft./ped.	Pedestrian Space 0.0 sq.ft./ped.		
Pedestrian LOS D	Pedestrian LOS F		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 112.2	North Crosswalk 134.8		
West Crosswalk 128.5	West Crosswalk 92.2		
Surge Pedestrian Space	Surge Pedestrian Space		
North Crosswalk 7 sq.ft./ped.	North Crosswalk 5 sq.ft./ped.		
West Crosswalk 5 sq.ft./ped.	West Crosswalk 6 sq.ft./ped.		
Surge Pedestrian LOS	Surge Pedestrian LOS		
North Crosswalk E	North Crosswalk F		
West Crosswalk F	West Crosswalk F		

2025 PRE 9/11 CONDITIONS Northeast Corner	2025 POST 9/11 CONDITIONS Northeast Corner	2025 MITIGATED CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 21.8 sq.ft./ped.	Pedestrian Space -6.7 sq.ft./ped.		
Pedestrian LOS D	Pedestrian LOS F		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 112.2	North Crosswalk 134.8		
East Crosswalk 6.7	East Crosswalk 23.6		
Surge Pedestrian Space	Surge Pedestrian Space		
North Crosswalk 7 sq.ft./ped.	North Crosswalk 5 sq.ft./ped.		
East Crosswalk 99 sq.ft./ped.	East Crosswalk 25 sq.ft./ped.		
Surge Pedestrian LOS	Surge Pedestrian LOS		
North Crosswalk E	North Crosswalk F		
East Crosswalk B	East Crosswalk C		

2025 PRE 9/11 CONDITIONS Southwest Corner	2025 POST 9/11 CONDITIONS Southwest Corner	2025 MITIGATED CONDITIONS Southwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space -2.5 sq.ft./ped.	Pedestrian Space 37.6 sq.ft./ped.		
Pedestrian LOS F	Pedestrian LOS C		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 117.1	South Crosswalk 38.0		
West Crosswalk 128.5	West Crosswalk 92.2		
Surge Pedestrian Space	Surge Pedestrian Space		
South Crosswalk 8 sq.ft./ped.	South Crosswalk 18 sq.ft./ped.		
West Crosswalk 5 sq.ft./ped.	West Crosswalk 6 sq.ft./ped.		
Surge Pedestrian LOS	Surge Pedestrian LOS		
South Crosswalk E	South Crosswalk D		
West Crosswalk F	West Crosswalk F		

2025 PRE 9/11 CONDITIONS Southeast Corner	2025 POST 9/11 CONDITIONS Southeast Corner	2025 MITIGATED CONDITIONS Southeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 29.1 sq.ft./ped.	Pedestrian Space -8.2 sq.ft./ped.		
Pedestrian LOS C	Pedestrian LOS F		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 117.1	South Crosswalk 38.0		
East Crosswalk 6.7	East Crosswalk 23.6		
Surge Pedestrian Space	Surge Pedestrian Space		
South Crosswalk 8 sq.ft./ped.	South Crosswalk 18 sq.ft./ped.		
East Crosswalk 99 sq.ft./ped.	East Crosswalk 25 sq.ft./ped.		
Surge Pedestrian LOS	Surge Pedestrian LOS		
South Crosswalk E	South Crosswalk D		
East Crosswalk B	East Crosswalk C		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 10: CHURCH STREET AT LIBERTY STREET
COMPARISON OF 2025 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 98.4 sq.ft./ped.	*Pedestrian Space* 38.3 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* C		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 58.3	North Crosswalk 48.1		
West Crosswalk 33.3	West Crosswalk 21.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 13 sq.ft./ped.	*North Crosswalk* 14 sq.ft./ped.		
West Crosswalk 20 sq.ft./ped.	*West Crosswalk* 25 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk E	*North Crosswalk* E		
West Crosswalk D	*West Crosswalk* C		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 28.4 sq.ft./ped.	*Pedestrian Space* -11.1 sq.ft./ped.		
Pedestrian LOS C	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 27.1	North Crosswalk 48.1		
East Crosswalk 45.4	East Crosswalk 9.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk 28 sq.ft./ped.	*North Crosswalk* 14 sq.ft./ped.		
East Crosswalk 15 sq.ft./ped.	*East Crosswalk* 66 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk C	*North Crosswalk* E		
East Crosswalk E	*East Crosswalk* B		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 22.3 sq.ft./ped.	*Pedestrian Space* 122.5 sq.ft./ped.		
Pedestrian LOS D	*Pedestrian LOS* B		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 20.3	South Crosswalk 21.8		
West Crosswalk 33.3	West Crosswalk 21.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 44 sq.ft./ped.	*South Crosswalk* 31 sq.ft./ped.		
West Crosswalk 20 sq.ft./ped.	*West Crosswalk* 25 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* C		
West Crosswalk D	*West Crosswalk* C		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 100.3 sq.ft./ped.	*Pedestrian Space* -9.0 sq.ft./ped.		
Pedestrian LOS B	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 20.3	South Crosswalk 21.8		
East Crosswalk 11.8	East Crosswalk 9.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk 44 sq.ft./ped.	*South Crosswalk* 31 sq.ft./ped.		
East Crosswalk 56 sq.ft./ped.	*East Crosswalk* 66 sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk B	*South Crosswalk* C		
East Crosswalk B	*East Crosswalk* B		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 10: CHURCH STREET AT LIBERTY STREET
COMPARISON OF 2025 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED BUILD PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 49.3 sq.ft./ped.	Pedestrian Space 17.5 sq.ft./ped.		
Pedestrian LOS B	Pedestrian LOS D		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 147.2	North Crosswalk 88.8		
West Crosswalk 47.5	West Crosswalk 52.5		
Surge Pedestrian Space	Surge Pedestrian Space		
North Crosswalk 5 sq.ft./ped.	North Crosswalk 8 sq.ft./ped.		
West Crosswalk 14 sq.ft./ped.	West Crosswalk 10 sq.ft./ped.		
Surge Pedestrian LOS	Surge Pedestrian LOS		
North Crosswalk F	North Crosswalk E		
West Crosswalk E	West Crosswalk E		

2025 PRE 9/11 CONDITIONS Northeast Corner	2025 POST 9/11 CONDITIONS Northeast Corner	2025 MITIGATED CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 33.4 sq.ft./ped.	Pedestrian Space -12.6 sq.ft./ped.		
Pedestrian LOS C	Pedestrian LOS F		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
North Crosswalk 19.5	North Crosswalk 88.8		
East Crosswalk 41.6	East Crosswalk 27.1		
Surge Pedestrian Space	Surge Pedestrian Space		
North Crosswalk 39 sq.ft./ped.	North Crosswalk 8 sq.ft./ped.		
East Crosswalk 16 sq.ft./ped.	East Crosswalk 22 sq.ft./ped.		
Surge Pedestrian LOS	Surge Pedestrian LOS		
North Crosswalk C	North Crosswalk E		
East Crosswalk D	East Crosswalk D		

2025 PRE 9/11 CONDITIONS Southwest Corner	2025 POST 9/11 CONDITIONS Southwest Corner	2025 MITIGATED CONDITIONS Southwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 12.3 sq.ft./ped.	Pedestrian Space 56.9 sq.ft./ped.		
Pedestrian LOS E	Pedestrian LOS B		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 40.2	South Crosswalk 26.2		
West Crosswalk 47.5	West Crosswalk 52.5		
Surge Pedestrian Space	Surge Pedestrian Space		
South Crosswalk 22 sq.ft./ped.	South Crosswalk 26 sq.ft./ped.		
West Crosswalk 14 sq.ft./ped.	West Crosswalk 10 sq.ft./ped.		
Surge Pedestrian LOS	Surge Pedestrian LOS		
South Crosswalk D	South Crosswalk C		
West Crosswalk E	West Crosswalk E		

2025 PRE 9/11 CONDITIONS Southeast Corner	2025 POST 9/11 CONDITIONS Southeast Corner	2025 MITIGATED CONDITIONS Southeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	CORNER ANALYSIS:		
Pedestrian Space 38.3 sq.ft./ped.	Pedestrian Space -8.9 sq.ft./ped.		
Pedestrian LOS C	Pedestrian LOS F		
CROSSWALK ANALYSIS:	CROSSWALK ANALYSIS:		
Maximum Surge	Maximum Surge		
South Crosswalk 40.2	South Crosswalk 26.2		
East Crosswalk 25.5	East Crosswalk 27.1		
Surge Pedestrian Space	Surge Pedestrian Space		
South Crosswalk 22 sq.ft./ped.	South Crosswalk 26 sq.ft./ped.		
East Crosswalk 26 sq.ft./ped.	East Crosswalk 22 sq.ft./ped.		
Surge Pedestrian LOS	Surge Pedestrian LOS		
South Crosswalk D	South Crosswalk C		
East Crosswalk C	East Crosswalk D		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 11: GREENWICH STREET AT FULTON STREET
COMPARISON OF 2025 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space ### sq.ft./ped.	*Pedestrian Space -5.8 sq.ft./ped.*		
Pedestrian LOS ###	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 29.3		
West Crosswalk 0.0	West Crosswalk 49.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk ### sq.ft./ped.	*North Crosswalk 23 sq.ft./ped.*		
West Crosswalk 0 sq.ft./ped.	*West Crosswalk 9 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ###	*North Crosswalk D*		
West Crosswalk ###	*West Crosswalk E*		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space ### sq.ft./ped.	*Pedestrian Space 30.9 sq.ft./ped.*		
Pedestrian LOS ###	*Pedestrian LOS C*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 29.3		
East Crosswalk 0.0	East Crosswalk 51.3		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk ### sq.ft./ped.	*North Crosswalk 23 sq.ft./ped.*		
East Crosswalk ### sq.ft./ped.	*East Crosswalk 9 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ###	*North Crosswalk D*		
East Crosswalk ###	*East Crosswalk E*		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space ### sq.ft./ped.	*Pedestrian Space -8.4 sq.ft./ped.*		
Pedestrian LOS ###	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 36.1		
West Crosswalk 0.0	West Crosswalk 49.5		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk ### sq.ft./ped.	*South Crosswalk 19 sq.ft./ped.*		
West Crosswalk ### sq.ft./ped.	*West Crosswalk 9 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ###	*South Crosswalk D*		
West Crosswalk ###	*West Crosswalk E*		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space ### sq.ft./ped.	*Pedestrian Space 237.6 sq.ft./ped.*		
Pedestrian LOS ###	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 36.1		
East Crosswalk 0.0	East Crosswalk 51.3		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk ### sq.ft./ped.	*South Crosswalk 19 sq.ft./ped.*		
East Crosswalk ### sq.ft./ped.	*East Crosswalk 9 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ###	*South Crosswalk D*		
East Crosswalk ###	*East Crosswalk E*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 11: GREENWICH STREET AT FULTON STREET
COMPARISON OF 2025 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space -7.6 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 76.1		
West Crosswalk 0.0	West Crosswalk 91.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 9 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 5 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk E*		
West Crosswalk ####	*West Crosswalk F*		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space 11.3 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS E*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 76.1		
East Crosswalk 0.0	East Crosswalk 91.3		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 9 sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk 5 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk E*		
East Crosswalk ####	*East Crosswalk F*		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space -8.1 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 69.7		
West Crosswalk 0.0	West Crosswalk 91.4		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk 10 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 5 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk E*		
West Crosswalk ####	*West Crosswalk F*		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space 126.3 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS B*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 69.7		
East Crosswalk 0.0	East Crosswalk 91.3		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk 10 sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk 5 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk E*		
East Crosswalk ####	*East Crosswalk F*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 11: GREENWICH STREET AT FULTON STREET
COMPARISON OF 2025 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space -9.4 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *0.0*	North Crosswalk *36.5*		
West Crosswalk *0.0*	West Crosswalk *61.8*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 18 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 7 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk D*		
West Crosswalk ####	*West Crosswalk E*		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space 30.1 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS C*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *0.0*	North Crosswalk *36.5*		
East Crosswalk *0.0*	East Crosswalk *49.4*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 18 sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk 9 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk D*		
East Crosswalk ####	*East Crosswalk E*		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space -5.8 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *0.0*	South Crosswalk *45.4*		
West Crosswalk *0.0*	West Crosswalk *61.8*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk 15 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk 7 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk E*		
West Crosswalk ####	*West Crosswalk E*		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space 222.9 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS A*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *0.0*	South Crosswalk *45.4*		
East Crosswalk *0.0*	East Crosswalk *49.4*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk 15 sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk 9 sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk E*		
East Crosswalk ####	*East Crosswalk E*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 12: GREENWICH STREET MIDBLOCK
COMPARISON OF 2025 AM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space -5.9 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *0.0*	North Crosswalk *31.2*		
West Crosswalk *0.0*	West Crosswalk *0.0*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 85 sq.ft./ped.*		
West Crosswalk 0 sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk B*		
West Crosswalk ####	*West Crosswalk ####*		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS ####*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *0.0*	North Crosswalk *0.0*		
East Crosswalk *0.0*	East Crosswalk *0.0*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk #### sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk ####*		
East Crosswalk ####	*East Crosswalk ####*		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS ####*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *0.0*	South Crosswalk *0.0*		
West Crosswalk *0.0*	West Crosswalk *0.0*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk #### sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk ####*		
West Crosswalk ####	*West Crosswalk ####*		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS ####*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *0.0*	South Crosswalk *0.0*		
East Crosswalk *0.0*	East Crosswalk *0.0*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk #### sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk ####*		
East Crosswalk ####	*East Crosswalk ####*		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 12: GREENWICH STREET MIDBLOCK
COMPARISON OF 2025 MD PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space* -12.8 sq.ft./ped.		
Pedestrian LOS ####	*Pedestrian LOS* F		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 40.4		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* 66 sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* B		
West Crosswalk ####	*West Crosswalk* ####		

2025 PRE 9/11 CONDITIONS Northeast Corner	2025 POST 9/11 CONDITIONS Northeast Corner	2025 MITIGATED CONDITIONS Northeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space* #### sq.ft./ped.		
Pedestrian LOS ####	*Pedestrian LOS* ####		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk 0.0	North Crosswalk 0.0		
East Crosswalk 0.0	East Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk* #### sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk* ####		
East Crosswalk ####	*East Crosswalk* ####		

2025 PRE 9/11 CONDITIONS Southwest Corner	2025 POST 9/11 CONDITIONS Southwest Corner	2025 MITIGATED CONDITIONS Southwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space* #### sq.ft./ped.		
Pedestrian LOS ####	*Pedestrian LOS* ####		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 0.0		
West Crosswalk 0.0	West Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* #### sq.ft./ped.		
West Crosswalk #### sq.ft./ped.	*West Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* ####		
West Crosswalk ####	*West Crosswalk* ####		

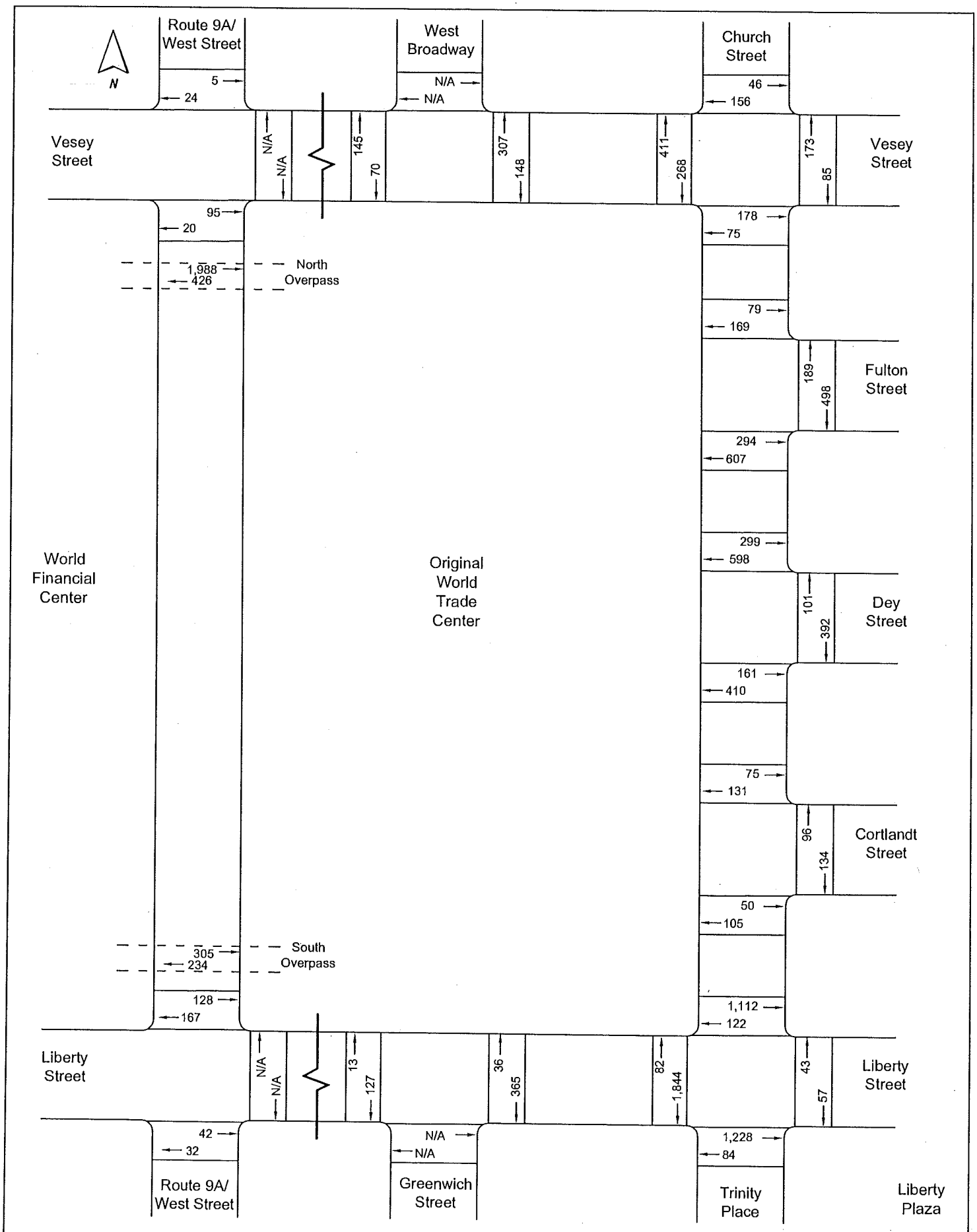
2025 PRE 9/11 CONDITIONS Southeast Corner	2025 POST 9/11 CONDITIONS Southeast Corner	2025 MITIGATED CONDITIONS Southeast Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space* #### sq.ft./ped.		
Pedestrian LOS ####	*Pedestrian LOS* ####		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk 0.0	South Crosswalk 0.0		
East Crosswalk 0.0	East Crosswalk 0.0		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk* #### sq.ft./ped.		
East Crosswalk #### sq.ft./ped.	*East Crosswalk* #### sq.ft./ped.		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk* ####		
East Crosswalk ####	*East Crosswalk* ####		

NOTE: [ ] Indicate Significant Impact.

PATH TERMINAL EIS
STREET CORNER & CROSSWALK ANALYSIS SUMMARY TABLE
LOCATION 12: GREENWICH STREET MIDBLOCK
COMPARISON OF 2025 PM PEAK HOUR PRE 9/11 vs. POST 9/11 vs. MITIGATED PEDESTRIAN LEVELS OF SERVICE

2025 PRE 9/11 CONDITIONS Northwest Corner	2025 POST 9/11 CONDITIONS Northwest Corner	2025 MITIGATED CONDITIONS Northwest Corner	MITIGATION MEASURES
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space -13.2 sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS F*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *0.0*	North Crosswalk *45.4*		
West Crosswalk *0.0*	West Crosswalk *0.0*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk 58 sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk B*		
West Crosswalk ####	*West Crosswalk ####*		
2025 PRE 9/11 CONDITIONS Northeast Corner	**2025 POST 9/11 CONDITIONS Northeast Corner**	**2025 MITIGATED CONDITIONS Northeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS ####*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
North Crosswalk *0.0*	North Crosswalk *0.0*		
East Crosswalk *0.0*	East Crosswalk *0.0*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
North Crosswalk #### sq.ft./ped.	*North Crosswalk #### sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
North Crosswalk ####	*North Crosswalk ####*		
East Crosswalk ####	*East Crosswalk ####*		
2025 PRE 9/11 CONDITIONS Southwest Corner	**2025 POST 9/11 CONDITIONS Southwest Corner**	**2025 MITIGATED CONDITIONS Southwest Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS ####*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *0.0*	South Crosswalk *0.0*		
West Crosswalk *0.0*	West Crosswalk *0.0*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk #### sq.ft./ped.*		
West Crosswalk #### sq.ft./ped.	*West Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk ####*		
West Crosswalk ####	*West Crosswalk ####*		
2025 PRE 9/11 CONDITIONS Southeast Corner	**2025 POST 9/11 CONDITIONS Southeast Corner**	**2025 MITIGATED CONDITIONS Southeast Corner**	**MITIGATION MEASURES**
CORNER ANALYSIS:	**CORNER ANALYSIS:**		
Pedestrian Space #### sq.ft./ped.	*Pedestrian Space #### sq.ft./ped.*		
Pedestrian LOS ####	*Pedestrian LOS ####*		
CROSSWALK ANALYSIS:	**CROSSWALK ANALYSIS:**		
Maximum Surge	Maximum Surge		
South Crosswalk *0.0*	South Crosswalk *0.0*		
East Crosswalk *0.0*	East Crosswalk *0.0*		
Surge Pedestrian Space	*Surge Pedestrian Space*		
South Crosswalk #### sq.ft./ped.	*South Crosswalk #### sq.ft./ped.*		
East Crosswalk #### sq.ft./ped.	*East Crosswalk #### sq.ft./ped.*		
Surge Pedestrian LOS	*Surge Pedestrian LOS*		
South Crosswalk ####	*South Crosswalk ####*		
East Crosswalk ####	*East Crosswalk ####*		

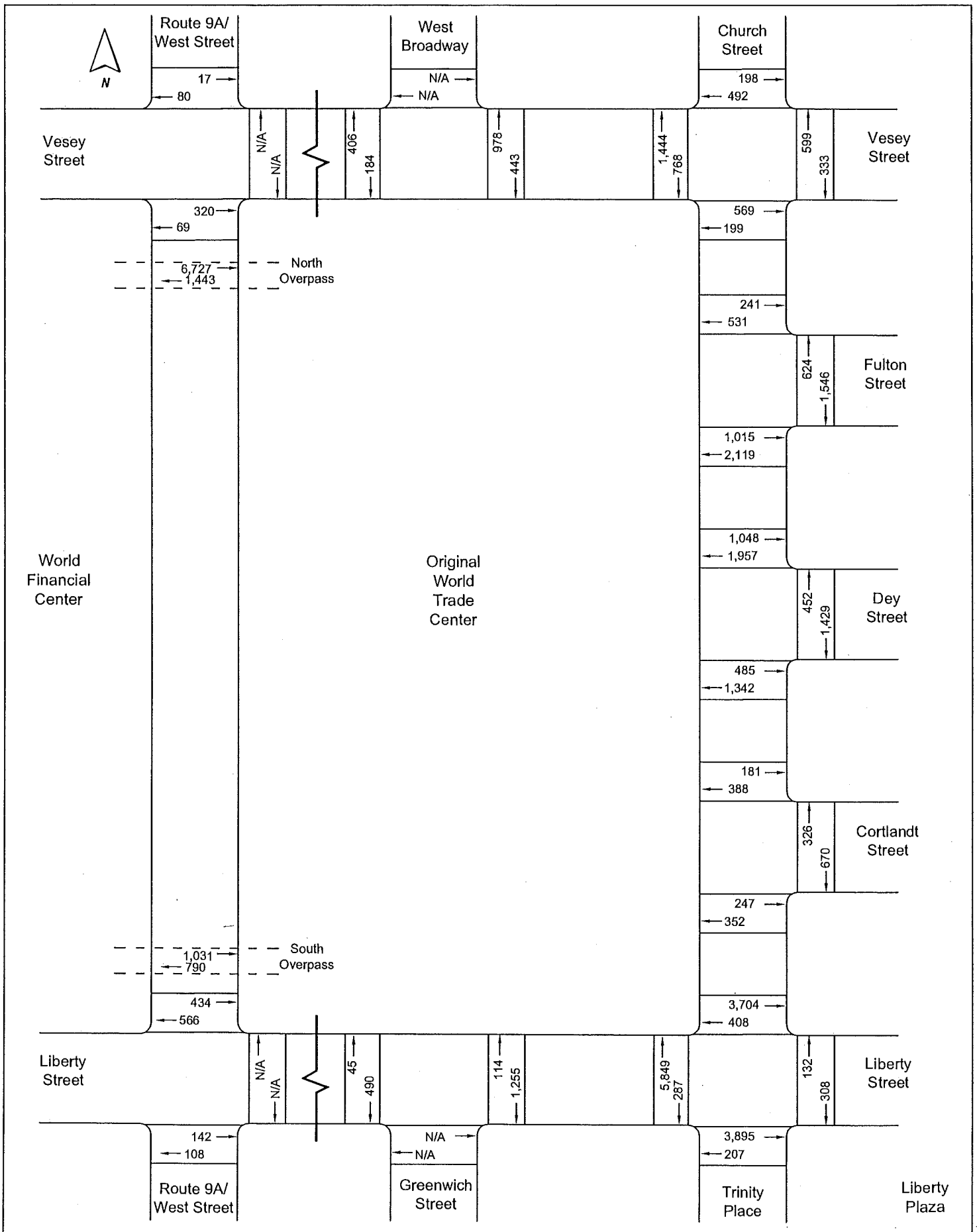
NOTE: [ ] Indicate Significant Impact.



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

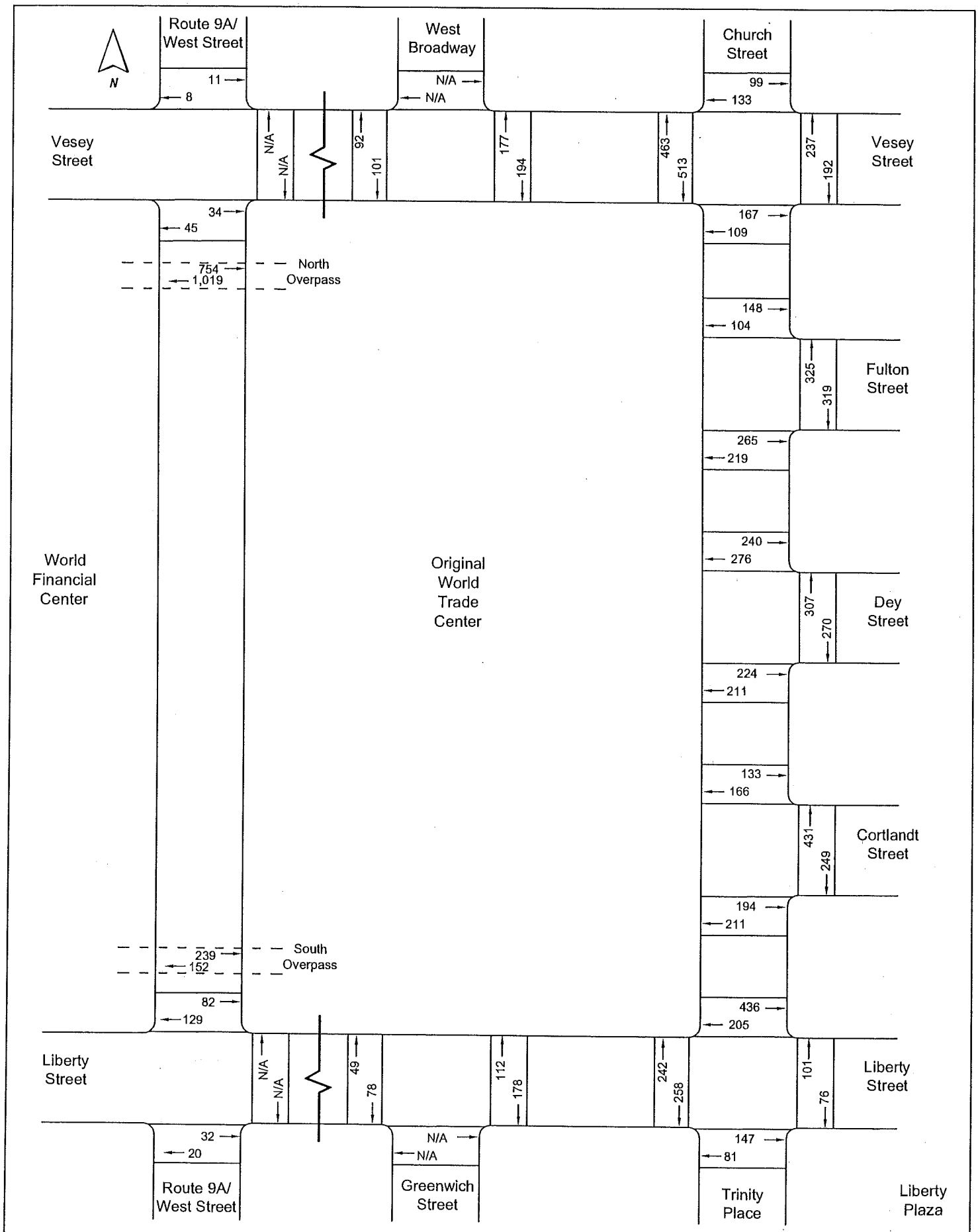
2000 Pre-9/11 Conditions
AM Peak 15-Minute Volumes
Figure 1



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

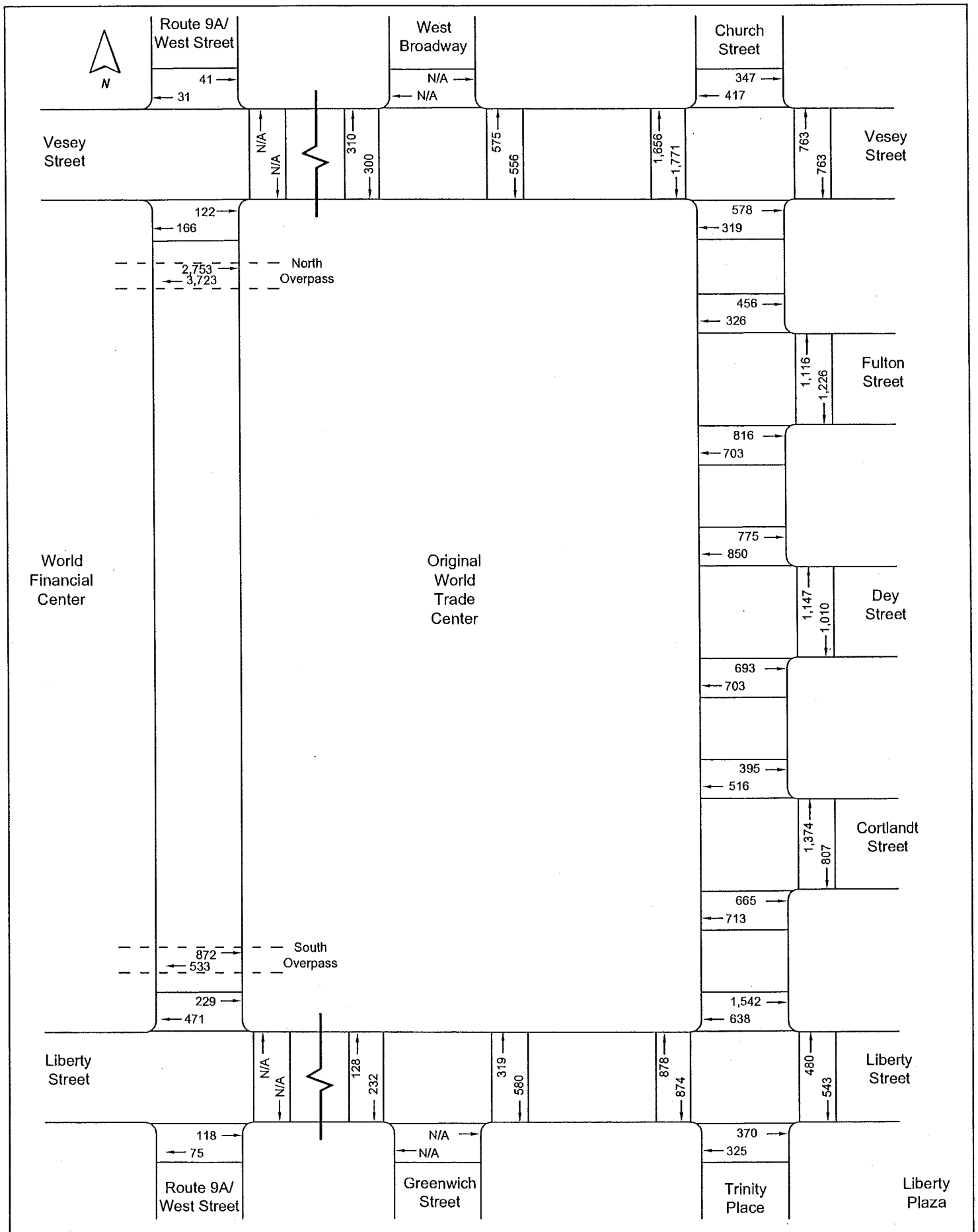
2000 Pre-9/11 Conditions
AM Peak Hour Volumes
Figure 2



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

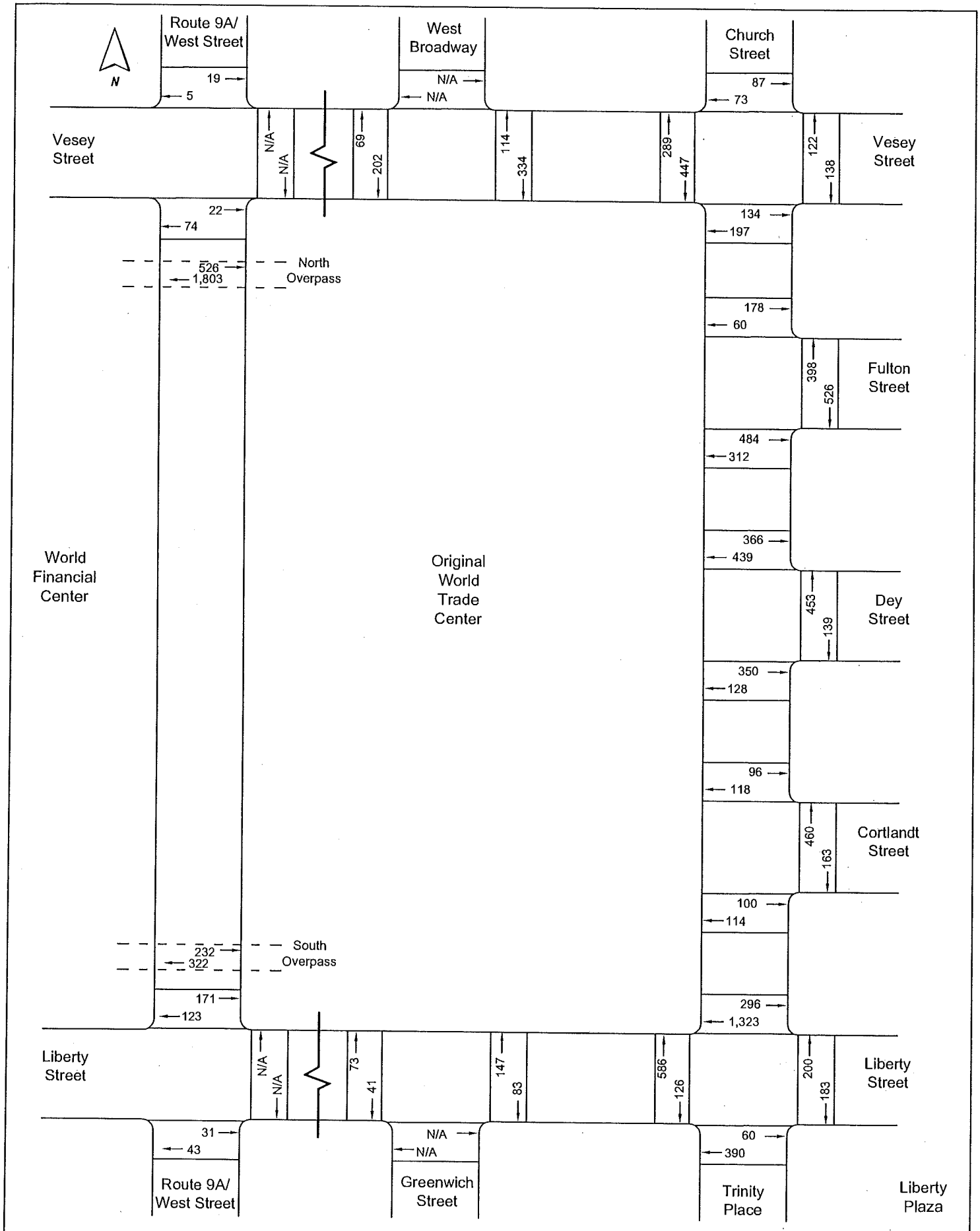
2000 Pre-9/11 Conditions
Midday Peak 15-Minute Volumes
Figure 3



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

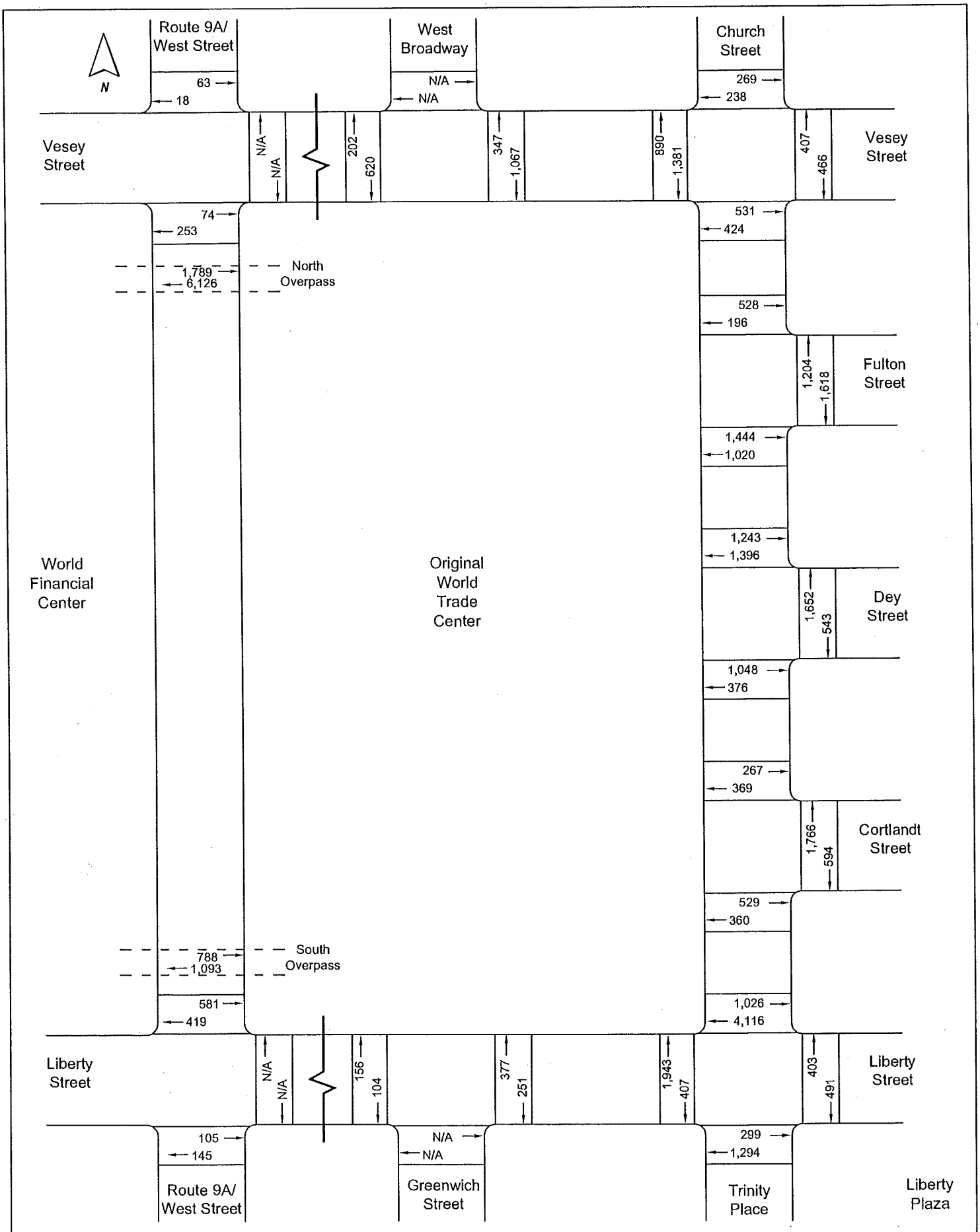
2000 Pre-9/11 Conditions
Midday Peak Hour Volumes
Figure 4



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

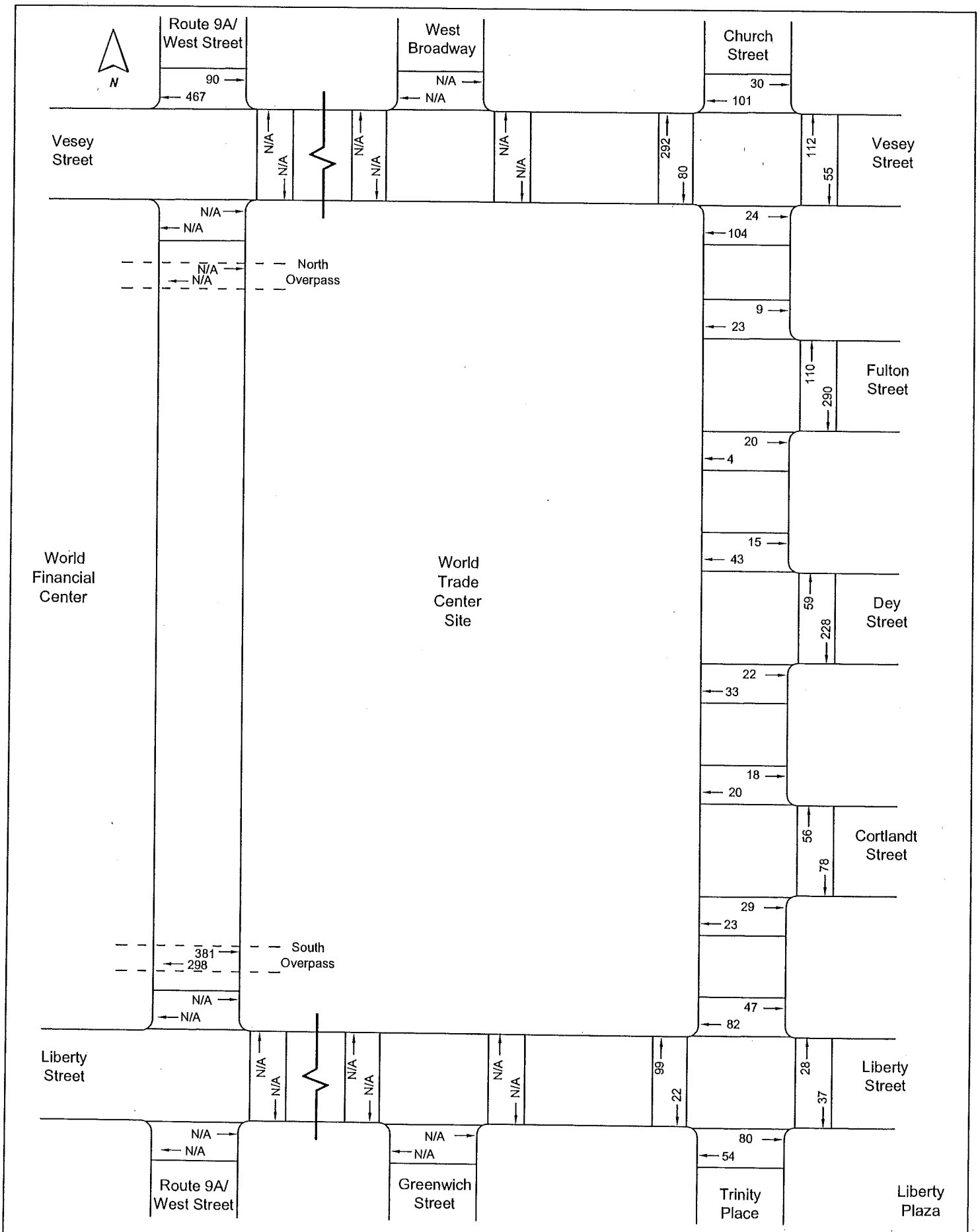
2000 Pre-9/11 Conditions
PM Peak 15-Minute Volumes
Figure 5



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

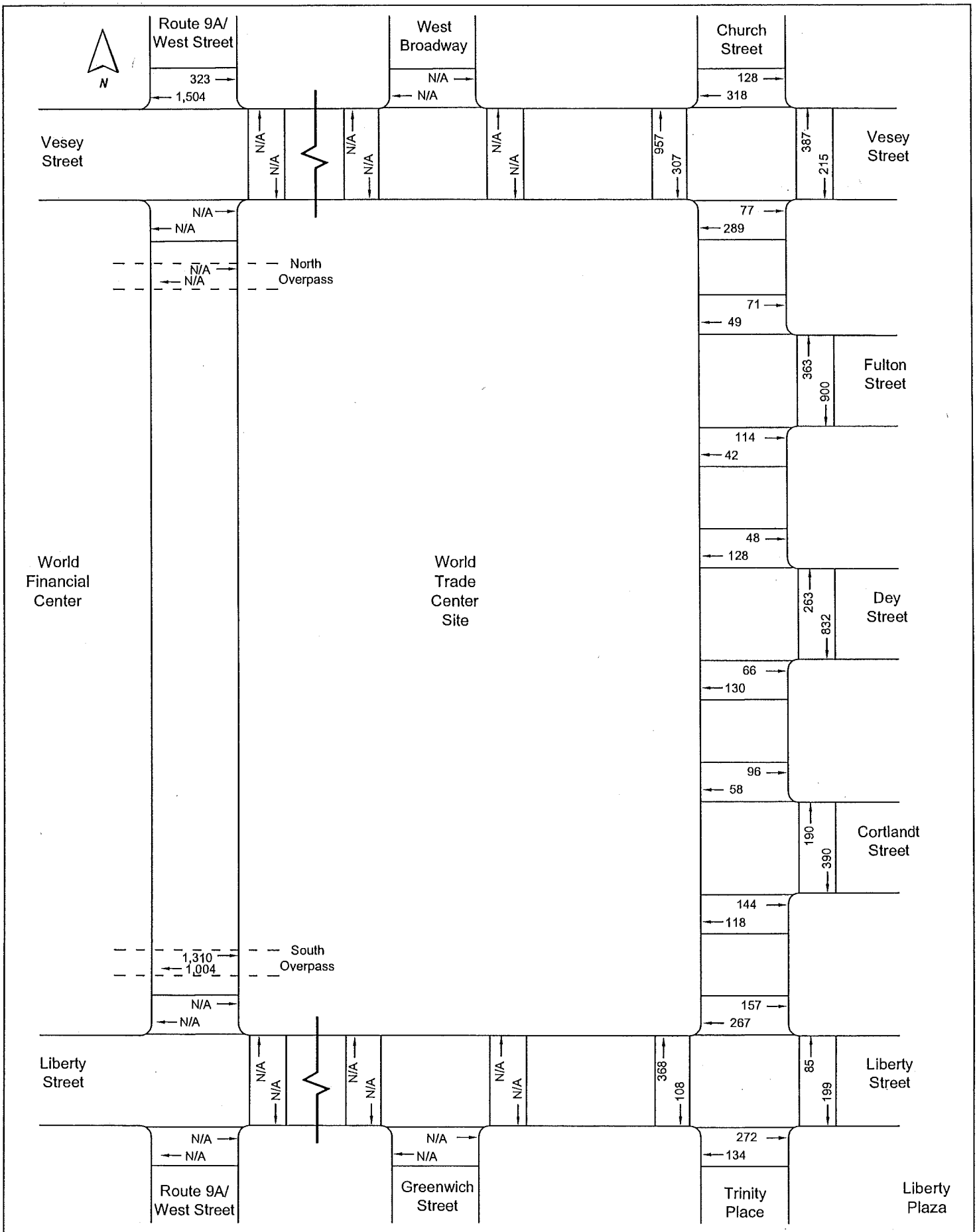
2000 Pre-9/11 Conditions
PM Peak Hour Volumes
Figure 6



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

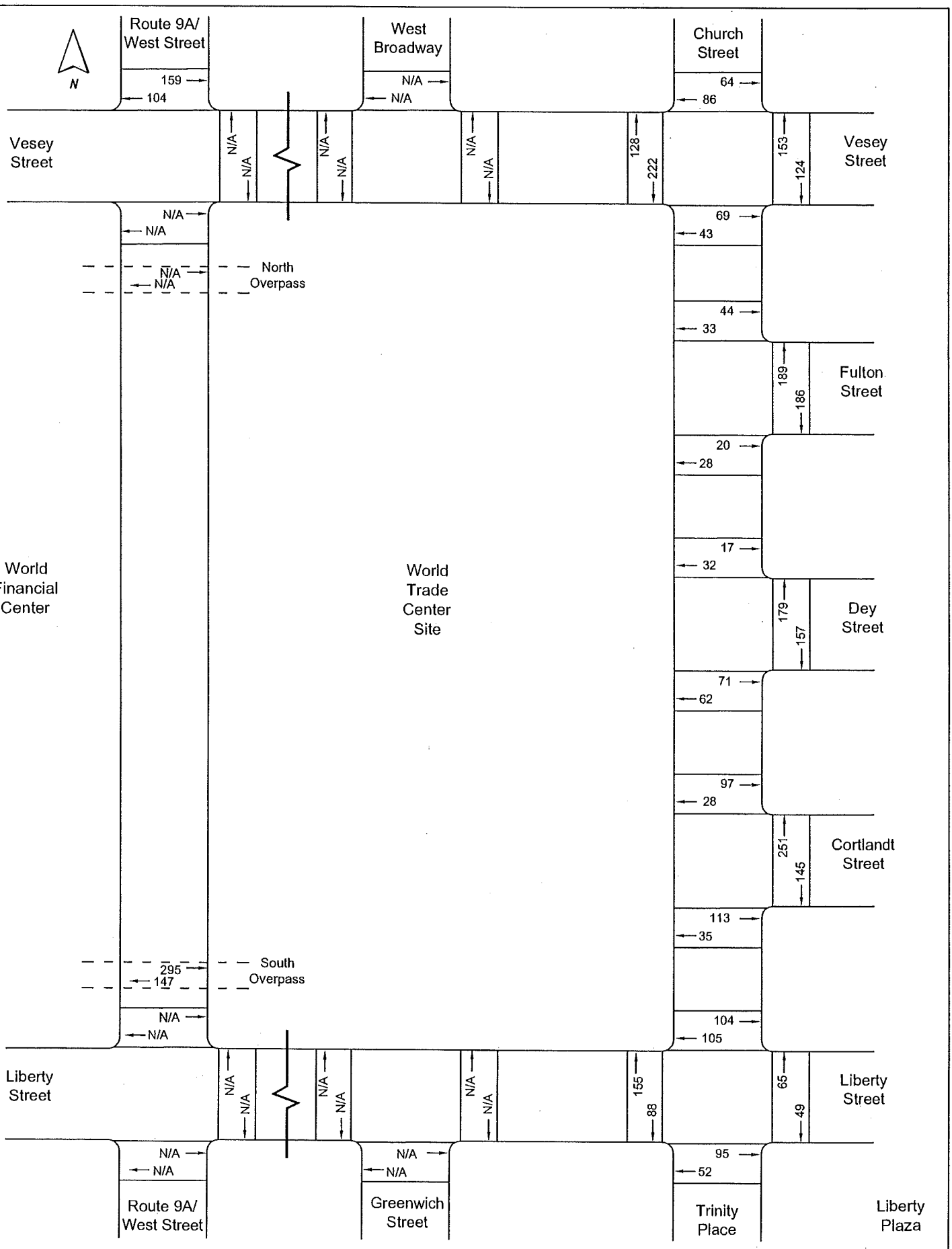
2003 Existing Conditions
AM Peak 15-Minute Volumes
Figure 7



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

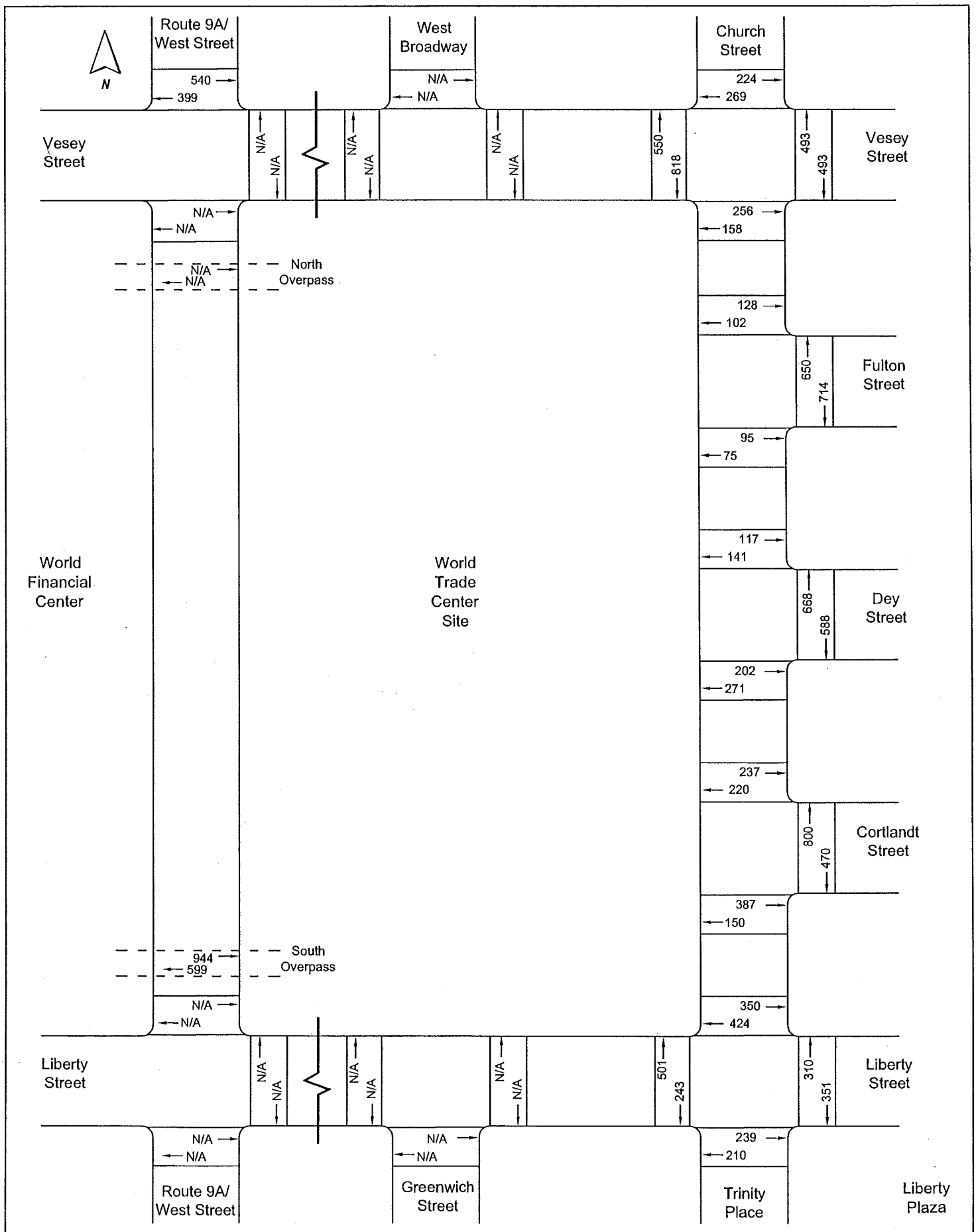
2003 Existing Conditions
AM Peak Hour Volumes
Figure 8



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

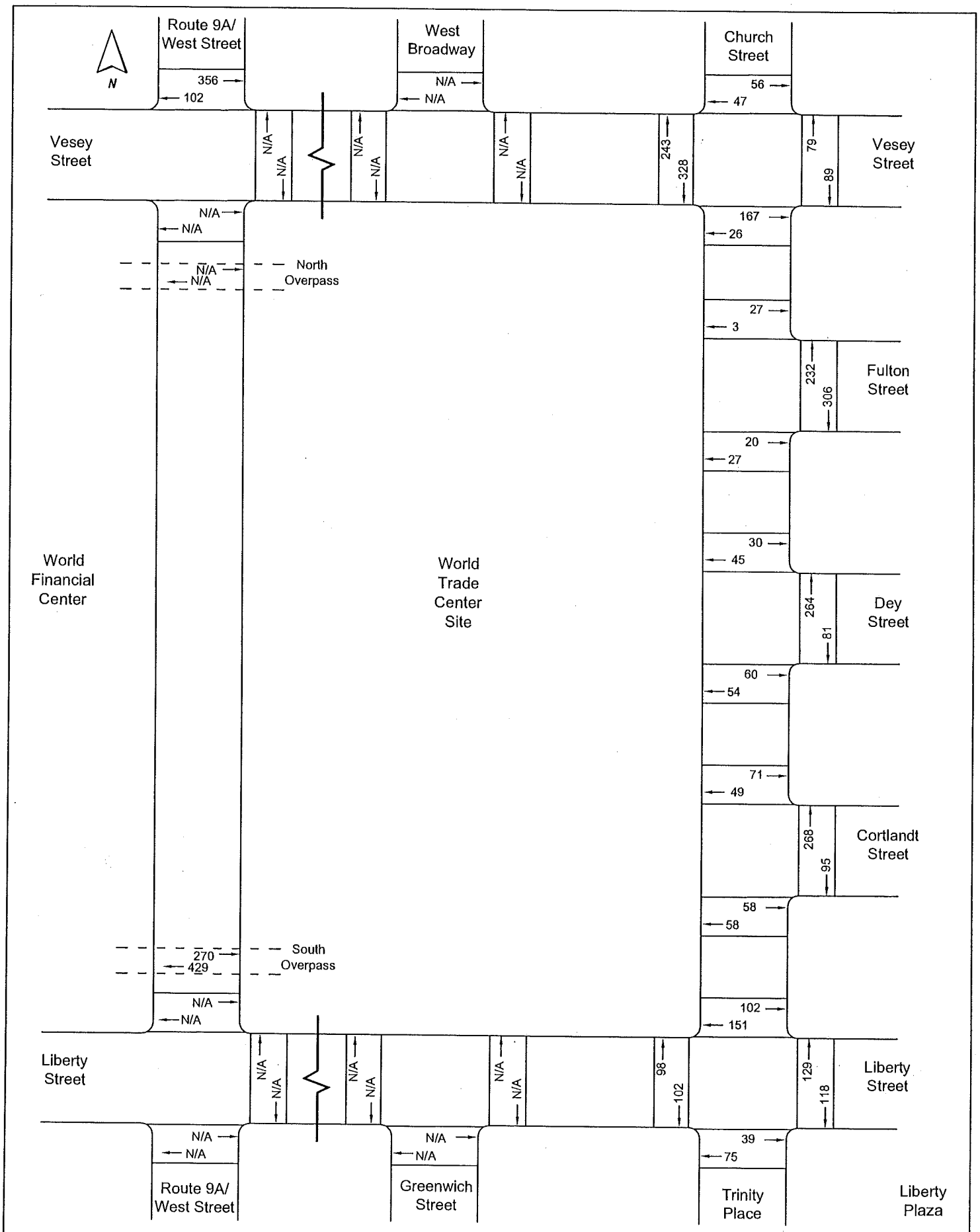
2003 Existing Conditions
Midday Peak 15-Minute Volumes
Figure 9



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

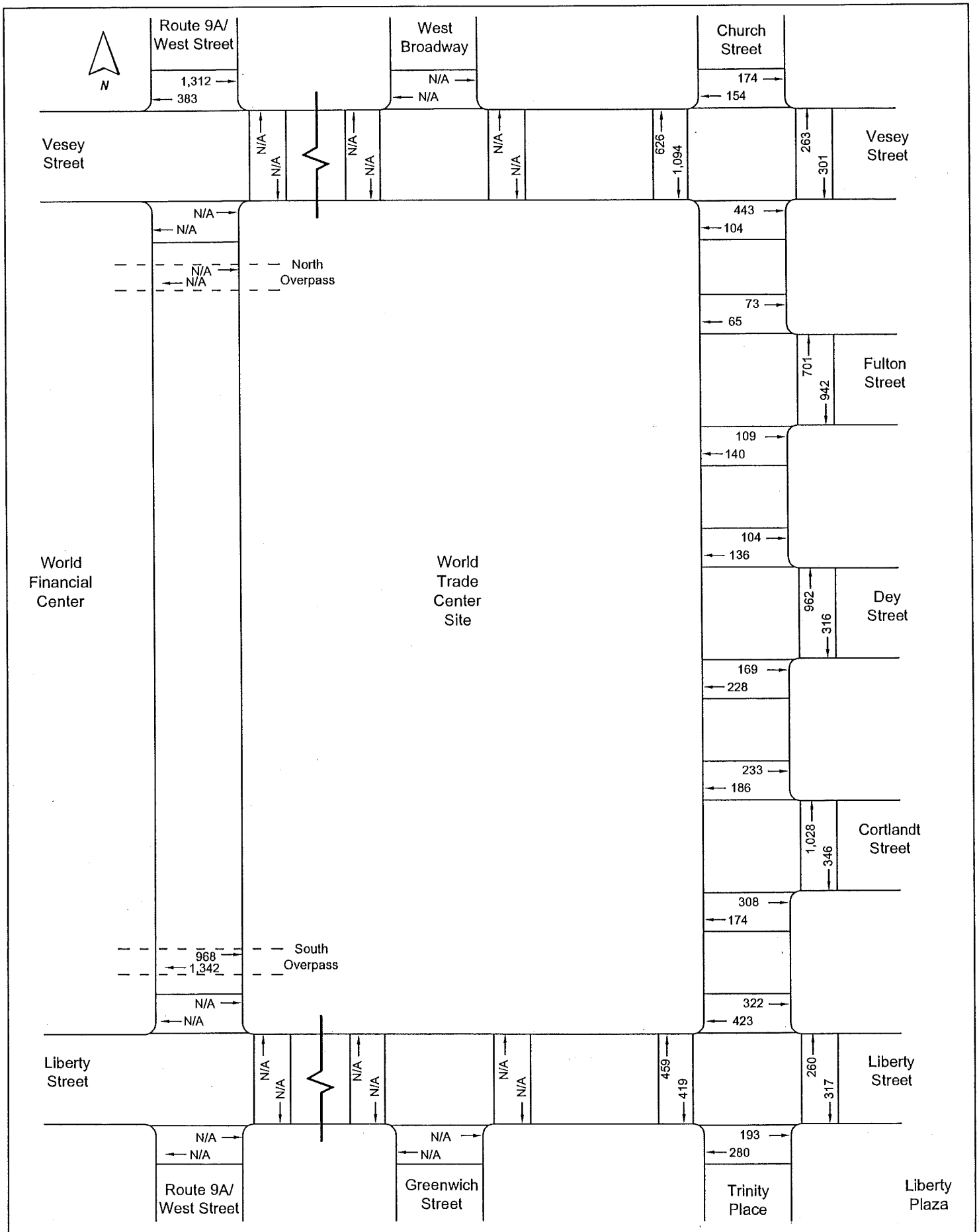
2003 Existing Conditions
Midday Peak Hour Volumes
Figure 10



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

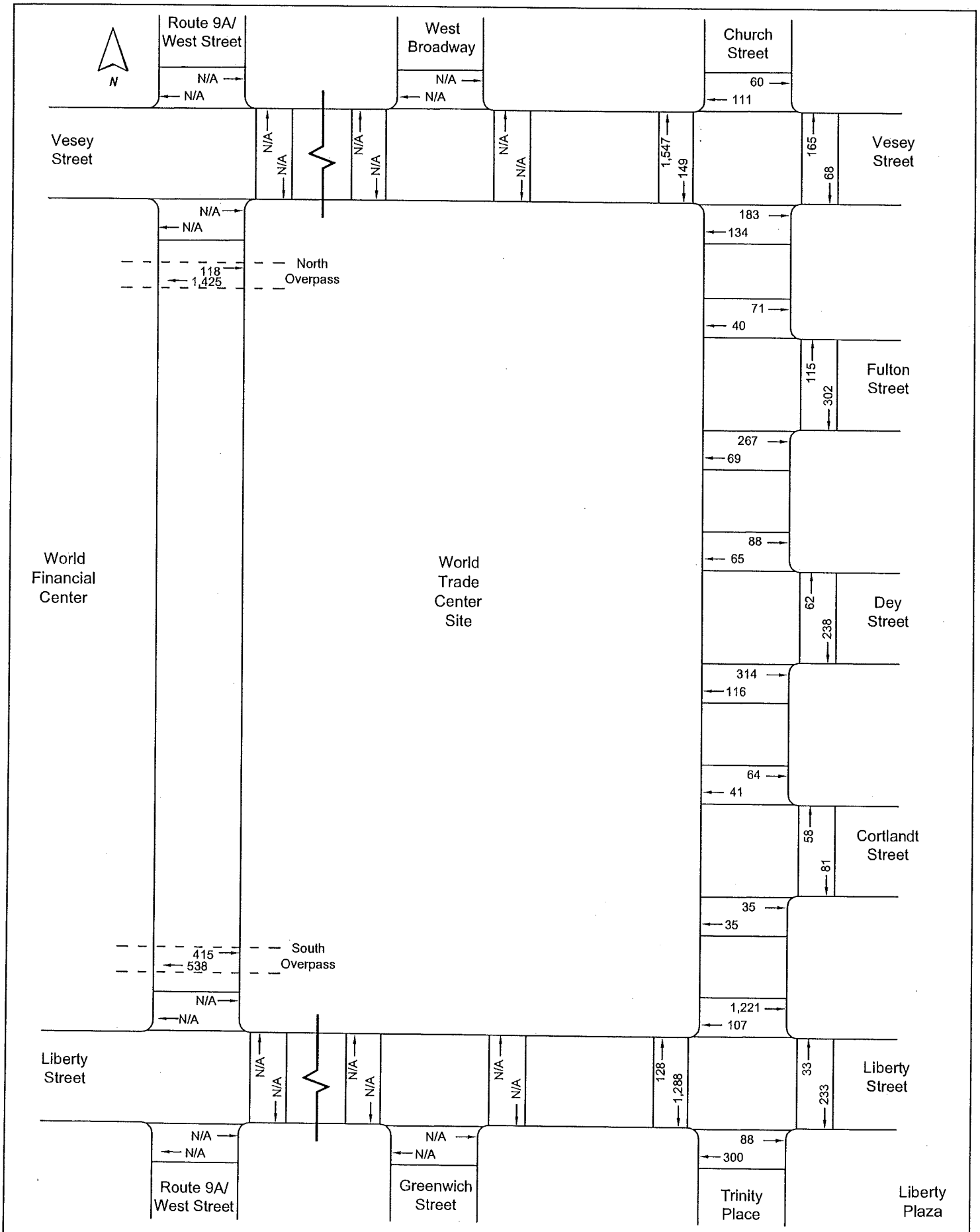
2003 Existing Conditions
PM Peak 15-Minute Volumes
Figure 11



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

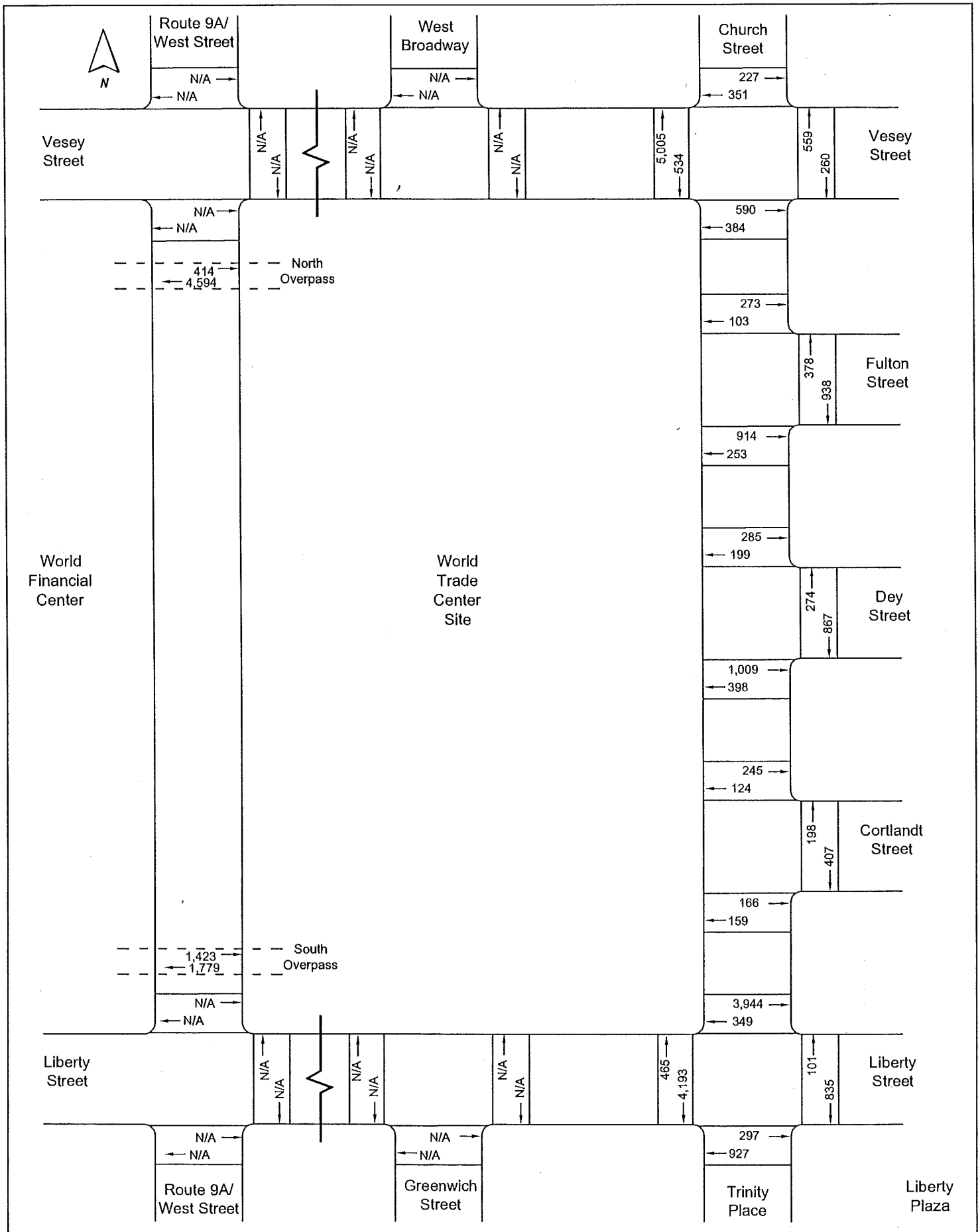
2003 Existing Conditions
PM Peak Hour Volumes
Figure 12



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

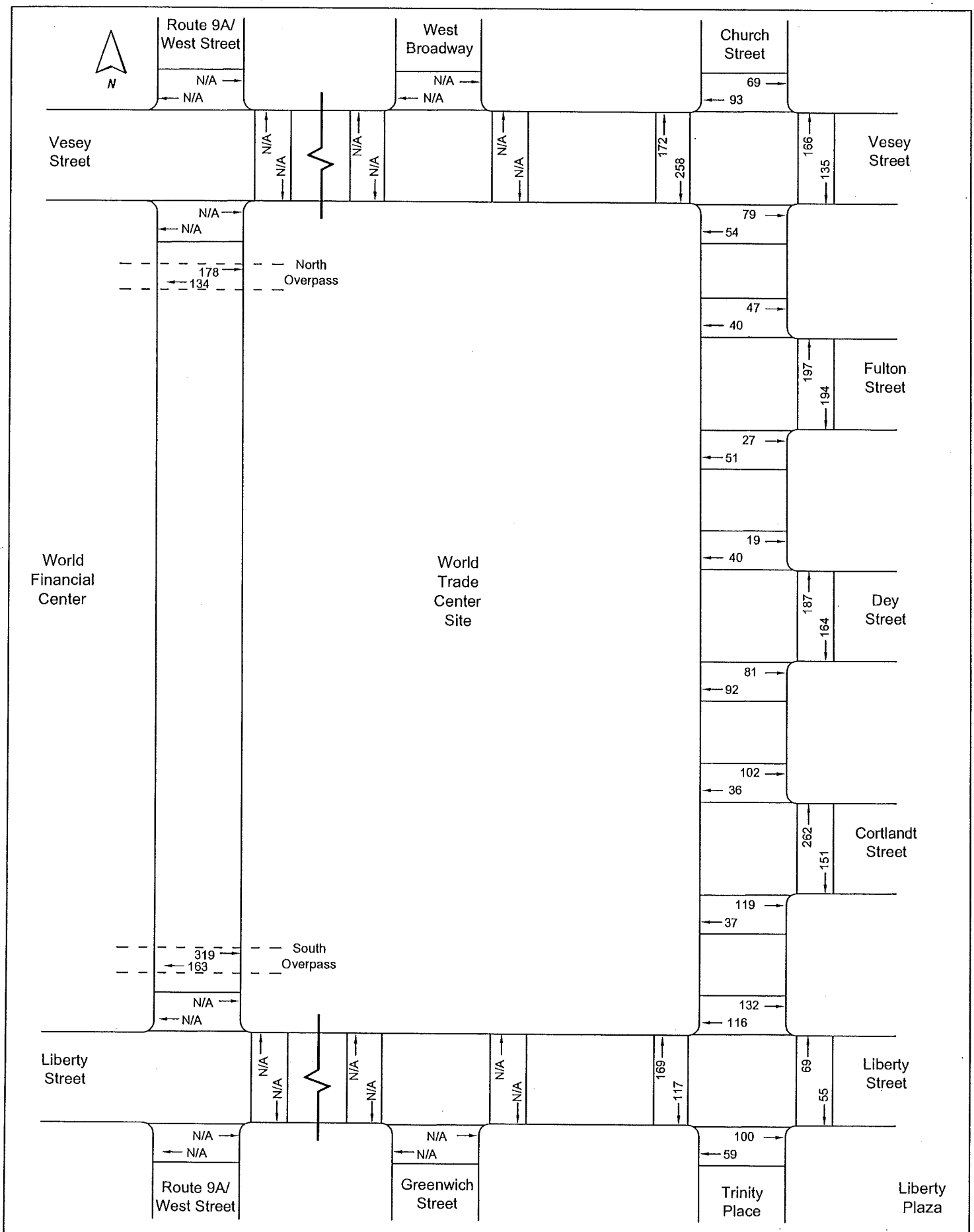
2006 Construction Conditions
Peak AM 15-Minute Volumes
Figure 13



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

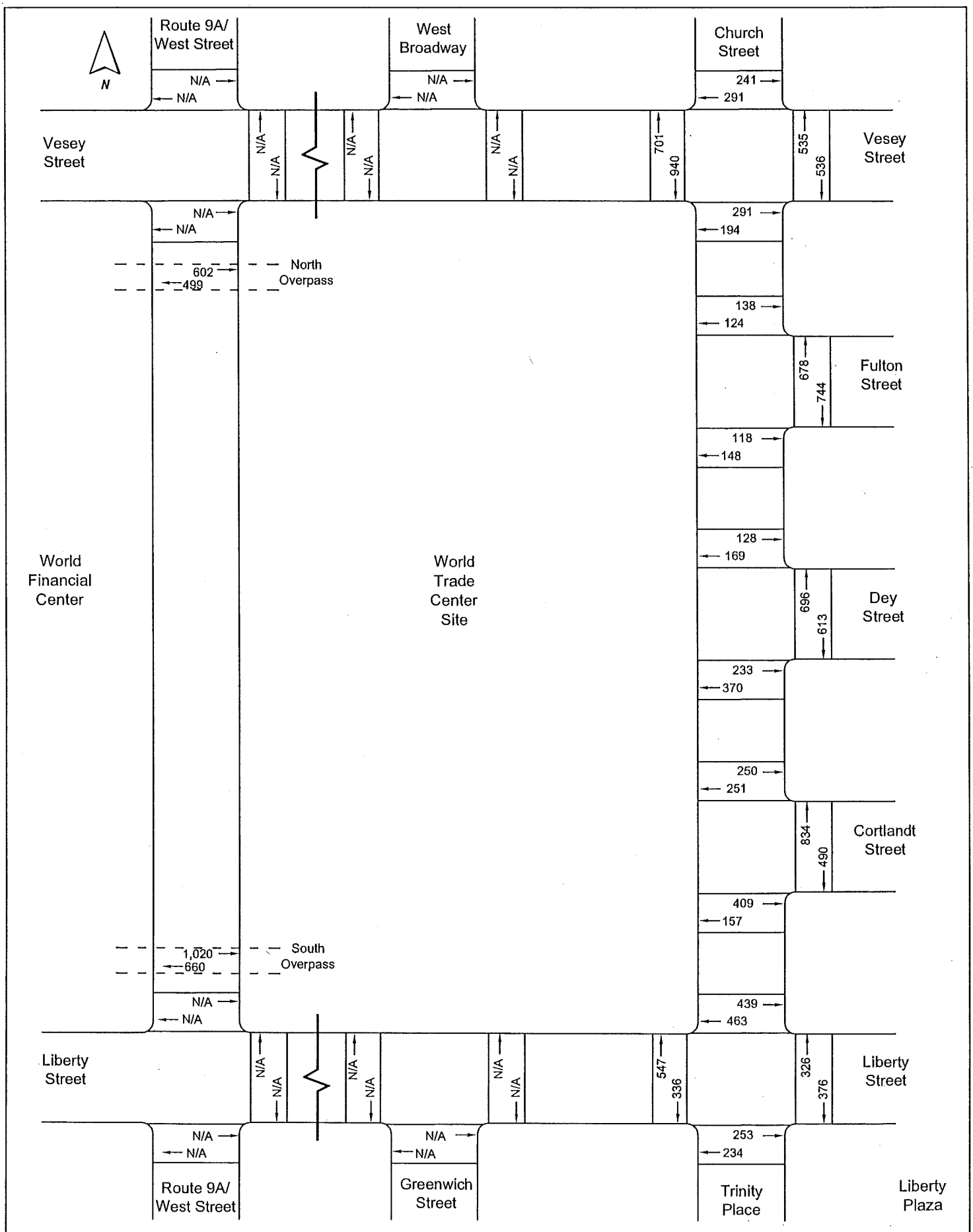
2006 Construction Conditions
AM Peak Hour Volumes
Figure 14



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

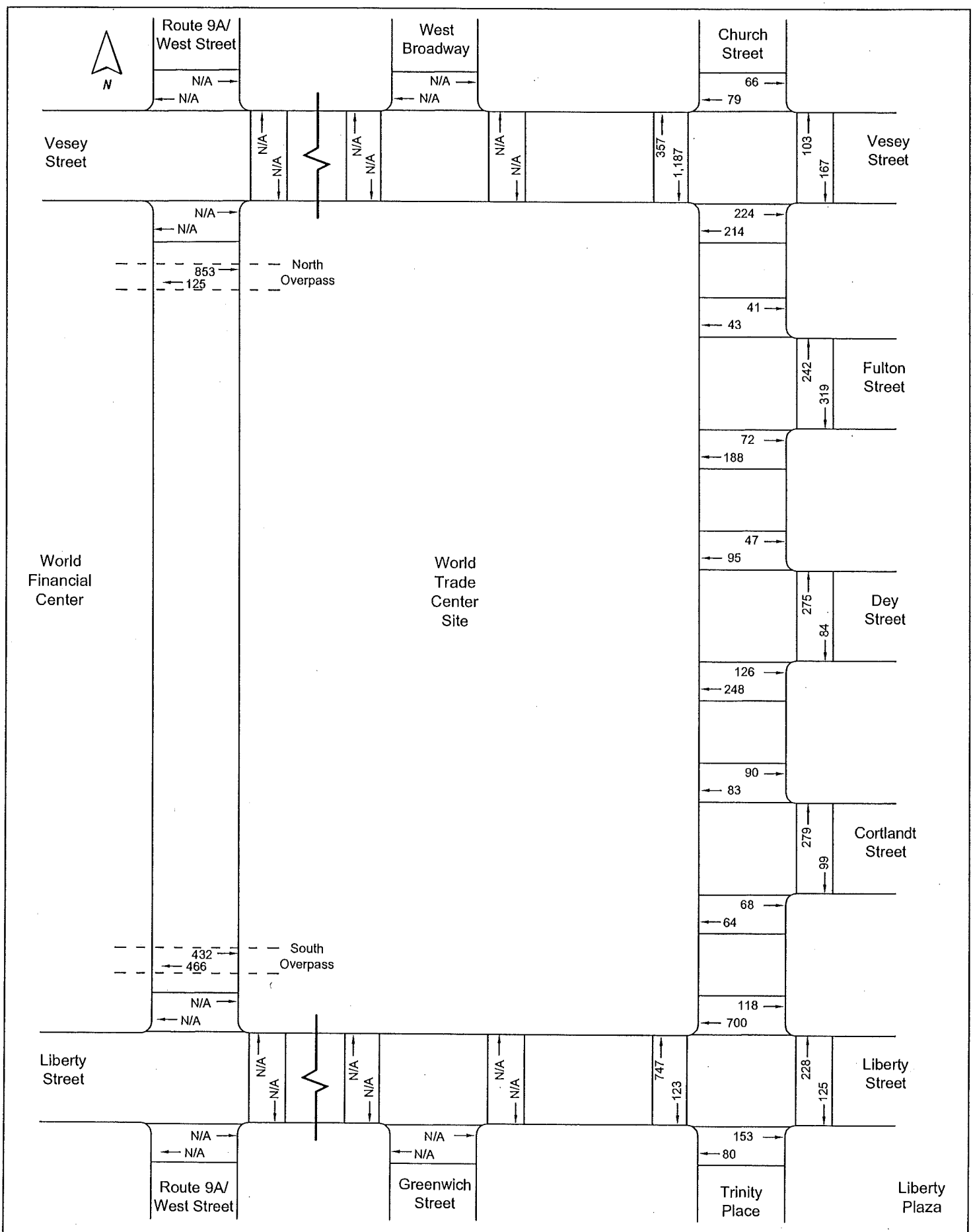
2006 Construction Conditions
Midday Peak 15-Minute Volumes
Figure 15



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

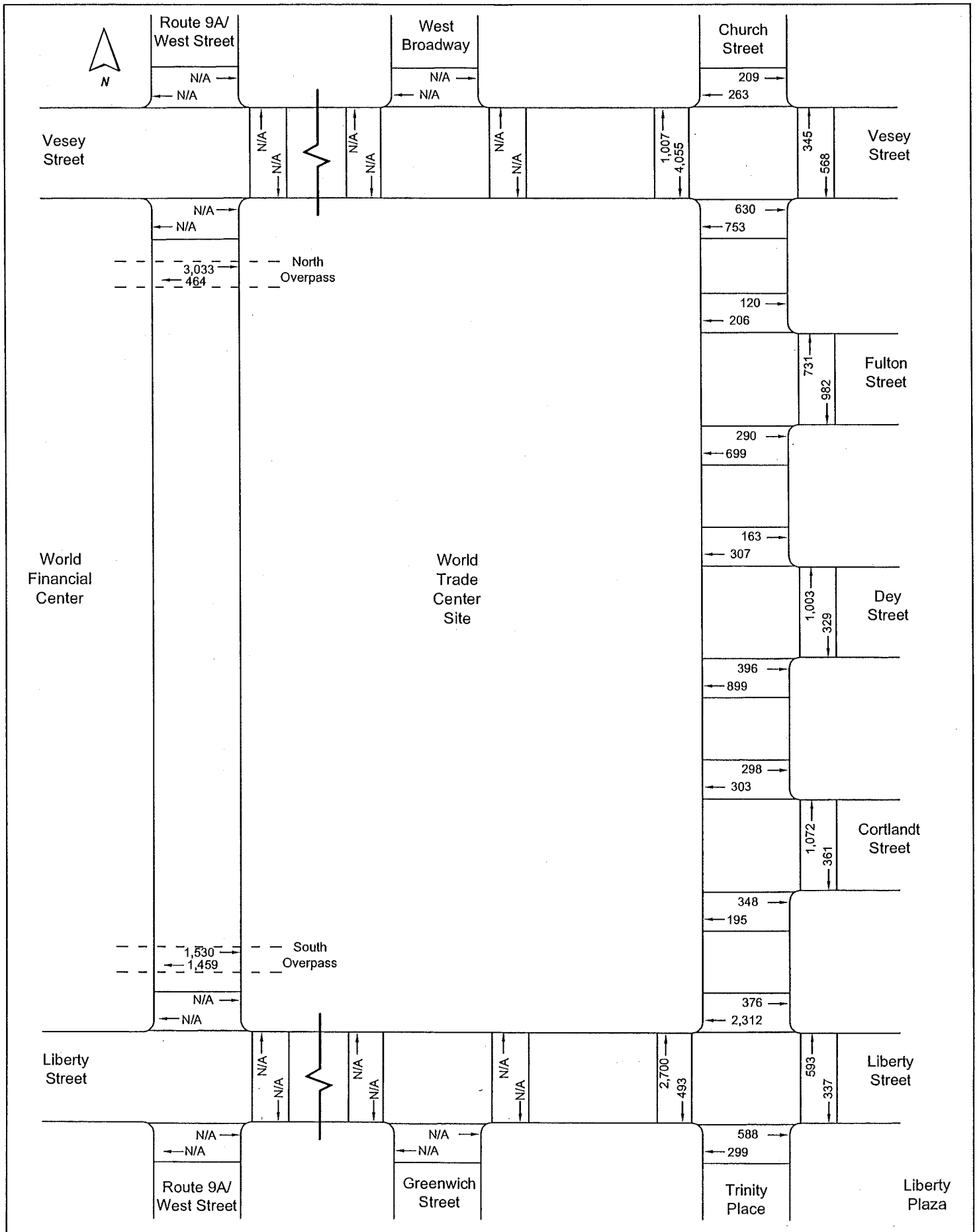
2006 Construction Conditions
Midday Peak Hour Volumes
Figure 16



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

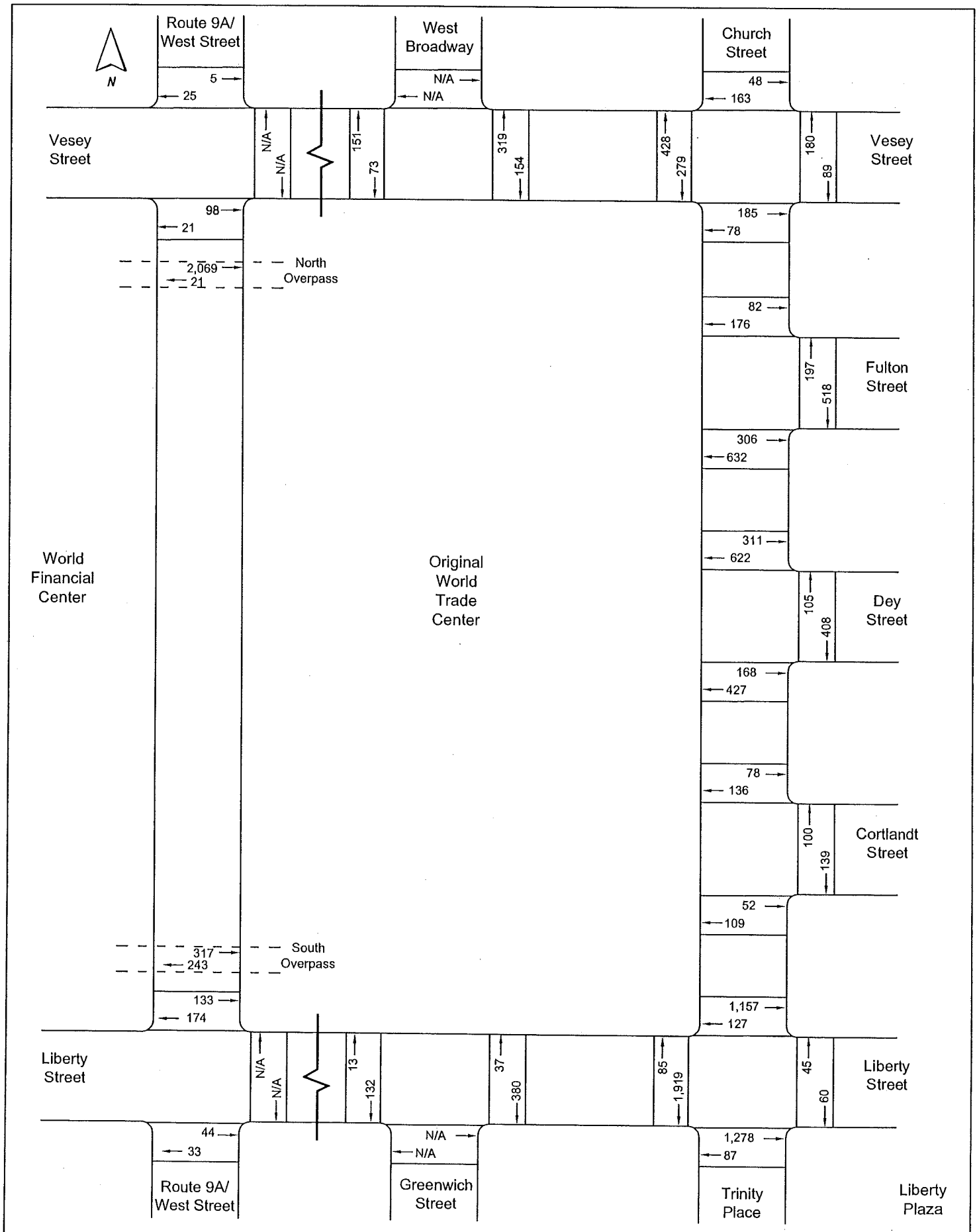
2006 Construction Conditions
PM Peak 15-Minute Volumes
Figure 17



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

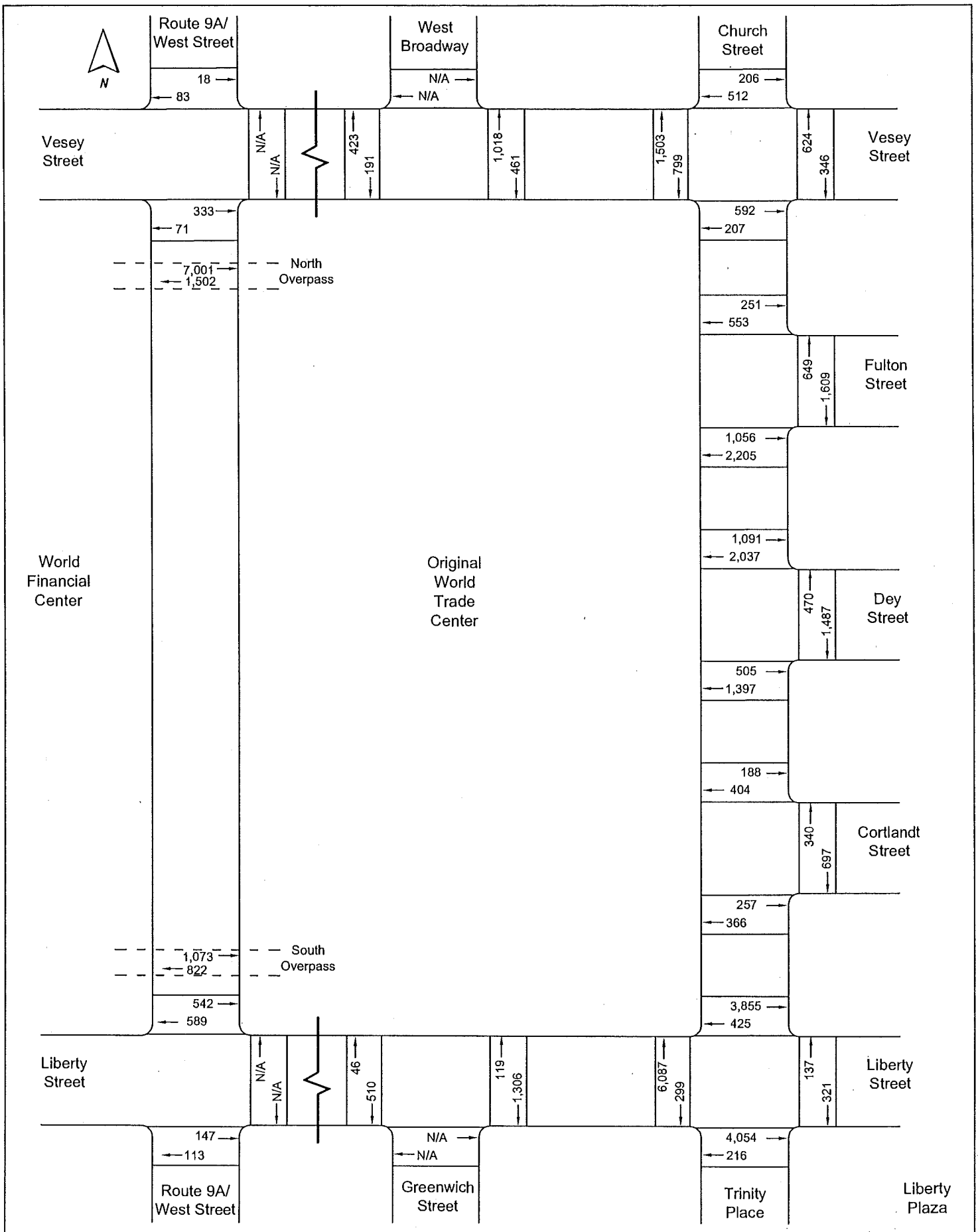
2006 Construction Conditions
PM Peak Hour Volumes
Figure 18



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

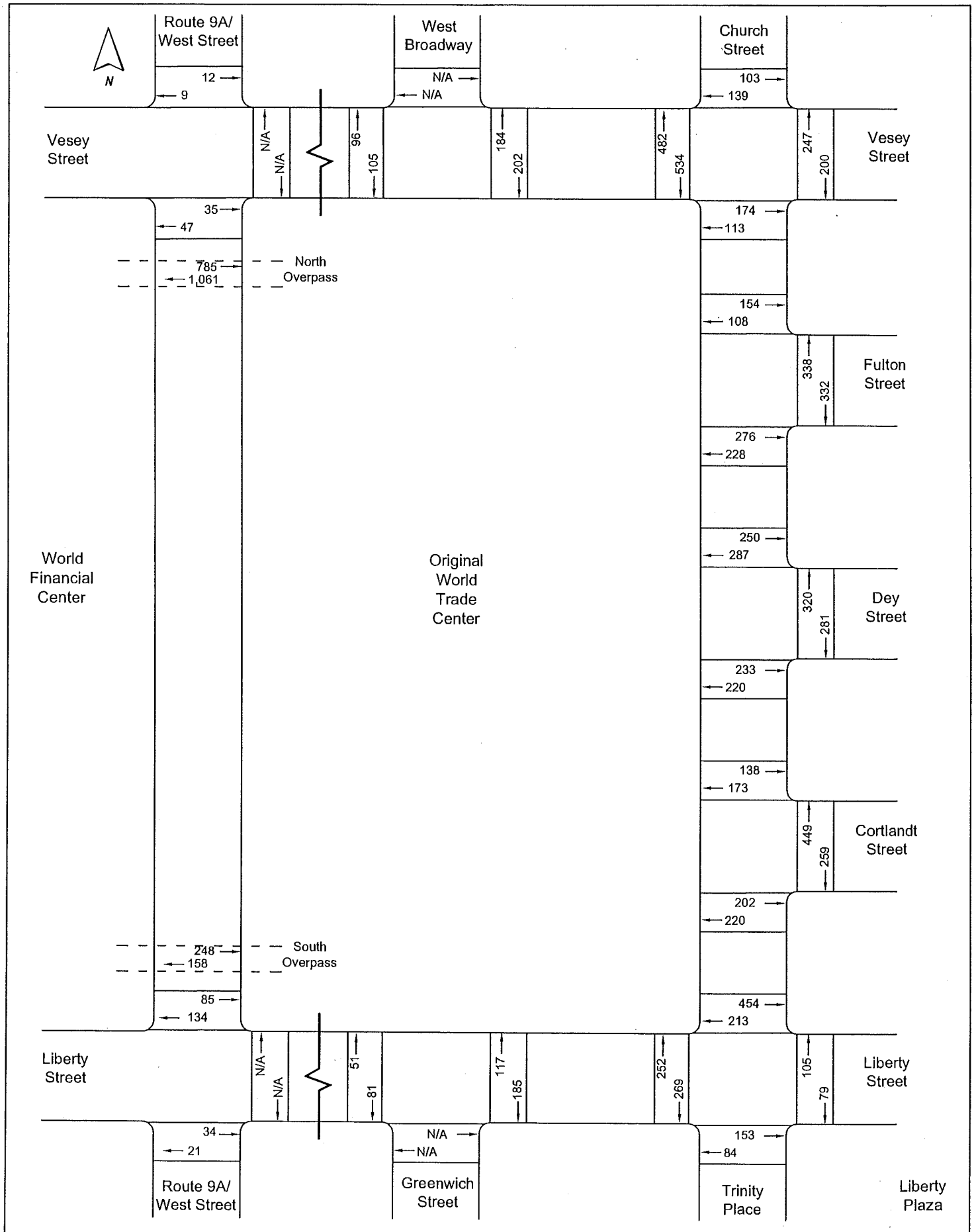
2009 Projected Pre-9/11 Conditions
AM Peak 15-Minute Volumes
Figure 19



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

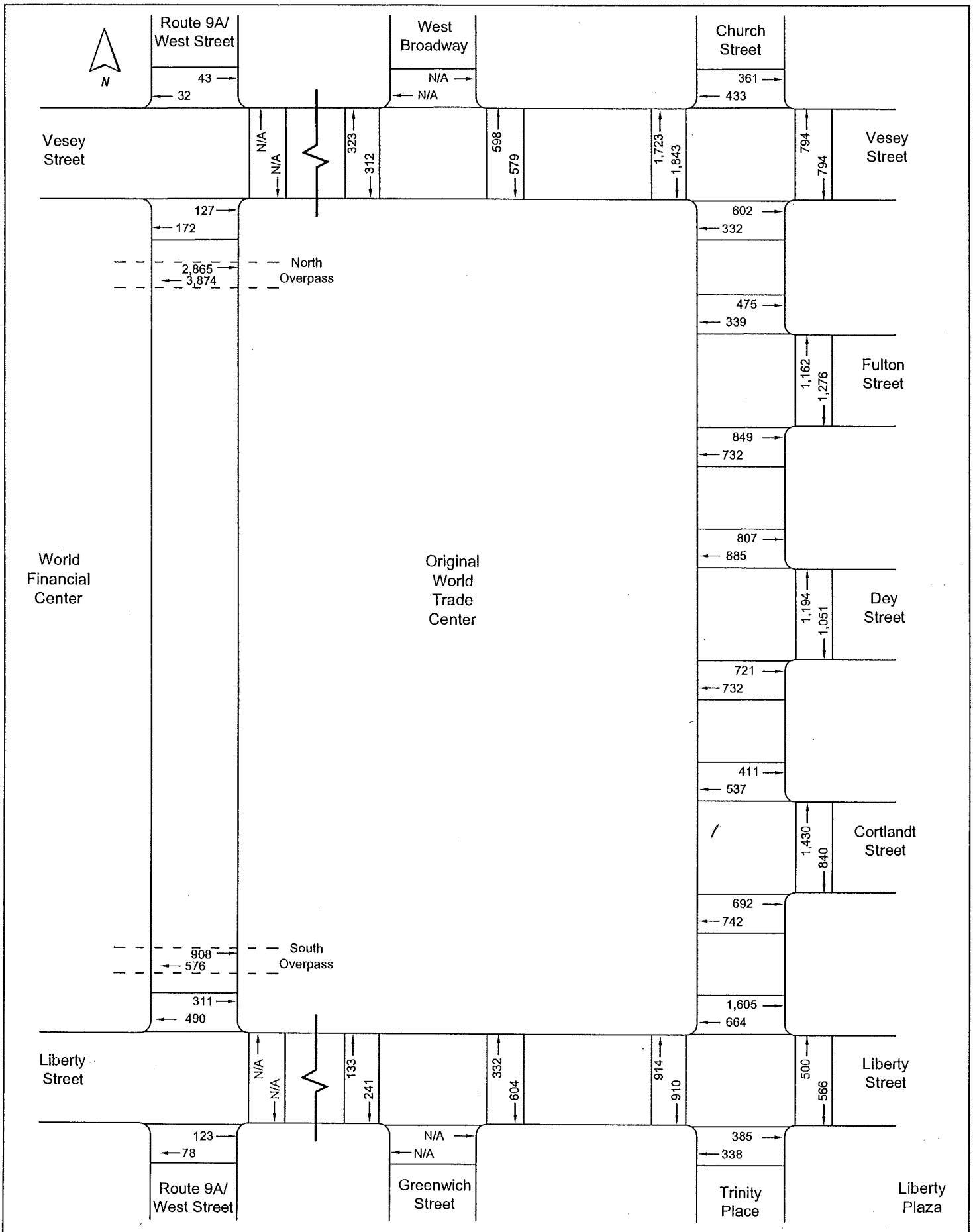
2009 Projected Pre-9/11 Conditions
AM Peak Hour Volumes
Figure 20



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

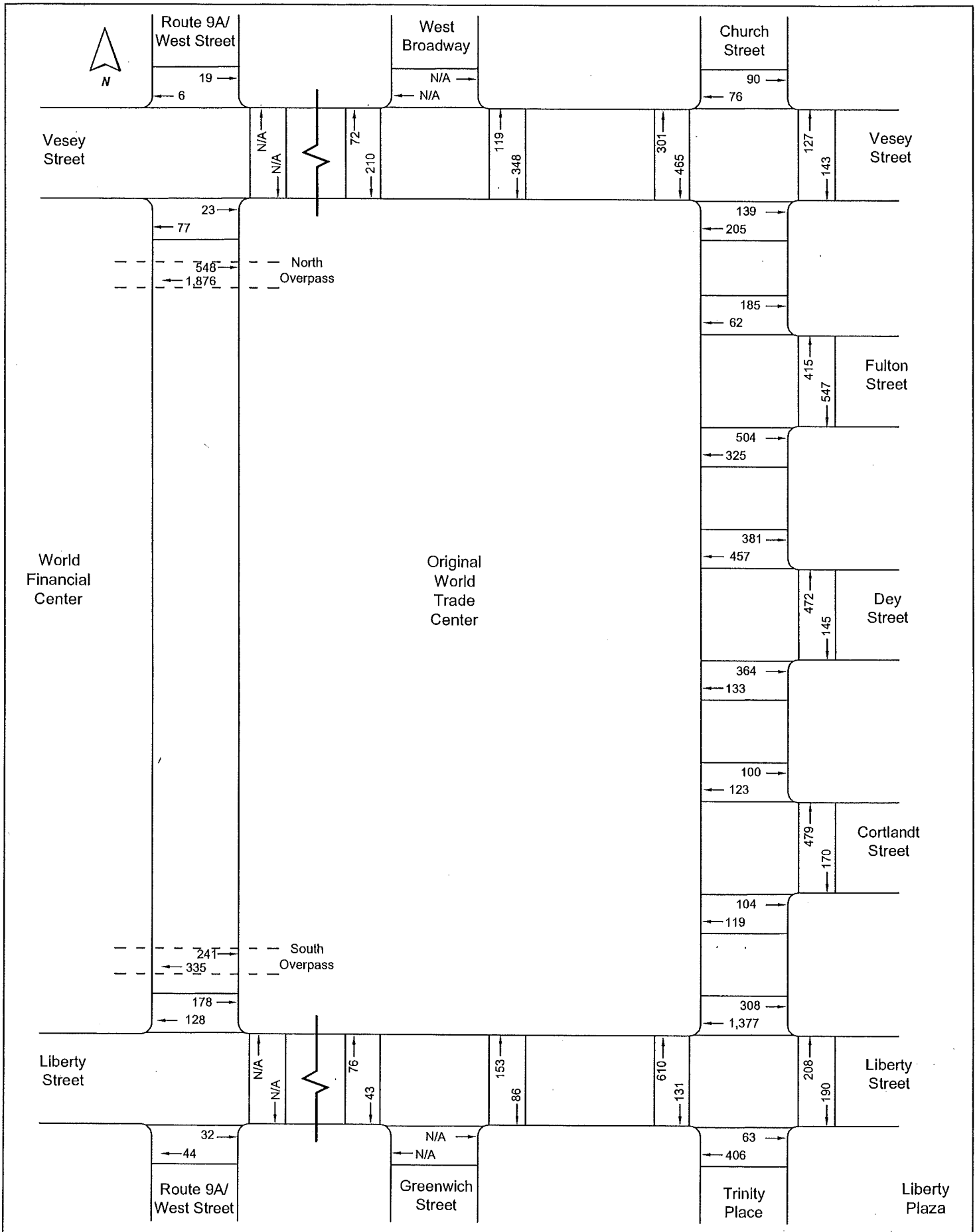
2009 Projected Pre-9/11 Conditions
Midday Peak 15-Minute Volumes
Figure 21



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

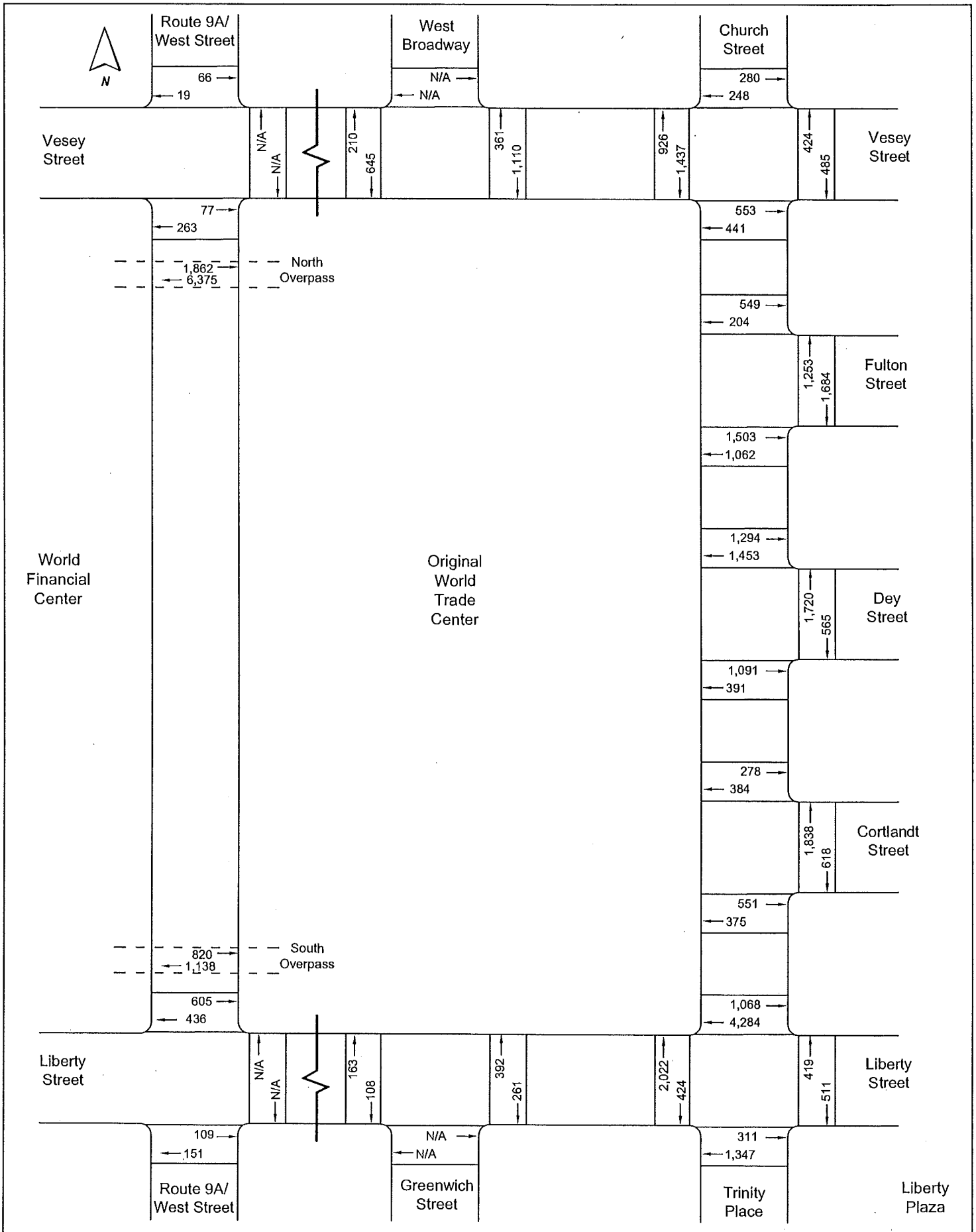
2009 Projected Pre-9/11 Conditions
Midday Peak Hour Volumes
Figure 22



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

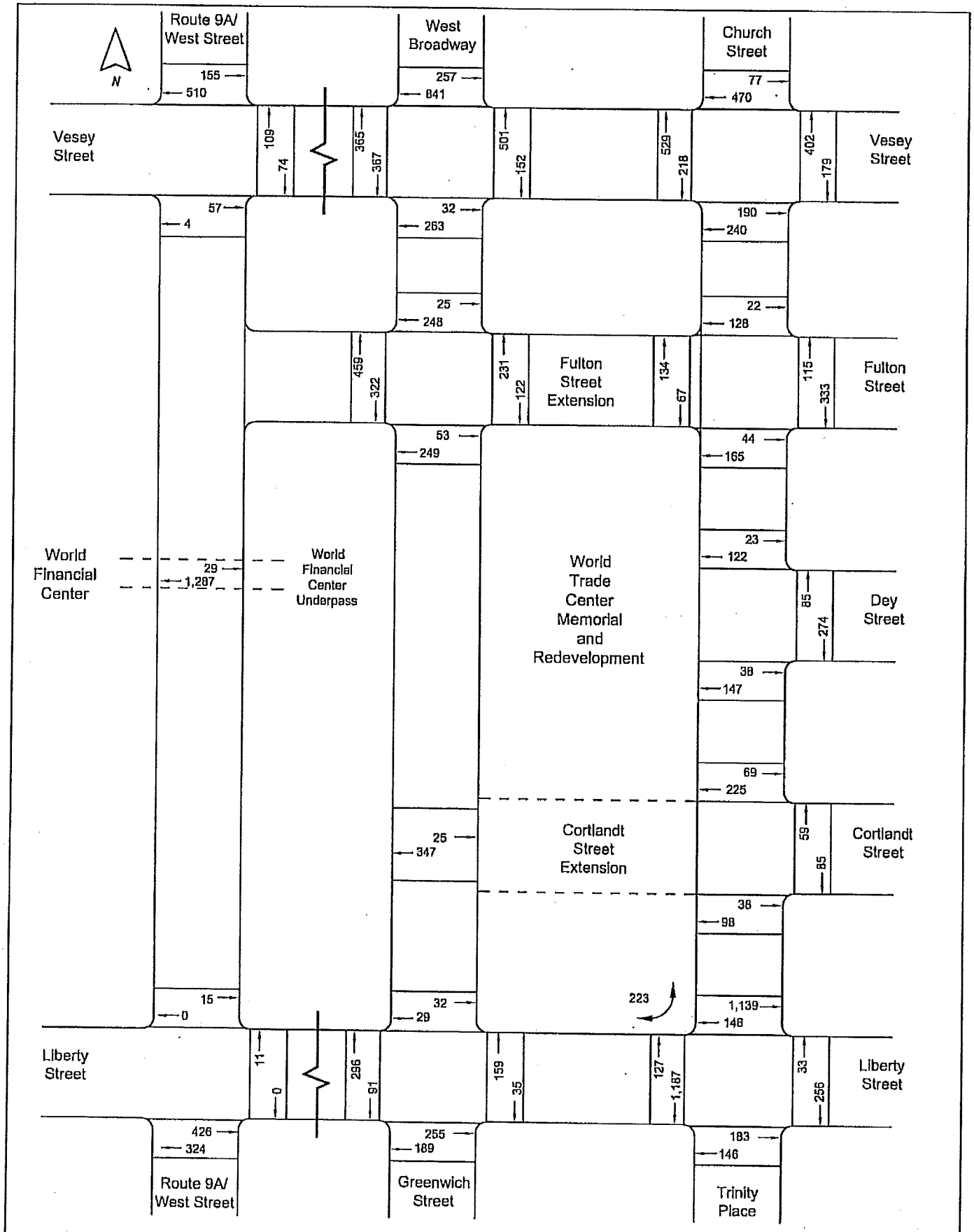
2009 Projected Pre-9/11 Conditions
PM Peak 15-Minute Volumes
Figure 23



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

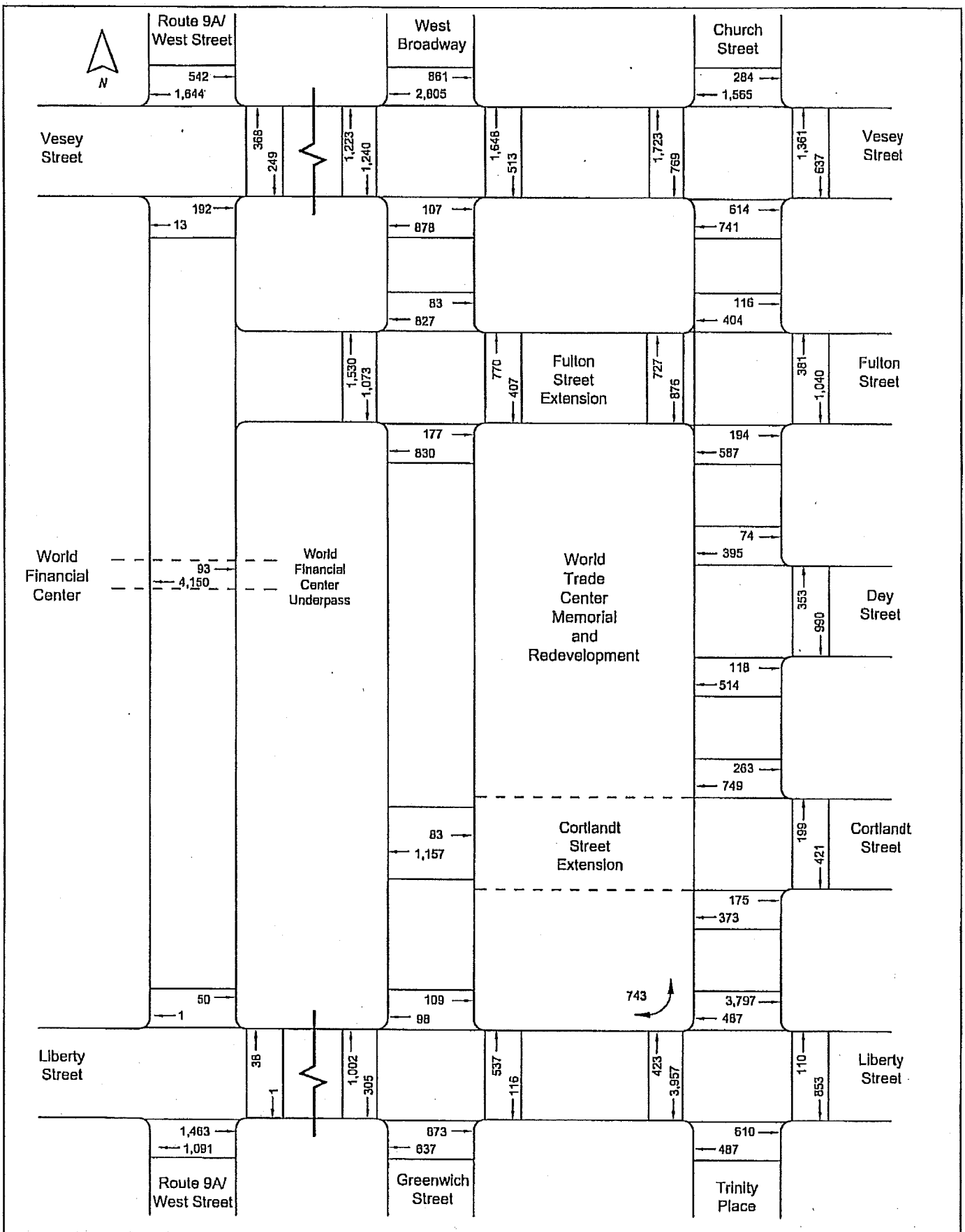
2009 Projected Pre-9/11 Conditions
PM Peak Hour Volumes
Figure 24



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

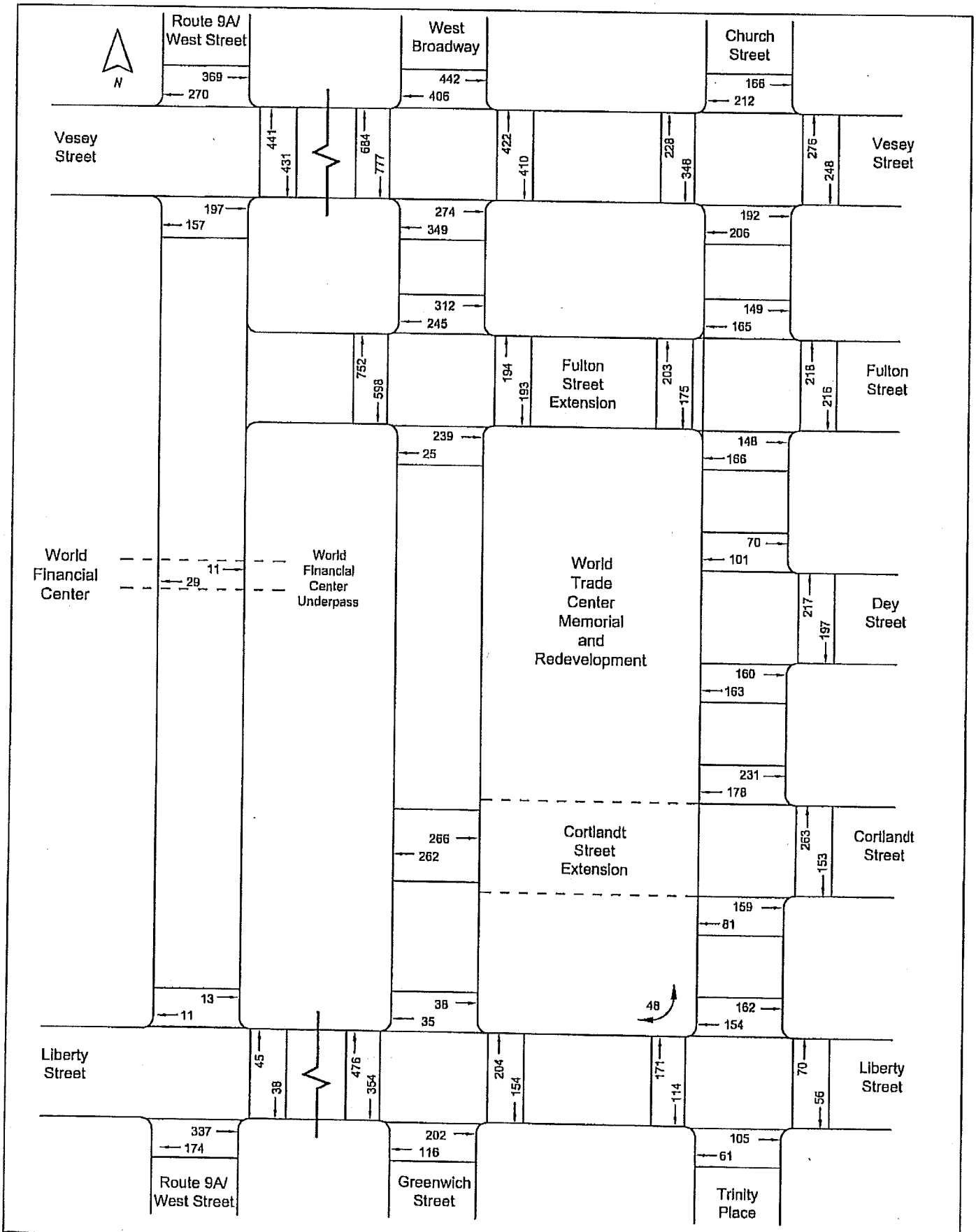
2009 Proposed Action Conditions
AM Peak 15-Minute Volumes
Figure 25



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

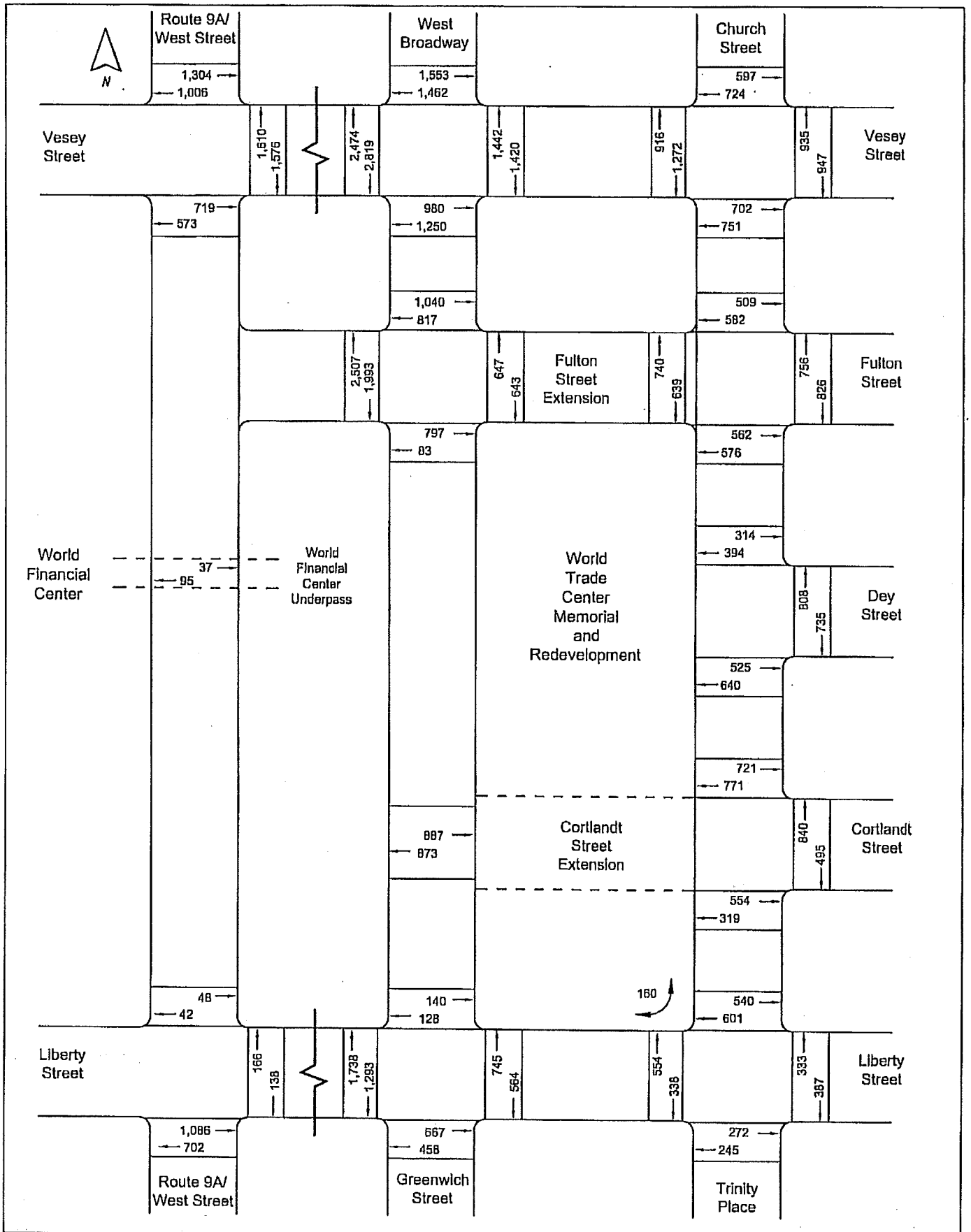
2009 Proposed Action Conditions
AM Peak Hour Volumes
Figure 26



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

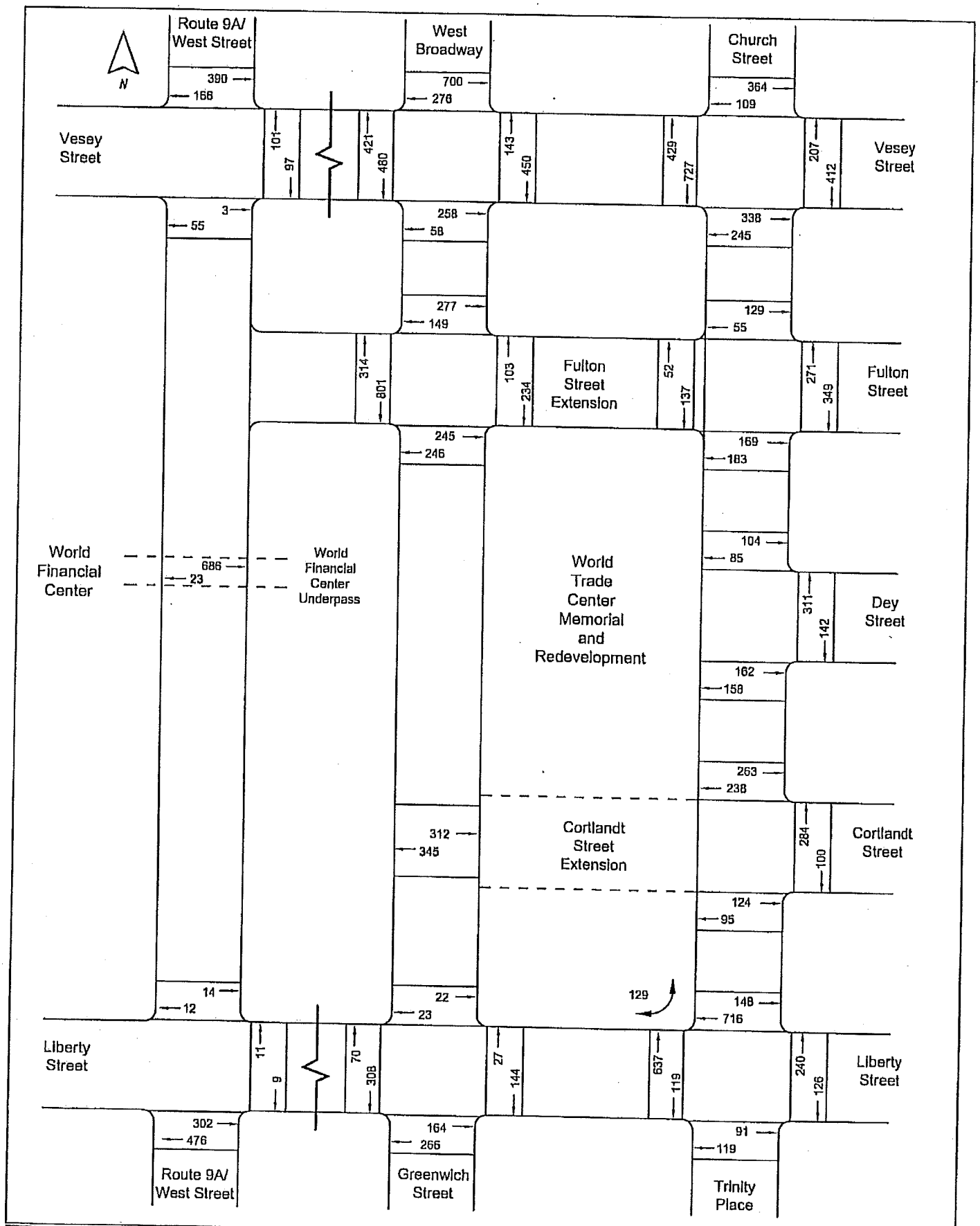
2009 Proposed Action Conditions
Midday Peak 15-Minute Volumes
Figure 27



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

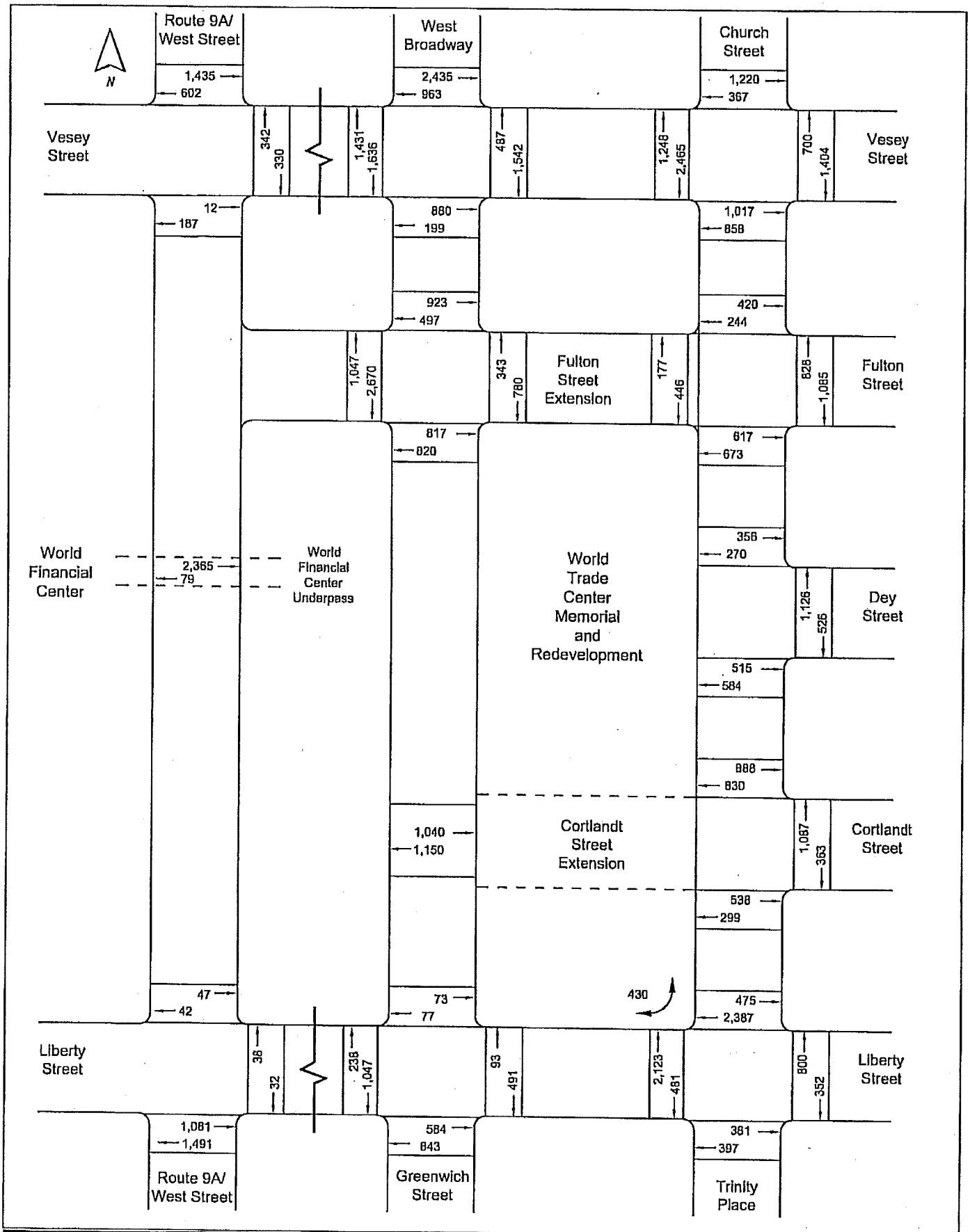
2009 Proposed Action Conditions
Midday Peak Hour Volumes
Figure 28



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

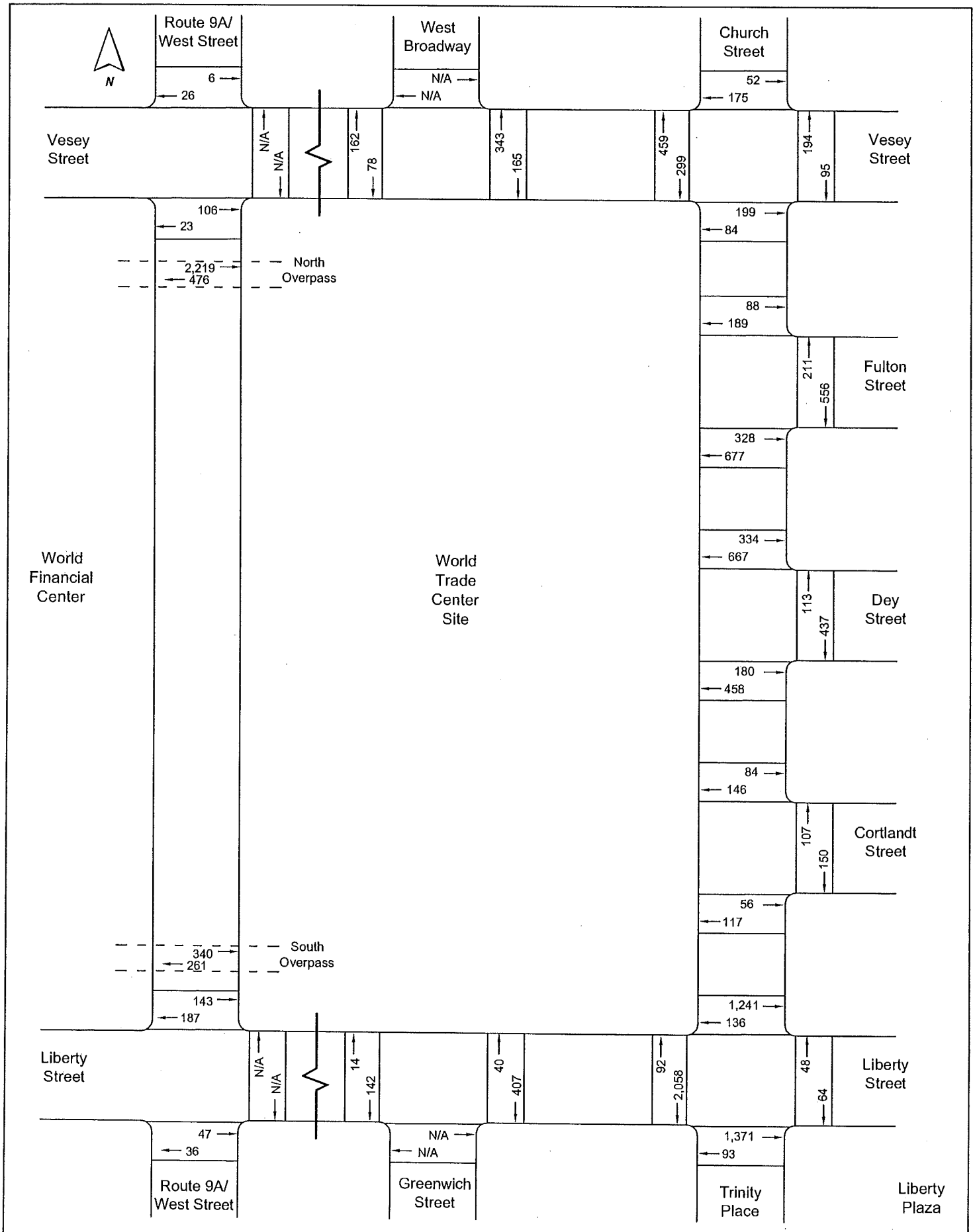
2009 Proposed Action Conditions
PM Peak 15-Minute Volumes
Figure 29



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

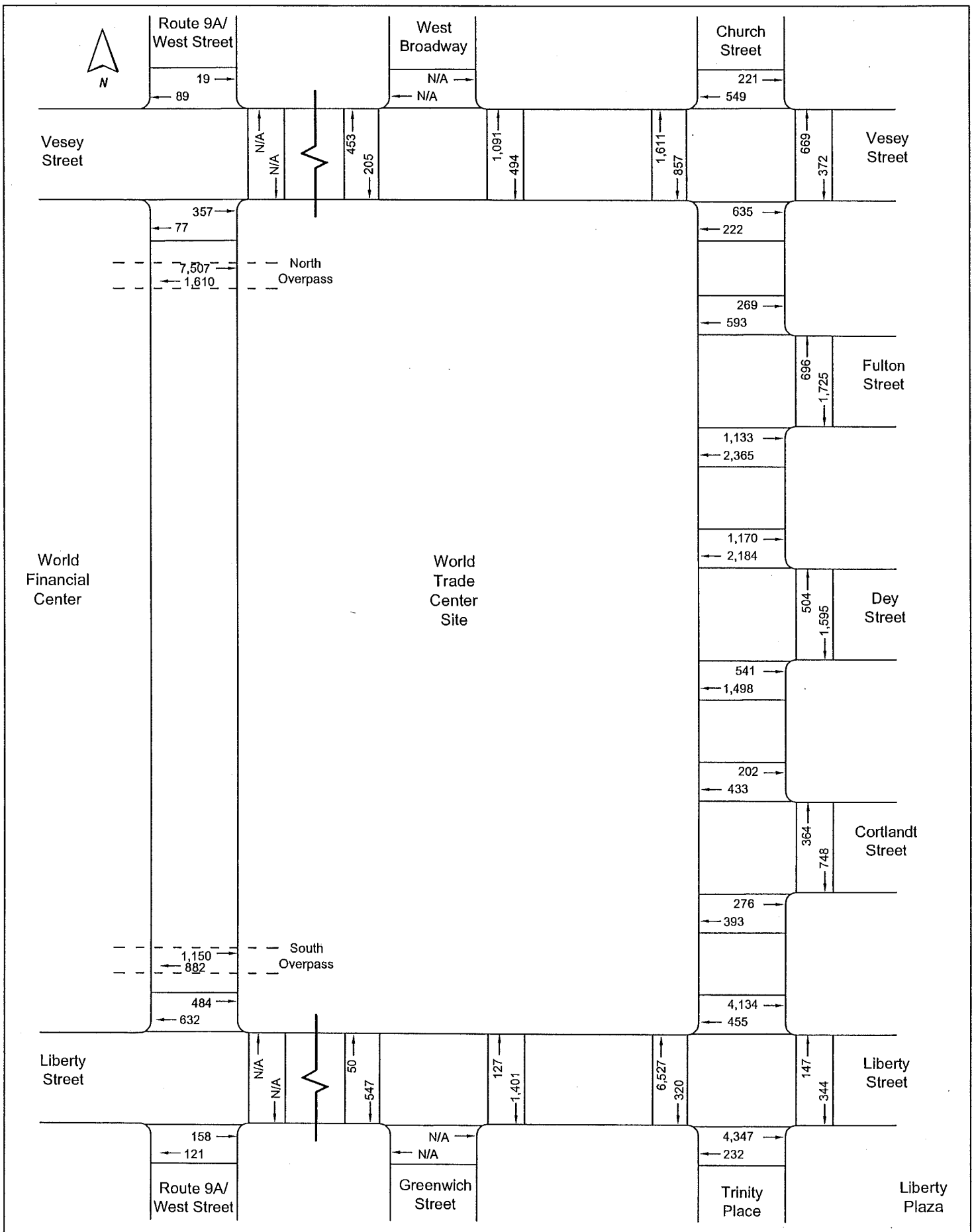
2009 Proposed Action Conditions
PM Peak Hour Volumes
Figure 30



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

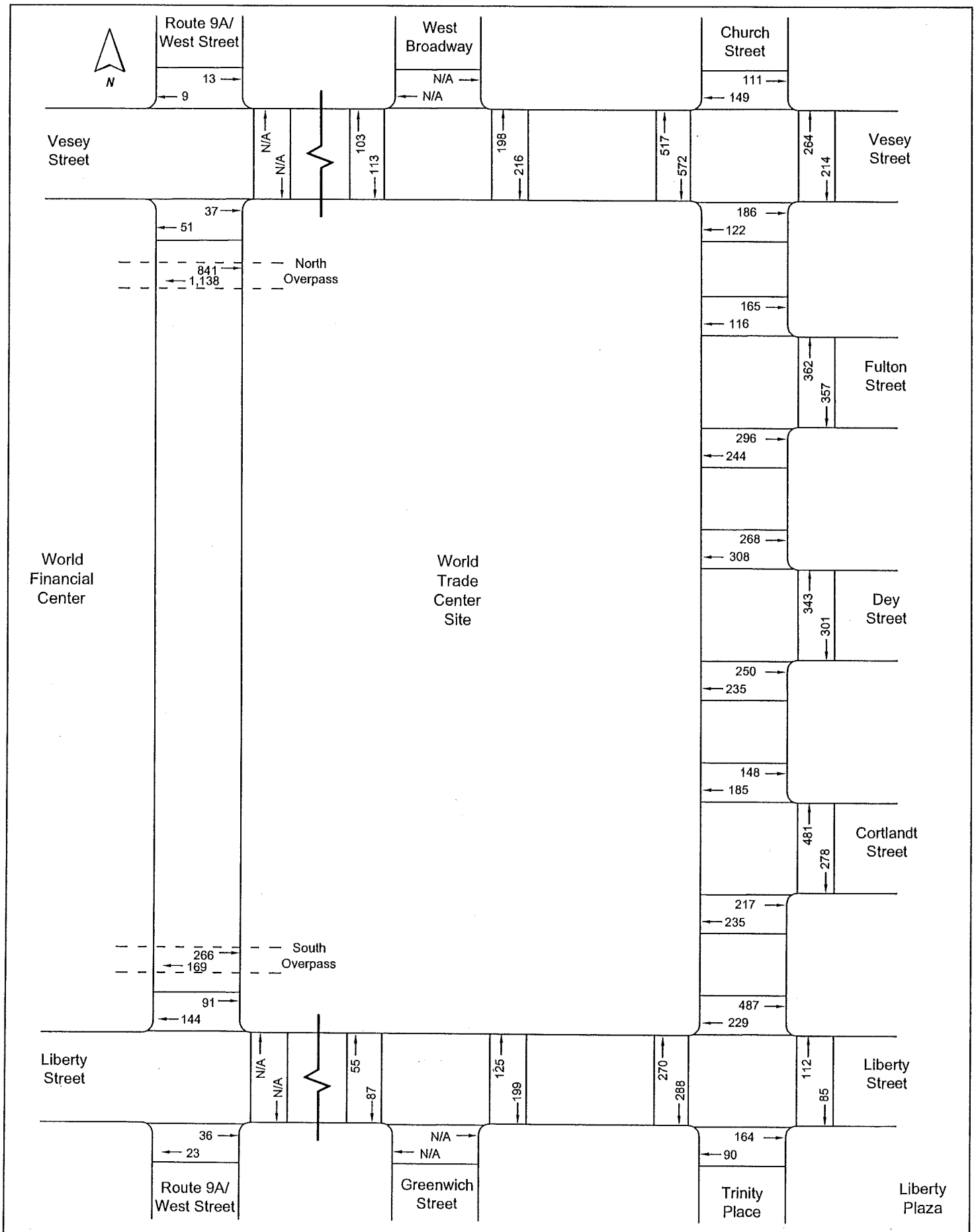
2025 Projected Pre-9/11 Conditions
AM Peak 15-Minute Volumes
Figure 31



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

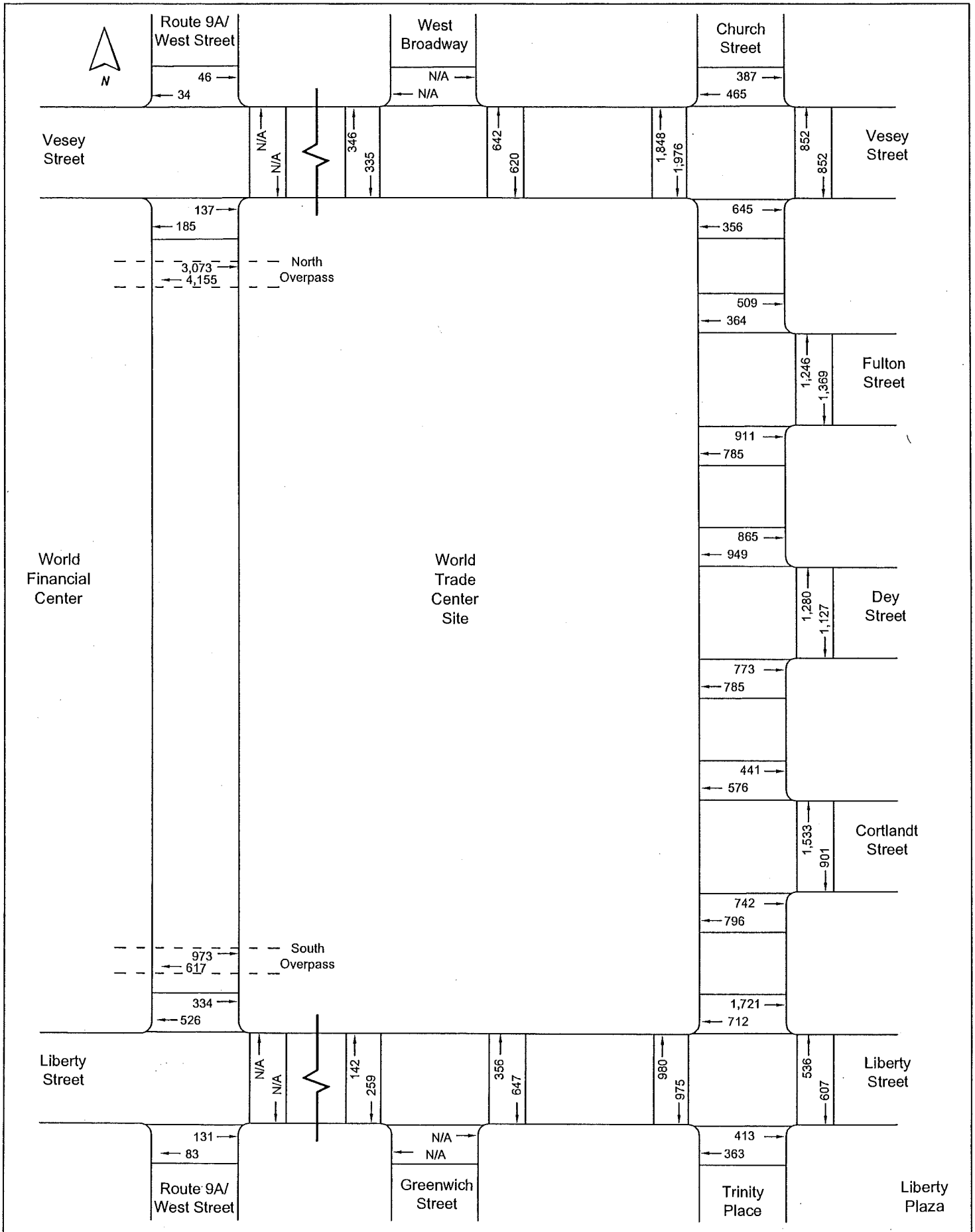
2025 Projected Pre-9/11 Conditions
AM Peak Hour Volumes
Figure 32



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

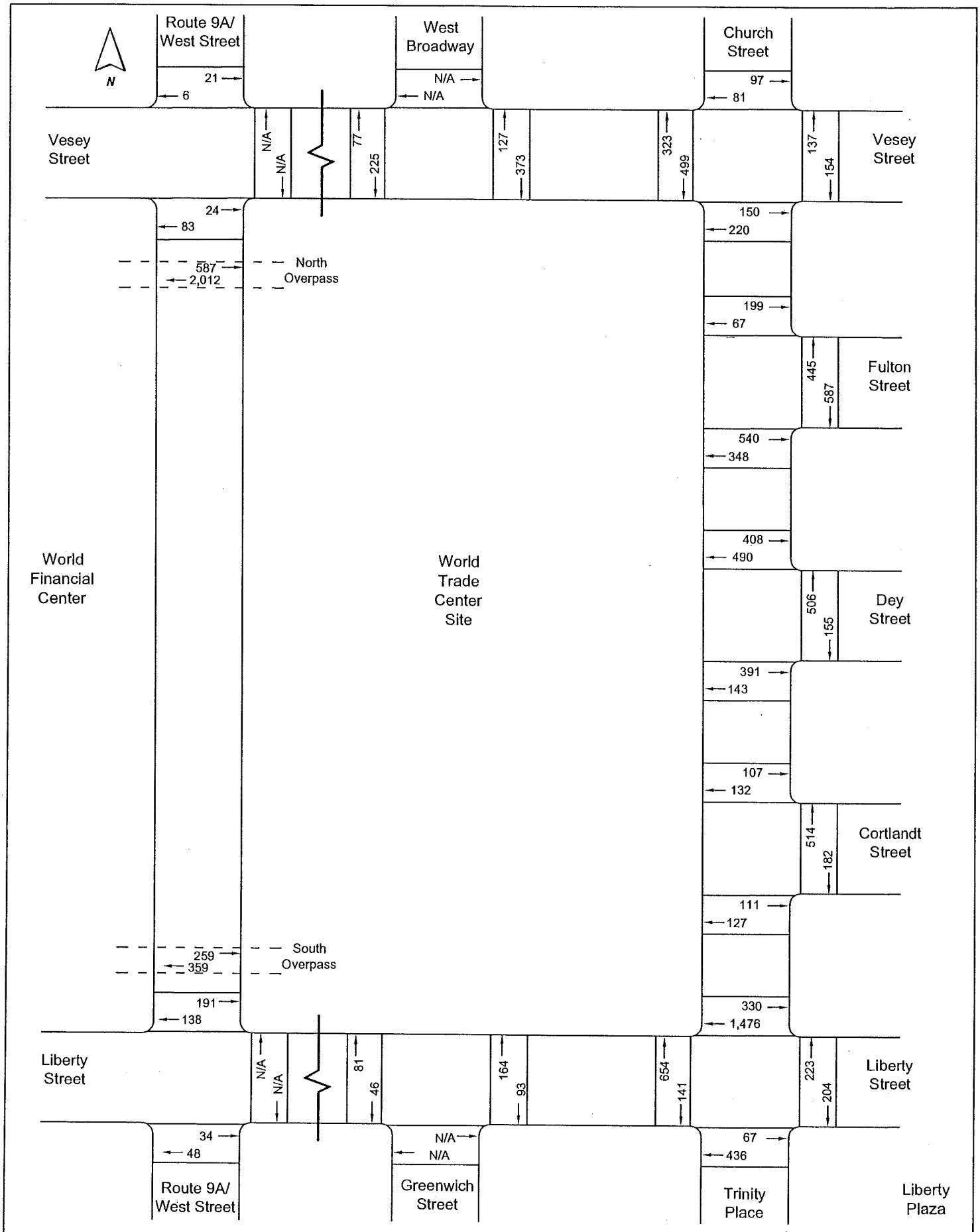
2025 Projected Pre-9/11 Conditions
Midday Peak 15-Minute Volumes
Figure 33



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

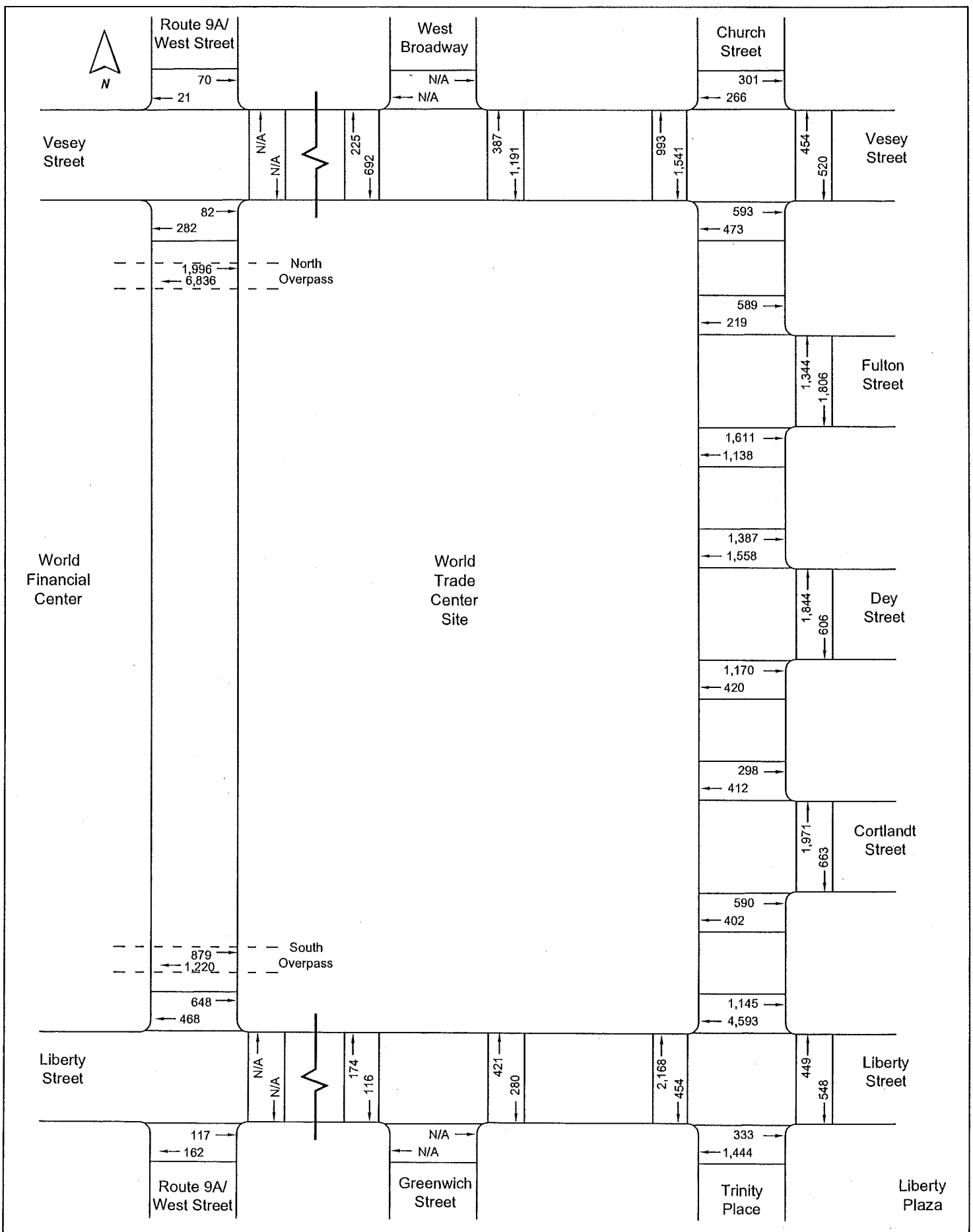
2025 Projected Pre-9/11 Conditions
Midday Peak Hour Volumes
Figure 34



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

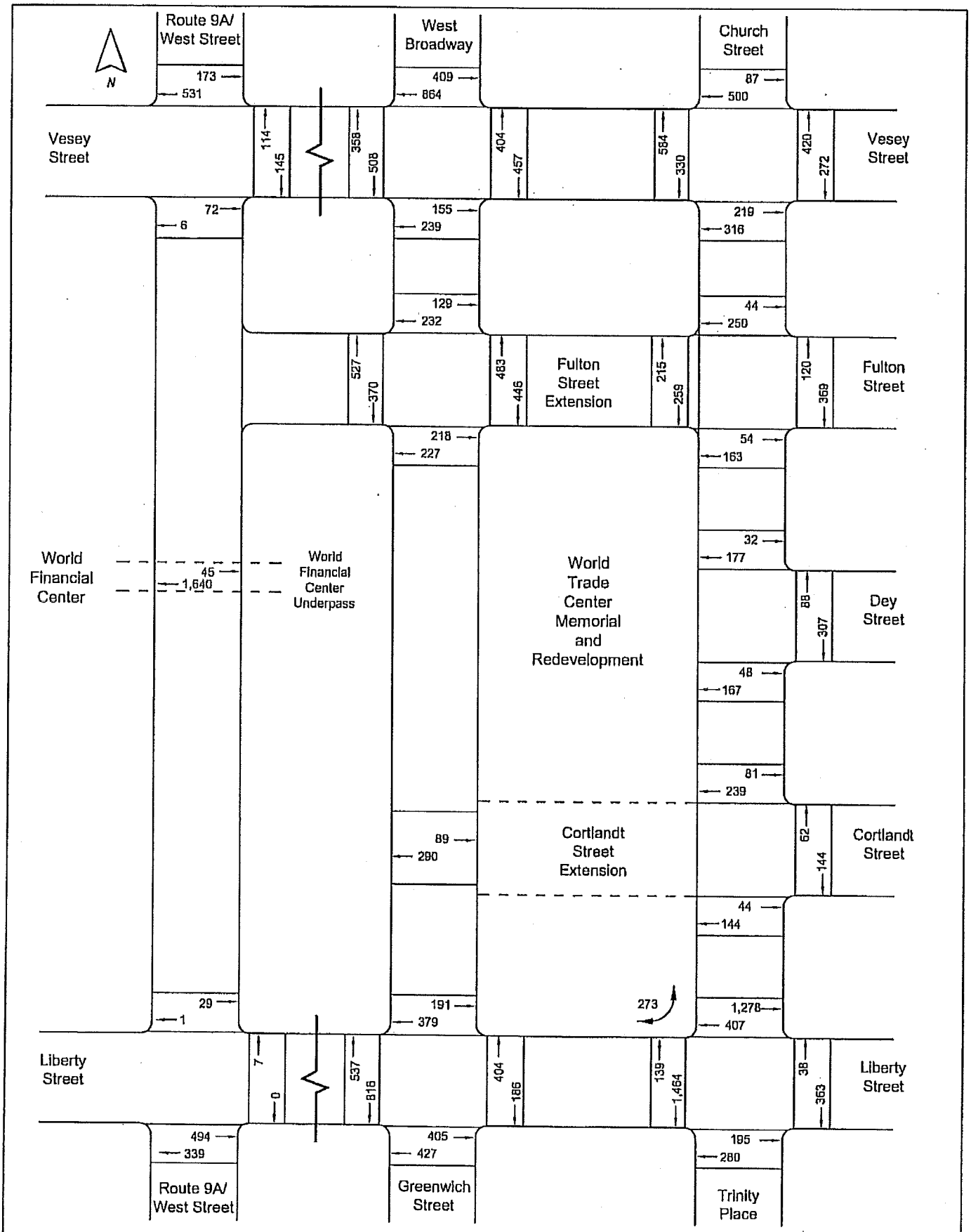
2025 Projected Pre-9/11 Conditions
PM Peak 15-Minute Volumes
Figure 35



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

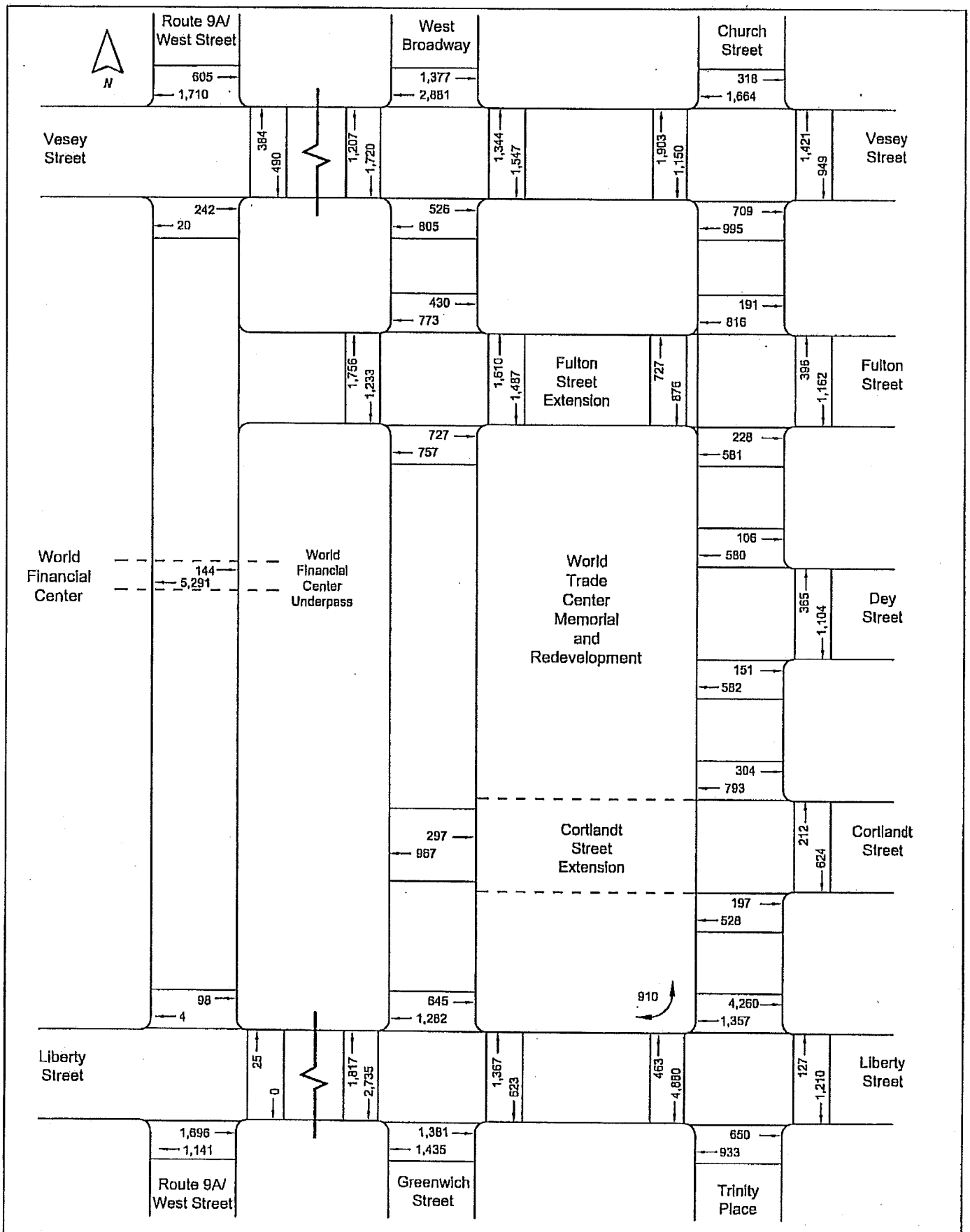
2025 Projected Pre-9/11 Conditions
PM Peak Hour Volumes
Figure 36



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

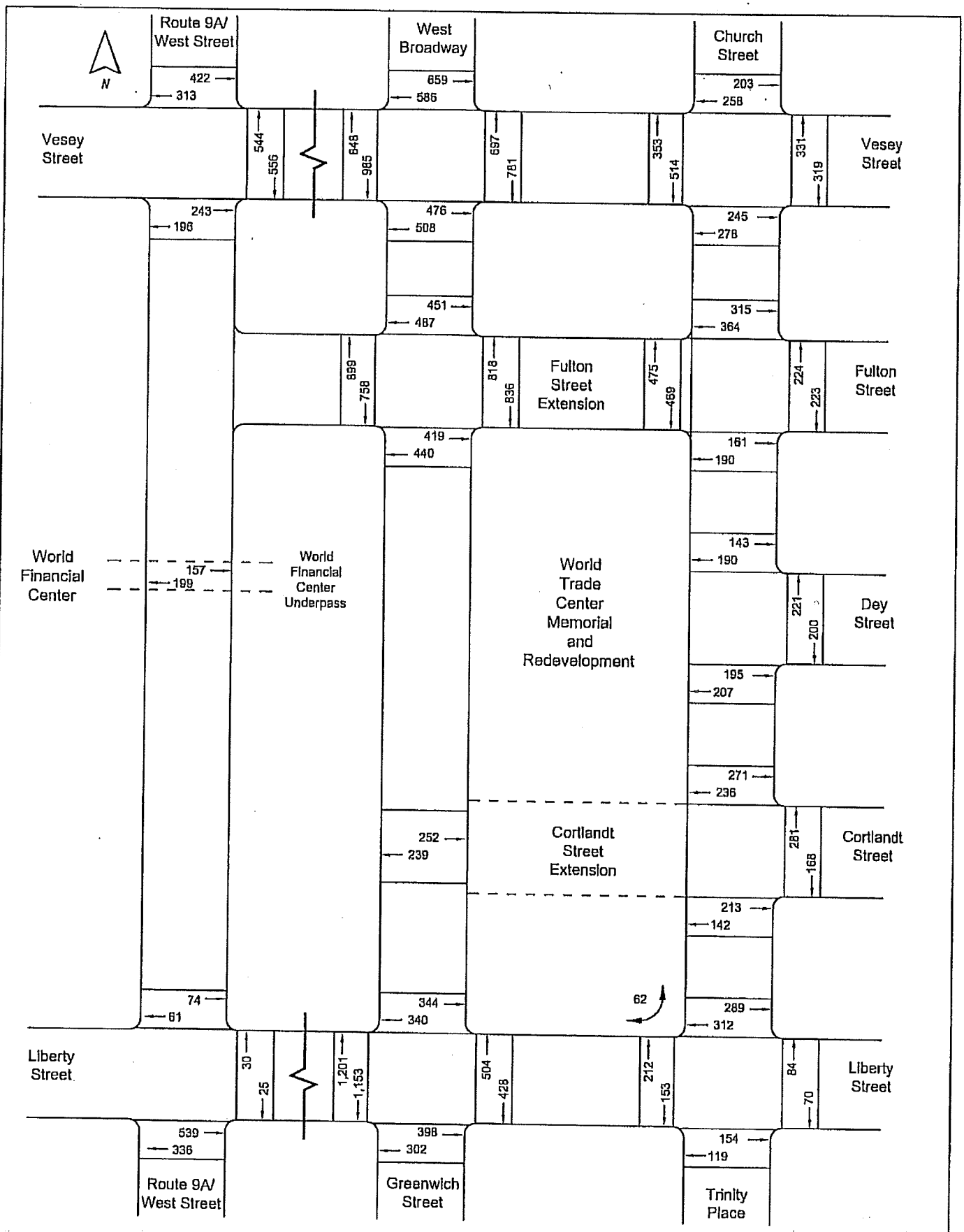
2025 Proposed Action Conditions
AM Peak 15-Minute Volumes
Figure 37



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

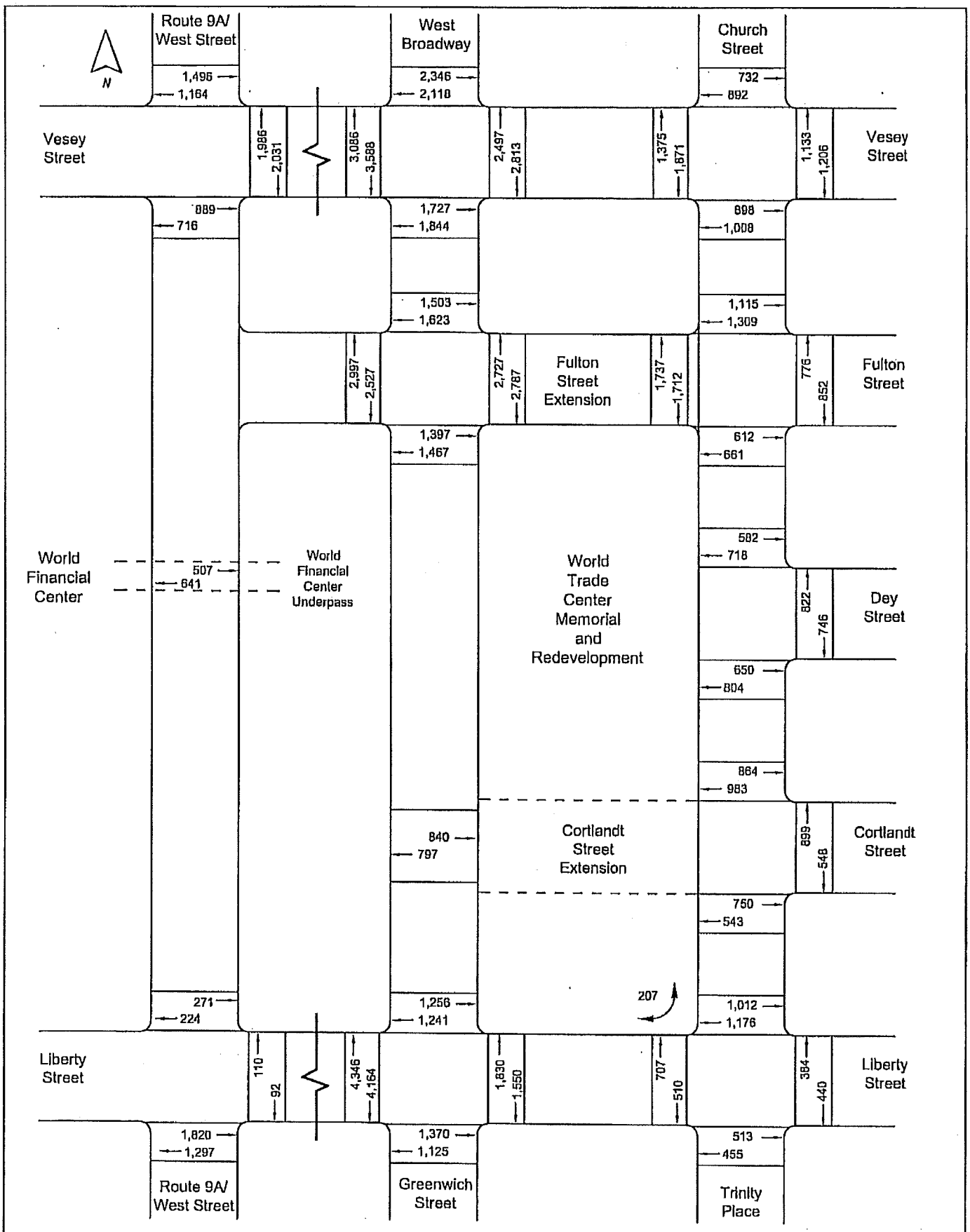
2025 Proposed Action Conditions
AM Peak Hour Volumes
Figure 38



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

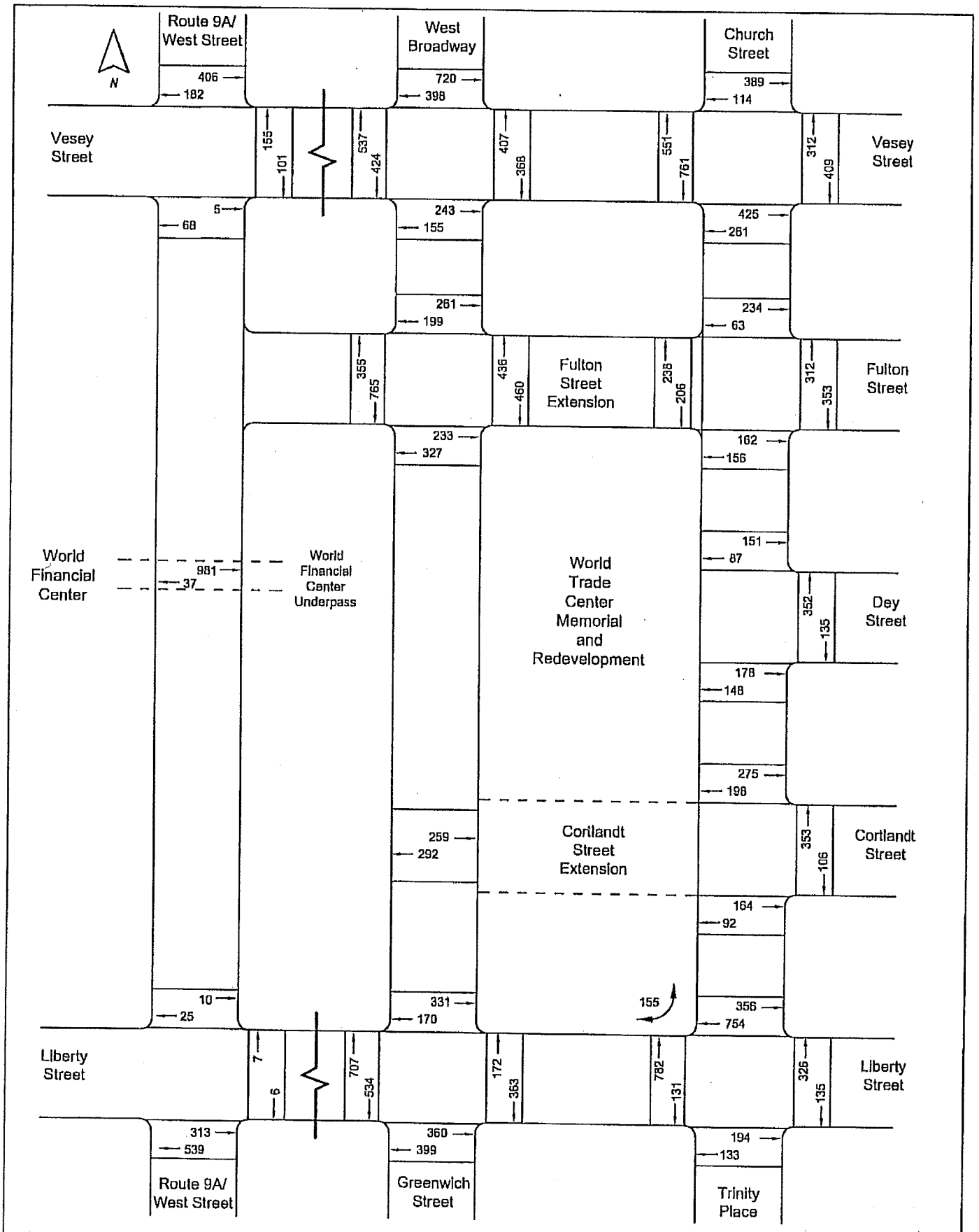
2025 Proposed Action Conditions
Midday Peak 15-Minute Volumes
Figure 39



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

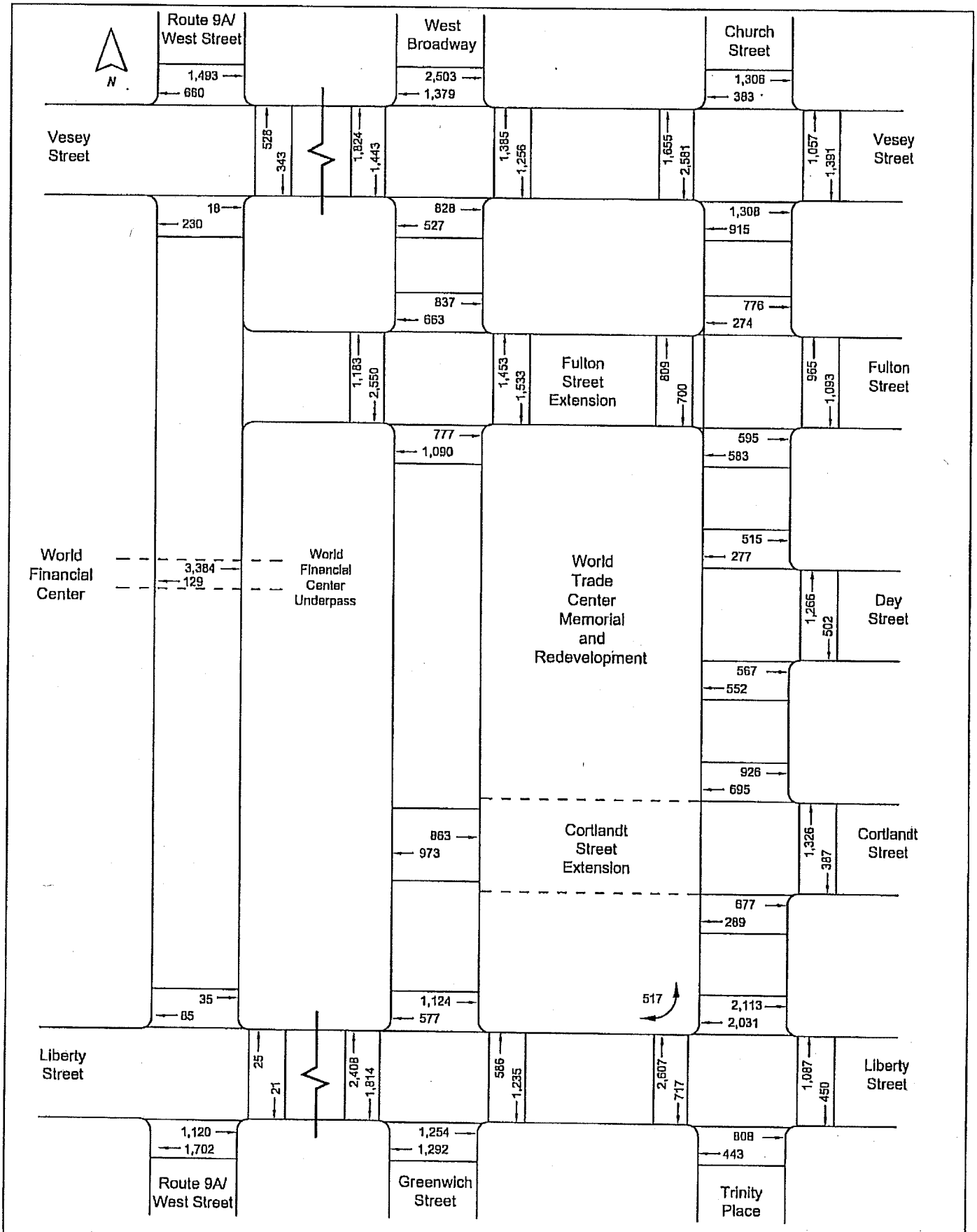
2025 Proposed Action Conditions
Midday Peak Hour Volumes
Figure 40



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

2025 Proposed Action Conditions
PM Peak 15-Minute Volumes
Figure 41



Eng-Wong, Taub & Associates
Traffic and Transportation Consultants

Permanent WTC PATH Terminal EIS
On-Street Pedestrian Volumes

2025 Proposed Action Conditions
PM Peak Hour Volumes
Figure 42

Appendix C-5: Cumulative Construction Traffic

CONTENTS

Table 1	2006 Cumulative Construction Level of Service Analysis: 2006 AM Peak Hour
Table 2	2006 Cumulative Construction Level of Service Analysis: 2006 Midday Peak Hour
Table 3	2006 Cumulative Construction Level of Service Analysis: 2006 PM Peak Hour
Figure 1	2006 Peak Hour Total Construction Vehicle Trips (courtesy of *Fulton Street Transit Center, Environmental Impact Statement*)

TABLE 1
2006 CUMULATIVE CONSTRUCTION LEVEL OF SERVICE ANALYSIS
2006 AM PEAK (8:15 - 9:15 AM)

INTERSECTION AND APPROACH	NO BUILD				BUILD				SIGNIFICANT IMPACT?
	Lane Group	V/C (1) Ratio	Delay (2)	LOS	Lane Group	V/C Ratio (1)	Delay (2)	LOS	No Build vs. Build
Canal Street/West Street (NYS Rt. 9A) (Signalized)									
Westbound (Canal Street)	L	0.20	43.2	D	L	0.22	43.6	D	NO
Westbound (Canal Street)	LR	0.45	50.1	D	LR	0.45	50.1	D	NO
Westbound (Canal Street)	R	0.53	53.3	D	R	0.53	53.3	D	NO
Northbound (West Street)	T	0.66	2.4	A	T	0.66	2.4	A	NO
Southbound (West Street)	T	0.57	1.8	A	T	0.58	1.9	A	NO
Intersection			4.3	A			4.3	A	NO
Canal Street/West Street (NYS Rt. 9A) (Signalized)									
Northbound (West Street)	TR	0.90	19.6	B	TR	0.91	20.1	C	NO
Northbound (West Street)	R	0.41	11.4	B	R	0.42	11.5	B	NO
Southbound (West Street)	L	1.02	103.7	F	L	1.02	103.7	F	NO
Southbound (West Street)	T	0.99	18.1	B	T	1	33.2	C	NO
Intersection			29.8	C			35.9	D	NO
Chambers Street/West Street (NYS Rt. 9A) (Signalized)									
Eastbound (Chambers Street)	LTR	0.63	47.6	D	LTR	0.63	47.6	D	NO
Westbound (Chambers Street)	LT	0.73	52.8	D	LT	0.73	52.8	D	NO
Westbound (Chambers Street)	R	0.43	25.8	C	R	0.43	25.8	C	NO
Northbound (West Street)	TR	0.94	27.2	C	TR	0.95	28.4	C	NO
Southbound (West Street)	L	0.68	13.5	B	L	0.67	13.2	B	NO
Southbound (West Street)	TR	0.63	16.4	B	TR	0.64	16.5	B	NO
Intersection			24.7	C			25.3	C	NO
Vesey Street/West Street (NYS Rt. 9A) (Signalized)									NO
Eastbound (Vesey Street)	L	0.67	54.4	D	L	0.67	54.4	D	NO
Eastbound (Vesey Street)	TR	0.2	34.7	C	TR	0.20	34.7	C	NO
Westbound (Vesey Street)	L	0.01	33.9	C	L	0.06	34.7	C	NO
Westbound (Vesey Street)	TR	0.04	32.8	C	TR	0.04	32.8	C	NO
Northbound (West Street)	TR	1.01	150.3	F	TR	1.01	151.3	F	YES
Southbound (West Street)	L	0.10	9.5	A	L	0.19	11.5	B	NO
Southbound (West Street)	TR	1.07	60.0	E	TR	1.08	63.0	E	NO
Intersection			103.8	F			105	F	NO
Liberty Street/West Street (NYS Rt. 9A) (Signalized)									
Eastbound (Liberty Street)	L	0.59	45.1	D	L	0.59	45.1	D	NO
Eastbound (Liberty Street)	R	0.13	35.2	D	R	0.13	35.2	D	NO
Northbound (West Street)									
Northbound (West Street)	TR	0.91	19.5	B	TR	0.91	19.8	B	NO
Southbound (West Street)	L	0.02	47.1	D	L	0.11	48.7	D	NO
Southbound (West Street)	TR	0.83	15.8	B	TR	0.83	16	B	NO
Intersection			19.4	B			19.7	B	NO
Rector Street/West Street (NYS Rt. 9A) (Unsignalized)									
Northbound (West Street)	R	-	0.0	A	R	-	0.0	A	NO
Intersection			0.0	A			0.0	A	NO
Brooklyn Battery Tunnel Exit/West Street (NYS Rt. 9A) (Signalized)									
Eastbound (Brooklyn Battery Tunnel Exit)	R	0.64	27.4	C	R	0.64	27.4	C	NO
Westbound (Brooklyn Battery Tunnel Exit)	L	0.73	62.8	E	L	0.73	62.8	E	NO
Westbound (Brooklyn Battery Tunnel Exit)	R	0.41	64.4	E	R	0.41	64.7	E	NO
Northbound (West Street)	T	0.78	35.4	D	T	0.78	35.4	D	NO
Northbound (West Street)	R	0.70	36.6	D	R	0.70	36.6	D	NO
Southbound (West Street)	TR	0.85	38.0	D	TR	0.85	38.0	D	NO
Intersection			50.7	D			50.8	D	NO
Barclay Street/West Street (NYS Rt. 9A) (Unsignalized)									
Westbound (Barclay Street)	R	0.55	24.4	C	R	0.64	28.2	D	NO
Intersection			24.4	C			28.2	D	NO
Barclay Street/Greenwich Street (Unsignalized)									
Southbound (Greenwich Street)	R	0.07	9.4	A	R	0.07	9.6	A	NO
Intersection			9.4	A			9.6	A	NO
Canal Street/Hudson Street (Signalized)									
Eastbound (Canal Street)	L	1.05	67.9	E	L	1.06	71.7	E	NO
Eastbound (Canal Street)	LT	0.61	10.7	B	LT	0.61	10.7	B	NO
Westbound (Canal Street)	T	1.00	72.1	E	T	1.00	72.1	E	NO
Westbound (Canal Street)	R	0.20	5.7	A	R	0.20	5.7	A	NO
Northbound (Hudson Street)	LTR	0.87	44.1	D	LTR	0.88	44.8	D	NO
Northbound (Hudson Street)	R	0.56	36.1	D	R	0.56	36.1	D	NO
Intersection			41.9	D			42.9	D	NO
Canal Street/Varick Street (Signalized)									
Eastbound (Canal Street)	TR	0.45	10.4	B	TR	0.45	10.4	B	NO
Westbound (Canal Street)	LT	0.93	49.8	D	LT	0.93	49.8	D	NO
Southbound (Varick Street)	L	0.21	23.2	C	L	0.21	23.2	C	NO
Southbound (Varick Street)	T	0.67	29.8	C	T	0.67	29.8	C	NO
Southbound (Varick Street)	R	0.12	22.1	C	R	0.12	22.1	C	NO
Intersection			29.8	C			29.8	C	NO

TABLE 1
2006 CUMULATIVE CONSTRUCTION LEVEL OF SERVICE ANALYSIS
2006 AM PEAK (8:15 - 9:15 AM)

INTERSECTION AND APPROACH	NO BUILD				BUILD				SIGNIFICANT IMPACT?
	Lane Group	V/C (1) Ratio	Delay (2)	LOS	Lane Group	V/C Ratio (1)	Delay (2)	LOS	No Build vs. Build
Barclay Street/West Broadway (Signalized)									
Westbound (Barclay Street)	T	0.30	18.6	B	T	0.36	19.4	B	NO
Southbound (West Broadway)	R	0.09	12.0	B	R	0.09	12.0	B	NO
Intersection			17.4	B			18.2	B	NO
Worth Street/Church Street (Signalized)									
Eastbound (Worth Street)	LT	0.98	65.8	E	LT	0.98	65.8	E	NO
Westbound (Worth Street)	TR	0.88	44.4	D	TR	0.88	44.4	D	NO
Northbound (Church Street)	LTR	1.12	83.7	F	LTR	1.13	85.3	F	NO
Intersection			72.7	E			73.8	E	NO
Chambers Street/Church Street (Signalized)									
Eastbound (Chambers Street)	LT	1.02	103.3	F	LT	1.02	103.3	F	NO
Westbound (Chambers Street)	TR	0.77	27.8	C	TR	0.77	27.8	C	NO
Northbound (Church Street)	LTR	1.31	169.6	F	LTR	1.31	171.4	F	YES
Intersection			125.3	F			126.4	F	YES
Barclay Street/Church Street (Signalized)									
Westbound (Barclay Street)	TR	0.13	19.4	B	T	0.13	19.1	B	NO
Westbound (Barclay Street)	R	1.86	433.1	F	R	1.26	168.4	F	NO
Northbound (Church Street)	LT	1.01	47.5	D	LT	1.05	60.0	E	YES
Intersection			139.8	F			84.0	F	NO
Vesey Street/Church Street (Signalized)									
Eastbound (Vesey Street)	LT	0.05	19.2	B	LT	0.08	19.5	B	NO
Northbound (Church Street)	LTR	0.91	21.5	C	LTR	0.93	24.0	C	NO
Northbound (Church Street)	R	0.35	9.0	A	R	0.35	9.0	A	NO
Intersection			20.2	C			22.5	C	NO
Fulton Street/Church Street (Signalized)									
Westbound (Fulton Street)	R	0.14	19.6	B	R	0.14	19.6	B	NO
Northbound (Church Street)	T	0.87	24.5	C	T	0.89	26.0	C	NO
Intersection			24.3	C			25.7	C	NO
Dey Street/Church Street (Signalized)									
Westbound (Dey Street)	R	0.00	24.2	C	R	0.00	24.2	C	NO
Northbound (Church Street)	T	0.76	13.5	B	T	0.77	14.0	B	NO
Intersection			13.5	B			14.0	B	NO
Cortland Street/Church Street (Signalized)									
Westbound (Cortland Street)	R	0.92	55.4	E	R	0.93	58.0	E	NO
Northbound (Church Street)	T	0.61	10.4	B	T	0.63	10.6	B	NO
Intersection			24.1	C			25.0	C	NO
Liberty Street/Church Street (Signalized)									
Eastbound (Liberty Street)	LT	0.07	18.7	B	LT	0.10	19.0	B	NO
Northbound (Church Street)	T	0.58	9.9	A	T	0.58	9.9	A	NO
Northbound (Church Street)	R	0.15	6.6	A	R	0.15	6.6	A	NO
Intersection			10.2	B			10.4	B	NO
Canal Street/Broadway (Signalized)									
Eastbound (Canal Street)	TR	0.46	19.3	B	TR	0.47	19.4	B	NO
Westbound (Canal Street)	DefL	0.71	30.9	C	DefL	0.72	31.7	C	NO
Westbound (Canal Street)	T	0.32	8.7	A	T	0.32	8.7	A	NO
Southbound (Broadway)	LTR	0.38	19.3	B	LTR	0.38	19.3	B	NO
Intersection			19.9	B			20.1	C	NO
Worth Street/Broadway (Signalized)									
Eastbound (Worth Street)	TR	0.96	98.4	F	TR	0.96	98.4	F	NO
Westbound (Worth Street)	LT	0.72	35.1	D	LT	0.72	35.1	D	NO
Southbound (Broadway)	LTR	1.25	290.2	F	LTR	1.26	292.8	F	YES
Intersection			191.1	F			192.9	F	YES
Chambers Street/Broadway (Signalized)									
Eastbound (Chambers Street)	TR	0.91	42.6	D	TR	0.91	42.6	D	NO
Westbound (Chambers Street)	L	0.52	25.8	C	L	0.52	25.8	C	NO
Westbound (Chambers Street)	T	0.68	23.7	C	TR	0.68	23.7	C	NO
Southbound (Broadway)	LTR	0.90	25.8	C	LTR	0.91	26.2	C	NO
Intersection			29.4	C			29.6	C	NO
Vesey Street/Ann Street/Broadway (Signalized)									
Eastbound (Vesey Street/Ann Street)	L	0.46	44.8	D	L	0.46	44.8	D	NO
Eastbound (Vesey Street/Ann Street)	TR	0.31	39.7	D	TR	0.31	39.1	D	NO
Southbound (Broadway)	L	0.93	40.2	D	L	0.93	40.2	D	NO
Southbound (Broadway)	LT	1.00	50.1	D	LT	1.01	51.0	D	NO
Intersection			46.6	D			47.2	D	NO

Source: The Louis Berger Group, Inc. (2003)
(1) Note: Volume to Capacity Ratio
(2) Note: Delay is measured in seconds per vehicle
(na) Not Applicable

TABLE 2
2006 CUMULATIVE CONSTRUCTION LEVEL OF SERVICE ANALYSIS
2006 MIDDAY PEAK (12:00 - 1:00 PM)

INTERSECTION AND APPROACH	NO BUILD				BUILD				SIGNIFICANT IMPACT?
	Lane Group	V/C (1) Ratio	Delay (2)	LOS	Lane Group	V/C Ratio (1)	Delay (2)	LOS	No Build vs. Build
Canal Street/West Street (NYS Rt. 9A) (Signalized)									
Westbound (Canal Street)	L	0.34	43.8	D	L	0.37	44.3	D	NO
Westbound (Canal Street)	R	0.62	55.1	E	R	0.62	55.1	E	NO
Northbound (West Street)	T	0.45	1.7	A	T	0.46	1.7	A	NO
Southbound (West Street)	T	0.39	1.4	A	T	0.39	1.4	A	NO
Intersection			8.2	A			8.2	A	NO
Canal Street/West Street (NYS Rt. 9A) (Signalized)									
Northbound (West Street)	TR	0.60	11.9	B	TR	0.61	12.0	B	NO
Northbound (West Street)	R	0.42	11.4	B	R	0.43	11.6	B	NO
Southbound (West Street)	L	1.01	72.5	E	L	1.01	72.5	E	NO
Southbound (West Street)	T	0.96	17.3	B	T	0.98	21.1	C	NO
Intersection			22.5	C			23.9	C	NO
Chambers Street/West Street (NYS Rt. 9A) (Signalized)									
Eastbound (Chambers Street)	LTR	0.34	39.2	D	LTR	0.34	39.2	D	NO
Westbound (Chambers Street)	LT	0.48	41.8	D	LT	0.48	41.8	D	NO
Westbound (Chambers Street)	R	0.47	27.1	C	R	0.47	27.1	C	NO
Northbound (West Street)	TR	0.66	16.9	B	TR	0.67	17.1	B	NO
Southbound (West Street)	L	0.67	11.9	B	L	0.67	12.3	B	NO
Southbound (West Street)	TR	0.54	15.1	B	TR	0.55	15.3	B	NO
Intersection			17.9	B			18.1	B	NO
Vesey Street/West Street (NYS Rt. 9A) (Signalized)									
Eastbound (Vesey Street)	L	0.55	47.1	D	L	0.55	47.1	D	NO
Eastbound (Vesey Street)	TR	0.21	34.8	C	TR	0.21	34.8	C	NO
Westbound (Vesey Street)	L	0.02	34.1	C	L	0.07	34.9	C	NO
Westbound (Vesey Street)	TR	0.04	32.8	C	TR	0.04	32.8	C	NO
Northbound (West Street)	TR	1.00	64.6	E	TR	1.00	66.8	E	NO
Southbound (West Street)	L	0.11	7.2	A	L	0.20	9.5	A	NO
Southbound (West Street)	TR	1.05	59.6	E	TR	1.06	62.7	E	NO
Intersection			60.4	E			62.5	E	NO
Liberty Street/West Street (NYS Rt. 9A) (Signalized)									
Eastbound (Liberty Street)	L	0.43	40.4	D	L	0.43	40.4	D	NO
Eastbound (Liberty Street)	R	0.09	34.5	C	R	0.09	34.5	C	NO
Northbound (West Street)									
Northbound (West Street)	TR	0.67	11.9	B	TR	0.67	12.0	B	NO
Southbound (West Street)	L	0.02	47.1	D	L	0.11	48.7	D	NO
Southbound (West Street)	TR	0.72	12.9	B	TR	0.72	13.0	B	NO
Intersection			14.0	B			14.2	B	NO
Rector Street/West Street (NYS Rt. 9A) (Unsignalized)									
Northbound (West Street)	R	-	0.0	A	R	-	0.0	A	NO
Intersection			0.0	A			0.0	A	NO
Brooklyn Battery Tunnel Exit/West Street (NYS Rt. 9A) (Signalized)									
Eastbound (Brooklyn Battery Tunnel Exit)	R	0.20	22.0	C	R	0.20	22.0	C	NO
Westbound (Brooklyn Battery Tunnel Exit)	L	0.44	65.1	E	L	0.44	65.1	E	NO
Westbound (Brooklyn Battery Tunnel Exit)	R	0.29	42.4	D	R	0.30	42.6	D	NO
Northbound (West Street)	T	0.52	30.0	C	T	0.52	30.0	C	NO
Northbound (West Street)	R	0.75	71.7	E	R	0.75	71.7	E	NO
Southbound (West Street)	TR	0.57	31.1	C	TR	0.57	31.1	C	NO
Intersection			46.0	D			46.0	D	NO
Barclay Street/West Street (NYS Rt. 9A) (Unsignalized)									
Westbound (Barclay Street)	R	0.19	12.8	B	R	0.25	13.4	B	NO
Intersection			12.8	B			13.4	B	NO
Barclay Street/Greenwich Street (Unsignalized)									
Southbound (Greenwich)	R	0.02	8.8	A	R	0.02	9.0	A	NO
Intersection			8.8	A			9.0	A	NO
Canal Street/Hudson Street (Signalized)									
Eastbound (Canal Street)	L	0.95	42.3	D	L	0.96	44.7	D	NO
Eastbound (Canal Street)	LT	0.90	34.2	C	LT	0.90	34.2	C	NO
Westbound (Canal Street)	T	0.90	47.7	D	T	0.90	47.7	D	NO
Westbound (Canal Street)	R	1.00	64.5	E	R	1.00	64.5	E	NO
Northbound (Hudson Street)	LTR	0.66	34.4	C	LTR	0.67	34.6	C	NO
Northbound (Hudson Street)	R	0.55	35.7	D	R	0.55	35.7	D	NO
Intersection			42.7	D			43.3	D	NO
Canal Street/Varick Street (Signalized)									
Eastbound (Canal Street)	TR	0.31	8.9	A	TR	0.31	8.9	A	NO
Westbound (Canal Street)	LT	1.04	59.2	E	LT	1.04	59.2	E	NO
Southbound (Varick Street)	L	0.34	25.4	C	L	0.34	25.4	C	NO
Southbound (Varick Street)	T	0.57	27.7	C	T	0.57	27.7	C	NO
Southbound (Varick Street)	R	0.38	26.4	C	R	0.38	26.4	C	NO
Intersection			34.9	C			34.9	C	NO

TABLE 2
2006 CUMULATIVE CONSTRUCTION LEVEL OF SERVICE ANALYSIS
2006 MIDDAY PEAK (12:00 - 1:00 PM)

INTERSECTION AND APPROACH	NO BUILD				BUILD				SIGNIFICANT IMPACT?
	Lane Group	V/C (1) Ratio	Delay (2)	LOS	Lane Group	V/C Ratio (1)	Delay (2)	LOS	No Build vs. Build
Barclay Street/West Broadway (Signalized)									
Westbound (Barclay Street)	T	0.16	17.0	B	T	0.22	17.7	B	NO
Southbound (West Broadway)	R	0.01	11.3	B	R	0.01	11.3	B	NO
Intersection			16.8	B			17.5	B	NO
Worth Street/Church Street (Signalized)									
Eastbound (Worth Street)	LT	0.83	44.0	D	LT	0.83	44.0	D	NO
Westbound (Worth Street)	TR	0.77	39.8	D	TR	0.77	39.8	D	NO
Northbound (Church Street)	LTR	1.04	81.7	F	LTR	1.05	82.9	F	NO
Intersection			69.4	E			70.3	E	NO
Chambers Street/Church Street (Signalized)									
Eastbound (Chambers Street)	LT	1.04	79.9	E	LT	1.04	79.9	E	NO
Westbound (Chambers Street)	TR	0.69	24.2	C	TR	0.69	24.2	C	NO
Northbound (Church Street)	LTR	1.14	100.6	F	LTR	1.15	102.0	F	NO
Intersection			79.1	E			79.9	E	NO
Barclay Street/Church Street (Signalized)									
Westbound (Barclay Street)	TR	0.11	19.9	B	T	0.11	19.9	B	NO
Westbound (Barclay Street)	R	1.27	181.0	F	R	0.86	50.3	D	NO
Northbound (Church Street)	LT	0.86	24.7	C	LT	0.91	29.2	C	NO
Intersection			56.9	E			33.1	C	NO
Vesey Street/Church Street (Signalized)									
Eastbound (Vesey Street)	LT	0.01	18.8	B	LT	0.07	19.5	B	NO
Northbound (Church Street)	LTR	0.66	15.4	B	LTR	0.68	15.9	B	NO
Northbound (Church Street)	R	0.66	21.4	C	R	0.66	21.4	C	NO
Intersection			16.7	B			17.1	C	NO
Fulton Street/Church Street (Signalized)									
Westbound (Fulton Street)	R	0.61	32.5	C	R	0.61	32.5	C	NO
Northbound (Church Street)	T	0.80	20.6	C	T	0.82	21.5	C	NO
Intersection			22.3	C			23.1	C	NO
Dey Street/Church Street (Signalized)									
Westbound (Dey Street)	R	0.00	24.2	C	R	0.00	24.2	C	NO
Northbound (Church Street)	T	0.69	12.0	B	T	0.71	12.4	B	NO
Intersection			12.0	B			12.4	B	NO
Cortland Street/Church Street (Signalized)									
Westbound (Cortland Street)	R	1.04	85.5	F	R	1.06	89.1	F	YES
Northbound (Church Street)	T	0.46	8.5	A	T	0.47	8.6	A	NO
Intersection			39.2	D			40.3	D	NO
Liberty Street/Church Street (Signalized)									
Eastbound (Liberty Street)	LT	0.02	18.2	B	LT	0.05	18.5	B	NO
Northbound (Church Street)	T	0.50	8.9	A	T	0.50	8.9	A	NO
Northbound (Church Street)	R	0.21	7.2	A	R	0.21	7.2	A	NO
Intersection			8.9	A			9.2	A	NO
Canal Street/Broadway (Signalized)									
Eastbound (Canal Street)	TR	0.41	18.6	B	TR	0.41	18.6	B	NO
Westbound (Canal Street)	LT	0.65	12.6	B	LT	0.66	12.7	B	NO
Southbound (Broadway)	LTR	0.50	21.1	C	LTR	0.50	21.1	C	NO
Intersection			17.1	B			17.2	B	NO
Worth Street/Broadway (Signalized)									
Eastbound (Worth Street)	TR	0.85	70.4	E	TR	0.85	70.4	E	NO
Westbound (Worth Street)	LT	0.75	53.9	D	LT	0.75	53.9	D	NO
Southbound (Broadway)	LTR	0.99	245.1	F	LTR	1.00	250.7	F	YES
Intersection			152.9	F			156.1	F	YES
Chambers Street/Broadway (Signalized)									
Eastbound (Chambers Street)	TR	0.69	24.8	C	TR	0.69	24.8	C	NO
Westbound (Chambers Street)	L	0.35	19.3	B	L	0.35	19.3	B	NO
Westbound (Chambers Street)	T	0.60	21.2	C	T	0.6	21.2	C	NO
Southbound (Broadway)	LTR	0.70	15.9	B	LTR	0.71	16.1	B	NO
Intersection			19.4	B			19.4	B	NO
Vesey Street/Ann Street/Broadway (Signalized)									
Eastbound (Vesey Street/Ann Street)	L	0.54	48.4	D	L	0.54	48.4	D	NO
Eastbound (Vesey Street/Ann Street)	TR	0.88	79.4	E	TR	0.88	79.4	E	NO
Southbound (Broadway)	L	0.67	20.3	C	L	0.67	20.3	C	NO
Southbound (Broadway)	LT	0.78	21.0	C	LT	0.79	21.2	C	NO
Intersection			27.5	C			27.6	C	NO

Source: The Louis Berger Group, Inc. (2003)
(1) Note: Volume to Capacity Ratio
(2) Note: Delay is measured in seconds per vehicle
(na) Not Applicable

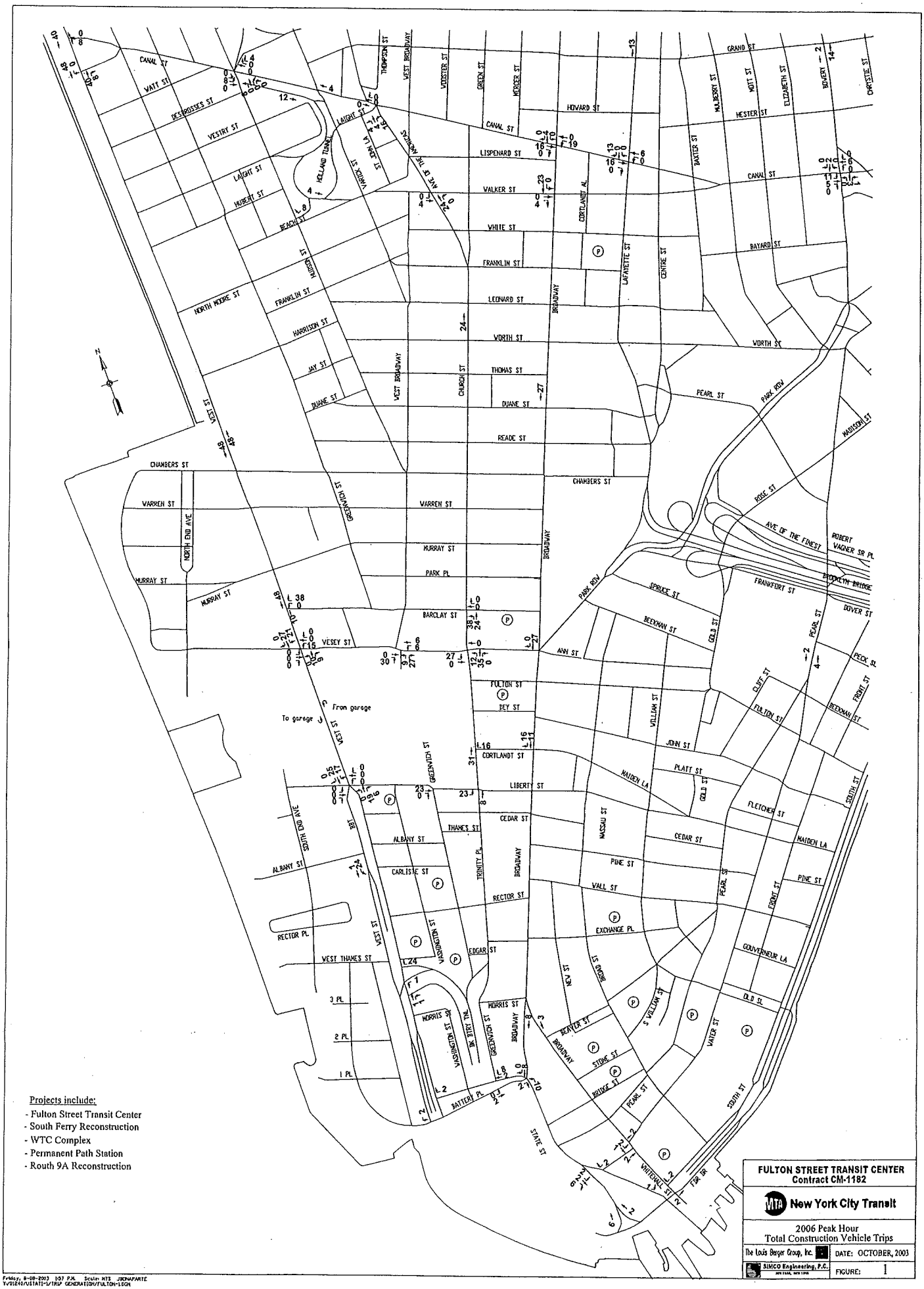
TABLE 3
2006 CUMULATIVE CONSTRUCTION LEVEL OF SERVICE ANALYSIS
2006 PM PEAK (5:00 - 6:00 PM)

INTERSECTION AND APPROACH	NO BUILD				BUILD				SIGNIFICANT IMPACT?
	Lane Group	V/C (1) Ratio	Delay (2)	LOS	Lane Group	V/C Ratio (1)	Delay (2)	LOS	No Build vs. Build
Canal Street/West Street (NYS Rt. 9A) (Signalized)									
Westbound (Canal Street)	L	0.2	39.3	D	L	0.22	39.6	D	NO
Westbound (Canal Street)	R	0.41	44.9	D	R	0.41	44.9	D	NO
Northbound (West Street)	T	0.63	2.4	A	T	0.64	2.5	A	NO
Southbound (West Street)	T	0.67	2.5	A	T	0.67	2.5	A	NO
Intersection			4.3	A			4.3	A	NO
Canal Street/West Street (NYS Rt. 9A) (Signalized)									
Northbound (West Street)	TR	0.81	15.9	B	TR	0.82	16.1	B	NO
Northbound (West Street)	R	0.23	9.2	A	R	0.24	9.2	A	NO
Southbound (West Street)	L	1.01	73.8	E	L	1.01	73.8	E	NO
Southbound (West Street)	T	1.00	31.7	C	T	1.01	34.7	C	NO
Intersection			29.0	C			30.5	C	NO
Chambers Street/West Street (NYS Rt. 9A) (Signalized)									
Eastbound (Chambers Street)	LTR	0.30	38.1	D	LTR	0.30	38.1	D	NO
Westbound (Chambers Street)	LT	0.72	54.3	D	LT	0.72	54.3	D	NO
Westbound (Chambers Street)	R	0.67	33.1	C	R	0.67	33.1	C	NO
Northbound (West Street)	TR	0.76	19.2	B	TR	0.78	19.4	B	NO
Southbound (West Street)	L	0.84	20.6	C	L	0.84	20.6	C	NO
Southbound (West Street)	TR	0.83	21.2	C	TR	0.85	21.6	C	NO
Intersection			22.6	C			22.9	C	NO
Vesey Street/West Street (NYS Rt. 9A) (Signalized)									
Eastbound (Vesey Street)	L	0.76	61.6	E	L	0.76	61.6	E	NO
Eastbound (Vesey Street)	TR	0.19	34.5	C	TR	0.19	34.5	C	NO
Westbound (Vesey Street)	L	0.01	33.9	C	L	0.06	34.7	C	NO
Westbound (Vesey Street)	TR	0.01	32.4	C	TR	0.01	32.4	C	NO
Northbound (West Street)	TR	1.05	65.6	E	TR	1.06	67.2	E	NO
Southbound (West Street)	L	0.04	8.0	A	L	0.13	9.9	A	NO
Southbound (West Street)	TR	1.05	67.9	E	TR	1.06	70.1	E	NO
Intersection			65.6	E			67.2	E	NO
Liberty Street/West Street (NYS Rt. 9A) (Signalized)									
Eastbound (Liberty Street)	L	0.41	39.9	D	L	0.41	39.9	D	NO
Eastbound (Liberty Street)	R	0.23	37.2	D	R	0.23	37.2	D	NO
Northbound (West Street)									
Northbound (West Street)	TR	0.72	12.8	B	TR	0.73	12.9	B	NO
Southbound (West Street)	L	0.02	47.1	D	L	0.10	48.4	D	NO
Southbound (West Street)	TR	1.09	83.1	F	TR	1.09	85.2	F	NO
Intersection			52.9	D			54.1	D	NO
Rector Street/West Street (NYS Rt. 9A) (Unsignalized)									
Northbound (West Street)	R	-	0.0	A	R	-	0.0	A	NO
Intersection			0.0	A			0.0	A	NO
Brooklyn Battery Tunnel Exit/West Street (NYS Rt. 9A) (Signalized)									
Eastbound (Brooklyn Battery Tunnel Exit)	R	0.53	24.7	C	R	0.53	24.7	C	NO
Westbound (Brooklyn Battery Tunnel Exit)	L	0.48	63.7	E	L	0.48	63.7	E	NO
Westbound (Brooklyn Battery Tunnel Exit)	R	0.42	50.3	D	R	0.42	50.6	D	NO
Northbound (West Street)	T	0.72	33.1	C	T	0.72	33.1	C	NO
Northbound (West Street)	R	1.10	100.9	F	R	1.10	100.9	F	NO
Southbound (West Street)	TR	1.00	59.5	E	TR	1.00	59.5	E	NO
Intersection			63.7	E			63.7	E	NO
Barclay Street/West Street (NYS Rt. 9A) (Unsignalized)									
Westbound (Barclay Street)	R	0.27	14.5	B	R	0.34	15.4	C	NO
Intersection			14.5	B			15.4	C	NO
Barclay Street/Greenwich Street (Unsignalized)									
Southbound (Greenwich Street)	R	0.01	9.0	A	R	0.01	9.2	A	NO
Intersection			9.0	A			9.2	A	NO
Canal Street/Hudson Street (Signalized)									
Eastbound (Canal Street)	L	0.67	33.7	C	L	0.68	34.2	C	NO
Eastbound (Canal Street)	T	0.62	12.9	B	T	0.62	12.9	B	NO
Westbound (Canal Street)	T	0.76	43.2	D	T	0.76	43.2	D	NO
Westbound (Canal Street)	R	0.94	35.8	D	R	0.94	35.8	D	NO
Northbound (Hudson Street)	LTR	0.82	39.6	D	LTR	0.82	40.0	D	NO
Northbound (Hudson Street)	R	0.70	40.9	D	R	0.70	40.9	D	NO
Intersection			34.7	C			34.9	C	NO
Canal Street/Varick Street (Signalized)									
Eastbound (Canal Street)	TR	0.29	8.8	A	TR	0.29	8.8	A	NO
Westbound (Canal Street)	LT	1.06	121.2	F	LT	1.06	121.2	F	NO
Southbound (Varick Street)	L	0.75	45.9	D	L	0.75	45.9	D	NO
Southbound (Varick Street)	T	0.49	26.3	C	T	0.49	26.3	C	NO
Southbound (Varick Street)	R	0.11	22.0	C	R	0.11	22.0	C	NO
Intersection			66.5	E			66.5	E	NO

TABLE 3
2006 CUMULATIVE CONSTRUCTION LEVEL OF SERVICE ANALYSIS
2006 PM PEAK (5:00 - 6:00 PM)

INTERSECTION AND APPROACH	NO BUILD				BUILD				SIGNIFICANT IMPACT?
	Lane Group	V/C (1) Ratio	Delay (2)	LOS	Lane Group	V/C Ratio (1)	Delay (2)	LOS	No Build vs. Build
Barclay Street/West Broadway (Signalized)									
Westbound (Barclay Street)	T	0.22	17.7	B	T	0.28	18.4	B	NO
Southbound (West Broadway)	R	0.04	11.6	B	R	0.04	11.6	B	NO
Intersection			16.8	B			17.7	B	NO
Worth Street/Church Street (Signalized)									
Eastbound (Worth Street)	LT	0.61	31.7	C	LT	0.61	31.7	C	NO
Westbound (Worth Street)	TR	0.81	38.8	D	TR	0.81	38.8	D	NO
Northbound (Church Street)	LTR	1.04	82.4	F	LTR	1.05	83.6	F	NO
Intersection			67.7	E			68.5	E	NO
Chambers Street/Church Street (Signalized)									
Eastbound (Chambers Street)	LT	1.03	70.9	E	LT	1.03	70.9	E	NO
Westbound (Chambers Street)	TR	0.63	22.1	C	TR	0.63	22.1	C	NO
Northbound (Church Street)	LTR	1.29	162.7	F	LTR	1.30	164.1	F	YES
Intersection			115.1	F			116.0	F	NO
Barclay Street/Church Street (Signalized)									
Westbound (Barclay Street)	TR	0.17	21.3	C	TR	0.17	21.3	C	NO
Westbound (Barclay Street)	R	1.31	196.4	F	R	1.31	196.4	F	NO
Northbound (Church Street)	LT	0.76	19.5	B	LT	0.8	21.3	C	NO
Intersection			60.1	E			60.2	E	NO
Vesey Street/Church Street (Signalized)									
Eastbound (Vesey Street)	LT	0.03	19.0	B	LT	0.07	19.3	B	NO
Northbound (Church Street)	LTR	0.63	10.0	A	LTR	0.65	10.3	B	NO
Northbound (Church Street)	R	0.23	6.8	A	R	0.23	6.8	A	NO
Intersection			9.8	A			10.3	B	NO
Fulton Street/Church Street (Signalized)									
Westbound (Fulton Street)	R	0.24	20.9	C	R	0.24	20.9	C	NO
Northbound (Church Street)	T	0.61	14.8	B	T	0.63	15.2	B	NO
Intersection			15.5	B			15.8	B	NO
Dey Street/Church Street (Signalized)									
Westbound (Dey Street)	R	0.00	24.2	C	R	0.00	24.2	C	NO
Northbound (Church Street)	T	0.57	9.4	A	T	0.58	9.6	A	NO
Intersection			9.4	A			9.6	A	NO
Cortland Street/Church Street (Signalized)									
Westbound (Cortland Street)	R	0.96	64.0	E	R	0.98	66.8	E	NO
Northbound (Church Street)	T	0.35	7.5	A	T	0.36	7.6	A	NO
Intersection			31.6	C			32.5	C	NO
Liberty Street/Church Street (Signalized)									
Eastbound (Liberty Street)	LT	0.00	18.1	B	LT	0.03	18.3	B	NO
Northbound (Church Street)	T	0.34	7.4	A	T	0.34	7.4	A	NO
Northbound (Church Street)	R	0.11	6.2	A	R	0.11	6.2	A	NO
Intersection			7.4	A			7.7	A	NO
Canal Street/Broadway (Signalized)									
Eastbound (Canal Street)	TR	0.94	41.4	D	TR	0.94	41.9	D	NO
Westbound (Canal Street)	DefL	1.09	96.1	F	DefL	1.10	100.4	F	YES
Westbound (Canal Street)	T	0.69	16.7	B	T	0.70	16.8	B	NO
Southbound (Broadway Street)	LTR	0.61	22.7	C	LTR	0.61	22.7	C	NO
Intersection			36.9	D			39.8	D	NO
Worth Street/Broadway (Signalized)									
Eastbound (Worth Street)	TR	0.65	25.7	C	TR	0.65	25.7	C	NO
Westbound (Worth Street)	LT	0.71	26.9	C	LT	0.71	26.9	C	NO
Southbound (Broadway Street)	LTR	1.26	295.3	F	LTR	1.27	297.9	F	YES
Intersection			196.3	F			198.2	F	YES
Chambers and Broadway (Signalized)									
Eastbound (Chambers Street)	TR	0.84	32.8	C	TR	0.84	32.8	C	NO
Westbound (Chambers Street)	L	0.37	20.5	C	L	0.37	20.5	C	NO
Westbound (Chambers Street)	T	0.61	21.5	C	T	0.61	21.5	C	NO
Southbound (Broadway Street)	LTR	0.91	26.0	C	LTR	0.91	26.3	C	NO
Intersection			26.6	C			26.7	C	NO
Vesey Street/Ann Street/Broadway (Signalized)									
Eastbound (Vesey Street/Ann Street)	L	0.33	40.0	D	L	0.33	40.0	D	NO
Eastbound (Vesey Street/Ann Street)	TR	0.36	40.6	D	TR	0.36	40.6	D	NO
Southbound (Broadway Street)	L	1.04	69.1	E	L	1.04	69.1	E	NO
Southbound (Broadway Street)	LT	0.64	17.4	B	LT	0.65	17.5	B	NO
Intersection			40.9	D			40.9	D	NO

Source: The Louis Berger Group, Inc. (2003)
(1) Note: Volume to Capacity Ratio
(2) Note: Delay is measured in seconds per vehicle
(na) Not Applicable



Projects include:

- Fulton Street Transit Center
- South Ferry Reconstruction
- WTC Complex
- Permanent Path Station
- Routh 9A Reconstruction

FULTON STREET TRANSIT CENTER
Contract CM-1182

MTA New York City Transit

2006 Peak Hour
Total Construction Vehicle Trips

The Louis Berger Group, Inc. | DATE: OCTOBER, 2003

SIMCO Engineering, P.C. | FIGURE: 1

Friday, 8-08-2003 3:07 P.M. Scale: NTS JROMAINE
T:\PIER40\STAT1-1\TRIP GENERATION\FULTON-LEGN

Appendix D

Air Quality

APPENDIX D: Air Quality

INTRODUCTION

CUMULATIVE AIR QUALITY ANALYSIS

CONSTRUCTION METHODS AND IMPACTS

Included in this appendix is additional information regarding the WTC Permanent PATH Terminal construction period and the associated air quality analysis. The cumulative effects of the PATH on-site and off-site construction along with other projects planned in Lower Manhattan are discussed in Chapter 9, "Air Quality," and Chapter 15, "Cumulative Effects." During the construction period, the potential effects on ambient air quality in the study area are the sum of three distinct sources of air pollutant emissions: on-road vehicles, construction equipment, and fugitive dust. The cumulative local (microscale) effects assessment considered the following major Lower Manhattan projects in addition to the WTC Permanent PATH Terminal:

1. World Trade Center Memorial and Redevelopment Plan
2. Route 9A Project
3. Fulton Street Transit Center

For the regional (mesoscale) analysis, in addition to these projects, emissions from the South Ferry Station construction were added, based on worst-case assumptions and data from the Environmental Assessment for that project.

The project sponsors agreed upon the set of emission levels to be used for both the on-road and non-road equipment. Once emission levels were determined, each project sponsor performed the cumulative effects assessment in their respective area of potential effect. As explained in Chapters 9 and 15, the analysis of on-site sources for each project included factors such as the type of equipment in each work zone, the duration of equipment use, and the size of the equipment. Provided in this appendix is additional information regarding the construction methods, equipment, and emission factors used in the cumulative air quality analysis for these projects.

The air quality analyses have been updated since the DEIS to reflect several project changes. As of the time of this document, a preferred alternative has not yet been selected for the Route 9A project. The project may consist of either the At-Grade Alternative or the Short Bypass Alternative. Since these alternatives would result in different construction methods, and therefore different air pollutant emissions, the cumulative air quality analysis was performed twice to include each of the potential Route 9A scenarios. Construction methods and equipment are therefore presented in this Appendix for both the Route 9A At-Grade and Short Bypass Alternatives. Another update since the DEIS was the elimination from the Route 9A project of the proposed busway tunnel to Site 26.

In addition to affecting the cumulative air quality analysis, the Route 9A alternative will affect the WTC PATH Terminal project. As discussed in Chapter 9, "Air Quality," the construction of the pedestrian concourse (part of the WTC PATH Terminal project) that would run under Route 9A would vary significantly depending whether the At-Grade or Short Bypass Alternative is selected. Therefore, the air quality analysis for the WTC PATH Terminal only (i.e., independent of the cumulative analysis) was also run twice to account for both scenarios. Due to the overlap in location between the pedestrian concourse and the Route 9A project, the scheduled construction of the pedestrian concourse is linked to the Route 9A project. The construction equipment tables presented below for the Route 9A project include the pedestrian concourse. The actual emissions from the construction, however, are attributed to the WTC PATH Terminal project, since the pedestrian concourse would not be built if the WTC PATH Terminal were not built.

A similar situation exists regarding the construction of the waterlines for the WTC Memorial and Redevelopment project. For construction feasibility purposes, these waterlines will be constructed along with the other elements of the Route 9A project. The construction equipment tables presented below for the Route 9A project include the WTC Memorial and Redevelopment project waterlines. The emissions from the construction of the waterlines, however, are attributed to the WTC Memorial and Redevelopment project.

PERMANENT WTC PATH TERMINAL

CONSTRUCTION METHODS AND IMPACTS

Permanent Tracks, Platform Conversion, Mezzanine and Concourse Construction (Zone 1) – Traffic and Construction Equipment

Construction period for this activity is estimated to consist of demolition and construction activities occurring simultaneously. Following the construction of a temporary sixth track adjacent to the westernmost existing fifth track, demolition and conversion activities would occur in 3 major sections, each further broken down into 2 components; a northern and a southern component (6 stages total). To maintain train service and passenger safety and access, only one half (either northern or southern half) would be demolished and converted then the second half would follow. This cycle, of stage, of activity would continue until all six tracks and platforms were converted.

Duration of completing all 6 stages is estimated to run for 21 months. All work estimated based on one 10-hour shift commencing at 0700 and running to 1800 Monday to Saturday. All work is within the west bathtub of the site with access from the existing ramp from Liberty Street. No street closings, lane closings or sidewalk closings are anticipated for this work to take place.

Demolition – Temporary sixth track to be built prior to any demolition and conversion activities. Demolition is to occur in total of six stages. Demolition will occur on only the northern or southern half of platform and sets of tracks at one time to ensure continuous train service and passenger access. Estimated duration for demolition per stage is 24 days or 24 shifts. Demolition is included in the 3.5-month overall duration per stage.

Delivery Type *Per Stage (6 Stages total)*	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration per stage
Demolition Debris	1,000	Tons	68	10	6	1 Month
Service/Utility /Fuel Trucks				6	4	
Subcontractors Light Trucks				16	12	
Total Construction Workers	15 to 20					
Arriving by Personal Vehicle	3 to 4					
Arriving by Mass Transit	12 to 16					
Supervisory/QA	3 to 5					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	2 to 3					

Equipment – All demolition work occurs within the existing western bathtub of the WTC site. Demolition work will occur periodically over the 21-month construction schedule for periods up to 24 days each. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Dump Trucks is based on waiting time and loading time on site only. Equipment required is as follows:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Hydraulic All Terrain Crane	50 Ton	Diesel	165	1	1	80%	1 Month
Crawler Crane	200 Ton	Diesel	450	1	1	90%	
Hydraulic Excavator w/Hoe Ram	3.5 Cubic Yard	Diesel	320	1	1	90%	
Hydraulic Excavator w/Thumb	3.5 Cubic Yard	Diesel	320	1	1	90%	
Dump Trucks	Tandem Axle – 15 CY	Diesel	325	5	3	5%	
Air Compressor (for Pavement Breakers)	1600 CFM	Diesel	460	1	1	90%	
Pavement Breakers	90 lbs			4	4	90%	

Construction – Preliminary estimates for the duration of the stage construction of the PATH permanent tracks, platform conversion, mezzanine and concourse construction is 6 months per stage and roughly 21 months overall. Concrete Truck Trips have been generated based on a worst case scenario of a maximum pour of 500 CY.

Delivery Type *Per Stage (6 Stages total)*	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration per stage
Concrete	950	CY	95	100	3.2	2.5 Months
Reinforcing Steel	150	Tons	8	2	0.27	
Structural Steel	1300	Tons	68	8	2.3	
Service/Utility /Fuel Trucks				6	4	
Subcontractors Light Trucks				26	22	
Construction Workers	30 to 40					
Arriving by Personal Vehicle	6 to 8					
Arriving by Mass Transit	24 to 32					
Supervisory/QA	10 to 15					
Arriving by Personal Vehicle	2 to 3					
Arriving by Mass Transit	8 to 12					

It is anticipated that a Construction Crew of 30 to 40 craft workers will be required on site during the peak period of each stage, with an additional 10 to 15 supervisory, quality assurance or administrative personnel. Our assumption is that most individuals will arrive at the site using mass transit, however we would estimate that 10 to 15 light trucks will arrive at the site during the first and second shift shape-up times, (coinciding with morning and evening peak traffic periods) with an additional 5 to 10 service/utility/delivery truck frequenting the site during each shift.

Equipment – All construction work takes place within the western bathtub. Access is by way of the existing ramp from Liberty Street. Construction laydown area for materials will be within the footprint of the permanent PATH Station or immediately adjacent to the footprint within the western bathtub. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Concrete Trucks and Tractor Trailers are based on the approximate waiting time and loading/unloading time on site only. The following construction equipment will be required:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Hydraulic All Terrain Crane	50 Ton	Diesel	165	1	1	80%	2.5 months
Crawler Crane	200 Ton	Diesel	450	1	1	90%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	2	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	.1	50%	
Concrete Truck	10 CY Tandem or Tri-axle	Diesel	325	50	1.6	5%	
Tractor Trailer	Tandem Axle Tractor w/45 Foot Trailer	Diesel	325	5	1.3	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	2	2	90%	
Air Compressor (for Impact Wrenches)	1600 CFM	Diesel	460	2	2	90%	
Impact Wrenches	1" Socket Drive			20	20	80%	

Tunnels under 1 & 9 Line (Zone 3) – Traffic and Construction Equipment

The driving of the mezzanine and concourse tunnels under the 1 & 9 subway tunnel beneath Greenwich Street will take place from within the existing subway tunnel (grouting operation) and from within the existing west bathtub. Estimated duration of tunneling driving and construction is 20 months. Tunneling, Underpinning, and Construction activities will occur throughout this period. Mobilization of equipment, removal of excavated spoils and delivery of construction materials will be minor in nature to the overall site operations and will add the following traffic:

Delivery Type	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Spoil Removal	10,000	CY	670	12	2.8	20 Months
Underpinning	1,000	Tons	50	2	0.21	
Concrete / Steel	1,500	CY	150	4	0.63	
Service/Utility /Fuel Trucks				4	2	
Subcontractors Light Trucks				10	6	
Construction Workers	15 to 20					
Arriving by Personal Vehicle	3 to 4					
Arriving by Mass Transit	12 to 16					
Supervisory/QA	3 to 8					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	2 to 6					

Equipment – Grouting beneath the existing subway tunnel will be performed from within the tunnel and will involve the use of compressed air operated drill rigs and grout pumps. Tunneling beneath the subway will occur from the western bathtub and proceeding east. Tunneling will be accomplished with a tunnel roadheader and will require removal of existing piling supporting the existing tunnel and replacement with new piles/foundations. Spoils will be removed via the existing ramp to Liberty Street, or by lifting to the surface with a crane and skip box. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Concrete Trucks and Tractor Trailers are based on the approximate waiting time and loading/unloading time on site only. The following construction equipment will be required for the underpinning operation that will take approximately 6 months of the 20-month construction period:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Air Operated Grout Drills				3	1	90%	20 Months
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	0.67	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	0.33	30%	
Concrete Trucks	10 Cubic yard Tandem or Tri-axle	Diesel	325	2	0.67	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	2	0.67	90%	

The following construction equipment will be required for the excavation of the tunnel and spoil removal operation that will take approximately 6 months of the 20-month construction period:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Roadheader for tunneling	12 foot Diameter	Diesel	120	1	0.33	33%	20 Months
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	0.67	90%	
Crawler Crane (for spoil removal)	100 Ton	Diesel	350	1	0.33	90%	
Dump Truck	Tandem Axle – 15 CY	Diesel	325	1	0.33	5%	

The following construction equipment will be required for the tunnel lining operation that will take approximately 8 months of the 20-month construction period:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	0.67	90%	20 Months
Crawler Crane (for Material and Form support)	100 Ton	Diesel	350	1	0.33	80%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	0.33	30%	
Concrete Trucks	10 Cubic yard Tandem or Tri-axle	Diesel	325	1.4	0.67	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	2	.8	90%	

Tunnels and Concourses (Zones 2 & 4) – Traffic and Construction Equipment

The driving of the concourse tunnels under West and Church Streets will take place from within the existing west bathtub and the east bathtub in Zone 4 as described above. The West Street concourse will provide access to the World Financial Center under Route 9A and may be affected by the Route 9A project if the Short Bypass Alternative is selected. Estimated duration of underpinning, tunnel driving and construction is 15 months. Tunneling, Underpinning, and Construction activities will occur throughout this period. Mobilization of equipment, removal of excavated spoils and delivery of construction materials will be minor in nature to the overall site operations and will add the following traffic:

3a West Street Tunnel

Delivery Type	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Spoil Removal	10,000	CY	670	10	3.7	15 Months
Underpinning	1,000	Tons	50	2	0.28	
Concrete / Steel	1,500	CY	150	4	0.83	
Service/Utility /Fuel Trucks				4	2	
Subcontractors Light Trucks				10	8	
Construction Workers	15 to 20					
Arriving by Personal Vehicle	3 to 4					
Arriving by Mass Transit	12 to 16					
Supervisory/QA	3 to 8					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	2 to 6					

Equipment – Tunneling beneath Liberty will occur from the western bathtub. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Concrete Trucks and Dump Trucks are based on the approximate waiting time and loading/unloading time on site only. The following construction equipment will be required for the underpinning operation that will take approximately 5 months of the 15-month construction period (but may be assumed to be evenly distributed over the 15 month period:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Air Operated Grout Drills				3	1	90%	15 Months
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	0.67	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	0.33	30%	
Concrete Trucks	10 Cubic yard Tandem or Tri-axle	Diesel	325	2	0.1	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	2	.67	90%	

The following construction equipment will be required for the excavation of the tunnel and spoil removal operation that will take approximately 5 months of the 15-month construction period:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Roadheader for tunneling	12 foot Diameter	Diesel	120	1	0.33	33%	15 Months
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	0.67	90%	
Crawler Crane (for spoil removal)	100 Ton	Diesel	350	1	0.33	90%	
Dump Truck	Tandem Axle – 15 CY	Diesel	325	5	1.9	5%	

The following construction equipment will be required for the tunnel lining operation that will take approximately 5 months of the 15-month construction period:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	0.67	90%	15 Months
Crawler Crane (for Material and Form support)	100 Ton	Diesel	350	1	0.33	80%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	0.33	30%	
Concrete Trucks	10 Cubic yard Tandem or Tri-axle	Diesel	325	2	0.42	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	2	0.67	90%	

3b Church Street Tunnel

Delivery Type	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Spoil Removal	10,000	CY	670	10	3.7	15 Months
Underpinning	1,000	Tons	50	2	0.28	
Concrete / Steel	1,500	CY	150	4	0.83	
Service/Utility /Fuel Trucks				4	2	
Subcontractors Light Trucks				10	8	
Construction Workers	15 to 20					
Arriving by Personal Vehicle	3 to 4					
Arriving by Mass Transit	12 to 16					
Supervisory/QA	3 to 8					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	2 to 6					

Equipment – Tunneling beneath Church St. will occur from the eastern bathtub. Tunneling will be accomplished with a tunnel roadheader and will require removal of spoils to the surface adjacent to Liberty and West Streets by lifting to the surface with a crane and skip box. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Concrete Trucks and Dump Trucks are based on the approximate waiting time and loading/unloading time on site only. The following construction equipment will be required for the underpinning operation that will take approximately 5 months of the 15-month construction period:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Air Operated Grout Drills				3	1	90%	15 Months
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	0.67	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	0.33	30%	
Concrete Trucks	10 Cubic yard Tandem or Tri-axle	Diesel	325	2	0.1	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	2	0.67	90%	

The following construction equipment will be required for the excavation of the tunnel and spoil removal operation that will take approximately 5 months of the 15-month construction period:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Roadheader for tunneling	12 foot Diameter	Diesel	120	1	0.33	33%	15 Months
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	0.67	90%	
Crawler Crane (for spoil removal)	100 Ton	Diesel	350	1	0.33	90%	
Dump Truck	Tandem Axle – 15 CY	Diesel	325	5	1.9	5%	

The following construction equipment will be required for the tunnel lining operation that will take approximately 5 months of the 15-month construction period:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	0.67	90%	15 Months
Crawler Crane (for Material and Form support)	100 Ton	Diesel	350	1	0.33	80%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	0.33	30%	
Concrete Trucks	10 Cubic yard Tandem or Tri-axle	Diesel	325	2	0.42	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	2	0.67	90%	

Excavation/Deconstruction Temporary Station (Zone 6) – Traffic and Construction Equipment

Demolition – Demolition of Temporary Station east of 1 & 9 Subway and north of Zone 4. Estimated duration for demolition work is 3.5 months.

Delivery Type	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Demolition Debris	7,500	Tons	500	16	12	3.5 Months
Service/Utility /Fuel Trucks				6	4	
Subcontractors Light Trucks				16	12	
Construction Workers	15 to 20					
Arriving by Personal Vehicle	3 to 4					
Arriving by Mass Transit	12 to 16					
Supervisory/QA	3 to 5					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	2 to 3					

Equipment – All demolition work occurs within and immediately adjacent to the footprint of the Temporary PATH Station. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Dump Trucks is based on the approximate waiting time and loading time on site only. Equipment required is as follows:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Hydraulic All Terrain Crane	50 Ton	Diesel	165	1	1	80%	3.5 Months
Crawler Crane	200 Ton	Diesel	450	1	1	90%	
Hydraulic Excavator w/Hoe Ram	3.5 Cubic Yard	Diesel	320	1	1	90%	
Hydraulic Excavator w/Thumb	3.5 Cubic Yard	Diesel	320	1	1	90%	
Hydraulic Excavator w/Grapple	3.5 Cubic Yard	Diesel	320	1	1	90%	
Track Loader w/Waste Handling Bucket	5.5 Cubic Yard	Diesel	160	1	1	90%	
Dump Trucks	Tandem Axle – 15 CY	Diesel	325	8	6	5%	
Air Compressor (for Pavement Breakers)	1600 CFM	Diesel	460	2	2	90%	
Pavement Breakers	90 lbs.			12	12	80%	

Excavation- It is assumed that sheet piling will be used at the northern and southern portions of Zone 6 to allow for removal following excavation and construction of pedestrian concourses.

Delivery Type	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Excavate to 238'	135,000	CY	9,000	250	250	3 Months
Service/Utility /Fuel Trucks				8	6	
Subcontractors Light Trucks				34	30	
Construction Workers	30 to 40					
Arriving by Personal Vehicle	6 to 8					
Arriving by Mass Transit	24 to 32					
Supervisory/QA	4 to 6					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	3 to 4					

Equipment – Construction of the Slurry Wall closure pieces along Greenwich and Church Streets will be performed from within the footprint of the proposed Permanent PATH Terminal. The Slurry Wall closures will be constructed first, with excavation to EL 238' and the installation of soil/rock anchors to tie back the slurry wall second. Excavation and tie back installation will be performed within the footprint of the terminal and will require a lane closing along Church Street for access and staging of dump trucks for spoil removal. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Concrete Trucks and Dump Trucks are based on the approximate waiting time and loading/unloading time on site only. Equipment required is as follows:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Hydraulic Excavators	3.5 CY	Diesel	320	2	2	90%	3 Months
Dozer	150 HP	Diesel	150	1	1	90%	
Dump Trucks	Tandem Axle - 15 CY	Diesel	325	125	125	5%	
Diesel Generators/ Compressors	100 HP	Diesel	100	2	2	90%	

Construction of the PATH Terminal Building (Zone 6) – Traffic and Construction Equipment

Construction – Construction of the PATH Terminal Building includes construction of all sub-grade (El. 238') and above grade levels. For the Grand Space it is anticipated that some of the structural steel framing will be pre-fabricated trusses to span the width of the Grand Space and may require lane closings on Church Street for erection. Assumes 500 CY concrete pours

Structural Framing

Delivery Type	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Concrete	12,000	CY	1,200	100	10	10 Months
Reinforcing Steel	1,800	Tons	90	2	0.75	
Structural Steel to 306'	16,000	Tons	800	8	6.7	
Structural Steel – Grand Space	3,000	Tons	150	4	1.25	
Service/Utility /Fuel Trucks*				16	12	
Subcontractors Light Trucks*				16	12	
Construction Workers	50 to 60					
Arriving by Personal Vehicle	10 to 12					
Arriving by Mass Transit	40 to 48					
Supervisory/QA	10 to 15					
Arriving by Personal Vehicle	2 to 3					
Arriving by Mass Transit	8 to 12					

** Service/Utility /Fuel/ Subcontractors Light Truck totals are constant throughout the construction of the Terminal. Where Structural Framing and "Glazing and Fitout" overlap, the Service/Utility /Fuel/ Subcontractors Light Truck totals are not additive (only count them once)*

Glazing and Fitout

Delivery Type	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Curtain Wall	400	Tons	20	2	0.12	13 Months
Interior Fitout				8	6	
Service/Utility /Fuel Trucks*				16	12	
Subcontractors Light Trucks*				16	12	
Construction Workers	50 to 60					
Arriving by Personal Vehicle	10 to 12					
Arriving by Mass Transit	40 to 48					
Supervisory/QA	10 to 15					
Arriving by Personal Vehicle	2 to 3					
Arriving by Mass Transit	8 to 12					

** Service/Utility /Fuel/ Subcontractors Light Truck totals are constant throughout the construction of the Terminal. Where Structural Framing and "Glazing and Fitout" overlap, the Service/Utility /Fuel/ Subcontractors Light Truck totals are not additive (only count them once)*

Equipment – In general the construction of the Permanent PATH Terminal will be performed from within the footprint of the proposed structure. A lane closure along Church Street will be required for receiving material deliveries and for the positioning of a crane for the erection of the pre-fabricated trusses for the grand space and for the structural steel framing. Foundation and subbasement work will be primarily of concrete construction to street level. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Concrete Trucks and Tractor Trailers are based on the approximate waiting time and loading time on site only. The following construction equipment will be required:

Structural Framing

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Crawler Crane	200 Ton	Diesel	450	1	1	90%	10 Months
Tower Crane	100 Ton	Diesel	250	1	1	90%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	2	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	2	2	50%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	50	5	5%	
Diesel Generators	100 HP	Diesel	100	2	2	90%	
Tractor Trailer	Tandem Axle Tractor w/45 Foot Trailer	Diesel	325	7	4.4	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	4	4	90%	
Air Compressor (for Impact Wrenches)	1600 CFM	Diesel	460	2	2	90%	
Impact Wrenches	1" Socket Drive			10	10	80%	

Glazing and Fitout

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Tower Crane	100 Ton	Diesel	250	1	1	90%	13 Months
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	2	90%	
Diesel Generators	100 HP	Diesel	100	2	2	90%	
Welding Machines	35 HP Diesel Engine	Diesel	35	4	4	90%	
Air Compressor (for Impact Wrenches)	1600 CFM	Diesel	460	2	2	90%	
Impact Wrenches	1" Socket Drive			10	10	80%	
Tractor Trailer	Tandem Axle Tractor w/45 Foot Trailer	Diesel	325	5	3.2	5%	

WTC MEMORIAL AND REDEVELOPMENT PLAN

CONSTRUCTION METHODS AND IMPACTS

CONSTRUCTION TRAFFIC AND CONSTRUCTION EQUIPMENT

Demolition/Excavation of East Bathtub (Zones 4 & 5) – Traffic and Construction Equipment

All work estimated based on one 10-hour shift commencing at 0700 and ending at 1800, Monday to Saturday. This analysis assumes two one-hour Peak Traffic Periods occurring some time in the morning and evening

East Slurry Wall – East Slurry Wall construction will consist of creating two bathtubs – one bounded by Vesey St., Church St., north side of Permanent PATH Terminal and along 1 & 9 subway tunnel. The other will be bounded by the north side of the divided PATH concourse, Church St., Liberty St., and the east side of the 1 & 9 subway tunnel. The slurry wall and excavation will be conducted down to a level of EL 238'. As the Slurry Wall progresses around the site, the area immediately adjacent to the wall will be benched down to the first level of tieback anchors, to allow installation of the anchors to commence prior to completion of the wall. Some excavation activities will coincide with the slurry wall and tieback anchoring activities. Traffic and Construction Equipment for the tie back installation is covered under Excavation below.

Delivery Type ZONE 4	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration Worst Case
Slurry Wall – Exc.	6,600	CY	440	16	7.3	5 Months
Slurry Wall – Conc.	6,600	CY	660	18	11	
Slurry Wall – Rebar	1,600	Tons	80	2	1.33	
Service/Utility /Fuel Trucks				16	12	
Subcontractors Light Trucks				8	4	
Construction Workers	20 to 30					
Arriving by Personal Vehicle	4 to 6					
Arriving by Mass Transit	16 to 24					
Supervisory/QA	4 to 6					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	3 to 4					

Delivery Type ZONE 5	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration Worst Case
Slurry Wall – Exc.	6,600	CY	440	16	7.3	5 Months
Slurry Wall – Conc.	6,600	CY	660	18	11	
Slurry Wall – Rebar	1,100	Tons	55	2	1.33	
Service/Utility /Fuel Trucks				16	12	
Subcontractors Light Trucks				8	4	
Construction Workers	10 to 20					
Arriving by Personal Vehicle	2 to 4					
Arriving by Mass Transit	8 to 16					
Supervisory/QA	4 to 6					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	3 to 4					

Equipment – Construction of the Slurry Wall surrounding Zone 4 will be performed from within the footprint of the proposed development within those zones. The Slurry Wall will be constructed by the panel method and will require two crews of men and equipment to meet the proposed schedule. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Daily Use for Concrete Trucks and Dump Trucks are based on waiting time and unloading/loading time on site only. Equipment required is as follows:

Equipment Type Zone 4	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Slurry Plant Mixing Plant	100 m^3 per hour – Diesel 50 HP	Diesel	50	2	2	90%	5 Months
Desanding Plant	100 m^3 per hour – Diesel 50 HP	Diesel	50	2	2	50%	
Crawler Crane w/clam shell	100 Ton	Diesel	350	2	2	90%	
Hydraulic All Terrain Crane	50 Ton	Diesel	165	1	1	25%	
Crawler Crane (for rebar placement)	200 Ton	Diesel	450	2	2	50%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	2	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	2	2	50%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	9	5.5	5%	
Dump Trucks	Tandem Axle – 15 CY	Diesel	325	8	3.7	10%	
Hydraulic Excavators (lead in trench)	3.5 CY	Diesel	320	1	1	90%	
Dozer (maintain site grading)	150 HP	Diesel	150	1	1	20%	
Diesel Generators	10 HP	Gas	10	4	4	90%	

Equipment Type Zone 5	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Slurry Plant Mixing Plant	100 m^3 per hour – Diesel 50 HP	Diesel	50	1	1	90%	5 Months
Desanding Plant	100 m^3 per hour – Diesel 50 HP	Diesel	50	1	1	50%	
Crawler Crane w/clam shell	100 Ton	Diesel	350	1	1	90%	
Hydraulic All Terrain Crane	50 Ton	Diesel	165	1	1	25%	
Crawler Crane (for rebar placement)	200 Ton	Diesel	450	1	1	50%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	1	1	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	1	50%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	9	5.5	5%	
Dump Trucks	Tandem Axle – 15 CY	Diesel	325	8	3.7	10%	
Hydraulic Excavators (lead in trench)	3.5 CY	Diesel	320	1	1	10%	
Dozer (maintain site grading)	150 HP	Diesel	150	1	1	10%	
Diesel Generators	10 HP	Gas	10	2	2	90%	

Demolition in 2004 – The demolition of the existing H&M coffer dam and station will occur concurrently with the slurry wall construction. Estimated duration for demolition is 2 months for the former Hudson & Manhattan station along Church Street in Zone 4.

Delivery Type	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Demolition Debris	3,000	Tons	100	10	4.2	2 Months
Service/Utility /Fuel Trucks				8	6	
Subcontractors Light Trucks				16	12	
Total Construction Workers	10 to 15					
Arriving by Personal Vehicle	2 to 3					
Arriving by Mass Transit	8 to 12					
Supervisory/QA	3 to 5					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	2 to 3					

Equipment – All demolition work occurs within the east bathtub. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Dump Trucks is based on waiting time and loading time on site only. Equipment required is as follows:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Hydraulic All Terrain Crane	50 Ton	Diesel	165	1	1	50%	2 Months
Hydraulic Excavator w/Hoe Ram	3.5 Cubic Yard	Diesel	320	4	4	90%	
Hydraulic Excavator w/Thumb	3.5 Cubic Yard	Diesel	320	1	1	90%	
Hydraulic Excavator w/Grapple	3.5 Cubic Yard	Diesel	320	1	1	90%	
Hydraulic Excavator w/Shear	3.5 Cubic Yard	Diesel	320	1	1	50%	
Track Loader w/Waste Handling Bucket	5.5 Cubic Yard	Diesel	160	1	1	90%	
Dump Trucks	Tandem Axle – 15 CY	Diesel	325	5	2.1	10%	
Air Compressor (for Pavement Breakers)	1600 CFM	Diesel	460	1	1	50%	
Pavement Breakers	90 lbs.			4	4	50%	

Excavation – After completion of the east slurry wall construction, the east bathtub will be created by excavating within the slurry walls to bedrock at EL 238'. The area immediately adjacent to the slurry walls will be benched to allow the installation of the tieback anchors for temporary support of the slurry wall during construction of the basement levels of the development. The soil excavation can continue in the northern central and southern central portions of the bathtub, zones 4 and 5 respectively. Areas immediately adjacent to the slurry wall will be conducted last until the final row of tieback anchors has been completed.

Delivery Type ZONE 4	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration Worst Case
Soil/Rock Anchors	1,280	Ea	16	2	0.14	9 Months
Excavate to 238'	225,000	CY	15,000	170	138	
Service/Utility /Fuel Trucks				12	8	
Subcontractors Light Trucks				8	4	
Construction Workers	20 to 30					
Arriving by Personal Vehicle	4 to 6					
Arriving by Mass Transit	16 to 24					
Supervisory/QA	4 to 6					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	3 to 4					

Delivery Type ZONE 5	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Soil/Rock Anchors	880	Ea	12	2	2	9 Months
Excavate to 238'	206,000	CY	13,750	153	127	
Service/Utility /Fuel Trucks				12	8	
Subcontractors Light Trucks				8	6	
Construction Workers	10 to 20					
Arriving by Personal Vehicle	2 to 4					
Arriving by Mass Transit	8 to 16					
Supervisory/QA	4 to 6					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	3 to 4					

Equipment – Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Dump Trucks is based on waiting time and loading time on site only. Equipment required is as follows:

Equipment Type Zone 4	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Hydraulic Drill Rig (for Anchors)	Diesel 150 HP	Diesel	150	2	2	90%	9 Months
Crawler Crane (to support Anchor Operation)	100 Ton	Diesel	350	1	1	50%	
Hi-Lift (Forklift) (for Anchor Oper.)	5 ton – 40 foot boom	Diesel	120	1	1	90%	
Hydraulic Excavators	3.5 CY	Diesel	320	3	3	90%	
Dozer	150 HP	Diesel	150	2	2	90%	
Dump Trucks	15 CY	Diesel	325	85	69	5%	
Diesel Generators	10 HP	Gas	10	2	2	90%	

Equipment Type Zone 5	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Hydraulic Drill Rig for Anchors	Diesel 150 HP	Diesel	150	2	2	90%	9 Months
Crawler Crane (to support Anchor Oper.)	100 Ton	Diesel	350	1	1	50%	
Hi-Lift (Forklift) (for Anchor Oper.)	5 ton – 40 foot boom	Diesel	120	1	1	90%	
Hydraulic Excavators	3.5 CY	Diesel	320	2	2	90%	
Dozer	150 HP	Diesel	150	1	1	90%	
Dump Trucks	15 CY	Diesel	325	76	64	5%	
Diesel Generators	10 HP	Gas	10	2	2	90%	

Tunnels – Traffic and Construction Equipment

The driving of the ramp tunnels under 1/9 line will take place from within the existing west bathtub and the east bathtub in Zone 4 and 5 as described above. Estimated duration of tunneling driving and construction is 15 months. Mobilization of equipment, removal of excavated spoils and delivery of construction materials will be minor in nature to the overall site operations and will add the following traffic:

Delivery Type	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Spoil Removal	11,000	CY	750	8	4.2	15 Months
Underpinning	1,500	Tons	75	2	0.42	
Concrete / Steel	1,800	CY	180	8	1	
Service/Utility /Fuel Trucks				8	4	
Subcontractors Light Trucks				20	14	
Construction Workers	20 to 25					
Arriving by Personal Vehicle	4 to 5					
Arriving by Mass Transit	16 to 20					
Supervisory/QA	4 to 8					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	3 to 6					

Equipment–Tunneling will be accomplished with a tunnel roadheader and staged underpinning; and will require removal of spoils to the surface adjacent to Liberty and West Streets by lifting to the surface with a crane and skip box. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Concrete Trucks and Dump Trucks are based on waiting time and unloading/loading time on site only. The following construction equipment will be required for the underpinning operation that will take approximately 5 months of the 15-month construction period:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Air Operated Grout Drills				3	1	90%	15 Months
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	0.67	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	0.33	30%	
Concrete Trucks	10 Cubic yard Tandem or Tri-axle	Diesel	325	1	0.2	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	2	1.33	90%	

The following construction equipment will be required for the excavation of the tunnel and spoil removal operation that will take approximately 5 months of the 15-month construction period:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Roadheader for tunneling	12 foot Diameter	Diesel	120	1	0.33	33%	15 Months
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	0.67	90%	
Crawler Crane (for spoil removal)	100 Ton	Diesel	350	1	0.33	90%	
Dump Truck	Tandem Axle – 15 CY	Diesel	325	4	2.1	5%	

The following construction equipment will be required for the tunnel lining operation that will take approximately 5 months of the 15-month construction period:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	0.67	90%	15 Months
Crawler Crane (for Material and Form support)	100 Ton	Diesel	350	1	0.33	80%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	0.33	30%	
Concrete Trucks	10 Cubic yard Tandem or Tri-axle	Diesel	325	4	0.5	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	2	0.67	90%	

Northwest Quadrant Subgrade Retail – WTC Concourse, Freedom Tower Foundations (Zone 2) – Traffic and Construction Equipment

Construction – This activity includes the construction of all structural elements in Zone 2 within the northwest quadrant (north of WTC Tower 2 footprint) of the site and within the west bathtub for the foundations and sub-grade levels for WTC Concourses, cultural space and performing arts program to El. 364'. The activity does not include Permanent WTC PATH platforms, track, mezzanine and concourse areas in Zone 2. Concrete Truck Trips have been generated based on a worst-case scenario of a maximum pour of 600 CY.

Delivery Type Northwest Quadrant	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Concrete	11,000	CY	1,100	120	7	13 Months
Reinforcing Steel*	1,800	Tons	90	4	0.6	
Structural Steel 306' to 364'*	5,000	Tons	250	6	1.6	
Curtain Wall*	87,000	SF	116	8	0.74	
Interior Fitout*	464,000	SF	700	6	4.5	
Service/Utility /Fuel Trucks				36	32	
Subcontractors Light Trucks				44	40	
Construction Workers	300 to 400					
Arriving by Personal Vehicle	60 to 80					
Arriving by Mass Transit	240 to 320					
Supervisory/QA	40 to 45					
Arriving by Personal Vehicle	8 to 9					
Arriving by Mass Transit	32 to 36					
**Assumed to be evenly distributed throughout the subtask duration*						

Equipment – In general the construction within the Northwest Quadrant will be performed from within the footprint of the proposed structures. Foundation and subbasement work will be primarily of concrete construction to street level. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Concrete Trucks and Tractor Trailers are based on waiting time and unloading time on site only. The following construction equipment will be required:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Crawler Crane	200 Ton	Diesel	450	2	2	90%	13 Months
Tower Crane	100 Ton	Diesel	250	4	4	90%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	1	1	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	1	60%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	60	3.5	5%	
Diesel Generators	500 HP	Diesel	100	1	1	35%	
Tractor Trailer	Tandem Axle Tractor w/45 Foot Trailer	Diesel	325	12	3.7	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	0	0	80%	
Air Compressor (for Impact Wrenches)	800 CFM	Diesel	310	1	1	80%	
Impact Wrenches	1" Socket Drive			10	10	60%	

Memorial, Open Space, Cultural Space (Zones 1 & 2) – Traffic and Construction Equipment

Construction – This activity includes the construction of all structural elements in Zone 1 & 2 within the west bathtub for the Memorial Site, Open Space and Cultural Space from the proposed location of Fulton Street on the north and Liberty Street on the south to El. 364'. This activity does not include Permanent WTC PATH platforms, track, mezzanine and concourse areas in Zone 2. Preliminary estimates for the duration of the construction of these areas are 25 months. For the Cultural Spaces it is anticipated that some of the structural steel framing will be pre-fabricated trusses to span the width of the atrium/open areas and should not require lane closings, since the affected streets, Greenwich, Fulton and Liberty will be under construction within the boundaries of the WTC Redevelopment. Concrete Truck Trips have been generated based on a worst-case scenario of a maximum pour of 600 CY.

Delivery Type Memorial, Open and Cultural Spaces	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Concrete	25,500	CY	2,550	120	8.5	25 Months
Reinforcing Steel	4,100	Tons	205	2	0.68	
Structural Steel 306' to 364'*	3,000	Tons	150	4	0.5	
Curtain Wall*	67,000	SF	90	4	0.3	
Interior Fitout*	766,000	SF	1,150	10	3.8	
Service/Utility /Fuel Trucks				36	32	
Subcontractors Light Trucks				44	40	
Construction Workers	200 to 250					
Arriving by Personal Vehicle	10 to 15					
Arriving by Mass Transit	190 to 235					
Supervisory/QA	40 to 45					
Arriving by Personal Vehicle	4 to 6					
Arriving by Mass Transit	36 to 39					

Equipment – In general the construction within the Memorial Site, Open Space and Cultural Space will be performed from within the footprint of the proposed structures over the Permanent PATH Terminal. Foundation and subbasement work will be primarily of concrete construction to street level. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Concrete Trucks and Tractor Trailers are based on waiting time and unloading time on site only. The following construction equipment will be required:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Crawler Crane	200 Ton	Diesel	450	1	1	90%	25 Months
Tower Crane	100 Ton	Diesel	250	2	2	90%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	2	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	1	60%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	60	4.2	5%	
Diesel Generators	500 HP	Diesel	100	1	1	20%	
Tractor Trailer	Tandem Axle Tractor w/45 Foot Trailer	Diesel	325	10	2.65	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	0	0	80%	
Air Compressor (for Impact Wrenches)	800 CFM	Diesel	310	1	1	80%	
Impact Wrenches	1" Socket Drive			10	10	60%	

Southeast Quadrant Sub-grade – Towers 3 & 4 Foundations & Retail Below Grade (Zone 4) – Traffic and Construction Equipment

Construction – This activity includes the construction of all structural elements in Zone 4 for the foundations of Towers 3 and 4 and retail areas south of the Permanent PATH Terminal to El. 364'. The activity does not include the Permanent WTC PATH Terminal in Zone 6. Preliminary estimates for the duration of the construction of these areas are 15 months commencing Oct 2005 thru Dec 2006 Concrete Truck Trips have been generated based on a worst-case scenario of a maximum pour of 600 CY.

Delivery Type Zone 4	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Concrete	18,000	CY	1,800	120	10	15 Months
Reinforcing Steel	2,800	Tons	140	2	0.78	
Structural Steel 306' to 364'*	3,000	Tons	150	4	0.83	
Curtain Wall*	81,000	SF	108	4	0.6	
Interior Fitout*	715,000	SF	1,075	10	6	
Service/Utility /Fuel Trucks				36	32	
Subcontractors Light Trucks				44	40	
Construction Workers	150 to 200					
Arriving by Personal Vehicle	5 to 8					
Arriving by Mass Transit	145 to 192					
Supervisory/QA	20 to 25					
Arriving by Personal Vehicle	2 to 5					
Arriving by Mass Transit	18 to 20					
**Assumed to be evenly distributed throughout the subtask duration*						

Equipment – In general the construction of the foundations of Towers 3 and 4 and retail levels to El.364' in the Zone 4 will begin within the east bathtub and will be performed from within the footprint of the proposed structures Foundation and subbasement work will be primarily of concrete construction to street level. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Concrete Trucks and Tractor Trailers are based on waiting time and unloading time on site only. The following construction equipment will be required:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Crawler Crane	200 Ton	Diesel	450	1	1	90%	15 months
Tower Crane	100 Ton	Diesel	250	2	2	90%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	2	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	1	60%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	60	5	5%	
Diesel Generators	500 HP	Diesel	100	1	1	20%	
Tractor Trailer	Tandem Axle Tractor w/45 Foot Trailer	Diesel	325	10	4.1	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	0	0	80%	
Air Compressor (for Impact Wrenches)	1,600 CFM	Diesel	460	1	1	80%	
Impact Wrenches	1" Socket Drive			15	15	60%	

Northeast Quadrant Sub-grade – Tower 2 Foundation & Retail Below Grade (Zone 5) – Traffic and Construction Equipment

Construction – This activity includes the construction of all structural elements in Zone 5 for the foundations of Tower 2 and retail spaces from sub-grade levels to El. 364' north of the Permanent PATH Terminal including the sub-grade levels below the proposed location of Fulton Street through the redevelopment site. The activity does not include Permanent WTC PATH Terminal in Zone 6. Preliminary estimates for the duration of the construction of these areas are 12 months commencing Sept 2005 thru Sept 2006. Lane closings along Vesey Street will be required. Concrete Truck Trips have been generated based on a worst-case scenario of a maximum pour of 600 CY.

Delivery Type Northeast Quadrant	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Concrete	15,000	CY	1,500	120	8.3	15 Months
Reinforcing Steel	2,500	Tons	125	2	0.7	
Structural Steel to 306' - 364'*	1,000	Tons	50	2	0.27	
Curtain Wall*	70,000	SF	95	4	0.52	
Interior Fitout*	540,000	SF	810	14	4.5	
Service/Utility /Fuel Trucks				36	32	
Subcontractors Light Trucks				44	40	
Construction Workers	100 to 150					
Arriving by Personal Vehicle	5 to 10					
Arriving by Mass Transit	95 to 140					
Supervisory/QA	20 to 25					
Arriving by Personal Vehicle	2 to 5					
Arriving by Mass Transit	18 to 20					

Equipment – In general the construction of the foundations of Tower 2 and retail levels to El.364' in the Zone 4 will begin within the east bathtub and will be performed from within the footprint of the proposed structures. Foundation and subbasement work will be primarily of concrete construction to street level. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Concrete Trucks and Tractor Trailers are based on waiting time and unloading time on site only. The following construction equipment will be required:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use Use	Duration
Crawler Crane	200 Ton	Diesel	450	1	1	90%	15 Months
Tower Crane	100 Ton	Diesel	250	2	2	90%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	2	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	1	60%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	60	4.1	5%	
Diesel Generators	500 HP	Diesel	500	1	1	20%	
Tractor Trailer	Tandem Axle Tractor w/45 Foot Trailer	Diesel	325	11	3	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	*0*	*0*	80%	
Air Compressor (for Impact Wrenches)	1,600 CFM	Diesel	460	1	1	80%	
Impact Wrenches	1" Socket Drive			15	15	60%	

East Bathtub Retail Above Grade Fitout (Zones 4, 5 & 6)

This activity includes the fitout of the retail development to El. 364' east of Greenwich Street and including the 7,200 SF of retail space within the Permanent PATH Terminal. Work includes all retail store finishes and furnishings, including necessary HVAC, Electrical and Mechanical. The preliminary schedule indicates that the work will require 23 months.

Delivery Type East Bathtub Retail Fitout Above Grade	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Interior Fitout (Retail Store & Restaurant Fixtures)	150,000	Tons	7,500	30	26	23 Months
Service/Utility /Fuel Trucks				34	30	
Subcontractors Light Trucks				44	40	
Construction Workers	200 to 250					
Arriving by Personal Vehicle	5 to 10					
Arriving by Mass Transit	195 to 240					
Supervisory/QA	30 to 35					
Arriving by Personal Vehicle	2 to 5					
Arriving by Mass Transit	28 to 30					

Equipment – Retail Fitout will involve work almost entirely within the shell of the completed retail levels. Since the sub-grade parking and truck delivery areas will have been completed by this stage of construction, it is anticipated that most of the deliveries and staging/storage area of materials will occur within the underground parking and truck delivery areas.

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	2	90%	23 Months
Tractor Trailer	Tandem Axle Tractor w/45 Foot Trailer	Diesel	325	15	13	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	0	0	60%	

Tower Development Construction (Zones 2, 4 and 5) – Traffic and Construction Equipment

Tower Construction – Tower No. 1 will be fast tracked due to its symbolic nature. Towers 2 thru 5 will most likely follow at a normal pace, and it is assumed that the towers 2, 3 and 4 will be constructed simultaneously with tower 5 commencing at or near the completion of towers 2, 3 and 4. Construction activities for the tower construction include all levels above the highest retail level at El. 364. Concrete Truck Trips have been generated based on a worst-case scenario of a maximum pour of 600 CY.

Tower 1

Structural Framing

Delivery Type **Tower 1** **2.6 Million SF - 70 Stories**	**Quantity**	**Units**	**Total No. Of Truckloads**	**Trips per Day (Peak Day impact Calculation)**	**Trips per Day (cumulative impact calculation)**	**Estimated Duration**
Concrete - Floors	40,000	CY	4,000	120	24	14 Months
Structural Steel	35,000	Tons	1,750	20	10.4	
Service/Utility /Fuel Trucks				36	32	
Subcontractors Light Trucks				44	40	
Construction Workers	300 to 350					
Arriving by Personal Vehicle	60 to 65					
Arriving by Mass Transit	240 to 285					
Supervisory/QA	20 to 25					
Arriving by Personal Vehicle	4 to 5					
Arriving by Mass Transit	16 to 20					

Fitout and installation of curtain wall will commence some time after steel erection and concrete pours have commenced

Delivery Type Tower 1 2.6 Million SF - 70 Stories	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Curtain Wall	5,000	Tons	250	3	0.8	26 Months
Interior Fitout			1,000	10	3.2	
Service/Utility /Fuel Trucks*				36	32	
Subcontractors Light Trucks*				44	40	
Construction Workers	300 to 350					
Arriving by Personal Vehicle	60 to 65					
Arriving by Mass Transit	240 to 285					
Supervisory/QA	20 to 25					
Arriving by Personal Vehicle	4 to 5					
Arriving by Mass Transit	16 to 20					
**Service/Utility/Fuel/Light Truck numbers NOT to be cumulative with Service/Utility/Fuel/Light Truck totals for Structural Framing activity where Structural Framing and "Fitout and Curtain Wall" activities overlap (i.e: only count them once)*						

Equipment – In general the construction of Tower 1 be performed from within the footprint of the proposed structure and site. Lane closure along Vesey Street will continue to be necessary for receiving material deliveries. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Concrete Trucks and Tractor Trailers are based on waiting time and unloading time on site only. The following construction equipment will be required:

Structural Framing

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Crawler Crane	200 Ton	Diesel	450	2	2	90%	14 Months
Tower Crane	100 Ton	Diesel	250	4	4	90%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	2	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	2	2	60%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	60	12	10%	
Diesel Generators	750 HP	Diesel	100	1	1	20%	
Tractor Trailer	Tandem Axle Tractor w/45 Foot Trailer	Diesel	325	10	5.2	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	0	0	90%	
Air Compressor (for Impact Wrenches)	1,600 CFM	Diesel	460	1	1	90%	
Impact Wrenches	1" Socket Drive			15	15	80%	

Curtain Wall and Fitout

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Tower Crane	100 Ton	Diesel	250	4	4	90%	26 Months
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	2	90%	
Diesel Generators	100 HP	Diesel	100	0	0	20%	
Welding Machines	35 HP Diesel Engine	Diesel	35	0	0	90%	
Air Compressor (for Impact Wrenches)	800 CFM	Diesel	310	0	0	90%	
Impact Wrenches	1" Socket Drive			0	0	80%	
Tractor Trailer	Tandem Axle Tractor w/45 Foot Trailer	Diesel	325	6	2	5%	

Towers 2, 3, and 4

Structural Framing

Delivery Type Towers 2, 3 & 4 2.05 Million SF – 65 Stories 2.0 Million SF - 60 Stories 1.73 Million SF – 55 Stories	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Concrete	90,000	CY	9,000	100	31.3	24 Months
Structural Steel	84,000	Tons	4,200	26	14.5	
Service/Utility /Fuel Trucks				26	22	
Subcontractors Light Trucks				44	40	
Construction Workers	700 to 900					
Arriving by Personal Vehicle	50 to 60					
Arriving by Mass Transit	650 to 840					
Supervisory/QA	60 to 75					
Arriving by Personal Vehicle	4 to 5					
Arriving by Mass Transit	56 to 70					

Curtain Wall and Fitout

Delivery Type Towers 2, 3 & 4 2.05 Million SF – 65 Stories 2.0 Million SF - 60 Stories 1.73 Million SF – 55 Stories	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Curtain Wall	9,800	Tons	490	6	1.7	24 Months
Interior Fitout				20	18	
Service/Utility /Fuel Trucks*				26	24	
Subcontractors Light Trucks*				44	40	
Construction Workers	700 to 900					
Arriving by Personal Vehicle	50 to 60					
Arriving by Mass Transit	650 to 840					
Supervisory/QA	60 to 75					
Arriving by Personal Vehicle	4 to 5					
Arriving by Mass Transit	56 to 70					
**Service/Utility/Fuel/Light Truck numbers NOT to be cumulative with Service/Utility/Fuel/Light Truck totals for Structural Framing activity where Structural Framing and "Fitout and Curtain Wall" activities overlap (i.e: only count them once)*						

Equipment – Towers 2, 3 and 4 will be constructed primarily from within the tower. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Concrete Trucks and Tractor Trailers are based on waiting time and unloading time on site only. The following construction equipment will be required:

Structural Framing

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Crawler Crane	200 Ton	Diesel	450	4	4	90%	24 Months
Tower Crane	100 Ton	Diesel	250	6	6	90%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	3	3	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	4	4	60%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	50	15	5%	
Diesel Generators	750 HP	Diesel	100	3	3	20%	
Tractor Trailer	Tandem Axle Tractor w/45 Foot Trailer	Diesel	325	13	7	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	0	0	90%	
Air Compressor (for Impact Wrenches)	800 CFM	Diesel	310	3	3	90%	
Impact Wrenches	1" Socket Drive			45	45	80%	

Curtain Wall and Fitout

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Tower Crane	100 Ton	Diesel	250	6	6	90%	24 Months
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	3	3	90%	
Diesel Generators	100 HP	Diesel	100	0	0	20%	
Tractor Trailer	Tandem Axle Tractor w/45 Foot Trailer	Diesel	325	6	2	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	0	0	90%	
Air Compressor (for Impact Wrenches)	800 CFM	Diesel	310	0	0	90%	
Impact Wrenches	1" Socket Drive			0	0	80%	

De-construction of Deutsche Bank Building – Traffic and Construction Equipment

The de-construction of the Deutsche Bank Building will require sidewalk and lane closings on Greenwich, Liberty, Albany and Washington Streets for the entire duration. The building is a 40-story building with a height of 565 feet and an approximate footprint of 40,000 SF per floor. Our estimate is that it will require a minimum of 12 months to take down the structure after the completion of any hazardous abatement for asbestos and mold. The demolition has been estimated on a single 8-hour shift.

Delivery Type	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Gutting Floors	72,000	CY	1,800	18	12.5	12 Months
Concrete Floors	40,000	Tons	2,800	24	19.4	
Curtain Wall	3,400	Tons	225	4	1.6	
Structural Steel	18,400	Tons	1,000	10	7	
Service/Utility /Fuel Trucks				12	8	
Subcontractors Light Trucks				10	6	
Construction Workers	60 to 80					
Arriving by Personal Vehicle	12 to 16					
Arriving by Mass Transit	48 to 64					
Supervisory/QA	3 to 8					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	2 to 6					

Equipment – All demolition work occurs within the footprint and the adjacent sidewalk areas and lane closings around the perimeter of the site. Demolition is assumed to commence after hazardous materials abatement and will consist of the systematic gutting of the interiors prior to the cutting and removal of structural floor slabs and structural steel. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Demolition Trailers is based on waiting time and loading time on site only. Equipment required is as follows:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Fixed Leg Derrick Crane	100 Ton	Diesel	250	1	1	90%	12 Months
Hydraulic All Terrain Crane	50 Ton	Diesel	165	1	1	50%	
Concrete Saws – Diamond Blade	50 HP Diesel Engines	Diesel	50	4	4	80%	
Skid Steer Loaders w/Demolition Hammers		Diesel	40	8	8	90%	
Hydraulic Excavator w/Thumb	3.5 Cubic Yard	Diesel	320	1	1	80%	
Hydraulic Excavator w/Concrete Pulverizer Attachment	3.5 Cubic Yards	Diesel	320	4	4	90%	
Rubber Tire Loader	3.5 Cubic Yard	Diesel	196	1	1	80%	
Demolition Trailers	Tandem Axle Tractor w/25 CY Dump Trailer	Diesel	325	19	20	5%	
Air Compressor (for Pavement Breakers)	1600 CFM	Diesel	460	1	1	100%	
Pavement Breakers	90 lbs.			8	8	80%	

Southern Expansion – 5TH Tower South of Liberty Street – Traffic and Construction Equipment

Slurry Wall – The existing western bathtub will be enlarged to encompass the area south of Liberty Street from West Street to Greenwich Street and south to Cedar Street and including the city block bounded by Washington Street, Albany Street and Greenwich Street south of Cedar Street. The slurry wall construction will follow the demolition/de-construction of the Deutsche Bank Building. The

slurry wall and excavation will be conducted down to a level of EL 238'. As the Slurry Wall progresses around the site, the area immediately adjacent to the wall will be benched down to the first level of tieback anchors, to allow installation of the anchors to commence prior to completion of the wall. Some excavation activities will coincide with the slurry wall and tieback anchoring activities. Traffic and Construction Equipment for the tie back installation is covered under Excavation below.

Delivery Type South of Liberty St.	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration Worst Case
Slurry Wall – Exc.	10,300	CY	674	10	7	8 Months
Slurry Wall – Conc.	10,300	CY	1,010	16	10.5	
Slurry Wall – Rebar	2,275	Tons	114	2	1.2	
Service/Utility /Fuel Trucks				14	12	
Subcontractors Light Trucks				8	6	
Construction Workers	20 to 30					
Arriving by Personal Vehicle	4 to 6					
Arriving by Mass Transit	16 to 24					
Supervisory/QA	4 to 6					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	3 to 4					

Equipment – Construction of the Slurry Wall surrounding the southern expansion south of Liberty Street will be performed from within the footprint of the proposed development. The Slurry Wall will be constructed by the panel method and will require one crew of men and equipment to meet the proposed schedule. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Concrete Trucks and Dump Trucks are based on waiting time and unloading/loading time on site only. Equipment required is as follows:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Slurry Plant Mixing Plant	100 m^3 per hour – Diesel 50 HP	Diesel	50	1	1	90%	
Desanding Plant	100 m^3 per hour – Diesel 50 HP	Diesel	50	1	1	50%	
Crawler Crane w/clam shell	100 Ton	Diesel	350	1	1	90%	
Hydraulic All Terrain Crane	50 Ton	Diesel	165	1	1	25%	
Crawler Crane (for rebar placement)	200 Ton	Diesel	450	1	1	50%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	1	1	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	1	50%	8 Months
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	8	5.2	5%	
Dump Trucks	Tandem Axle – 15 CY	Diesel	325	5	3.5	10%	
Hydraulic Excavators (lead in trench)	3.5 CY	Diesel	320	1	1	10%	
Dozer (maintain site grading)	150 HP	Diesel	150	1	1	10%	
Diesel Generators	10 HP	Gas	10	2	2	90%	

Excavation - The area immediately adjacent to the slurry walls will be benched to allow the installation of the tieback anchors for temporary support of the slurry wall during construction of the basement levels of the southern expansion area development. The soil excavation can continue in the central portions of the bathtub during the tieback anchors operation. Areas immediately adjacent to the slurry wall will be conducted last until the final row of tieback anchors has been completed.

Delivery Type Southern Expansion Bathtub	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration Worst Case
Soil/Rock Anchors	1,680	Ea	21	2	.2	9 Months
Excavate to 241'	350,000	CY	23,500	260	217	
Service/Utility /Fuel Trucks				12	10	
Subcontractors Light Trucks				8	6	
Construction Workers	20 to 30					
Arriving by Personal Vehicle	4 to 6					
Arriving by Mass Transit	16 to 24					
Supervisory/QA	4 to 6					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	3 to 4					

Equipment – Excavation work will be performed from within the southern bathtub and will not require a staging area outside of the bathtub. The installation of the soil/rock anchor tiebacks will also be performed from within the bathtub and will not require a staging area outside of the bathtub. A lane closure will be required along Liberty Street to facilitate the staging of dump trucks and for receiving materials for the tie back operation. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Dump Trucks is based on waiting time and loading time on site only. Equipment required is as follows:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Hydraulic Drill Rig (for Anchors)	Diesel 150 HP	Diesel	150	2	2	90%	9 Months
Crawler Crane (to support Anchor Oper.)	100 Ton	Diesel	350	1	1	50%	
Hi-Lift (Forklift) (for Anchor Oper.)	5 ton – 40 foot boom	Diesel	120	1	1	90%	
Hydraulic Excavators	3.5 CY	Diesel	320	3	3	90%	
Dozer	150 HP	Diesel	150	2	2	90%	
Dump Trucks	Tandem Axle – 15 CY	Diesel	325	130	109	5%	
Diesel Generators	10 HP	Gas	10	2	2	90%	

Construction – This activity includes the construction of all of the structural elements for the non-tower sub-grade development within the southern expansion area to El. 364'. Concrete Truck Trips have been generated based on a worst-case scenario of a maximum pour of 600 CY.

Delivery Type South of Liberty Street to El. 364'	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Concrete	13,300	CY	1,330	120	9.2	12 Months
Reinforcing Steel	2,100	Tons	105	4	0.7	
Structural Steel to 364'	1,300	Tons	65	8	0.45	
Interior Fitout				26	26	
Service/Utility /Fuel Trucks				36	30	
Subcontractors Light Trucks				44	40	
Construction Workers	300 to 400					
Arriving by Personal Vehicle	60 to 80					
Arriving by Mass Transit	240 to 320					
Supervisory/QA	40 to 45					
Arriving by Personal Vehicle	8 to 9					
Arriving by Mass Transit	32 to 36					

Equipment – In general the construction within the southern expansion area will be performed from within the footprint of the proposed structures. Foundation and subbasement work will be primarily of concrete construction to street level. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Concrete Trucks and Tractor Trailers are based on waiting time and unloading time on site only. The following construction equipment will be required:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Crawler Crane	200 Ton	Diesel	450	2	2	90%	12 Months
Tower Crane	100 Ton	Diesel	250	2	2	90%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	2	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	2	2	60%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	60	5	5%	
Diesel Generators	500 HP	Diesel	500	1	1	20%	
Tractor Trailer	Tandem Axle Tractor w/45 Foot Trailer	Diesel	325	19	14	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	*0*	*0*	90%	
Air Compressor (for Impact Wrenches)	1600 CFM	Diesel	460	1	1	90%	
Impact Wrenches	1" Socket Drive			8	8	80%	

Tower Construction – This activity includes the construction of Tower 5 from El. 364 to the topping out of the building. Concrete Truck Trips have been generated based on a worst-case scenario of a maximum pour of 530 CY.

Delivery Type Tower 5 1.67 Million SF - 50 Stories	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Concrete	26,000	CY	2,600	106	9	24 Months
Structural Steel	20,000	Tons	1,000	16	3.5	
Curtain Wall	4,100	Tons	205	2	0.71	
Interior Fitout				26	26	
Service/Utility /Fuel Trucks				36	32	
Subcontractors Light Trucks				44	40	
Construction Workers	500 to 600					
Arriving by Personal Vehicle	50 to 60					
Arriving by Mass Transit	450 to 540					
Supervisory/QA	40 to 45					
Arriving by Personal Vehicle	4 to 5					
Arriving by Mass Transit	36 to 40					

Equipment – The construction of Tower 5 will be performed within the footprint of the proposed structure Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Concrete Trucks and Tractor Trailers are based on waiting time and unloading time on site only. The following construction equipment will be required:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily Use	Duration
Tower Crane	100 Ton	Diesel	250	1	1	90%	24 Months
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	2	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	1	60%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	53	4.5	5%	
Diesel Generators	750 HP	Diesel	100	1	1	90%	
Tractor Trailer	Tandem Axle Tractor w/45 Foot Trailer	Diesel	325	22	15	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	0	0	90%	
Air Compressor (for Impact Wrenches)	1,600 CFM	Diesel	460	1	1	90%	
Impact Wrenches	1" Socket Drive			15	15	80%	

ROUTE 9A PROJECT

CONSTRUCTION METHODS AND IMPACTS

CONSTRUCTION TRAFFIC AND EQUIPMENT

Project Summary

This summary presents an estimate and schedule for construction equipment to be used on the proposed Route 9A Project. As discussed earlier in this Appendix, as of the date of this document, two potential alternatives exist for the Route 9A Project–the Short Bypass Alternative and the At-Grade Alternative. Air quality analyses have been performed for both of these alternatives to account for the potential emissions during the construction period. The construction information for the Short Bypass Alternative is presented below, followed by the construction information for the At-Grade Alternative. The various equipment schedules reference construction stages, shown in the preliminary staging plans below. It should be noted that for both the Short Bypass Alternative and the At-Grade Alternative, a busway tunnel was originally proposed as an element of the project. It has since been determined the busway tunnel is not needed. The estimated emissions for the appropriate elements within the Route 9A Project have been reduced as indicated below to account for the removal of the busway tunnel.

ROUTE 9A PROJECT – SHORT BYPASS ALTERNATIVE

Equipment Estimate and Schedule Assumptions

1. Estimate and Schedule includes all engines greater than 60 HP.
2. All equipment will use ultra low sulfur diesel fuel.
3. Stage 0 – Early Action Infrastructure Items, single-shift hours of work are 7 AM to 5 PM, Mon. to Fri. (Stage 0 is an independent construction project to be completed prior to the Short Bypass Construction Project)
4. Stage I, II and III, double-shift hours of work are 6 AM to 2 AM, Mon. to Fri.
5. Stage IV, single-shift hours of work are 7 AM to 5 PM, Mon. to Fri.
6. During Stage I through V, maintenance work and schedule catch-up work will be performed Saturday 7 AM to 3 PM.
7. Dewatering ejector pump will run 24 hours per day, 7 days per week and will be wired to an electric source.
8. All light towers and lighting will be wired to an electric source.
9. All arrow boards and variable message signs will either be solar powered or wired to an electric source.
10. No on-site concrete batching or crushing operations will take place.
11. No worker vehicles will be permitted on-site, nor will any parking be provided on-site for workers.
12. Fugitive dust control will be handled as needed with a sweeper truck and water truck on-site.

Construction Equipment Schedules

The attached construction equipment schedule is generated from the 9A Short Bypass Preliminary Construction Schedule and is sorted by work task.

CONSTRUCTION EQUIPMENT SCHEDULE

Traffic Counts for Truck Material Delivery and Waste Export

The following table summarizes the truck counts for delivery and export of construction materials to and from the job site based on the preliminary construction schedule. The Schedule ID number corresponds to the first column number of each of the schedules.

CONSTRUCTION TRAFFIC—TRUCK COUNTS

Schedule ID No.		Trips
1.	**Stage 0 – Early Action Items – 355 Days = 253.6 W.D.@ 10 Hr./Day Mon.-Fri. 7A – 5 PM**	
2.	West Side Utilities – Verizon/ECS – 77 Days = 55 W.D.	
	Excavation – 9 Trucks x 3 Trips/Day x 48 Days *(@15 cy/truck = 405 cy/day = 19,440 cy)*	1,296 EA.
	Concrete – 5 Trucks x 1 Trip/Day x 44 Days *(@10 cy/truck = 50 cy/day = 2,200 cy)*	220 EA.
	Backfill – 13 Trucks x 3 Trips/Day x 30 Days *(@15 cy/truck = 585 cy/day = 17,250 cy)*	1,150 EA.
	Duct & MHs & Sheeting – 22 Trucks	22 EA.
	Supplies – 4 Trucks/Day x 30 Days	220 EA.
		2,908 EA.
		(52.87/W.D.)
2.	West Side Utilities – 48" Dia & 20" Dia Water Lines – 65 Days = 46.4 W.D.	
	Excavation – 5 Trucks x 4 Trips/Day x 45 Days	900 EA.
	Backfill – 5 Trucks x 4 Trips/Day x 45 Days	900 EA.
	Pipe & Fittings – 20 Trucks	20 EA.
	Supplies – 4 Trucks/Day x 46 Days	184 EA.
		2,004 EA.
		(44.83/W.D.)
2.	West Side Utilities – 16" Dia Gas Line & Electric – 45 Days = 32.1 W.D.	
	Excavation – 2 Trucks x 4 Trips/Day x 30 Days	240 EA.
	Backfill – 3 Trucks x 3 Trips/Day x 25 Days	225 EA.
	Pipe, Fittings & Duct – 10 Trucks	10 EA.
	Supplies – 4 Trucks/Day x 32 Days	128 EA.
		603 EA. (18.79/W.D)

Activity Number		t-08	Nov-08	Dec-08	Jan-09
	Crane,100T,350HP,Manitowoc 222 "100T"	0	0	0	0
	Crane,35T,273HP,Grove 2035	0	0	0	0
	Roller,Vibratory,150HP,84",CAT CS563E	0	0	0	0
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	0	0	0	0
	Pump,Elector Well,350HP	0	0	0	0
23	**Build SB Bypass Structure**	-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane,35T,273HP,Grove 2035	0	0	0	0
	Roller,Vibratory,150HP,84",CAT CS563E	0	0	0	0
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	0	0	0	0
	Crane,200T-1,340HP,Manitowoc 777	0	0	0	0
	Pump,Concrete Boom,150HP,36M,Butemeister	0	0	0	0
	Grader,185HP,CAT 12H	0	0	0	0
24	**Deck over Boat Sections - Temporary NB Roadway**	-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane,35T,273HP,Grove 2035	0	0	0	0
	Roller,Vibratory,150HP,84",CAT CS563E	0	0	0	0
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	0	0	0	0
	Crane,200T-1,340HP,Manitowoc 777	0	0	0	0
	Crane,150T-1,340HP,Manitowac 555	0	0	0	0
	Welding Machine-1,33HP,400AMP,Lincoln	0	0	0	0
	Paving Box,158HP,CAT AP-1000	0	0	0	0
	Welding Machine-2,33HP,400AMP,Lincoln	0	0	0	0
	Welding Machine-3,33HP,400AMP,Lincoln	0	0	0	0
	Welding Machine-4,33HP,400AMP,Lincoln	0	0	0	0
25	**Traffic Switch**				
26	**Stage III - Northbound Bypass (9 Mo.**				
27	**Remove Temporary NB Bridges & SB SOE**	-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Excavator,143HP,CAT 320CL	0	0	0	0
	Crane,35T,273HP,Grove 2035	0	0	0	0
	Loader,Wheel,260HP,CAT 966G	0	0	0	0
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	0	0	0	0
	Crane,150T-1,340HP,Manitowac 555	0	0	0	0
28	**Inst. Columns and Deck Support Slabs in WTC profe**	-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane,35T,273HP,Grove 2035	0	0	0	0
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	0	0	0	0
	Crane,150T-1,340HP,Manitowac 555	0	0	0	0
29	**Excavation & Bracing - NB Bypass**	-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane,35T,273HP,Grove 2035	0	0	0	0
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	0	0	0	0
	Backhoe,90HP,Dynahoe 190-4	0	0	0	0
	Crane,200T-1,340HP,Manitowoc 777	0	0	0	0
	Welding Machine-1,33HP,400AMP,Lincoln	0	0	0	0
	Excavator,428HP-1,CAT 375L	0	0	0	0
	Loader,Track-1,229HP,CAT 973	0	0	0	0
	Dozer,Track-1,338HP,CAT D8R	0	0	0	0
	Welding Machine-2,33HP,400AMP,Lincoln	0	0	0	0
30	**Excavation Below Bypass Subgrade**	-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Excavator,143HP,CAT 320CL	0	0	0	0
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	0	0	0	0
	Loader,Track-1,229HP,CAT 973	0	0	0	0
	(NOTE: For the air quality analysis, the hours assoc element from the project)				
31	**Drill & Install Caissons**	-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane,35T,273HP,Grove 2035	0	0	0	0
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	0	0	0	0
	Drill,204HP-1,Baur BG 12H	0	0	0	0
	Loader,Track-1,229HP,CAT 973	0	0	0	0
32	**Build Structure Below Grade**	-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane,100T,350HP,Manitowoc 222 100T	0	0	0	0
	Crane,35T,273HP,Grove 2035	0	0	0	0
	Roller,Vibratory,150HP,84",CAT CS563E	0	0	0	0
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	0	0	0	0
	Pump,Concrete Boom,150HP,36M,Butemeister	0	0	0	0
	(NOTE: For the air quality analysis, the hours asso element from the project)				
33	**Build NB Bypass & Truck Ramp Stuctures**	-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane,35T,273HP,Grove 2035	0	0	0	0
	Roller,Vibratory,150HP,84",CAT CS563E	0	0	0	0
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596J	0	0	0	0
	Crane,200T-1,340HP,Manitowoc 777	0	0	0	0
	Pump,Concrete Boom,150HP,36M,Butemeister	0	0	0	0
	Grader,185HP,CAT 12H	0	0	0	0
34	**Build WTC Truck Ramp Structures (PANYNJ)**	-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane,100T,350HP,Manitowoc 222 100T	0	0	0	0
	Crane,35T,273HP,Grove 2035	0	0	0	0
	Roller,Vibratory,150HP,84",CAT CS563E	0	0	0	0
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596J	0	0	0	0
	Excavator,321HP,CAT 345BL	0	0	0	0
	Pump,Concrete Boom,150HP,36M,Butemeister	0	0	0	0
35	**Stage IV - Project Completion (16 Mo**				
36	**Install Finishes, Lighting, Ventilation,Roadway etc**	-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Roller,Vibratory,150HP,84",CAT CS563E	0	0	0	0
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596J	0	0	0	0
	Paving Box,158HP,CAT AP-1000	0	0	0	0
	Truck,Pickup-1,250HP,Ford F250	0	0	0	0
	Truck,Pickup-2,250HP,Ford F250	0	0	0	0
	Truck,Pickup-3,250HP,Ford F250	0	0	0	0
	Truck,Pickup-4,250HP,Ford F250	0	0	0	0
37	**Install Finishes, Lighting, Ventilation,Roadway etc**	-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Roller,Vibratory,150HP,84",CAT CS563E	0	0	0	0
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596J	0	0	0	0
	Paving Box,158HP,CAT AP-1000	0	0	0	0
	Truck,Pickup-1,250HP,Ford F250	0	0	0	0
	Truck,Pickup-2,250HP,Ford F250	0	0	0	0
	Truck,Pickup-3,250HP,Ford F250	0	0	0	0
	Truck,Pickup-4,250HP,Ford F250	0	0	0	0
38	**Build Permanent Surface Roadways Over NB Bypa**	-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane,35T,273HP,Grove 2035	0	0	0	0
	Roller,Vibratory,150HP,84",CAT CS563E	0	0	0	0
	Backhoe,90HP,Dynahoe 190-4	0	0	0	0
	Grader,185HP,CAT 12H	0	0	0	0
	Paving Box,158HP,CAT AP-1000	0	0	0	0
39	**Traffic Switch - NB Traffic into NB Bypass**				
40	**Remove Decking & Temporary NB Roadway**	-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane,35T,273HP,Grove 2035	0	0	0	0
	Loader,Wheel,260HP,CAT 966G	0	0	0	0
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596	0	0	0	0
	Crane,200T-1,340HP,Manitowoc 777	0	0	0	0
	Crane,150T-1,340HP,Manitowac 555	0	0	0	0
41	**Traffic Switch - SB Traffic into SB Bypass**				
42	**Remove Temporary SB Roadway**	-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Excavator,143HP,CAT 320CL	0	0	0	0
	Loader,Wheel,260HP,CAT 966G	0	0	0	0
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596	0	0	0	0
	Loader,Track-1,229HP,CAT 973	0	0	0	0
43	**Build Permanent Roadway & Median Over SB Byp**	-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane,35T,273HP,Grove 2035	0	0	0	0
	Roller,Vibratory,150HP,84",CAT CS563E	0	0	0	0
	Backhoe,90HP,Dynahoe 190-4	0	0	0	0
	Grader,185HP,CAT 12H	0	0	0	0
	Paving Box,158HP,CAT AP-1000	0	0	0	0
44	**Project Completion**				

)RT BYPASS
T SCHEDULE SORTED BY WORK TASK
NT OF TRANSPORTATION

Oct-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09
SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0

Activity Number		Total Hours	W-Days Duration	Shifts/Day	Hrs/Shift	Equip Qty	Utilization	START	FINISH	Mar-04	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07
	Crane.100T.350HP.Manitowoc 222 100T	787 hrs	41Wdy	2	10	1	95%	4/6/06	6/2/06	0	421	27	0	0	0	0	0	0	0	0	0
	Crane.35T.273HP.Grove 2035	787 hrs	41Wdy	2	10	1	95%	4/6/06	6/2/06	0	421	27	0	0	0	0	0	0	0	0	0
	Roller.Vibratory.150HP.84".CAT CS563E	787 hrs	41Wdy	2	10	1	95%	4/6/06	6/2/06	0	421	27	0	0	0	0	0	0	0	0	0
	Air Compressor-1.185CFM.85HP.Atlas Copco XA596JD	787 hrs	41Wdy	2	10	1	95%	4/6/06	6/2/06	0	421	27	0	0	0	0	0	0	0	0	0
	Pump.Elector Well.350HP	787 hrs	41Wdy	2	10	1	95%	4/6/06	6/2/06	0	421	27	0	0	0	0	0	0	0	0	0
23	**Build SB Bypass Structure**	14,250 hrs	107Wdy	2	10	1	100%	5/16/06	10/12/06	Mo-Hrs: 0	Mo-Hrs: 1,520	Mo-Hrs: 2,850	Mo-Hrs: 2,945	Mo-Hrs: 2,945	Mo-Hrs: 2,850	Mo-Hrs: 1,140	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane.35T.273HP.Grove 2035	2,036 hrs	107Wdy	2	10	1	95%	5/16/06	10/12/06	0	217	407	421	421	407	163	0	0	0	0	0
	Roller.Vibratory.150HP.84".CAT CS563E	2,036 hrs	107Wdy	2	10	1	95%	5/16/06	10/12/06	0	217	407	421	421	407	163	0	0	0	0	0
	Air Compressor-1.185CFM.85HP.Atlas Copco XA596JD	4,071 hrs	107Wdy	2	10	2	95%	5/16/06	10/12/06	0	434	814	841	841	814	326	0	0	0	0	0
	Crane.200T-1.340HP.Manitowoc 777	2,036 hrs	107Wdy	2	10	1	95%	5/16/06	10/12/06	0	217	407	421	421	407	163	0	0	0	0	0
	Pump.Concrete Boom.150HP.36M.Butemeister	2,036 hrs	107Wdy	2	10	1	95%	5/16/06	10/12/06	0	217	407	421	421	407	163	0	0	0	0	0
	Grader.185HP.CAT 12H	2,036 hrs	107Wdy	2	10	1	95%	5/16/06	10/12/06	0	217	407	421	421	407	163	0	0	0	0	0
24	**Deck over Boat Sections - Temporary NB Roadway**	7,016 hrs	33Wdy	2	10	1	100%	9/18/06	11/3/06	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 1,941	Mo-Hrs: 4,628	Mo-Hrs: 448	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane.35T.273HP.Grove 2035	638 hrs	33Wdy	2	10	1	95%	9/18/06	11/3/06	0	0	0	0	0	176	421	41	0	0	0	0
	Roller.Vibratory.150HP.84".CAT CS563E	638 hrs	33Wdy	2	10	1	95%	9/18/06	11/3/06	0	0	0	0	0	176	421	41	0	0	0	0
	Air Compressor-1.185CFM.85HP.Atlas Copco XA596JD	1,276 hrs	33Wdy	2	10	2	95%	9/18/06	11/3/06	0	0	0	0	0	353	841	81	0	0	0	0
	Crane.200T-1.340HP.Manitowoc 777	638 hrs	33Wdy	2	10	1	95%	9/18/06	11/3/06	0	0	0	0	0	176	421	41	0	0	0	0
	Crane.150T-1.340HP.Manitowac 555	638 hrs	33Wdy	2	10	1	95%	9/18/06	11/3/06	0	0	0	0	0	176	421	41	0	0	0	0
	Welding Machine-1.33HP.400AMP.Lincoln	638 hrs	33Wdy	2	10	1	95%	9/18/06	11/3/06	0	0	0	0	0	176	421	41	0	0	0	0
	Paving Box.158HP.CAT AP-1000	638 hrs	33Wdy	2	10	1	95%	9/18/06	11/3/06	0	0	0	0	0	176	421	41	0	0	0	0
	Welding Machine-2.33HP.400AMP.Lincoln	638 hrs	33Wdy	2	10	1	95%	9/18/06	11/3/06	0	0	0	0	0	176	421	41	0	0	0	0
	Welding Machine-3.33HP.400AMP.Lincoln	638 hrs	33Wdy	2	10	1	95%	9/18/06	11/3/06	0	0	0	0	0	176	421	41	0	0	0	0
	Welding Machine-4.33HP.400AMP.Lincoln	638 hrs	33Wdy	2	10	1	95%	9/18/06	11/3/06	0	0	0	0	0	176	421	41	0	0	0	0
25	**Traffic Switch**																				
26	**Stage III - Northbound Bypass (9 Mo. Work @ 2 Ea 10 Hr Shft/Day)**																				
27	**Remove Temporary NB Bridges & SB SOE**	543 hrs	6Wdy	2	10	1	100%	11/6/06	11/14/06	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 543	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Excavator.143HP.CAT 320CL	109 hrs	6Wdy	2	10	1	95%	11/6/06	11/14/06	0	0	0	0	0	0	0	109	0	0	0	0
	Crane.35T.273HP.Grove 2035	109 hrs	6Wdy	2	10	1	95%	11/6/06	11/14/06	0	0	0	0	0	0	0	109	0	0	0	0
	Loader.Wheel.260HP.CAT 966G	109 hrs	6Wdy	2	10	1	95%	11/6/06	11/14/06	0	0	0	0	0	0	0	109	0	0	0	0
	Air Compressor-1.185CFM.85HP.Atlas Copco XA596JD	109 hrs	6Wdy	2	10	1	95%	11/6/06	11/14/06	0	0	0	0	0	0	0	109	0	0	0	0
	Crane.150T-1.340HP.Manitowac 555	109 hrs	6Wdy	2	10	1	95%	11/6/06	11/14/06	0	0	0	0	0	0	0	109	0	0	0	0
28	**Inst. Columns and Deck Support Slabs in WTC projections**	1,031 hrs	14Wdy	2	10	1	100%	11/15/06	12/4/06	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 869	Mo-Hrs: 163	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane.35T.273HP.Grove 2035	258 hrs	13Wdy	2	10	1	95%	11/15/06	12/4/06	0	0	0	0	0	0	0	217	41	0	0	0
	Air Compressor-1.185CFM.85HP.Atlas Copco XA596JD	516 hrs	13Wdy	2	10	2	95%	11/15/06	12/4/06	0	0	0	0	0	0	0	434	81	0	0	0
	Crane.150T-1.340HP.Manitowac 555	258 hrs	13Wdy	2	10	1	95%	11/15/06	12/4/06	0	0	0	0	0	0	0	217	41	0	0	0
29	**Excavation & Bracing - NB Bypass**	11,468 hrs	46Wdy	2	10	1	100%	11/15/06	1/18/07	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 2,823	Mo-Hrs: 5,469	Mo-Hrs: 3,176	Mo-Hrs: 0	Mo-Hrs: 0
	Crane.35T.273HP.Grove 2035	882 hrs	46Wdy	2	10	1	95%	11/15/06	1/18/07	0	0	0	0	0	0	0	217	421	244	0	0
	Air Compressor-1.185CFM.85HP.Atlas Copco XA596JD	882 hrs	46Wdy	2	10	1	95%	11/15/06	1/18/07	0	0	0	0	0	0	0	217	421	244	0	0
	Backhoe.90HP.Dynahoe 190-4	882 hrs	46Wdy	2	10	1	95%	11/15/06	1/18/07	0	0	0	0	0	0	0	217	421	244	0	0
	Crane.200T-1.340HP.Manitowoc 777	882 hrs	46Wdy	2	10	1	95%	11/15/06	1/18/07	0	0	0	0	0	0	0	217	421	244	0	0
	Welding Machine-1.33HP.400AMP.Lincoln	882 hrs	46Wdy	2	10	1	95%	11/15/06	1/18/07	0	0	0	0	0	0	0	217	421	244	0	0
	Excavator.428HP-1.CAT 375L	2,646 hrs	46Wdy	2	10	3	95%	11/15/06	1/18/07	0	0	0	0	0	0	0	651	1262	733	0	0
	Loader.Track-1.229HP.CAT 973	1,764 hrs	46Wdy	2	10	2	95%	11/15/06	1/18/07	0	0	0	0	0	0	0	434	841	489	0	0
	Dozer.Track-1.338HP.CAT D8R	1,764 hrs	46Wdy	2	10	2	95%	11/15/06	1/18/07	0	0	0	0	0	0	0	434	841	489	0	0
	Welding Machine-2.33HP.400AMP.Lincoln	882 hrs	46Wdy	2	10	1	95%	11/15/06	1/18/07	0	0	0	0	0	0	0	217	421	244	0	0
30	**Excavation Below Bypass Subgrade**	1,181 hrs	21Wdy	2	10	1	100%	1/1/07	1/30/07	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 1,181	Mo-Hrs: 0	Mo-Hrs: 0
	Excavator.143HP.CAT 320CL	394 hrs	21Wdy	2	10	1	95%	1/1/07	1/30/07	0	0	0	0	0	0	0	0	0	394	0	0
	Air Compressor-1.185CFM.85HP.Atlas Copco XA596JD	394 hrs	21Wdy	2	10	1	95%	1/1/07	1/30/07	0	0	0	0	0	0	0	0	0	394	0	0
	Loader.Track-1.229HP.CAT 973	394 hrs	21Wdy	2	10	1	95%	1/1/07	1/30/07	0	0	0	0	0	0	0	0	0	394	0	0
	(NOTE: For the air quality analysis, the hours associated with this task were reduced by 1/3 to account for the removal of the busway tunnel element from the project)																				
31	**Drill & Install Caissons**	1,968 hrs	20Wdy	2	10	1	100%	1/5/07	2/2/07	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 1,832	Mo-Hrs: 136	Mo-Hrs: 0
	Crane.35T.273HP.Grove 2035	394 hrs	20Wdy	2	10	1	95%	1/5/07	2/2/07	0	0	0	0	0	0	0	0	0	366	27	0
	Air Compressor-1.185CFM.85HP.Atlas Copco XA596JD	394 hrs	20Wdy	2	10	1	95%	1/5/07	2/2/07	0	0	0	0	0	0	0	0	0	366	27	0
	Drill.204HP-1.Baur BG 12H	787 hrs	20Wdy	2	10	2	95%	1/5/07	2/2/07	0	0	0	0	0	0	0	0	0	733	54	0
	Loader.Track-1.229HP.CAT 973	394 hrs	20Wdy	2	10	1	95%	1/5/07	2/2/07	0	0	0	0	0	0	0	0	0	366	27	0
32	**Build Structure Below Grade**	2,646 hrs	27Wdy	2	10	1	100%	1/26/07	3/5/07	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 407	Mo-Hrs: 1,900	Mo-Hrs: 339
	Crane.100T.350HP.Manitowoc 222 100T	529 hrs	27Wdy	2	10	1	95%	1/26/07	3/5/07	0	0	0	0	0	0	0	0	0	81	380	68
	Crane.35T.273HP.Grove 2035	529 hrs	27Wdy	2	10	1	95%	1/26/07	3/5/07	0	0	0	0	0	0	0	0	0	81	380	68
	Roller.Vibratory.150HP.84".CAT CS563E	529 hrs	27Wdy	2	10	1	95%	1/26/07	3/5/07	0	0	0	0	0	0	0	0	0	81	380	68
	Air Compressor-1.185CFM.85HP.Atlas Copco XA596JD	529 hrs	27Wdy	2	10	1	95%	1/26/07	3/5/07	0	0	0	0	0	0	0	0	0	81	380	68
	Pump.Concrete Boom.150HP.36M.Butemeister	529 hrs	27Wdy	2	10	1	95%	1/26/07	3/5/07	0	0	0	0	0	0	0	0	0	81	380	68
	(NOTE: For the air quality analysis, the hours associated with this task were reduced by 1/3 to account for the removal of the busway tunnel element from the project)																				
33	**Build NB Bypass & Truck Ramp Stuctures**	15,675 hrs	117Wdy	2	10	1	100%	2/9/07	7/23/07	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 1,900	Mo-Hrs: 2,945
	Crane.35T.273HP.Grove 2035	2,239 hrs	117Wdy	2	10	1	95%	2/9/07	7/23/07	0	0	0	0	0	0	0	0	0	0	271	421
	Roller.Vibratory.150HP.84".CAT CS563E	2,239 hrs	117Wdy	2	10	1	95%	2/9/07	7/23/07	0	0	0	0	0	0	0	0	0	0	271	421
	Air Compressor-1.185CFM.85HP.Atlas Copco XA596JD	4,479 hrs	117Wdy	2	10	2	95%	2/9/07	7/23/07	0	0	0	0	0	0	0	0	0	0	543	841
	Crane.200T-1.340HP.Manitowoc 777	2,239 hrs	117Wdy	2	10	1	95%	2/9/07	7/23/07	0	0	0	0	0	0	0	0	0	0	271	421
	Pump.Concrete Boom.150HP.36M.Butemeister	2,239 hrs	117Wdy	2	10	1	95%	2/9/07	7/23/07	0	0	0	0	0	0	0	0	0	0	271	421
	Grader.185HP.CAT 12H	2,239 hrs	117Wdy	2	10	1	95%	2/9/07	7/23/07	0	0	0	0	0	0	0	0	0	0	271	421
34	**Build WTC Truck Ramp Structures (PANYNJ)**	7,247 hrs	64Wdy	2	10	1	100%	4/24/07	7/22/07	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane.100T.350HP.Manitowoc 222 100T	1,208 hrs	64Wdy	2	10	1	95%	4/24/07	7/22/07	0	0	0	0	0	0	0	0	0	0	0	0
	Crane.35T.273HP.Grove 2035	1,208 hrs	64Wdy	2	10	1	95%	4/24/07	7/22/07	0	0	0	0	0	0	0	0	0	0	0	0
	Roller.Vibratory.150HP.84".CAT CS563E	1,208 hrs	64Wdy	2	10	1	95%	4/24/07	7/22/07	0	0	0	0	0	0	0	0	0	0	0	0
	Air Compressor-1.185CFM.85HP.Atlas Copco XA596JD	1,208 hrs	64Wdy	2	10	1	95%	4/24/07	7/22/07	0	0	0	0	0	0	0	0	0	0	0	0
	Excavator.321HP.CAT 345BL	1,208 hrs	64Wdy	2	10	1	95%	4/24/07	7/22/07	0	0	0	0	0	0	0	0	0	0	0	0
	Pump.Concrete Boom.150HP.36M.Butemeister	1,208 hrs	64Wdy	2	10	1	95%	4/24/07	7/22/07	0	0	0	0	0	0	0	0	0	0	0	0
35	**Stage IV - Project Completion (16 Mo w/6 Mo Overlap w/Stage III)**																				
36	**Install Finishes, Lighting, Ventilation,Roadway etc. in SB Bypass**	17,005 hrs	127Wdy	2	10	1	100%	1/26/07	7/23/07	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 570	Mo-Hrs: 2,660	Mo-Hrs: 2,945
	Roller.Vibratory.150HP.84".CAT CS563E	2,429 hrs	127Wdy	2	10	1	95%	1/26/07	7/23/07	0	0	0	0	0	0	0	0	0	81	380	421
	Air Compressor-1.185CFM.85HP.Atlas Copco XA596JD	2,429 hrs	127Wdy	2	10	1	95%	1/26/07	7/23/07	0	0	0	0	0	0	0	0	0	81	380	421
	Paving Box.158HP.CAT AP-1000	2,429 hrs	127Wdy	2	10	1	95%	1/26/07	7/23/07	0	0	0	0	0	0	0	0	0	81	380	421
	Truck.Pickup-1.250HP.Ford F250	2,429 hrs	127Wdy	2	10	1	95%	1/26/07	7/23/07	0	0	0	0	0	0	0	0	0	81	380	421
	Truck.Pickup-2.250HP.Ford F250	2,429 hrs	127Wdy	2	10	1	95%	1/26/07	7/23/07	0	0	0	0	0	0	0	0	0	81	380	421
	Truck.Pickup-3.250HP.Ford F250	2,429 hrs	127Wdy	2	10	1	95%	1/26/07	7/23/07	0	0	0	0	0	0	0	0	0	81	380	421
	Truck.Pickup-4.250HP.Ford F250	2,429 hrs	127Wdy	2	10	1	95%	1/26/07	7/23/07	0	0	0	0	0	0	0	0	0	81	380	421
37	**Install Finishes, Lighting, Ventilation,Roadway etc. in NB Bypass**	14,060 hrs	105Wdy	2	10	1	100%	6/18/07	11/12/07	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Roller.Vibratory.150HP.84".CAT CS563E	2,009 hrs	105Wdy	2	10	1	95%	6/18/07	11/12/07	0	0	0	0	0	0	0	0	0	0	0	0
	Air Compressor-1.185CFM.85HP.Atlas Copco XA596JD	2,009 hrs	105Wdy	2	10	1	95%	6/18/07	11/12/07	0	0	0	0	0	0	0	0	0	0	0	0
	Paving Box.158HP.CAT AP-1000	2,009 hrs	105Wdy	2	10	1	95%	6/18/07	11/12/07	0	0	0	0	0	0	0	0	0	0	0	0
	Truck.Pickup-1.250HP.Ford F250	2,009 hrs	105Wdy	2	10	1	95%	6/18/07	11/12/07	0	0	0	0	0	0	0	0	0	0	0	0
	Truck.Pickup-2.250HP.Ford F250	2,009 hrs	105Wdy	2	10	1	95%	6/18/07	11/12/07	0	0	0	0	0	0	0	0	0	0	0	0
	Truck.Pickup-3.250HP.Ford F250	2,009 hrs	105Wdy	2	10	1	95%	6/18/07	11/12/07	0	0	0	0	0	0	0	0	0	0	0	0
	Truck.Pickup-4.250HP.Ford F250	2,009 hrs	105Wdy	2	10	1	95%	6/18/07	11/12/07	0	0	0	0	0	0	0	0	0	0	0	0
38	**Build Permanent Surface Roadways Over NB Bypass & East Side**	6,175 hrs	65Wdy	2	10	1	100%	8/14/07	11/12/07	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane.35T.273HP.Grove 2035	1,235 hrs	65Wdy	2	10	1	95%	8/14/07	11/12/07	0	0	0	0	0	0	0	0	0	0	0	0
	Roller.Vibratory.150HP.84".CAT CS563E	1,235 hrs	65Wdy	2	10	1	95%	8/14/07	11/12/07	0	0	0	0	0	0	0	0	0	0	0	0
	Backhoe.90HP.Dynahoe 190-4	1,235 hrs	65Wdy	2	10	1	95%	8/14/07	11/12/07	0	0	0	0	0	0	0	0	0	0	0	0
	Grader.185HP.CAT 12H	1,235 hrs	65Wdy	2	10	1	95%	8/14/07	11/12/07	0	0	0	0	0	0	0	0	0	0	0	0
	Paving Box.158HP.CAT AP-1000	1,235 hrs	65Wdy	2	10	1	95%	8/14/07	11/12/07	0	0	0	0	0	0	0	0	0	0	0	0
39	**Traffic Switch - NB Traffic into NB Bypass**																				
40	**Remove Decking & Temporary NB Roadway**	1,425 hrs	15Wdy	2	10	1	100%	11/13/07	12/3/07	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane.35T.273HP.Grove 2035	285 hrs	15Wdy	2	10	1	95%	11/13/07	12/3/07	0	0	0	0	0	0	0	0	0	0	0	0
	Loader.Wheel.260HP.CAT 966G	285 hrs	15Wdy	2	10	1	95%	11/13/07	12/3/07	0	0	0	0	0	0	0	0	0	0	0	0
	Air Compressor-1.185CFM.85HP.Atlas Copco XA596JD	285 hrs	15Wdy	2	10	1	95%	11/13/07	12/3/07	0	0	0	0	0	0	0	0	0	0	0	0
	Crane.200T-1.340HP.Manitowoc 777	285 hrs	15Wdy	2	10	1	95%	11/13/07	12/3/07	0	0	0	0	0	0	0	0	0	0	0	0
	Crane.150T-1.340HP.Manitowac 555	285 hrs	15Wdy	2	10	1	95%	11/13/07	12/3/07	0	0	0	0	0	0	0	0	0	0	0	0
41	**Traffic Switch - SB Traffic into SB Bypass**																				
42	**Remove Temporary SB Roadway**	3,149 hrs	41Wdy	2	10	1	100%	12/3/07	1/30/08	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Excavator.143HP.CAT 320CL	787 hrs	41Wdy	2	10	1	95%	12/3/07	1/30/08	0	0	0	0	0	0	0	0	0	0	0	0
	Loader.Wheel.260HP.CAT 966G	787 hrs	41Wdy	2	10	1	95%	12/3/07	1/30/08	0	0	0	0	0	0	0	0	0	0	0	0
	Air Compressor-1.185CFM.85HP.Atlas Copco XA596JD	787 hrs	41Wdy	2	10	1	95%	12/3/07	1/30/08	0	0	0	0	0	0	0	0	0	0	0	0
	Loader.Track-1.229HP.CAT 973	787 hrs	41Wdy	2	10	1	95%	12/3/07	1/30/08	0	0	0	0	0	0	0	0	0	0	0	0
43	**Build Permanent Roadway & Median Over SB Bypass & West Side**	6,175 hrs	87Wdy	2	10	1	100%	1/31/08	6/1/08	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
	Crane.35T.273HP.Grove 2035	1,235 hrs	87Wdy	2	10	1	95%	1/31/08	6/1/08	0	0	0	0	0	0	0	0	0	0	0	0
	Roller.Vibratory.150HP.84".CAT CS563E	1,235 hrs	87Wdy	2	10	1	95%	1/31/08	6/1/08	0	0	0	0	0	0	0	0	0	0	0	0
	Backhoe.90HP.Dynahoe 190-4	1,235 hrs	87Wdy	2	10	1	95%	1/31/08	6/1/08	0	0	0	0	0	0	0	0	0	0	0	0
	Grader.185HP.CAT 12H	1,235 hrs	87Wdy	2	10	1	95%	1/31/08	6/1/08	0	0	0	0	0	0	0	0	0	0	0	0
	Paving Box.158HP.CAT AP-1000	1,235 hrs	87Wdy	2	10	1	95%	1/31/08	6/1/08	0	0	0	0	0	0	0	0	0	0	0	0
44	**Project Completion**							6/1/08	6/1/08												

)RT BYPASS
T SCHEDULE SORTED BY WORK TASK
NT OF TRANSPORTATION

;	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07
;T:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
;T:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
;651	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
;443	SubT:1,629	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
407	271	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407	271	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407	271	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407	271	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407	271	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407	271	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
;T:0	SubT:0	SubT;489	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
;T:0	SubT:0	SubT:2,850	SubT:2,945	SubT:1,045	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	407	421	149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	407	421	149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	814	841	299	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	407	421	149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	407	421	149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	407	421	149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
;T:0	SubT:0	SubT:1,574	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	394	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	394	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	394	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	394	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
;T:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:1,059	SubT;977	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	0	0	0	353	326	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	353	326	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	353	326	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
;T:0	SubT:0	SubT:0	SubT:0	SubT;4,207	SubT;4,071	SubT;3,664	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0	SubT:0
0	0	0	0	421	407	366	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	421	407	366	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	421	407	366	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	421	407	366	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	421	407	366	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	421	407	366	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	421	407	366	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	421	407	366	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
;s: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 651	Mo-Hrs: 4,886	Mo-Hrs: 5,049	Mo-Hrs: 4,071	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
0	0	0	0	0	0	54	407	421	339	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	54	407	421	339	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	163	1221	1262	1018	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	163	1221	1262	1018	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	163	1221	1262	1018	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	54	407	421	339	0	0	0	0	0	0	0	0	0	0	0	0	0	0
;s: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 1,086	Mo-Hrs: 1,696	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
0	0	0	0	0	0	0	0	217	339	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	217	339	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	217	339	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	217	339	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	217	339	0	0	0	0	0	0	0	0	0	0	0	0	0	0
;s: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 882	Mo-Hrs: 4,940	Mo-Hrs: 4,764	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
0	0	0	0	0	0	0	0	68	380	366	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	68	380	366	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	68	380	366	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	68	380	366	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	68	380	366	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	204	1140	1099	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	136	760	733	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	136	760	733	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	68	380	366	0	0	0	0	0	0	0	0	0	0	0	0	0
;s: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 244	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
0	0	0	0	0	0	0	0	0	0	0	81	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	81	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	81	0	0	0	0	0	0	0	0	0	0	0	0
;s: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 950	Mo-Hrs: 2,104	Mo-Hrs: 950	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
0	0	0	0	0	0	0	0	0	190	421	190	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	190	421	190	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	380	841	380	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	190	421	190	0	0	0	0	0	0	0	0	0	0	0	0
;s: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 2,036	Mo-Hrs: 1,221	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0
0	0	0	0	0	0	0	0	0	0	0	0	0	339	204	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	339	204	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	679	407	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	679	407	0	0	0	0	0	0	0	0	0
;s: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 1,696	Mo-Hrs: 2,104	Mo-Hrs: 136	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0	Mo-Hrs: 0

CONSTRUCTION TRAFFIC—TRUCK COUNTS

Schedule ID No.		Trips
3.	Slurry Walls West Side – 168 Days = 120 W.D.	
	Excavation – 2.5 Trucks x 2 Trips/Day x 115 Days	575 EA.
	Concrete – 3 Trucks x 3 Trips/Day x 96 Days	864 EA.
	Reinf. Steel– 34 Trucks	34 EA.
	Supplies – 4 Trucks/Day x 120 Days	480 EA.
		1,953 EA.
		(16.28/W.D.)
4.	Steel Sheeting West Side & East Side – 53 Days = 37.9 W.D.	
	Excavation = 5540 cy/15 cy per Truck	370 EA.
	Backfill = 5540 cy/15 cy per Truck	370 EA.
	Steel Sheeting = 8 Truckloads In & Out	8 EA.
	Supplies = 4 Trucks/Day x 37 Days	148 EA.
		896 EA.
		(23.64/W.D)
5.	Construct WTC Water Lines – 91 Days = 65 W.D.	
	Excavation – 4 Trucks x 3 Trips x 25 Days	300 EA.
	Concrete – 5 Trucks x 2 Trips x 8 Days	80 EA.
	Backfill – 3 Trucks x 3 Trips x 9 Days	171 EA.
	Pipe & Fittings - 10 Trucks	10 EA.
	Piling & Sheeting – 7 Trucks	7 EA.
	Supplies – 4 Trucks/Day x 65 Days	260 EA.
	[Note: This activity, while officially part of the WTC Memorial & Redevelopment project, will be constructed along with the other Route 9A elements to maximum construction efficiency. The air emissions from this activity are included as part of the WTC Memorial & Redevelopment project emissions.]	828 EA.
		(12.74/W.D.)

CONSTRUCTION TRAFFIC—TRUCK COUNTS

Schedule ID No.		Trips
6.	Construct Pedestrian Concourse West End – 134 Days = 95.7 W.D.	
	Excavation – 6 Trucks x 3 Trips x 20 Days	360 EA.
	Concrete – 2 Trucks x 1.5 Trips x 58 Days	175 EA.
	Backfill – 6 Trucks x 3 Trips x 17 Days	306 EA.
	SOE – 24 Trucks	24 EA.
	Reinf. Steel – 5 Trucks	5 EA.
	Supplies – 4 Trucks/Day x 95 Days	380 EA.
	[Note: This activity, while officially part of the WTC PATH Terminal project, will be constructed along with the other Route 9A elements to maximum construction efficiency. The air emissions from this activity are included as part of the WTC PATH Terminal project emissions.]	1,250 EA. (13.06/W.D.)
7.	Construct Busway Tunnel West End *[Note: This element has been removed from the Route 9A project.]*	
8.	**Stage 1 – Preparation Work – 159 Days = 113.6 W.D.@ 20 Hr./Day Mon.-Fri. 6 AM –2 AM**	
9.	Remove WTC Haul Road as Required – 11 Days = 7.9 W.D.	
	110 Truck Loads	110 EA. (13.92/W.D.)
10.	Slurry Walls – East Side – 72 Days = 51.4 W.D.	
	Excavation – 8 Trucks x 3 Trips x 45 Days	1,080 EA.
	Concrete – 13 Trucks x 3 Trips x 42 Days	1,638 EA.
	Reinf. Steel – 7 Trucks	7 EA.
	Supplies – 8 Trucks/Day x 51 Days	408 EA.
		3,133 EA. (60.95/W.D.)
11. & 12.	Construct NB & SB Temporary Lanes – 50 Days = 35.7 W.D.	
	Barrier – 5 Trucks x 2 Trips x 11 Days	110 EA.
	Asphalt & Gravel – 4800 cy/10 cy Per Truck	500 EA.
	Supplies – 4 Trucks/Day x 35 Days	140 EA.
		750 EA. (21.01/W.D.)

CONSTRUCTION TRAFFIC—TRUCK COUNTS

Schedule ID No.		Trips
13. & 14.	Construct Pedestrian Concourse & Busway Tunnel Below Highway – 85 Days = 60.7 W.D.	
	Excavation - 8 Trucks x 3 Trips x 18 Days	432 EA.
	Concrete – 2 Trucks x 2 Trips x 33 Days	132 EA.
	Backfill – 6 Trucks x 3 Trips x 14 Days	243 EA.
	SOE – 16 Trucks	16 EA.
	Reinf. Steel – 10 Trucks	10 EA.
	Supplies – 8 Trucks/Day x 60 Days	480 EA.
		1,313 EA.
		(21.63/W.D.)
	[Note: Since the time of the original air quality analysis, the busway tunnel has been removed from the Route 9A project. To account for the change in emissions, the total number of truck trips was reduced by 1/3]	***Less 1/3 for removed busway =***
	[Note: This activity, while officially part of the WTC PATH Terminal project, will be constructed along with the other Route 9A elements to maximum construction efficiency. The air emissions from this activity are included as part of the WTC PATH Terminal project emissions.]	875 EA.
		(14.42/W.D.)
15.	**Stage II – Southbound Bypass–383 Days = 273.6 WD@ 20 Hr./Day Mon.-Fri. 6 AM–2 AM**	
16.	Slurry Walls West of 78" Sewer Relocation – 90 Days = 64.3 W.D.	
	Excavation – 10.5 Trucks x 3 Trips x 60 Days	1,890 EA.
	Concrete – 15 Trucks x 3 Trips x 63 Days	2,835 EA.
	Reinf. Steel – 106 Trucks	106 EA.
	Supplies – 8 Trucks/Day x 64 Days	512 EA.
		5,343 EA.
		(83.09/W.D.)
17. & 18.	Excavation & Bracing SB Bypass – 60 Days = 42.9 W.D.	
	Excavation – 38.5 Trailers x 3 Trips x 40 Days	4,620 EA.
	Bracing, HP & Lagging – 186 Trucks	186 EA.
	Supplies – 8 Trucks/Day x 42 Days	336 EA.
		5,142 EA.
		(119.86/W.D.)

CONSTRUCTION TRAFFIC—TRUCK COUNTS

Schedule ID No.		Trips
19.	Excavation Below Subgrade – 30 Days = 21.4 W.D.	
	Excavation – 9.6 Trucks x 3 Trips x 20 Days	576 EA.
	Bracing – 12 Trucks	12 EA.
	Supplies – 8 Trucks/Day x 21 Days	168 EA.
		756 EA.
	[Note: Since the time of the original air quality analysis, the busway tunnel has been removed from the Route 9A project. To account for the change in emissions, the total number of truck trips was reduced by 1/3]	(35.33/W.D.)
		Less 1/3 for removed busway =
		504 EA.
		(23.55/W.D.)
20.	Drill & Install Caissons – 60 Days = 42.9 W.D.	
	Excavation – 3Trucks x 2 Trips x 42 Days	252 EA.
	Concrete – 3Trucks x 3 Trips x 42 Days	378 EA.
	Reinf. – 6 Cages/Day x 40 Days	240 EA.
	Supplies – 8 Trucks/Day x 42 Days	336 EA.
		1,206 EA.
		(28.11/W.D.)
21.	Build Structures Below Grade – 40 Days = 28.6 W.D.	
	Concrete – 5 Trucks x 3 Trips x 17 Days	250 EA.
	Reinf. Steel – 20 Trucks	20 EA.
	Backfill – 5 Trucks x 4 Trips x 2 Days	40 EA.
	Supplies – 8 Trucks/Day x 28 Days	224 EA.
		534 EA.
	[Note: Since the time of the original air quality analysis, the busway tunnel has been removed from the Route 9A project. To account for the change in emissions, the total number of truck trips was reduced by 1/3]	(18.67/W.D.)
		Less 1/3 for removed busway =
		356 EA.
		(12.45/W.D.)

CONSTRUCTION TRAFFIC—TRUCK COUNTS

Schedule ID No.		Trips
22.	Build 78" Dia Sewer Relocation & Outfall with Regulator – 60 Days = 42.9 W.D.	
	H-Piles – 520 Ton ÷ 17.5 Ton/Load	30 EA.
	Drilling – 1330 cy/15 cy Excavation	90 EA.
	Concrete – 1330 cy/10 cy per Truck	133 EA.
	Gravel – 980 cy/12 cy per Truck	82 EA.
	Cradle Conc. – 3300 cy/10 cy per Truck	330 EA.
	Reinf. – 660,000 #/40,000 # per Truck	17 EA.
	RCP – 2200 LF / 40 LF / Truck	55 EA.
	Encasement Conc. – 5500 cy / 10 cy per Truck	550 EA.
	Reinf. – 1,100,000 #/40,000 # per Truck	28 EA.
	Manholes – 8 EA. x 20 Trucks/EA.	160 EA.
	96" Dia Outfall – (880/40) + (6 MH x 15) + [(880/10) x 2]	288 EA.
	Pipe Exc. & Conc.	
	Regulator – Excavation & Concrete	200 EA.
	Formwork In & Out	40 EA.
	Supplies – 8 Trucks/Day x 42 Days	336 EA.
		2,339 EA.
		(54.52/W.D.)
23.	Build SB Bypass Structure – 150 Days = 107.1 W.D.	
	Concrete – 17,814 cy/10 cy per Truck	1,900 EA.
	Reinf. – 2,573 Ton/20 Ton per Truck	130 EA.
	Precast Roof – 1100 Ft./4' EA.	275 EA.
	Formwork In & Out	120 EA.
	Waterproofing –	60 EA.
	Tiles –	80 EA.
	6" A.C. Wearing Course & Gravel 2481 cy/10 cy per Truck	250 EA.
	Supplies – 8 Trucks/Day x 107 Days	856 EA.
		3,671 EA.
		(34.27/W.D.)

CONSTRUCTION TRAFFIC—TRUCK COUNTS

Schedule ID No.		Trips
24.	Deck Over Boat Sections & NB Temporary Roadway - 480 Days = 34.3 W.D.	
	Deck Beams – 82 EA. In & Out	164 EA.
	Cap Beams & Lateral Bracing	40 EA.
	Deck Panels – 60,000 SF/50 SF = (1200 EA./5 per Trip) x 2	480 EA.
	Supplies – 8 Trucks/Day x 34 Days	272 EA.
	Fill & Asphalt - 2500 cy/10 cy per Truck	250 EA.
		1,206 EA.
		(35.16/W.D.)
26.	**Stage III – Northbound Bypass – 265 Days = 189.3 WD@ 20 Hr./Day Mon.-Fri. 6AM-2AM**	
27.	Remove Temporary NB Bridges & SB SOE - 10 Days = 7.1 Days	
	Removals 7 Days @ 10 Loads/Day	70 EA.
		70 EA. (9.86/W.D.)
28.	Install Columns and Deck Support Slabs in WTC Projections – 20 Days = 143 W.D.	
	Concrete – 2,637 cy/10 cy per Truck	280 EA.
	Reinf. Steel – 401 Ton/20 Ton per Truck	25 EA.
	Formwork In & Out	20 EA.
	Supplies - 8 Trucks/Day x 14 Days	112 EA.
		437 EA.
		(30.56/W.D.)
29.	Excavation & Bracing – NB Bypass – 65 Days = 46.4 W.D.	
	Excavation – 28 Trailers x 3 Trips/Day x 47 Days	3,950 EA.
	Bracing, HP & Lagging – 186 Trucks	186 EA.
	Supplies - 8 Trucks/Day x 46 Days	368 EA.
		4,504 EA.
		(97.07/W.D.)

CONSTRUCTION TRAFFIC—TRUCK COUNTS

Schedule ID No.		Trips
30.	Excavation Below Bypass Subgrade – 30 Days = 21.4 W.D.	
	Excavation - 9.6 Trucks x 3 Trips/Day x 20 Days	576 EA.
	Bracing – 12 Trucks	12 EA.
	Supplies – 8 Trucks/Day x 21 Days	168 EA.
		756 EA.
	[Note: Since the time of the original air quality analysis, the busway tunnel has been removed from the Route 9A project. To account for the change in emissions, the total number of truck trips was reduced by 1/3]	(35.33/W.D.)
		Less 1/3 for removed busway =
		504 EA.
		(23.55/W.D.)
31.	Drill & Install Caissons – 30 Days = 21.4 W.D.	
	Excavation – 3 Trucks x 2 Trips/ Day x 21 Days	125 EA.
	Concrete – 3 Trucks x 3 Trips/Day x 21 Days	189 EA.
	Reinf. – 6 Cages/Day x 20 Days	120 EA.
	Supplies – 8 Trucks/Day x 21 Days	168 EA.
		603 EA.
		(28.18/W.D.)
32.	Build Structures Below Grade – 40 Days = 28.6 W.D.	
	Concrete – 5 Trucks x 3 Trips x 21 Days	320 EA.
	Reinf. Steel – 24 Trucks	24 EA.
	Backfill – 5 Trucks x 4 Trips x 2 Days	40 EA.
	Supplies – 8 Trucks/Day x 28 Days	224 EA.
		608 EA.
	[Note: Since the time of the original air quality analysis, the busway tunnel has been removed from the Route 9A project. To account for the change in emissions, the total number of truck trips was reduced by 1/3]	(21.26/W.D.)
		Less 1/3 for removed busway =
		405 EA.
		(14.17/W.D.)

CONSTRUCTION TRAFFIC—TRUCK COUNTS

Schedule ID No.		Trips
33.	Build NB Bypass & Truck Ramp Structures – 165 Days = 117.9 W.D.	
	Concrete – 18,230 cy/10 cy per Truck + 4488	1,900 EA.
	Reinf. – 1,891 Ton/20 ton per Truck + 673	130 EA.
	Precast Roof – 1100 Ft./4' EA.	275 EA.
	Formwork In & Out	80 EA.
	Waterproofing	40 EA.
	Tiles	40 EA.
	6" A.C. Wearing Course – 1749 cy/10 cy per Truck	175 EA.
	Supplies – 8 Trucks/Day x 117 Days	936 EA.
		3,576 EA.
		(30.33/W.D.)
34.	**Stage IV – Project Completion – 402 Days = 287.1 WD@ 10 Hr/Day Mon.-Fri. 7AM-5PM**	
35.	Install Finishes, Lighting, Ventilation, Roadway, Etc. in SB Bypass = 180 Days = 128.6 W.D.	
	Supplies & Materials = 10 Trucks/Day x 128 Days =	1,280 EA.
		(10.0/W.D.)
36.	Install Finishes, Lighting, Ventilation, Roadway, Etc. in NB Bypass = 150 Days = 107.1 W.D.	
	Supplies & Materials = 10 Trucks/Day x 107 Days =	1,070 EA.
		(10.0/W.D.)
37. to 42.	Build Permanent Surface Roadways & Median = 200 Days = 142.9 W.D.	
	Demolition – 15,409 cy/15 cy per Truck	1,700 EA.
	Concrete Barrier Removal – 7500 LF/100' per Truck	75 EA.
	Grading & Embankment – 5100 cy/15 cy per Truck	340 EA.
	Roadway Pavement – 15,010 cy/10 cy per Truck	150 EA.
	Topsoil – 4,997 cy/15 cy per Truck	340 EA.
	Trees – 900 EA./ 3 per Truck	300 EA.
	Concrete Barrier – 5,397 LF/100 LF per Truck	55 EA.
	Granite Curb & Swale – 8,995 LF/500' per Truck	18 EA.
	Granite Pavers - - 59,480 SF/5,000 SF per Truck	12 EA.
	Supplies & Materials – 8 Trucks/Day x 142 Days	1,136 EA.
		4,126 EA.
		(28.87/W.D.)

CONSTRUCTION TRAFFIC—TRUCK COUNTS		
Schedule ID No.		Trips
		TOTAL TRIPS = 54,856 EA.
		TOTAL WORK DAYS = 964 WORK DAYS
		AVERAGE TRIPS/WORK DAY = 56.90 TRIPS / WORK DAY

Construction Material Delivery and Export Summary

The following table summarizes the delivery and export of construction materials to and from the job site based on the preliminary construction schedule. The Schedule ID number shown below corresponds to the first column number of the various construction schedules.

CONSTRUCTION MATERIAL DELIVERY & EXPORT

Schedule ID No.		Quantity
1.	Stage 0 – Early Action Items– 355 Days = 253.6 W.D.@ 10 Hr./Day Mon.-Fri. 7AM– 5 PM	
2.	West Side Utilities – Verizon/ECS – 77 Days = 55 W.D.	
	Excavation – 27 Loads/Day x 15 CY/Load = 405 CY/Day x 48 Days	19,440 CY
	Concrete – 5 Loads/Day x 10 CY/Load = 50 CY/Day x 44 Days	2,200 CY
	Backfill – 39 Loads/Day x 15 CY/Load = 585 CY/Day x 30 Days	17,550 CY
	Duct & MHs & Sheeting – 22 Loads	22 Lds
	Supplies – 4 Loads/Day x 30 Days	220 Lds
2.	West Side Utilities – 48" Dia & 20" Dia Water Lines – 65 Days = 46.4 W.D.	
	Excavation – 20 Loads/Day x 15 CY/Load = 300 CY/Day x 45 Days	13,500 CY
	Backfill – 20 Loads/Day x 15 CY/Load = 300 CY/Day x 45 Days	13,500 CY
	Pipe & Fittings – 20 Loads	20 Lds
	Supplies – 4 Loads/Day x 46 Days	184 Lds
2.	West Side Utilities – 16" Dia Gas Line & Electric – 45 Days = 32.1 W.D.	
	Excavation –8 Loads/Day x 15 CY/Load = 120 CY/Day x 30 Days	3,600 CY
	Backfill – 9 Loads/Day x 15 CY/Load = 135 CY/Day x 25 Days	3,375 CY
	Pipe, Fittings & Duct – 10 Loads	10 Lds
	Supplies – 4 Loads/Day x 32 Days	128 Lds.
3.	Slurry Walls West Side – 168 Days = 120 W.D.	
	Excavation – 5Loads/Day x 12 CY/Load = 60 CY/Day x 115 Days	6,900 CY
	Concrete – 9 Loads/Day x 10 Cy/Load = 90 CY/Day x 96 Days	8,640 CY
	Reinf. Steel– 34 Loads	34 Lds
	Supplies – 4 Loads/Day x 120 Days	480 Lds

CONSTRUCTION MATERIAL DELIVERY & EXPORT

Schedule ID No.		Quantity
4.	Steel Sheeting West Side & East Side – 53 Days = 37.9 W.D.	
	Excavation = 10 Loads/Day x 15 CY per Load = 150 CY x 37 Days	5,550 CY
	Backfill = 10 Loads/Day x 15 CY per Load = 150 CY x 37 Days	5,550 CY
	Steel Sheeting = 8 Loads In & Out	8 Lds
	Misc Supplies = 4 Loads/Day x 37 Days	148 Lds
5.	Construct WTC Water Lines – 91 Days = 65 W.D.	
	Excavation – 15 Loads/Day x 15 CY/Load = 225 CY/Day x 25 Days	5,625 CY
	Concrete – 10 Loads/Day x 10 CY/Load = 100 CY/Day x 8 Days	800 CY
	Backfill – 9 Loads/Day x 15 CY/Load = 135 CY/Day x 9 Days	1,215 CY
	Pipe & Fittings - 10 Loads	10 Lds
	Piling & Sheeting – 7 Loads	7 Lds
	Supplies – 4 Loads/Day x 65 Days	260 Lds
	[Note: This activity, while officially part of the WTC Memorial & Redevelopment project, will be constructed along with the other Route 9A elements to maximum construction efficiency. The air emissions from this activity are included as part of the WTC Memorial & Redevelopment project emissions.]	
6.	Construct Pedestrian Concourse West End – 134 Days = 95.7 W.D.	
	Excavation –18 Loads/Day x 15 CY/Load = 270 CY/Day x 20 Days	5,400 CY
	Concrete – 3 Loads/Day x 10 CY/Load = 30 CY/Day 58 Days	1,740 CY
	Backfill – 18 Loads/Day x 15 Cy/Load = 270 CY/Day x 17 Days	4,590 CY
	SOE – 24 Loads	24 Lds
	Reinf. Steel – 5 Loads	5 Lds
	Supplies – 4 Loads/Day x 95 Days	380 Lds
	[Note: This activity, while officially part of the WTC PATH Terminal project, will be constructed along with the other Route 9A elements to maximum construction efficiency. The air emissions from this activity are included as part of the WTC PATH Terminal project emissions.]	
7.	Construct Busway Tunnel West End	
	[Note: This element has been removed from the Route 9A project.]	
8.	**Stage 1 – Preparation Work– 159 Days = 113.6 W.D.@ 20 Hr./Day Mon.-Fri. 6 AM– 2 AM**	
9.	Remove WTC Haul Road as Required – 11 Days = 7.9 W.D.	
	110 Load Loads	110 Lds

CONSTRUCTION MATERIAL DELIVERY & EXPORT

Schedule ID No.		Quantity
10.	Slurry Walls – East Side – 72 Days = 51.4 W.D.	
	Excavation – 24 Loads/Day x 15 CY/Load = 360 CY/Day x 45 Days	16,200 CY
	Concrete – 39 Loads x 10 CY/Load = 390 CY/Day x 42 Days	1,6380 CY
	Reinf. Steel – 7 Loads	7 Lds
	Supplies – 8 Loads/Day x 51 Days	408 Lds
11. & 12.	Construct NB & SB Temporary Lanes – 50 Days = 35.7 W.D.	
	Barrier – 10 Loads x 11 Days	110 Lds
	Asphalt & Gravel – 500 Loads x 12 cy/Load	6,000 CY
	Supplies – 4 Loads/Day x 35 Days	140 Lds
13. & 14.	Construct Pedestrian Concourse & Busway Tunnel Below Highway – 85 Days = 60.7 W.D.	
	Excavation – 24 Loads/Day x 15 CY/Load = 360 CY/Day x 18 Days	6,480 CY
	Concrete – 4 Loads/Day x 10 CY/Load = 40 Loads/Day x 33 Days	1,320 CY
	Backfill –18 Loads/Day x 15 CY/Load = 270 CY/Day x 14 Days	3,780 CY
	SOE – 16 Loads	16 Lds
	Reinf. Steel – 10 Loads	10 Lds
	Supplies – 8 Loads/Day x 60 Days	480 Lds
	[Note: Since the time of the original air quality analysis, the busway tunnel has been removed from the Route 9A project. To account for the change in emissions, the total number of truck trips was reduced by 1/3]	***Less 1/3 for removed busway***
	[Note: This activity, while officially part of the WTC PATH Terminal project, will be constructed along with the other Route 9A elements to maximum construction efficiency. The air emissions from this activity are included as part of the WTC PATH Terminal project emissions.]	
15.	**Stage II–Southbound Bypass– 383 Days = 273.6 WD@ 20 Hr./Day Mon.-Fri. 6 AM–2 AM**	
16.	Slurry Walls West of 78" Sewer Relocation – 90 Days = 64.3 W.D.	
	Excavation – 32 Loads/Day x 15 CY/Load = 480 CY/Day x 60 Days	28,800 CY
	Concrete – 45 Loads/Day x 10 CY/Load = 450 CY/Day x 63 Days	28,350 CY
	Reinf. Steel – 106 Loads	106 Lds
	Supplies – 8 Loads/Day x 64 Days	512 Lds

CONSTRUCTION MATERIAL DELIVERY & EXPORT

Schedule ID No.		Quantity
17. & 18.	Excavation & Bracing SB Bypass – 60 Days = 42.9 W.D.	
	Excavation – 116 Loads/Day x 30 CY/Load = 3,480 CY/Day x 40 Days	139,200 CY
	Bracing, HP & Lagging – 186 Loads	186 Lds
	Supplies – 8 Loads/Day x 42 Days	336 Lds
19.	Excavation Below Subgrade – 30 Days = 21.4 W.D.	
	Excavation – 29 Loads/Day x 15 CY/Load = 435 CY/Day x 20 Days	8,700 CY
	Bracing – 12 Loads	12 Lds
	Supplies – 8 Loads/Day x 21 Days	168 Lds
	[Note: Since the time of the original air quality analysis, the busway tunnel has been removed from the Route 9A project. To account for the change in emissions, the total number of truck trips was reduced by 1/3]	***Less 1/3 for removed busway***
20.	Drill & Install Caissons – 60 Days = 42.9 W.D.	
	Excavation – 6 Loads/Day x 15 CY/Load = 90 CY/Day x 42 Days	3,780 CY
	Concrete – 9 Loads/Day x 10 CY/Load = 90 CY/Day x 42 Days	3,780 CY
	Reinf. – 6 Cages/Day x 40 Days	240 Lds
	Supplies – 8 Loads/Day x 42 Days	336 Lds
21.	Build Structures Below Grade – 40 Days = 28.6 W.D.	
	Concrete – 15 Loads/Day x 10 CY/Load = 150 CY/Day x 17 Days	2,550 CY
	Reinf. Steel – 20 Loads	20 Lds
	Backfill – 5 Loads x 4 Trips x 2 Days	40 Lds
	Supplies – 8 Loads/Day x 28 Days	224 Lds
	[Note: Since the time of the original air quality analysis, the busway tunnel has been removed from the Route 9A project. To account for the change in emissions, the total number of truck trips was reduced by 1/3]	***Less 1/3 for removed busway***

CONSTRUCTION MATERIAL DELIVERY & EXPORT

Schedule ID No.		Quantity
22.	Build 78" Dia Sewer Relocation & Outfall with Regulator – 60 Days = 42.9 W.D.	
	H-Piles – 30 Loads	30 Lds
	Drilling (Excavation) – 90 Loads x 15 cy/Load	1,350 CY
	Concrete – 133 Loads x 10 cy/Load	1,330 CY
	Gravel – 82 Loads x 12 cy/Load	980 CY
	Cradle Conc. – 330 Loads x 10 cy/Load	3,300 CY
	Reinf. – 17 Loads	17 Lds
	RCP – 55 Loads	55 Lds
	Encasement Conc. – 550 Loads x 10 cy/Load	5,500 CY
	Reinf. – 28 Loads	28 Lds
	Manholes – 8 EA. x 20 Loads/EA.	160 Lds
	96" Dia Outfall – 288 Loads	288 Lds
	Regulator – Excavation & Concrete	200 EA.
	Formwork In & Out	40 Lds
	Supplies – 8 Loads/Day x 42 Days	336 Lds
23.	Build SB Bypass Structure – 150 Days = 107.1 W.D.	
	Concrete – 1,782 Loads x 10 cy/Load	17,812 CY
	Reinf. – 130 Loads	130 Lds
	Precast Roof – 275 Loads	275 Lds
	Formwork In & Out	120 Lds
	Waterproofing –	60 Lds
	Tiles –	80 Lds
	6" A.C. Wearing Course & Gravel 248 Loads x 12 cy/Load	2,976 CY
	Supplies – 8 Loads/Day x 107 Days	856 Lds
24.	Deck Over Boat Sections & NB Temporary Roadway - 480 Days = 34.3 W.D.	
	Deck Beams – 82 EA. In & Out	164 Lds
	Cap Beams & Lateral Bracing	40 Lds
	Deck Panels – 60,000 SF/50 SF = (1200 EA./5 per Trip) x 2	480 Lds
	Supplies – 8 Loads/Day x 34 Days	272 Lds
	Fill & Asphalt – 250 Loads x 12 cy/Load	3,000 Lds
26.	**Stage III–Northbound Bypass–265 Days = 189.3 WD@ 20 Hr./Day Mon.-Fri. 6AM - 2AM**	

CONSTRUCTION MATERIAL DELIVERY & EXPORT

Schedule ID No.		Quantity
27.	Remove Temporary NB Bridges & SB SOE - 10 Days = 7.1 Days Removals 7 Days @ 10 Loads/Day	70 Lds
28.	Install Columns and Deck Support Slabs in WTC Projections – 20 Days = 143 W.D. Concrete – 264 Loads x 10 cy/Load Reinf. Steel – 25 Loads Formwork In & Out Supplies - 8 Loads/Day x 14 Days	 2,640 CY 25 Lds 20 Lds 112 Lds
29.	Excavation & Bracing – NB Bypass – 65 Days = 46.4 W.D. Excavation – 84 Loads/Day x 30 CY/Load = 2,520 CY Day x 47 Days Bracing, HP & Lagging – 186 Loads Supplies - 8 Loads/Day x 46 Days	 118,440 CY 186 Lds 368 Lds
30.	Excavation Below Bypass Subgrade – 30 Days = 21.4 W.D. Excavation – 29 Loads/Day x 15 CY/Load x 20 Days Bracing – 12 Loads Supplies – 8 Loads/Day x 21 Days *[Note: Since the time of the original air quality analysis, the busway tunnel has been removed from the Route 9A project. To account for the change in emissions, the total number of truck trips was reduced by 1/3]*	 8,700 CY 12 Lds 168 Lds ***Less 1/3 for removed busway***
31.	Drill & Install Caissons – 30 Days = 21.4 W.D. Excavation – 6 Loads/Day x 15 CY/Load = 90 CY/Day x 21 Days Concrete – 9 Loads/Day x 10 CY/Load = 90 CY/Day x 21 Days Reinf. – 6 Loads/Day x 20 Days Supplies – 8 Loads/Day x 21 Days	 1,890 CY 1,890 CY 120 Lds 168 Lds
32.	Build Structures Below Grade – 40 Days = 28.6 W.D. Concrete – 15 Loads x 10 CY/Load = 150 CY/Day x 21 Days Reinf. Steel – 24 Loads Backfill –20 Loads/Day x 15 CY/Day = 300 CY/Day x 2 Days Supplies – 8 Loads/Day x 28 Days *[Note: Since the time of the original air quality analysis, the busway tunnel has been removed from the Route 9A project. To account for the change in emissions, the total number of truck trips was reduced by 1/3]*	 3,150 CY 24 Lds 600 CY 224 Lds ***Less 1/3 for removed busway***

CONSTRUCTION MATERIAL DELIVERY & EXPORT

Schedule ID No.		Quantity
33.	Build NB Bypass & Load Ramp Structures – 165 Days = 117.9 W.D.	
	Concrete – 1900 Loads x 10 cy/Load	19,000 CY
	Reinf. – 1,891 Ton/20 ton per Load + 673	130 Lds
	Precast Roof – 1100 Ft./4' EA.	275 Lds
	Formwork In & Out	80 Lds
	Waterproofing	40 Lds
	Tiles	40 Lds
	6" A.C. Wearing Course – 175 Loads x 12 cy/Load	2,100 CY
	Supplies – 8 Loads/Day x 117 Days	936 Lds
34.	**Stage IV – Project Completion – 402 Days = 287.1 W.D. @ 10 Hr/Day Mon.-Fri. 7AM-5PM**	
35.	Install Finishes, Lighting, Ventilation, Roadway, Etc. in SB Bypass = 180 Days = 128.6 W.D.	
	Supplies & Materials = 10 Loads/Day x 128 Days =	1,280 Lds
36.	Install Finishes, Lighting, Ventilation, Roadway, Etc. in NB Bypass = 150 Days = 107.1 W.D.	
	Supplies & Materials = 10 Loads/Day x 107 Days =	1,070 Lds
37. to 42.	Build Permanent Surface Roadways & Median = 200 Days = 142.9 W.D.	
	Demolition – 1700 Loads x 15 cy per Load	25,500 CY
	Concrete Barrier Removal – 7500 LF/100' per Load	75 Lds
	Grading & Embankment – 340 Loads x 15 cy/Load	5,100 CY
	Roadway Pavement – 150 Loads x 12 cy/Load	18,000 CY
	Topsoil – 333 Loads x 15 cy/Load	5,000 CY
	Trees – 900 EA./ 3 per Load	300 Lds
	Concrete Barrier – 5,397 LF/100 LF per Load	55 Lds
	Granite Curb & Swale – 8,995 LF/500' per Load	18 Lds
	Granite Pavers - - 59,480 SF/5,000 SF per Load	12 Lds
	Supplies & Materials – 8 Loads/Day x 142 Days	1,136 Lds

ROUTE 9A PROJECT – AT-GRADE ALTERNATIVE

Equipment Estimate and Schedule Assumptions

1. Estimate and Schedule includes all engines greater than 60 HP.
2. All equipment will use ultra low sulfur diesel fuel.
3. Standard shift hours of work will be from 6:00 AM to 5 PM Monday through Friday.
4. Off-Peak work hours will be from 10:00 PM to 6:00 AM Monday through Friday.
5. Double Shift work hours will be from 6:00 AM to 2:00 AM, Monday through Friday.
6. Throughout the stages maintenance work and schedule catch-up work will be performed Saturday 7 AM to 3 PM.
7. Dewatering ejector pump will run 24 hours per day, 7 days per week and will be wired to an electric source.
8. All light towers and lighting will be wired to an electric source.
9. All arrow boards and variable message signs will either be solar powered or wired to an electric source.
10. No on-site concrete batching or crushing operations will take place.
11. No worker vehicles will be permitted on-site, nor will any parking be provided on-site for workers.
12. Fugitive dust control will be handled as needed with a sweeper truck and water truck on-site.
13. The Infrastructure Project that includes the sewer regulator and communication line relocations is not included in this equipment estimate.

Construction Equipment Schedules

The attached construction equipment schedule is generated from the "Route 9A-At Grade Option Preliminary Construction Schedule" and is sorted by work task.

CONSTRUCTION EQUIPMENT SCHEDULE

Activity Number		Total Hours	W-Days Duration	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07
21	**STAGE 3**										
22	**Shift NB Traffic to Temp. SB Roadway**										
23	**Install Soldier Pile Wall WTC Exit Ramp (2 Shifts)**	2,672 hrs	21Wd								
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	311 hrs	21Wd								
	Backhoe,90HP,Dynahoe 190-4	394 hrs	21Wd								
	Crane,35T,273HP,Grove 2035	394 hrs	21Wd								
	Drill,204HP-1,Baur BG 12H	787 hrs	21Wd								
	Pump, Elector Well 350HP	394 hrs	21Wd								
	Truck,Pickup-1,250HP,Ford F250	394 hrs	21Wd								
24	**Install Bracing & Excavate WTC Exit Ramp (2 Shifts)**	3,542 hrs	21Wd								
	Backhoe,90HP,Dynahoe 190-4	394 hrs	21Wd								
	Crane,100T,350HP,Manitowoc 222 100T	394 hrs	21Wd								
	Dozer,Track-1,338HP,CAT D8R	787 hrs	21Wd								
	Excavator,428HP-1,CAT 375L	787 hrs	21Wd								
	Pump, Elector Well,350HP	394 hrs	21Wd								
	Welding Machine-1,33HP,400AMP,Lincoln	787 hrs	21Wd								
25	**Construct Structural Concrete for WTC Tunnel/Ramp (2 Shifts)**	7,474 hrs	78Wd								
	Backhoe,90HP,Dynahoe 190-4	1,479 hrs	78Wd								
	Crane,35T,273HP,Grove 2035	1,479 hrs	78Wd								
	Pump, Concrete Boom,150HP,36M,Butemeister	389 hrs	78Wd								
	Pump, Elector Well,350HP	1,479 hrs	78Wd								
	Roller,Vibratory,150HP,84",CAT CS563E	389 hrs	78Wd								
	Truck,Pickup-1,250HP,Ford F250	1,479 hrs	78Wd								
	Welding Machine-1,33HP,400AMP,Lincoln	779 hrs	78Wd								
26	**Construct Structural Concrete for Pedestrian Concourse**	4,514 hrs	64Wd								
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	477 hrs	64Wd								
	Crane,35T,273HP,Grove 2035	604 hrs	64Wd								
	Crane,100T,350HP,Manitowoc 222 100T	318 hrs	64Wd								
	Drill,204HP-1,Baur BG 12H	159 hrs	64Wd								
	Driver,Vibratory,175HP,ICE 216E	159 hrs	64Wd								
	Excavator,321HP,CAT 345BL	318 hrs	64Wd								
	Loader,Wheel,260HP,CAT 966G	477 hrs	64Wd								
	Pump, Concrete Boom,150HP,36M,Butemeister	159 hrs	64Wd								
	Pump, Elector Well 350HP	604 hrs	64Wd								
	Truck,Pickup-1,250HP,Ford F250	604 hrs	64Wd								
	Welding Machine-1,33HP,400AMP,Lincoln	636 hrs	64Wd								
	[NOTE: This activity, while officially part of the WTC PATH Terminal project, will be constructed along with the										
27	**Construct Structural Concrete for Busway Tunnel**										
	[NOTE: This activity has been removed from the project]										
28	**Construct WTC Waterline Segment**	1,379 hrs	28Wd								
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	209 hrs	28Wd								
	Backhoe,90HP,Dynahoe 190-4	209 hrs	28Wd								
	Crane,35T,273HP,Grove 2035	209 hrs	28Wd								
	Excavator,321HP,CAT 345BL	139 hrs	28Wd								
	Loader,Wheel,260HP,CAT 966G	209 hrs	28Wd								
	Pump, Concrete Boom,150HP,36M,Butemeister	70 hrs	28Wd								
	Pump, Elector Well,350HP	265 hrs	28Wd								
	Roller,Vibratory,150HP,84",CAT CS563E	70 hrs	28Wd								
	[NOTE: This activity, while officially part of the WTC Memorial and Redevelopment project, will be constructed										
29	**Construct 5' Retaining Wall on Existing WTC Slurry Wall**	2,511 hrs	64Wd								
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	477 hrs	64Wd								
	Backhoe,90HP,Dynahoe 190-4	477 hrs	64Wd								
	Crane,35T,273HP,Grove 2035	477 hrs	64Wd								
	Pump, Concrete Boom,150HP,36M,Butemeister	477 hrs	64Wd								
	Truck,Pickup-1,250HP,Ford F250	604 hrs	64Wd								
30	**Shift WTC Traffic to Completed WTC Ramp**	0 hrs	0Wd								
31	**Construct Permanent NB Roadway Embankment & Pvmnt (Albany St to Murray St)**	4,825 hrs	56Wd								
	Backhoe,90HP,Dynahoe 190-4	536 hrs	56Wd								
	Dozer,Track-1,338HP,CAT D8R	536 hrs	56Wd								
	Grader,185HP,CAT 12H	536 hrs	56Wd								
	Loader,Track-2,229HP,CAT 973	536 hrs	56Wd								
	Loader,Wheel,260HP,CAT 966G	536 hrs	56Wd								
	Pump, Concrete Boom,150HP,36M,Butemeister	536 hrs	56Wd								
	Roller,Vibratory,150HP,84",CAT CS563E	536 hrs	56Wd								
	Truck,Pickup-1,250HP,Ford F250	536 hrs	56Wd								
	Truck,Pickup-2,250HP,Ford F250	536 hrs	56Wd								
32	**Sidewalk/NB Pavement Repairs (W.Thames-Albany, Vesey-Chambers, OFF-PEAK)**	3,753 hrs	56Wd								
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	536 hrs	56Wd								
	Backhoe,90HP,Dynahoe 190-4	536 hrs	56Wd								
	Excavator,143HP,CAT 320CL	536 hrs	56Wd								
	Grader,185HP,CAT 12H	536 hrs	56Wd								
	Loader,Wheel,260HP,CAT 966G	536 hrs	56Wd								
	Roller,Vibratory,150HP,84",CAT CS563E	536 hrs	56Wd								
	Truck,Pickup-1,250HP,Ford F250	536 hrs	56Wd								
33	**STAGE 4**										
35	**Shift NB Traffic on New NB Roadway**										
36	**Construct Permanent SB Roadway Embankment & Pavement**	4,289 hrs	56Wd								
	Backhoe,90HP,Dynahoe 190-4	536 hrs	56Wd								
	Dozer,Track-1,338HP,CAT D8R	536 hrs	56Wd								
	Grader,185HP,CAT 12H	536 hrs	56Wd								
	Loader,Wheel,260HP,CAT 966G	536 hrs	56Wd								
	Pump, Concrete Boom,150HP,36M,Butemeister	536 hrs	56Wd								
	Roller,Vibratory,150HP,84",CAT CS563E	536 hrs	56Wd								
	Truck,Pickup-1,250HP,Ford F250	536 hrs	56Wd								
	Truck,Pickup-2,250HP,Ford F250	536 hrs	56Wd								
33	SW/Median/Pvmnt Repairs (W.Thames-Albany, Murray-Chambers,OFF-PEAK)	3,753 hrs	56Wd								
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	536 hrs	56Wd								
	Backhoe,90HP,Dynahoe 190-4	536 hrs	56Wd								
	Excavator,143HP,CAT 320CL	536 hrs	56Wd								
	Grader,185HP,CAT 12H	536 hrs	56Wd								
	Loader,Wheel,260HP,CAT 966G	536 hrs	56Wd								
	Roller,Vibratory,150HP,84",CAT CS563E	536 hrs	56Wd								
	Truck,Pickup-1,250HP,Ford F250	536 hrs	56Wd								
37	**STAGE 5**										
38	**Shift SB Traffic on New SB Roadway**										
39	**Remove Vesey Street Pedestrian Bridge**	1,995 hrs	56Wd	SubT:1,262	SubT:733						
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	665 hrs	56Wd	421	244						
	Backhoe,90HP,Dynahoe 190-4	333 hrs	56Wd	210	122						
	Crane,35T,273HP,Grove 2035	333 hrs	56Wd	210	122						
	Truck,Pickup-1,250HP,Ford F250	333 hrs	56Wd	210	122						
	Crane,100T,350HP,Manitowoc 222 100T	333 hrs	56Wd	210	122						
40	**Construct W.Promenade, Walkway, Bikeway, DO Lanes (W.Thames to Chambers)**	3,803 hrs	64Wd	SubT:1,893	SubT:1,710						
	Air Compressor-1,185CFM,85HP,Atlas Copco XA596JD	801 hrs	64Wd	421	380						
	Backhoe,90HP,Dynahoe 190-4	400 hrs	64Wd	210	190						
	Crane,35T,273HP,Grove 2035	400 hrs	64Wd	210	190						
	Excavator,143HP,CAT 320CL	400 hrs	64Wd	210	190						
	Grader,185HP,CAT 12H	400 hrs	64Wd	210	190						
	Loader,Wheel,260HP,CAT 966G	400 hrs	64Wd	210	190						
	Roller,Vibratory,150HP,84",CAT CS563E	400 hrs	64Wd	210	190						
	Truck,Pickup-1,250HP,Ford F250	400 hrs	64Wd	210	190						
41	**CONSTRUCTION COMPLETION**										

RADE OPTION
)N EQUIPMENT ESTIMATE
ENT OF TRANSPORTATION

Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07

project emissions.]

701	SubT:2,614	SubT:1,133
132	321	139
321	214	93
332	321	139
321	214	93
321	407	176
111	107	46
321	407	176
221	214	93
321	407	176
T:0	SubT:0	SubT:244
0	0	61
0	0	61
0	0	61
0	0	61

project emissions.]

	SubT:665	SubT:713
	95	102
	95	102
	95	102
	95	102
	95	102
	95	102
	95	102

Construction Equipment Schedules

The following table summarizes the truck counts for delivery and export of construction materials to and from the job site based on the Preliminary Construction Schedule (see Appendix A). The Schedule ID number corresponds to the first column number of each of the schedules.

ROUTE 9A - AT GRADE ALTERNATIVE
CONSTRUCTION MATERIAL DELIVERY/WASTE QUANTITIES AND TRUCK COUNTS

Schedule Item	Description	Quantity	Truck Capacity	Days	Trips Total	Trips/Day
1	Stage 1					
3	Construct Slurry Wall – 150 Days = 107 Work Days					
	Excavation	10,200cy	12cy	100	850	8.5
	Concrete	10,200cy	10cy	100	1020	10.2
	Reinf. Steel	2,000tons	20tons	77	100	1.3
	Supplies	250lds	1lds	100	250	2.5
				Total Trips:	***2,220***	
4	Construct 48" Water, 12" Water, 16" Gas = 80 Days = 57 Work Days					
	Excavation	5,000cy	12cy	40	417	10.4
	Backfill	4,000cy	12cy	20	333	16.7
	Pipe & Fittings	30lds	1lds	30	30	1.0
	Supplies	110lds	1lds	55	110	2.0
				Total Trips:	***890***	
5	Construct WTC Water Lines = 80 Days = 57 Work Days					
	Excavation	6,000cy	12cy	20	500	25.0
	Concrete	200cy	10cy	10	20	2.0
	Backfill	4,000cy	12cy	10	333	33.3
	Pipe & Fittings	20lds	1lds	10	20	2.0
	Piling & Sheeting	20lds	1lds	7	20	2.9
	Supplies	220lds	1lds	2	220	110.0
				Total Trips:	***1,113***	
	[NOTE: This activity, while officially part of the WTC Memorial and Redevelopment project, will be constructed along with the other Route 9A elements for construction efficiency purposes. The air emissions from this activity are included as part of the overall WTC Memorial and Redevelopment project emissions.]					
6	Construct Pedestrian Concourse Segment = 130 Days = 93 Work Days					
	Excavation	10,000cy	12cy	45	833	18.5
	Concrete	2,000cy	10cy	20	200	10.0
	Backfill	4,000cy	12cy	20	333	16.7
	SOE	24lds	1lds	12	24	2.0
	Waterpooofing	200cy	10cy	4	20	5.0
	Reinf. Steel	400tons	20tons	10	20	2.0
	Supplies	180lds	1lds	90	180	2.0
				Total Trips:	***1,610***	
	[NOTE: This activity, while officially part of the WTC PATH Terminal project, will be constructed along with the other Route 9A elements for construction efficiency purposes. The air emissions from this activity are included as part of the overall WTC PATH Terminal project emissions.]					
7	Construct Busway Tunnel Segment = 120 Days = 86 Work Days					
	[NOTE: This activity has been removed from the project]					
8	Construct SB Temporary Lanes = 50 Days = 36 Work Days					
	Excavation	2,000cy	12cy	20	167	8.4
	Barrier	40lds	1lds	5	40	8.0
	Asphalt & Gravel	5,000cy	12cy	30	417	13.9
	Supplies	70	1lds	35	70	2.0
				Total Trips:	***694***	
9	Construct Murray Street Pedestrian Bridge = 180 Days = 129 Work Days					
	H-Piles	200tons	10tons	10	20	2.0
	Drilling Escavation	1,500cy	12cy	30	125	4.2
	Concrete	2,000cy	10cy	50	200	4.0
	Reinf.	100tons	20tons	5	5	1.0
	Structural Steel	500tons	20tons	25	25	1.0
	Supplies	520lds	1lds	130	520	4.0
				Total Trips:	***895***	
10	Remove Haul Rd Bridge/Deck PATH Projection = 80 Days = 57 W.D.					
	Remove Old Bridge	200tons	10tons	10	20	2.0
	Excavation	500cy	12cy	5	42	8.4
	Concrete	500cy	10cy	15	50	3.3
	Reinf. Steel	70tons	20tons	4	4	1.0
	Girders	200tons	20tons	10	10	1.0
	Supplies	175lds	1lds	55	175	3.2
				Total Trips:	***301***	

ROUTE 9A - AT GRADE ALTERNATIVE
CONSTRUCTION MATERIAL DELIVERY/WASTE QUANTITIES AND TRUCK COUNTS

Schedule Item	Description	Quantity	Truck Capacity	Days	Trips Total	Trips/Day
11	Stage 2					
12	Soldier Pile Wall/Dewater for 78" Sewer =45D= 32 W.D. (Double Shift)					
	H-Piles	1,000tons	20tons	25	50	2.0
	Concrete	5,000cy	10cy	25	500	20.0
	Drilling Excavation	5,000cy	12cy	30	417	13.9
	Lagging	800tons	20tons	20	40	2.0
	Supplies	60lds	1lds	30	60	2.0
				Total Trips:	*1,067*	
13	Excavate/Brace 78" Sewer – 40 Days = 29 W.D. (Double Shift)					
	Excavation	32,000cy	24cy	29	1333	46.0
	Bracing, HP & Lagging	1,600tons	20tons	20	80	4.0
	Supplies	60lds	1lds	30	60	2.0
				Total Trips:	*1,473*	
14	Build 78" Sewer – 70 Days = 50 W.D. (Double Shift)					
	H-Piles	1,400tons	20tons	30	70	2.3
	Drilling Excavation	10,000cy	12cy	30	833	27.8
	Concrete	9,000cy	10cy	30	900	30.0
	Gravel	2,000cy	12cy	30	167	5.6
	Cradle Conc.	2,000cy	10cy	30	200	6.7
	Reinf.	250tons	20tons	7	13	1.9
	RCP	1,600ft	40ft	20	40	2.0
	Encasement Conc.	8,000cy	10cy	20	800	40.0
	Reinf.	600tons	20tons	10	30	3.0
	Manholes – 6 EA. x 20 Trucks/EA.	120lds	1lds	20	120	6.0
	Backfill	17,000cy	24cy	20	708	35.4
	Formwork In & Out	100lds	1lds	20	100	5.0
	Supplies	100lds	1lds	20	100	5.0
				Total Trips:	*4,081*	
15	Abandon Existing 78" Interceptor Sewer = 10 Days = 7 W.D.					
	Concrete	2,000cy	10cy	7	200	28.6
	Supplies	14lds	1lds	7	14	2.0
				Total Trips:	*214*	
16	Construct Pedestrian Concourse Segment – 80 Days = 57 W.D.					
	Excavation	5,000cy	12cy	10	417	41.7
	Concrete	1,000cy	10cy	10	100	10.0
	Backfill	2,500cy	12cy	5	208	41.6
	SOE & Sheet/Soldier Pile	160lds	1lds	7	160	22.9
	Waterpooofing	100cy	10cy	4	10	2.5
	Formwork In & Out	20lds	1lds	10	20	2.0
	Reinf. Steel	150tons	20tons	5	8	1.6
	Supplies	200lds	1lds	20	200	10.0
				Total Trips:	*1,123*	
	[NOTE: This activity, while officially part of the WTC PATH Terminal project, will be constructed along with the other Route 9A elements for construction efficiency purposes. The air emissions from this activity are included as part of the overall WTC PATH Terminal project emissions.]					
17	Construct Busway Tunnel Segment – 90 Days = 64 W.D.					
	[NOTE: This activity has been removed from the project]					
18	Construct WTC Water Lines – 80 Days = 57 W.D.					
	Excavation	6,000cy	12cy	20	500	25.0
	Concrete	200cy	10cy	10	20	2.0
	Backfill	4,000cy	12cy	10	333	33.3
	Pipe & Fittings	20lds	1lds	10	20	2.0
	Piling & Sheeting	20lds	1lds	7	20	2.9
	Supplies	220lds	1lds	2	220	110.0
				Total Trips:	*1,113*	
	[NOTE: This activity, while officially part of the WTC Memorial and Redevelopment project, will be constructed along with the other Route 9A elements for construction efficiency purposes. The air emissions from this activity are included as part of the overall WTC Memorial and Redevelopment project emissions.]					
19	Construct SB Temporary Lanes – 30 Days = 21 W.D.					
	Escavatoion	1,000cy	12cy	10	83	8.3
	Barrier	40lds	1lds	5	40	8.0
	Asphalt & Gravel	3,000cy	12cy	20	250	12.5
	Supplies	40	1lds	20	40	2.0
				Total Trips:	*413*	

ROUTE 9A - AT GRADE ALTERNATIVE
CONSTRUCTION MATERIAL DELIVERY/WASTE QUANTITIES AND TRUCK COUNTS

Schedule Item	Description	Quantity	Truck Capacity	Days	Trips Total	Trips/Day
20	**Stage 3**					
23	Construct Soldier Pile Wall for WTC Ramp = 30 Days = 21 Work Days					
	H-Piles	400tons	20tons	20	20	1.0
	Concrete	2,000cy	10cy	18	200	11.1
	Drilling Excavation	2,500cy	12cy	20	208	10.4
	Lagging	350tons	20tons	20	18	0.9
	Supplies	40lds	1lds	20	40	2.0
				Total Trips:	***486***	
24	Excavation & Bracing – NB Bypass – 30 Days = 21 W.D.					
	Excavation	15,000cy	24cy	18	625	34.7
	Bracing	100tons	20tons	20	5	0.3
	Supplies	40lds	1lds	20	40	2.0
				Total Trips:	***670***	
25	Build SB Bypass Structure – 110 Days = 79 W.D.					
	Caissons - Concrete	800cy	12cy	20	67	3.4
	Drilling Excavation	800cy	12cy	20	67	3.4
	Concrete	5,000cy	24cy	40	208	5.2
	Reinf.	1,200tons	20tons	25	60	2.4
	Formwork In & Out	40lds	1lds	20	40	2.0
	Waterproofing	300cy	12cy	5	25	5.0
	Tiles –	50tons	20tons	20	3	0.2
	Supplies	160lds	1lds	80	160	2.0
				Total Trips:	***630***	
26	Construct Pedestrian Concourse Segment – 90 Days = 65 W.D.					
	Excavation	3,500cy	12cy	20	292	14.6
	Concrete	1,000cy	12cy	17	83	4.9
	Backfill	1,500cy	12cy	20	125	6.3
	Waterpooofing	100cy	10cy	2	10	5.0
	SOE & Sheet/Soldier Pile	80lds	1lds	20	80	4.0
	Reinf. Steel	150tons	20tons	8	8	1.0
	Supplies	130lds	1lds	65	130	2.0
				Total Trips:	***728***	
	[NOTE: This activity, while officially part of the WTC PATH Terminal project, will be constructed along with the other Route 9A elements for construction efficiency purposes. The air emissions from this activity are included as part of the overall WTC PATH Terminal project emissions.]					
27	Construct Busway Tunnel Segment – 80 Days = 57 W.D.					
	[NOTE: This activity has been removed from the project]					
28	Construct WTC Water Lines – 91 Days = 65 W.D.					
	Excavation	6,000cy	12cy	25	500	20.0
	Concrete	200cy	10cy	15	20	1.3
	Backfill	4,000cy	12cy	20	333	16.7
	Pipe & Fittings	20lds	1lds	10	20	2.0
	Piling & Sheeting	20lds	1lds	7	20	2.9
	Supplies	130lds	1lds	65	130	2.0
				Total Trips:	***1,023***	
	[NOTE: This activity, while officially part of the WTC Memorial and Redevelopment project, will be constructed along with the other Route 9A elements for construction efficiency purposes. The air emissions from this activity are included as part of the overall WTC Memorial and Redevelopment project emissions.]					
29	Construct 5' Retaining Wall on Existing WTC Slurry Wall=90 Days = 64 W.D.					
	Excavation	2,000cy	12cy	20	167	8.4
	Concrete (Wall = 1100')	2,500cy	10cy	50	250	5.0
	Reinf. Steel	500tons	20tons	25	25	1.0
	Backfill	500cy	12cy	10	42	4.2
	Formwork In & Out	40lds	1lds	10	40	4.0
	Supplies	120lds	1lds	60	120	2.0
				Total Trips:	***644***	
31	NB Roadway, Emb't, Sidewalk (Albany-Vesey) =80 Days= 57 W.D.					
	Demolition	2,500cy	12cy	15	208	13.9
	Grading & Embankment	15,000cy	24cy	30	625	20.8
	Roadway Pavement	3,000cy	10cy	25	300	12.0
	Granite Curb	120tons	20tons	6	6	1.0
	Concrete Sidewalk	1,000cy	10cy	25	100	4.0
	Reinf. Steel	100tons	20tons	5	5	1.0
	Supplies & Materials	120lds	1lds	55	120	2.2
				Total Trips:	***1,364***	

ROUTE 9A - AT GRADE ALTERNATIVE
CONSTRUCTION MATERIAL DELIVERY/WASTE QUANTITIES AND TRUCK COUNTS

Schedule Item	Description	Quantity	Truck Capacity	Days	Trips Total	Trips/Day
32	Sidewalk,Pvmnt Repairs, (W-Thames-Albany,Vesey-Chambers (off peak)=80 Days= 57 W.D.					
	Demolition	2,000cy	12cy	20	167	8.4
	Granite Curb	100tons	20tons	5	5	1.0
	Roadway Pavement	2,000cy	10cy	20	200	10.0
	Concrete Sidewalk	900cy	10cy	25	90	3.6
	Reinf. Steel	100tons	20tons	5	5	1.0
	Supplies & Materials	120lds	1lds	55	120	2.2
				Total Trips:	***587***	
33	**Stage 4**					
35	Construct SB Roadway, Median (Albany to Murray) 80 Days = 57 Work Days					
	Demolition	2,000cy	12cy	15	167	11.1
	Grading & Embankment	2,000cy	24cy	25	83	3.3
	Topsoil	2,500cy	12cy	15	208	13.9
	Roadway Pavement	3,000cy	10cy	25	300	12.0
	Granite Curb	120tons	20tons	6	6	1.0
	Supplies & Materials	120lds	1lds	55	120	2.2
				Total Trips:	***884***	
36	SB Roadway, Median (W.Thames-Albany,Vesey-Chambers) 80 Days = 57 Work Days					
	Demolition	2,000cy	12cy	15	167	11.1
	Roadway Pavement	2,000cy	12cy	15	167	11.1
	Topsoil	2,500cy	12cy	15	208	13.9
	Granite Curb	120tons	20tons	6	6	1.0
	Supplies & Materials	100tons	20tons	6	5	0.8
		120lds	1lds	55	120	2.2
				Total Trips:	***673***	
37	**Stage 5**					
39	Construct East Side Median, Walkway, Bikeway,Drof-off Lanes= 80 Days = 57 W.D.					
	Demolition	3,000cy	12cy	15	250	16.7
	Grading & Embankment	2,000cy	12cy	15	167	11.1
	Drop Off Lanes & Bikeway Pavement	2,000cy	12cy	15	167	11.1
	Topsoil	3,000cy	12cy	15	250	16.7
	Granite Curb	120tons	20tons	6	6	1.0
	Sidewalk Concrete	1,500cy	10cy	15	150	10.0
	Supplies & Materials -- 8 Trucks/Day x 142 Days	120lds	1lds	55	120	2.2
				Total Trips:	***860***	
40	Landscape Medians and Sidewalk Areas = 90 Days = 64 Days					
	Demolition -- 15,409 cy/15 cy per Truck	500cy	12cy	15	42	2.8
	Concrete Barrier Removal	150lds	1lds	20	150	7.5
	Trees	300lds	1lds	50	300	6.0
	Granite Pavers	12lds	1lds	12	12	1.0
	Supplies & Materials	150lds	1lds	60	150	2.5
				Total Trips:	***654***	

TOTAL TRIPS:	***26,410***
TOTAL WORKING DAYS:	***521***
AVERAGE DAILY TRIPS:	***51***

FULTON STREET TRANSIT CENTER

CONSTRUCTION METHODS AND IMPACTS

Tunneling for Underpasses – Traffic and Construction Equipment

Tunneling operations will be required to construct concourse beneath the N/R Line at Church Street and the 4/5 Line beneath Broadway. The tunneling operations will be performed from within the existing tunnels (grouting operations) and from the cut and cover excavations for the Transit Center and the Dey Street Concourse. It is assumed here that grouting equipment will access the tunneling locations from within the existing subway tunnels. Spoils from tunneling operations will be removed through the cut and cover excavations to street level for hauling from the site. Grouting and underpinning operations will most likely be performed overnight and on weekends to minimize disruption to transit operations. No street closings are anticipated for this work to take place since the grouting will be performed within the subway tunnels and the tunneling work will be performed from the cut and cover excavation of Dey Street and the open excavation for the Transit Center.

4/5 underpasses

Delivery Type	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Spoil Removal	7,000	CY	470	8	6.5	6 Months
Underpinning	1,000	Tons	50	2	0.7	
Concrete / Steel	1,000	CY	100	4	1.4	
Service/Utility /Fuel Trucks				4	2	
Subcontractors Light Trucks				10	6	
Construction Workers	15 to 20					
Arriving by Personal Vehicle	3 to 4					
Arriving by Mass Transit	12 to 16					
Supervisory/QA	3 to 8					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	2 to 6					

Equipment – Grouting beneath the existing subway tunnel will be performed from within the tunnel and will involve the use of compressed air operated drill rigs and grout pumps. Access to the tunnel will be from Transit Authority maintenance access points. Minimal laydown area exterior to the tunnel will necessary. Tunneling beneath the subway lines will occur from the cut and cover and open excavations. Tunneling will be accomplished with a tunnel roadheader and will require removal of existing piling supporting the existing tunnel and replacement with new piles/foundations. Spoils will be removed by lifting to the surface with a crane and skip box. Percentage of Daily Use is based on construction operations working 9 hours during a 10 hour shift, with the remaining hour taken up by maintenance of equipment, lunch and breaks. Percentage of Use for Concrete Trucks is based on the approximate waiting time and unloading time on site only. Underpinning operations will require approximately 2 months of the 6 month overall schedule. For the underpinning operation the following construction equipment will be required:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Air Operated Grout Drills				4	1.3	90%	6 Months
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	0.33	20%	
Concrete Trucks	10 Cubic yard Tandem or Tri-axle	Diesel	325	2	0	5%	
Air Compressor (for Drills)	1600 CFM	Diesel	460	2	0.67	90%	
Welding Machines	35 HP Diesel Engine			2	0.67	70%	

Spoil removal operations will require approximately 2 months of the 6 month overall schedule. For the spoil removal operation the following construction equipment will be required:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Crawler Crane	100 Ton	Diesel	450	1	0.3	90%	6 Months
Roadheader (for tunneling)	12 foot Diameter	Diesel	120	2	0.67	90%	
Dump Trucks	15 Cubic Yard Tandem	Diesel	325	4	3.2	5%	

Concrete Liner construction operations will require approximately 2 months of the 6 month overall schedule.

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	0.67	90%	6 Months
Crawler Crane (for Material and Form support)	100 Ton	Diesel	350	1	0.33	80%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	0.33	30%	
Concrete Trucks	10 Cubic yard Tandem or Tri-axle	Diesel	325	2	.7	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	2	.67	90%	

N/R Underpass

Delivery Type	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Spoil Removal	7,000	CY	470	8	3.3	12 Months
Underpinning	1,000	Tons	50	2	0.35	
Concrete / Steel	1,000	CY	100	4	0.7	
Service/Utility /Fuel Trucks				4	2	
Subcontractors Light Trucks				10	6	
Construction Workers	15 to 20					
Arriving by Personal Vehicle	3 to 4					
Arriving by Mass Transit	12 to 16					
Supervisory/QA	3 to 8					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	2 to 6					

Equipment – Grouting beneath the existing subway tunnel will be performed from within the tunnel and will involve the use of compressed air operated drill rigs and grout pumps. Access to the tunnel will be from Transit Authority maintenance access points. Minimal laydown area exterior to the tunnel will necessary. Tunneling beneath the subway lines will occur from the cut and cover and open excavations. Tunneling will be accomplished with a tunnel roadheader and will require removal of existing piling supporting the existing tunnel and replacement with new piles/foundations. Spoils will be removed by lifting to the surface with a crane and skip box. Percentage of Daily Use is based on construction operations working 9 hours during a 10 hour shift, with the remaining hour taken up by maintenance of equipment, lunch and breaks. Percentage of Use for Concrete Trucks is based on the approximate waiting time and unloading time on site only. Underpinning operations will require approximately 4 months of the 12 month overall schedule. For the underpinning operation the following construction equipment will be required:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Air Operated Grout Drills				4	1.33	90%	12 Months
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	0.33	20%	
Concrete Trucks	10 Cubic yard Tandem or Tri-axle	Diesel	325	2	0	5%	
Air Compressor (for Drills)	1600 CFM	Diesel	460	2	0.67	90%	
Welding Machines	35 HP Diesel Engine			2	0.67	70%	

Spoil removal operations will require approximately 4 months of the 12 month overall schedule. For the spoil removal operation the following construction equipment will be required:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Crawler Crane	100 Ton	Diesel	450	1	0.33	90%	12 Months
Roadheader (for tunneling)	12 foot Diameter	Diesel	120	2	0.67	90%	
Dump Trucks	15 Cubic Yard Tandem	Diesel	325	4	1.6	5%	

Concrete Liner construction operations will require approximately 4 months of the 12 month overall schedule.

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	2	0.67	90%	12 Months
Crawler Crane (for Material and Form support)	100 Ton	Diesel	350	1	0.33	80%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	0.33	30%	
Concrete Trucks	10 Cubic yard Tandem or Tri-axle	Diesel	325	2	0.35	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	2	0.67	90%	

Concourse Construction under Dey Street – Traffic and Construction Equipment

For Worst Case Situation it is assumed that the Dey Street Concourse will be constructed by a cut and cover excavation operation. The first operation will be to relocate all utility lines from the area in which the excavation support system will be constructed. This scenario includes the use of a concrete retaining wall system along the building lines parallel to Dey Street. The concrete retaining wall would be constructed by the slurry trench method of construction using the panel method. The panel method allows an approximate 20 ft. length of wall to be excavated, steel reinforcement installed, and concrete tremie poured to complete the panel before moving to the next section. Panels can also be alternately skipped to allow continuous excavation while placing the reinforcing steel and concrete in the previous excavation.

Dey Street is approximately 350 ft in length from Church to Broadway. Separate excavation retention systems will be required at Church St. and Broadway to facilitate the tunneling operation under the N/R Lines at Church St. and the 4/5 Lines at Broadway. Assume that the excavation support will terminate at 10 feet below the invert of the excavation for the Downtown Concourse or approximately 55 feet from the surface of existing Dey Street. Assume width of slurry trench and wall at 3 feet. Assume that the maximum production rate is 40 lineal feet (2 panels) of wall per week.

The slurry walls along Dey Street will be constructed by closing one side of the street at a time. Additionally, temporary piles and grade beam will be constructed at the center of Dey Street to support the precast temporary roadway over the cut and cover excavation.

Utility Relocations

The relocation of existing utilities within the Dey Street Right-of-Way (ROW) will be performed prior to the excavation.

Delivery Type	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Spoil Removal	1,000	CY	67	8	1.8	3 Months
Service/Utility /Fuel Trucks				4	2	
Subcontractors Light Trucks				10	6	
Construction Workers	20 to 30					
Arriving by Personal Vehicle	2 to 3					
Arriving by Mass Transit	18 to 27					
Supervisory/QA	3 to 8					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	2 to 6					

Equipment – Hydraulic excavators, rubber tire loaders and backhoes will be utilized for the excavation of the utility trenches and placement of electric and telephone ducts and water and sanitary sewer pipe. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Dump Trucks and Concrete Trucks are based on the approximate waiting time and loading/unloading time on site only. The following construction equipment will be required:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Hydraulic Excavator	1.5 CY	Diesel	138	2	2	90%	3 Months
Rubber Tire Loader	3.5 CY	Diesel	196	2	2	90%	
Rubber Tire Backhoe/Loader	1.25 CY	Diesel	88	4	4	90%	
Dump Trucks	15 CY Tandem or Tri-axle	Diesel	325	4	0.9	5%	
Pumps for Dewatering	4" Gasoline Powered	Gasoline	16	2	2	90%	
Compressor	185 CFM	Diesel	80	2	2	80%	
Pavement Breakers	90 Lbs			2	2	80%	
Generators	Gasoline Powered	Gasoline	12	2	2	90%	
Air hammers (ringing and ripping)	Gasoline	Gasoline		2	2	25%	

Slurry Wall – Construction will consist of closing half of Dey Street at one time for the excavation and placement of the slurry wall. Prior to slurry wall construction the utilities within the closed portion of Dey Street will be temporarily relocated. A single lane closing along Broadway or Church Street will be required to stage materials and support equipment since excavation of the Transit Center site is scheduled concurrently.

Delivery Type	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Slurry Wall – Exc.	4,500	CY	300	8	6.3	4 Months
Slurry Wall – Conc.	4,500	CY	450	12	9.4	
Slurry Wall - Rebar	1,000	Tons	50	2	1	
Service/Utility /Fuel Trucks				6	6	
Subcontractors Light Trucks				12	10	
Construction Workers	20 to 30					
Arriving by Personal Vehicle	4 to 6					
Arriving by Mass Transit	16 to 24					
Supervisory/QA	4 to 6					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	3 to 4					

Equipment – Construction of the Slurry Wall along Dey Street will be performed from within the closed portion of the street. Lane closures will be required along Church and Broadway to accommodate the delivery of materials and the staging of equipment. Percentage of Daily Use is based on construction operations working 9 hours during a 10 hour shift, with the remaining hour taken up by maintenance of equipment, lunch and breaks. Percentage of Use for Concrete Trucks and Dump Trucks are based on the approximate waiting time and loading/unloading time on site only. Equipment required is as follows:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Slurry Plant Mixing Plant	100 m^3 per hour – Diesel 50 HP	Diesel	50	1	1	90%	4 Months
Desanding Plant	100 m^3 per hour – Diesel 50 HP	Diesel	50	1	1	50%	
Crawler Crane w/clam shell	100 Ton	Diesel	350	1	1	90%	
Crawler Crane	100 Ton	Diesel	350	1	1	50%	
Crawler Crane w/Pile Driving Setup	100 Ton	Diesel	350	1	1	50%	
Compressor for Piling Driving	800 CFM	Diesel	310	1	1	50%	
Hydraulic All Terrain Crane	35 Ton	Diesel	165	1	1	80%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	1	1	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	1	40%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	6	4.7	5%	
Dump Trucks	Tandem Axle – 15 CY	Diesel	325	4	3.1	5%	
Rubber Tire Loader	3.5 CY	Diesel	196	2	2	80%	
Diesel Generators	100 HP	Diesel	100	2	2	90%	

Excavation – After the completion of the slurry walls on both sides of Dey Street, including closure pieces at Church and Broadway a cut and cover excavation operation will proceed to bring the excavation to the proposed invert grade. The entire width between the retaining walls would be excavated to the proposed invert elevation of the concourse tunnel. Excavation would be slowed at intermediate levels to allow the installation of struts to brace the concrete retaining walls across the excavation. Assume that struts would be installed to support temporary

roadway, just above proposed tunnel and midway between crown and invert of proposed tunnel. Assume stepped excavation and production rate of 4 vertical feet and 50 lineal feet per day.

Delivery Type	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Excavate to Invert	25,000	CY	1,670	40	34	4 Months
Service/Utility /Fuel Trucks				6	4	
Subcontractors Light Trucks				8	6	
Construction Workers	20 to 30					
Arriving by Personal Vehicle	4 to 6					
Arriving by Mass Transit	16 to 24					
Supervisory/QA	4 to 6					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	3 to 4					

Equipment – Excavation work will be performed from within the closed portion of Dey Street and will require a lane closing on Church or Broadway to accommodate a staging area for dump trucks and material deliveries of structural steel for support of the slurry wall and support of the temporary precast roadway over the excavation. As the excavation progresses, the spoil will be lifted to the surface in skip box by crane. Percentage of Daily Use is based on construction operations working 9 hours during a 10 hour shift, with the remaining hour taken up by maintenance of equipment, lunch and breaks. Percentage of Use for Dump Trucks is based on the approximate waiting time and loading/unloading time on site only. Equipment required is as follows:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Hydraulic All Terrain Crane (Struts)	50 Ton	Diesel	165	1	1	50%	4 Months
Crawler Crane	100 Ton	Diesel	350	1	1	70%	
Hydraulic Excavator	3.5 CY	Diesel	320	1	1	100%	
Dozer	100 HP	Diesel	100	1	1	70%	
Dump Trucks	Tandem Axle – 15 CY	Diesel	325	20	17	5%	
Welding Machines (Strut Installation)	35 HP Diesel Engine	Diesel	35	1		50%	
Air Compressor (for Pavement Breakers)	800 CFm	Diesel	310	1	1	25%	
Pavement Breakers	90 Lbs.			2	2	25%	

Construct Concourse

Delivery Type	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Concrete	12,440	CY	830	26	8.6	12 Months
Structural Steel	1,000	tons	100	6	0.35	
Fitout	500	CY	50	2	0.35	
Service/Utility /Fuel Trucks				6	4	
Subcontractors Light Trucks				12	10	
Construction Workers	20 to 30					
Arriving by Personal Vehicle	4 to 6					
Arriving by Mass Transit	16 to 24					
Supervisory/QA	4 to 6					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	3 to 4					

Equipment

Equipment Type	Size	Engine Type	Size HP	Quantity		Percentage of Daily Use	
Crawler Crane	100 Ton	Diesel	350	1	1	90%	12 Months
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	1	1	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	1	50%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	13	4.3	5%	
Rubber Tire Loader	3.5 CY	Diesel	196	1	1	50%	
Diesel Generators	100 HP	Diesel	100	2	2	90%	

Reinstate Dey Street

Delivery Type	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Refill	11,000	CY	730	40	30.4	2 Months
Service/Utility /Fuel Trucks				6	4	
Subcontractors Light Trucks				8	6	
Construction Workers	20 to 30					
Arriving by Personal Vehicle	4 to 6					
Arriving by Mass Transit	16 to 24					
Supervisory/QA	4 to 6					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	3 to 4					

Equipment – Excavation work will be performed from within the closed portion of Dey Street and will require a lane closing on Church or Broadway to accommodate a staging area for dump trucks and material deliveries of structural steel for support of the slurry wall and support of the temporary precast roadway over the excavation. As the excavation progresses, the spoil will be

lifted to the surface in skip box by crane. Percentage of Daily Use is based on construction operations working 9 hours during a 10 hour shift, with the remaining hour taken up by maintenance of equipment, lunch and breaks. Percentage of Use for Dump Trucks is based on the approximate waiting time and loading/unloading time on site only. Equipment required is as follows:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Hydraulic All Terrain Crane (Struts)	50 Ton	Diesel	165	1	1	50%	2 Months
Crawler Crane	100 Ton	Diesel	350	1	1	70%	
Hydraulic Excavator	3.5 CY	Diesel	320	1	1	100%	
Dozer	100 HP	Diesel	100	1	1	70%	
Dump Trucks	Tandem Axle – 15 CY	Diesel	325	20	15	5%	
Welding Machines (Strut Installation)	35 HP Diesel Engine	Diesel	35	1	1	50%	
Air Compressor (for Pavement Breakers)	800 CFm	Diesel	310	1	1	25%	
Pavement Breakers	90 Lbs.			2	2	25%	

Building Stabilization – Traffic and Construction Equipment

Corbin Building – It is assumed that the Corbin Building will become a part of the final design of the proposed Fulton Street Transit Center. For this exercise it is assumed that the above grade portions of the façade on the Broadway and John Street sides will be retained. During demolition of the adjacent structures and the portions of the Corbin Building that will not be retained, it will be necessary to construct a structural support system for the façade on the Broadway and John Street sides of the façade. Most likely this will employ an augered pile foundation with a structural steel skeleton erected within the sidewalk area of Broadway and John Street. The sidewalk and one lane on Broadway and John Street will be closed during erection of the support system. The sidewalk and closed lane on John Street can be opened after erection of the support system and a protective cover over the sidewalk. Traffic impacts are as follows:

Delivery Type	Quantity	Units	Total No. Of Truckloads	Trips per Day	Estimated Duration
Mobilization	4	Ea	4	2	2 Day
Pile Foundation for Support System	12	Ea	2	2	2 Days
Structural Steel Support System	500	Tons	25	2	2 Month
Service/Utility /Fuel Trucks				2	2 Months
Subcontractors Light Trucks				4 to 6	2 Months
Construction Workers	15 to 20				
Arriving by Personal Vehicle	3 to 4				
Arriving by Mass Transit	12 to 16				
Supervisory/QA	3 to 5				
Arriving by Personal Vehicle	1 to 2				
Arriving by Mass Transit	2 to 3				

Equipment – Erection of the temporary support structure for the façade will be from the John Street side of the Corbin Building, including the driving/augering of support piles in the sidewalk area. The sidewalk and one lane on John Street will need to be closed during erection. The hydraulic all terrain crane and crawler crane with auger or pile driver would be utilized for approximately one month in this activity. All remaining equipment in list below would be used the following month. Percentage of Daily Use is based on construction operations working 9 hours during a 10 hour shift, with the remaining hour taken up by maintenance of equipment, lunch and breaks. Percentage of Use for Tractor Trailers is based on the approximate waiting time and unloading time on site only. Installation of the piles for the temporary support structure is estimated to take 1-month of the 2-month schedule. Equipment required is as follows:

Equipment Type	Size	Engine Type	Size HP	Quantity	Percentage of Daily Use
Hydraulic All Terrain Crane	50 Ton	Diesel	165	1	50%
Crawler Crane w/Auger or Pile Driver	100 Ton	Diesel	350	1	50%
Air Compressor (for Pile Driving)	1600 CFM	Diesel	460	1	50%

The erection of the temporary façade support is estimated to take 1-month of the 2- month schedule. Equipment required for erection of the temporary façade support is as follows:

Equipment Type	Size	Engine Type	Size HP	Quantity	Percentage of Daily Use
Crawler Crane	200 Ton	Diesel	450	1	90%
Hi-Lift(Forklift)	5 ton – 40 foot boom	Diesel	120	1	90%
Tractor Trailer	Tandem Axle Tractor w/45 FT Trailer	Diesel	325	2	1%
Welding Machine	35 HP Diesel Engine	Diesel	35	1	90%
Air Compressor (for Impact Wrenches)	800 CFM	Diesel	310	1	90%
Impact Wrenches	1" Socket Drive			4	90%
Welding Machine	35 HP Diesel Engine	Diesel	35	1	90%

Transit Center Construction – Traffic and Construction Equipment

Demolition of Existing Buildings (194-204 Broadway,)– All buildings within the footprint of the proposed Transit Center (194-204 Broadway) will be demolished to grade and the basements removed and the site made level for the installation of a slurry wall and other earth retention systems to support the surrounding streets and buildings during excavation for the Transit Center. The one to three story buildings will be demolished first with the 12-story building demolished floor-by-floor next. The area will then be used as a staging area for activities within the Dey Street right-of-way and concourse until construction of the Dey Street Head (Entrance) House. The Corbin Building will have the interior floors and rear walls removed after the erection of the temporary support structure for the façade.

Delivery Type	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration per stage
Demolition Debris	1,000	Tons	500	20	13.9	3 Months
Service/Utility /Fuel Trucks				8	6	
Subcontractors Light Trucks				6	4	
Total Construction Workers	20 to 25					
Arriving by Personal Vehicle	4 to 5					
Arriving by Mass Transit	16 to 20					
Supervisory/QA	3 to 5					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	2 to 3					

Equipment – For the one and three story buildings, demolition will be accomplished from within the footprint of the existing buildings with lane closings and sidewalk closings along Broadway and Fulton Street to facilitate staging of dump trucks for debris removal and safety. The 12-story building will be demolished from the top down from within the site with debris brought to ground level for sorting and loading out. The Corbin Building will be de-constructed last, also from the top down with the removal of the rear walls and interior floors to grade for sorting and loading out. Percentage of Daily Use is based on construction operations working 9 hours during a 10 hour shift, with the remaining hour taken up by maintenance of equipment, lunch and breaks. Percentage of Use for Dump Trucks is based on the approximate waiting time and loading time on site only. Equipment required is as follows:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Crawler Crane w/clamshell or grapple	200 Ton	Diesel	450	1	1	90%	3 Months
Hydraulic Excavator w/Hoe Ram	3.5 Cubic Yard	Diesel	320	1	1	90%	
Hydraulic Excavator w/Grapple	3.5 Cubic Yard	Diesel	320	1	1	90%	
Track Loader w/Waste Handling Bucket	5.5 Cubic Yard	Diesel	160	1	1	80%	
Dump Trucks	Tandem Axle – 15 CY	Diesel	325	10	7	5%	
Air Compressor (for Pavement Breakers)	1600 CFM	Diesel	460	1	1	50%	
Pavement Breakers	90 lbs.			4	4	50%	

Slurry Wall and Sheeting/Shoring – Construction will be performed within the footprint of the proposed Transit Center site with access to the site from Fulton Street for removal of spoils and delivery of materials. Soldier beam and lagging may be used for support of portions of the excavation at penetrations for concourse connections to the transit center.

Delivery Type	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Slurry Wall – Exc.	3,900	CY	260	8	5.4	4 Months
Slurry Wall – Conc.	3,900	CY	390	10	8	
Slurry Wall - Rebar	1,000	Tons	50	2	1	
Service/Utility /Fuel Trucks				6	4	
Subcontractors Light Trucks				12	10	
Construction Workers	20 to 30					
Arriving by Personal Vehicle	4 to 6					
Arriving by Mass Transit	16 to 24					
Supervisory/QA	4 to 6					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	3 to 4					

Slurry Wall and Sheeting/Shoring Construction Equipment – Construction of the Slurry Wall around the Transit Center site will be performed from within the footprint of the site. Percentage of Daily Use is based on construction operations working 9 hours during a 10 hour shift, with the remaining hour taken up by maintenance of equipment, lunch and breaks. Percentage of Use for Concrete Trucks and Dump Trucks are based on the approximate waiting time and unloading/loading time on site only. Equipment required is as follows.

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Slurry Plant Mixing Plant	100 m^3 per hour – Diesel 50 HP	Diesel	50	1	1	90%	
Desanding Plant	100 m^3 per hour – Diesel 50 HP	Diesel	50	1	1	50%	
Crawler Crane w/clam shell	100 Ton	Diesel	350	1	1	90%	
Crawler Crane	100 Ton	Diesel	350	1	1	50%	
Crawler Crane w/Piling Driving Setup	100 Ton	Diesel	350	1	1	50%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	1	1	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	1	50%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	5	4	5%	
Dump Trucks	Tandem Axle – 15 CY	Diesel	325	4	2.7	5%	
Rubber Tire Loader	3.5 CY	Diesel	196	1	1	80%	
Diesel Generators	100 HP	Diesel	100	1	1	90%	

Excavation – After the completion of the earth retention systems, the Transit Center site will be excavated to the proposed grade.

Delivery Type	Quantity	Units	Total No. Of Loads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration Worst Case
Excavate to Sub-grade	45,000	CY	3,000	200	83	3 Months
Service/Utility /Fuel Trucks				6	4	
Subcontractors Light Trucks				8	6	
Construction Workers	10 to 20					
Arriving by Personal Vehicle	2 to 4					
Arriving by Mass Transit	8 to 16					
Supervisory/QA	4 to 6					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	3 to 4					

Equipment – Excavation work will be performed from within the footprint of the Transit Center. A lane closing will be required on Broadway and Fulton to queue dump trucks and to allow access to the site. As the excavation progresses, tiebacks or rakers will be installed to temporarily support the slurry wall and soldier beams. Percentage of Daily Use is based on construction operations working 9 hours during a 10 hour shift, with the remaining hour taken up by maintenance of equipment, lunch and breaks. Percentage of Use for Dump Trucks is based on the approximate waiting time and loading time on site only. Equipment required is as follows:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Crawler Crane	100 Ton	Diesel	350	1	1	50%	3 Months
Hydraulic Excavator	3.5 CY	Diesel	320	1	1	90%	
Hydraulic Excavator	2 CY	Diesel	300	1	1	90%	
Dozer	100 HP	Diesel	100	1	1	80%	
Dump Trucks	Tandem Axle – 15 CY	Diesel	325	100	42	5%	
Welding Machines (Support Installation)	35 HP Diesel Engine	Diesel	35	1	1	50%	
Air Compressor (for Pavement Breakers)	800 CFM	Diesel	310	1	1	50%	
Pavement Breakers	90 Lbs.			2	2	50%	

Foundation– The foundations of the Transit Center will be constructed from within the footprint of the site, however access to the site from Fulton Street will need to be maintained to allow pile driving equipment access to the sub-grade. It is assumed that an earthen ramp or one constructed of a temporary bridge structure will be the means of access. The estimated length of time is six months for foundations.

Delivery Type	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Concrete	3,000	CY	200	20	2.8	6 Months
Reinforcing Steel	600	Tons	30	2	0.42	
Service/Utility /Fuel Trucks				20	12	
Subcontractors Light Trucks				20	12	
Construction Workers	80 to 100					
Arriving by Personal Vehicle	16 to 20					
Arriving by Mass Transit	64 to 80					
Supervisory/QA	10 to 15					
Arriving by Personal Vehicle	2 to 3					
Arriving by Mass Transit	8 to 12					

Foundation Equipment – Foundation and subbasement work will be primarily of concrete construction to street level. Lane closing along Fulton Street will be required for access to the site and queuing of delivery trucks. Percentage of Daily Use is based on construction operations working 9 hours during a 10 hour shift, with the remaining hour taken up by maintenance of equipment, lunch and breaks. Percentage of Use for Concrete Trucks and Dump Trucks are based on the approximate waiting time and loading time on site only. The estimated time for foundation and concrete construction is 6 months; pile driving will take 2-months of the 6-month foundation work. The following construction equipment will be required for foundation and pile driving:

Pile equipment

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Crawler Crane	200 Ton	Diesel	450	2	0.67	90%	6 Months
Crawler Crane w/Pile Driving Setup	100 Ton	Diesel	350	1	0.33	90%	
Compressor (for Pile Driving)	1600 CFM	Diesel	460	1	0.33	90%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	1	0.33	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	0.33	50%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	10	0	5%	
Diesel Generators	100 HP	Diesel	100	2	0.67	90%	
Tractor Trailer	Tandem Axle Tractor w/45 Foot Trailer	Diesel	325	2	0.1	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	2	0.67	100%	

Foundation Concrete Equipment - The foundation and concrete work is estimated to take 4 months of the 6-month foundation and concrete schedule. The following equipment is required for the foundation and concrete work:

Superstructure Equipment - The erection of the superstructure and enclosing facade is estimated to take 6-months. The following equipment is required:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Crawler Crane	200 Ton	Diesel	450	2	2	100%	6 Months
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	1	1	100%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	1	50%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	8	2	5%	
Diesel Generators	100 HP	Diesel	100	2	2	100%	
Tractor Trailer	Tandem Axle Tractor w/45 Foot Trailer	Diesel	325	5	2	5%	
Welding Machines	35 HP Diesel Engine	Diesel	35	2	2	100%	
Air Compressor (for Impact Wrenches)	1600 CFM	Diesel	460	2	2	100%	
Impact Wrenches	1" Socket Drive			10	10	80%	

Widening of A/C Mezzanine – Traffic and Construction Equipment

The A/C Mezzanine widening will be accomplished using a sequential cut and cover operation to allow the existing platforms to remain in service during construction. The operation will require a minimum of a lane closing along Fulton Street to accommodate the operation and staging area for equipment and materials. Construction activities include grouting, temporary bracing, demolition and excavation of roadway, slurry wall construction, concrete construction, interior fitout of mezzanine and reconstruction of Fulton Street over the widened mezzanine.

Utility Relocations -The relocation of existing utilities within the Fulton Street Right-of-Way (ROW) will be performed prior to the excavation

Delivery Type	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Spoil Removal	1,000	CY	67	8	0.62	9 Months
Service/Utility /Fuel Trucks				4	2	
Subcontractors Light Trucks				10	4	
Construction Workers	20 to 30					
Arriving by Personal Vehicle	2 to 3					
Arriving by Mass Transit	18 to 27					
Supervisory/QA	3 to 8					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	2 to 6					

Equipment – Hydraulic excavators, rubber tire loaders and backhoes will be utilized for the excavation of the utility trenches and placement of electric and telephone ducts and water and sanitary sewer pipe. Percentage of Daily Use for construction equipment has been based on operating 9 hours out of a 10-hour shift. The 9 hours are based on allowing for morning start-up, coffee breaks, lunch break and daily fueling/maintenance. Percentage of Use for Dump Trucks and Concrete Trucks are based on the approximate waiting time and loading/unloading time on site only. The following construction equipment will be required:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Rubber Tire Loader	3.5 CY	Diesel	196	1	0.25	90%	9 Months
Rubber Tire Backhoe/Loader	1.25 CY	Diesel	88	1	0.25	90%	
Dump Trucks	15 CY Tandem or Tri-axle	Diesel	325	4	0.23	5%	
Pumps for Dewatering	4" Gasoline Powered	Gasoline	16	2	2	90%	
Compressor	185 CFM	Diesel	80	2	0.25	80%	
Pavement Breakers	90 Lbs			2	0.25	80%	
Air hammers (ringing and ripping)				2	0.1	80%	

Slurry Wall

Delivery Type Per Segment	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Slurry Wall – Exc.	2000	CY	35	6	1.9	6 Month
Slurry Wall – Conc.	2000	CY	50	6	2.8	
Slurry Wall - Rebar	120	Tons	2	2	0.1	
Service/Utility /Fuel Trucks				6	4	
Subcontractors Light Trucks				12	10	
Construction Workers	40 to 50					
Arriving by Personal Vehicle	8 to 10					
Arriving by Mass Transit	32 to 40					
Supervisory/QA	4 to 6					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	3 to 4					

Slurry Wall Equipment

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Slurry Plant Mixing Plant	100 m^3 per hour – Diesel 50 HP	Diesel	50	1	1	90%	6 Month
Desanding Plant	100 m^3 per hour – Diesel 50 HP	Diesel	50	1	1	90%	
Crawler Crane w/clam shell	100 Ton	Diesel	350	1	1	90%	
Crawler Crane	100 Ton	Diesel	350	1	1	50%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	1	1	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	1	35%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	3	1.4	5%	
Dump Trucks	Tandem Axle – 15 CY	Diesel	325	3	.9	5%	
Rubber Tire Loader	3.5 CY	Diesel	196	1	1	50%	
Compressor (for Pavement Breakers)	1600 CFM	Diesel	460	1	1	25%	
Pavement Breakers	90 Lbs			10	10	35%	
Diesel Generators	100 HP	Diesel	100	2	2	90%	

Construction will be performed in segments along the length of the widening. Each segment will be completed in its entirety before work begins on the next segment in order to maintain access to the platforms. Temporary stairs will be utilized to move passengers around the out of service segment of mezzanine. It is anticipated that the work will take approximately 9 months for the entire widening. Impacts and durations in table below are based on new segment.

Widening Construction Sequence - Estimated 40 days for excavation, concrete placement for mezzanine is 4 month per stage, Street reconstruction is 40 days

Delivery Type Per Segment	Quantity	Units	Total No. Of Truckloads	Trips per Day (Peak Day impact Calculation)	Trips per Day (cumulative impact calculation)	Estimated Duration
Excavation	8000	CY	266	26	5	9 Months
Bracing Delivery	600	Tons	30	2	0.28	
Concrete for Mezzanine	2400	CY	240	6	2.2	
Reconstruct Fulton St	4,000	Tons	200	10	1.85	
Service/Utility /Fuel Trucks				6	4	
Subcontractors Light Trucks				12	10	
Construction Workers	40 to 50					
Arriving by Personal Vehicle	8 to 10					
Arriving by Mass Transit	32 to 40					
Supervisory/QA	4 to 6					
Arriving by Personal Vehicle	1 to 2					
Arriving by Mass Transit	3 to 4					

A/C Widening Construction Equipment – Roadway Demolition and slurry wall construction will require lane closing for the work as well as a staging area for equipment and materials. Grout injection will be performed from within the existing subway tunnel and from the surface. Percentage of Daily Use is based on construction operations working 9 hours during a 10 hour shift, with the remaining hour taken up by maintenance of equipment, lunch and breaks. Percentage of use is based on the Estimated Duration from the above table at 3 Months per segment, for a total of 12 months of construction time. Percentage of Use for Concrete Trucks and Dump Trucks are based on the approximate waiting time and loading time on site only. Equipment required for the estimated 4-months of total grout injection is as follows:

Equipment Type	Size	Engine Type	Size HP	Quantity (peak calculation)	Quantity (cumulative calculation)	Percentage Daily of Use	Duration
Air Operated Grout Injection Drills				3	1.3	90%	9 Months
Compressor for Grout Injection	1600 CFM	Diesel	460	3	1.3	90%	
Grout Plant	10 m^3 per hour	Diesel	50	1	0.44	90%	
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	1	0.44	90%	
Rubber Tire Loader	3.5 CY	Diesel	196	1	0.44	50%	
Compressor (for Pavement Breakers)	1600 CFM	Diesel	460	1	0.44	25%	
Pavement Breakers	90 Lbs			10	4.4	25%	
Diesel Generators	100 HP	Diesel	100	2	0.88	90%	

The excavation for the mezzanine construction is estimated to take 40 total

Equipment Type	Size	Engine Type	Size HP	Quantity		Percentage of Daily Use	
Crawler Crane	100 Ton	Diesel	350	1	0.14	50%	9 Months
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	1	0.14	90%	
Hydraulic Excavator	2 CY	Diesel	300	1	0.14	90%	
Hydraulic Excavator w/Hoe Ram	2 CY	Diesel	300	1	0.14	90%	
Dump Trucks	Tandem Axle – 15 CY	Diesel	325	13	2.5	5%	
Rubber Tire Loader	3.5 CY	Diesel	196	1	0.14	50%	
Compressor (for Pavement Breakers)	1600 CFM	Diesel	460	1	0.14	90%	
Pavement Breakers	90 Lbs			10	1.4	90%	
Diesel Generators	100 HP	Diesel	100	2	0.28	90%	

The concrete placement for mezzanine construction is estimated at 4-month

Equipment Type	Size	Engine Type	Size HP	Quantity		Percentage of Daily Use	
Crawler Crane	100 Ton	Diesel	350	1	0.44	90%	9 Months
Hi-Lift (Forklift)	5 ton – 40 foot boom	Diesel	120	1	0.44	90%	
Concrete Pump	150 CY/Hour – 100 foot boom	Diesel	300	1	0.44	50%	
Concrete Trucks	10 Cubic Yard Tandem or Tri-Axle	Diesel	325	5	1.2	5%	
Rubber Tire Loader	3.5 CY	Diesel	196	1	0.44	50%	
Diesel Generators	100 HP	Diesel	100	2	0.88	90%	

The reconstruction of Fulton Street is estimated to take 40 total days

Equipment Type	Size	Engine Type	Size HP	Quantity		Percentage of Daily Use	
Asphalt Paving Machine	10 Foot Screed Width	Diesel	153	1	0.14	90%	9 Months
Asphalt Compactor	Vibratory 10 Ton	Diesel	70	1	0.14	90%	
Dump Trucks (Asphalt Paving)	Tandem Axle – 15 CY	Diesel	325	5	0.19	5%	
Rubber Tire Loader	3.5 CY		196	1	0.14	50%	
Compressor (for Pavement Breakers)	1600 CFM		460	1	0.14	20%	
Pavement Breakers	90 Lbs			2	0.28	20%	

AIR QUALITY

MOBILE SOURCE ANALYSIS

Mobile source analyses were run for the three scenarios defined in the chapter. The increments were added, where applicable, to increments from the stationary construction modeling results. The totals included background from monitoring stations as well as local background traffic increments (modeled) that would not be included in background monitored concentrations (e.g. Route 9A).

Road dust was included for all PM_{10} runs, based on the procedure delineated in AP–42 (EPA December, 2003). Silt loading was based on the average daily traffic volumes for Route 9A and Church Street; a silt loading factor of 0.16 g/m^2 was used for the construction site entrance. This is the highest loading factor used in New York City, and assumes that access roads would be cleaned regularly.

All other assumptions and procedures for mobile source modeling were identical to those used in analyses in the Air Quality chapter.

As in the analyses in the Air Quality chapter, predicted neighborhood scale $PM_{2.5}$ concentrations are conservatively high due to the fact that the minimum distance between the roadway and receptors of 15 meter was used for that analyses, rather than a distance of approximately 30 meters based on one meter per 1,000 vehicles ADT.

STATIONARY SOURCE ANALYSIS

All emission factors for on-site engine emissions were calculated using the draft EPA NONROAD2004 model—the most current data available, based on the engine size and including the loading factor for operation of that type of engine, as presented in Table 1 below. These factors, which included the use of ultra low sulfur diesel fuel (ULSD), were then scaled down to represent emissions from engines using emissions reduction technologies, as follows: 26 percent for ULSD and diesel oxidation catalysts (DOC); 90 percent for ULSD and diesel particle filters (DPF—the latter was applied only for average emissions estimates for mitigation. See Table 1 for details.) These reductions are based on actual measurements studied by NESCAUM as detailed in Chapter 9.

All emissions were modeled using hourly emission factors, 10 hours per day, 6 days per week, from 7 am to noon, and from 1 pm to 6 pm, with a usage percent applied depending on the actual daily hours for the equipment (for example, if a certain engine in needed on the peak day only for 4 hours, the emission factor is scaled by 4/10=0.4). Construction emissions of Route 9A were modeled as 20 hour days, 5 days per week.

Emission factors for sources modeled as discrete point sources, such as generators and tower cranes, were calculated based on the above factors, the size of the engine and the daily use percentage as presented above in the construction description, and therefore varied depending on location and construction phase.

Area sources were defined for each phase and zone, which included all sources that do not have a fixed location. Total emission factors for these sources are presented in Table 2 below. Area sources were all given an initial vertical dispersion of five meters, aside from the Freedom Tower, where sources would be vertically distributed on a number of floors, which was conservatively assumed all to occur within a few ground floors and modeled with an initial dispersion of 18 meters.

Cumulative emissions would clearly be the highest in 2006, as can be seen by the activities planned (see Chapter 3, "Construction".) The peak 24-hour model was based on the 2006 January emissions for the scenario with Route 9A At Grade, and April emissions for the scenario with Route 9A Short Bypass. The cumulative PM_{10} and $PM_{2.5}$ emissions with the At Grade scenario were predicted to be in March and June, respectively, and in May for the Short Bypass Scenario; these emissions were therefore used to represent each peak. Peak emissions under both scenarios are presented in Figures 1 and 2 below.

IMPACT ASSESSMENT

The impacts presented in Chapter 9, "Air Quality", include four types of results:

1. *Highest*—these results were usually from locations immediately adjacent to the construction site boundary of the Proposed Action, in the case of Proposed Action results, or of one of the other major reconstruction projects, in the case of cumulative results. Those results were mostly in accessible public spaces, such as sidewalks; some of those results were predicted at residential locations immediately adjacent to the site.
2. *Residential only*—these results were extracted from receptors representing residential or hotel locations where exposure time would be expected to be the longest. The firehouse was included as well since firemen often spend extended living hours in the firehouse.
3. *Other Locations on Access Routes*—these results represent the mobile source impacts only, representing other sites along the access routes that would not be exposed to emissions from the construction site itself, but rather only to increased construction vehicle traffic. Since all construction vehicles converge on the site, this is a conservative estimate for other locations that may experience only part of the traffic increment.
4. *Neighborhood Scale*—This result, used for annual $PM_{2.5}$ only, is the average of a ground level, 25-meter resolution receptor grid centered on the receptor with the highest local result. This represents a measure for the impact in the nearby neighborhood, to be compared to the corresponding threshold level.

For total concentrations, in addition to measured backgrounds, local mobile source background was added from the CAL3QHC model results. All mobile source maximums were extracted for each intersection and added to the ISCST3 construction model results in that area.

Table 1
2006 Emission Factors for Construction Equipment

Equipment Type	Power Output	NONROAD Emission Factor with ULSD		Adjusted Emission Factor with DOCs*		Adjusted Emission Factor with DOCs, DPFs and Tier II Standards**	
	(hp)	(g/hp-hr)		(g/hp-hr)		(g/hp-hr)	
		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Air Compressor	185	0.107	0.104	0.075	0.073	0.028	0.027
Air Compressor	310,360, 460	0.146	0.141	0.102	0.099	0.038	0.037
Air Compressor	80	0.238	0.231	0.167	0.162	0.057	0.055
Asphalt Compactor	70	0.365	0.354	0.255	0.248	0.078	0.076
Asphalt Paving Machine	153	0.214	0.208	0.150	0.145	0.039	0.038
Backhoe	90	0.274	0.265	0.192	0.186	0.057	0.055
Concrete Pump	300	0.238	0.231	0.167	0.162	0.039	0.038
Crawler Crane	273	0.151	0.146	0.106	0.102	0.039	0.038
Crawler Crane	340,350, 450	0.151	0.146	0.106	0.102	0.039	0.038
Diesel Generator	100	0.360	0.349	0.252	0.244	0.057	0.055
Diesel Generator	500	0.331	0.322	0.232	0.225	0.039	0.038
Diesel Generator	750	0.333	0.323	0.233	0.226	0.039	0.038
Dozer	100	0.331	0.321	0.231	0.225	0.057	0.055
Dozer	150	0.178	0.173	0.125	0.121	0.039	0.038
Drill	204	0.195	0.189	0.136	0.132	0.039	0.038
Excavator	143	0.172	0.167	0.120	0.117	0.045	0.043
Gas Generator	10	0.078	0.076	0.078	0.076	0.078	0.076
Gas Pump for Dewatering	16	0.077	0.074	0.077	0.074	0.077	0.074
Grader	185	0.150	0.146	0.105	0.102	0.039	0.038
Hi-Lift (Forklift)	120	0.206	0.200	0.144	0.140	0.054	0.052
Hydraulic All Terrain Crane	165	0.111	0.108	0.078	0.075	0.029	0.028
Hydraulic Drill Rig	150	0.206	0.200	0.144	0.140	0.039	0.038
Hydraulic Excavator	300	0.144	0.140	0.101	0.098	0.037	0.036
Hydraulic Excavator	320,321, 428	0.131	0.127	0.092	0.089	0.034	0.033
Paving Box	158	0.214	0.208	0.150	0.145	0.039	0.038
Pump	150	0.248	0.241	0.174	0.168	0.039	0.038
Pump	350	0.310	0.301	0.217	0.211	0.039	0.038
Roadheader for tunneling	120	0.172	0.167	0.120	0.117	0.045	0.043
Rubber tire backhoe/loader	88	0.365	0.354	0.255	0.248	0.057	0.055
Rubber tire loader	196	0.163	0.158	0.114	0.111	0.039	0.038
Slurry mixing or desanding plant or grout plant	50	0.354	0.343	0.354	0.343	0.300	0.291
Tower Crane	273	0.092	0.089	0.064	0.062	0.024	0.023
Track Dozer	338	0.151	0.146	0.106	0.102	0.039	0.038

Table 1 (cont.)
2006 Emission Factors for Construction Equipment

Equipment Type	Power Output	NONROAD Emission Factor with ULSD		Adjusted Emission Factor with DOCs*		Adjusted Emission Factor with DOCs, DPFs and Tier II Standards**	
	(hp)	(g/hp-hr)		(g/hp-hr)		(g/hp-hr)	
		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Track Loader	160	0.161	0.156	0.113	0.109	0.039	0.038
Track Loader	229	0.150	0.145	0.105	0.102	0.039	0.038
Vibratory Roller	150	0.190	0.184	0.133	0.129	0.039	0.038
Welding Machines	33,35	0.299	0.290	0.299	0.290	0.299	0.290
Wheel Loader	260	0.150	0.145	0.105	0.102	0.039	0.038

Notes: * 30% reduction for DOCs on engines > 50 hp

** Mitigation Scenario – Tier II standards and an average 74% reduction for DPFs on 75% engines and DOCs on 25% of engines > 50 hp. Based on DPF reduction of 90% and DOC reduction of 40% including an average of 14% reduction due to ULSD—

{ 25% * (1–40%) + 75% * (1–90%) } / (1–14%) = 26% → 74% reduction

For engines where the mitigated emission factor exceeded the Tier II standard, the Tier II emission cap was used.

Sources: NONROAD2004 model, New York

Table 2
Area Source Emission Factors

Zone	Area [m^2]	Emission Factor [g/s-m^2]			
		$PM_{2.5}$		PM_{10}	
		Peak Day Average	Annual Average	Peak Day Average	Annual Average
LMDC					
Tunneling Under 1/9 Line	4,600	6.76E-06	2.02E-06	7.37E-06	2.21E-06
Northwest Quadrant below grade Retail	11,705	3.65E-06	2.50E-06	4.06E-06	2.74E-06
Memorial, Open Space, Cultural Space (Zones 1 & 2)	30,500	—	1.23E-07	—	1.36E-07
Southeast Quadrant blow grade - Towers 3 & 4 (Zone 4)	12,090	3.82E-06	3.43E-06	4.63E-06	3.78E-06
Northeast Quadrant blow grade - Tower 2 (Zone 5)	8,665	5.32E-06	4.78E-06	6.12E-06	5.22E-06
East Bathtub Above Grade Fit-out	28,935	—	1.26E-07	—	1.48E-07
Freedom Tower Structural Framing, Curtain Wall & Fit-out	5,150	2.38E-05	1.56E-05	2.65E-05	1.7E-05
Southern Expansion - Excavation & Construction	12,075	7.96E-06	7.58E-06	9.14E-06	8.41E-06
PATH					
Platform/Mezzanine Conversion - Demolition & Construction	8,390	1.11E-05	5.72E-06	1.35E-05	6.41E-06
1/9 Tunnel Underpinning, Excavation, Lining Operation	2,670	2.04E-05	5.55E-06	2.23E-05	6.06E-06
West St Tunnel Underpinning, Excavation, Lining Operation	965	5.65E-05	1.86E-05	6.18E-05	2.03E-05
Church St Tunnel Underpinning, Excavation, Lining Operation	400	1.36E-04	4.50E-05	1.49E-04	4.90E-05
Demolition Temporary PATH Concourse	8,210	—	1.92E-06	—	2.32E-06
Route 9A					
Stage II Slurry Wall, Excavation, Concrete Box, Road Deck	9,245	4.92E-06	6.26E-06	8.55E-06	8.38E-06
Notes: All factors were applied to 10 hours per day only					

Figure 1
Peak $PM_{2.5}$ Emissions by Project -- 2006
with Route 9A At Grade

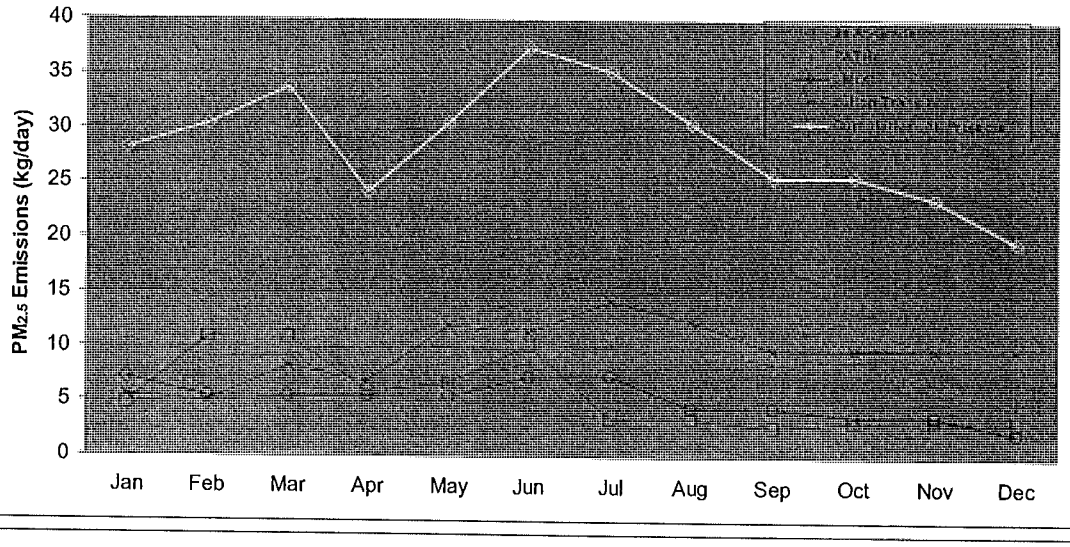
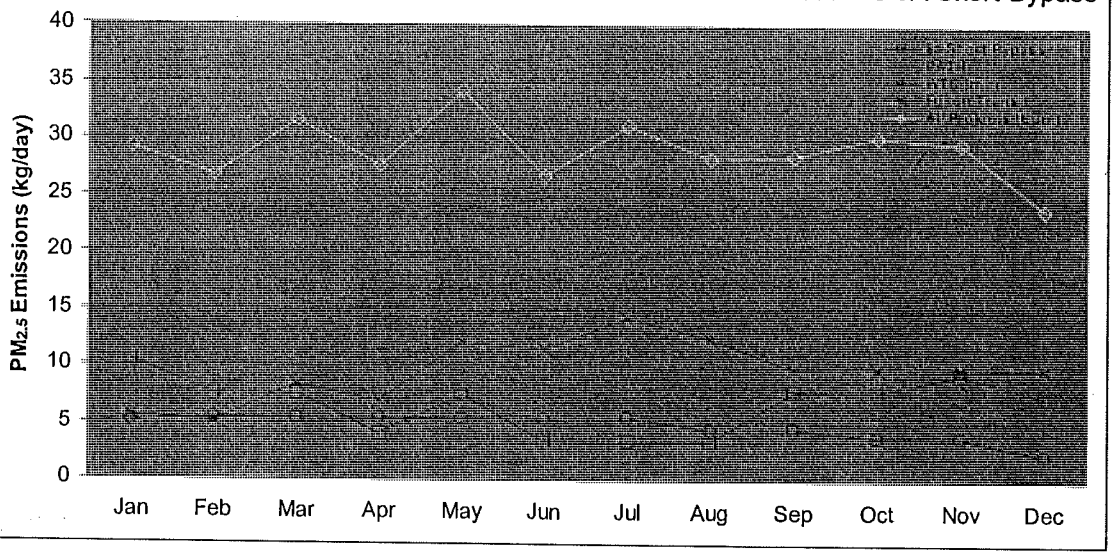


Figure 2
Peak $PM_{2.5}$ Emissions by Project-- 2006
with Route 9A Short Bypass



Appendix E

Noise and Vibration

A. INTRODUCTION

This appendix provides further detail on the methodologies used to estimate construction period and operational period noise impacts from the Permanent WTC PATH Terminal. Following a description of these methodologies are detailed calculations spreadsheets that support the summary tables shown in Chapter 10, "Noise and Vibration."

B. CONSTRUCTION PERIOD

CONSTRUCTION NOISE METHODOLOGY

Noise from construction activities was estimated following the methodologies set forth in the April 1995 FTA guidance manual. The detailed noise assessment procedures were followed. The procedure uses the following equation to calculate noise levels from operation of a single piece of construction equipment.

$L_{eq} = E.L. + 10 \log (U.F.) - 20 \log (D/50) - 10\ G \log (D/50)$

where:

L_{eq} is the noise level at a receiver of the equipment over a specified time period;
E.L. is the noise emission level of the equipment at a reference distance of 50 feet;
G is a constant that accounts for topography and ground effects (which would be 0 for hard ground);
D is the distance from the receiver to the piece of equipment; and
U.F. is a usage factor that accounts for the fraction of time that the equipment is in use over the specified time period.

The combination of noise from all pieces of equipment operating during the same time period is obtained from adding the L_{eq} values for each piece of equipment. For the detailed assessment, 8-hour L_{eq} values and 30-day average L_{dn} values were calculated assuming all appropriate usage factors for the specified time periods for each element of construction as discussed in Chapter 3, "Construction Methods and Materials."

CONSTRUCTION VIBRATION METHODOLOGY

The FTA guidance manual provides some simple screening methodologies for determining where there is a significant potential for impact from construction activities. Such activities include pile driving, demolition, drilling, excavation, or blasting in close proximity to sensitive structures. The procedure includes: (1) selecting the equipment and determining the vibratory levels at a reference distance of 25 feet; (2) determining peak particle velocity at a receptor location using the following formula:

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

where:

PPV_{equip} is the peak particle velocity of the equipment adjusted for distance;
PPV_{ref} is the reference vibration level in in/sec at 25 feet; and
D is the distance in feet from the equipment to the receiver,

C. TRAIN OPERATIONS

OPERATIONAL TRANSIT NOISE METHODOLOGY

Noise from the PATH train operations was analyzed using the methodologies set forth in the FTA guidance manual. The analysis considered two major noise sources associated with the PATH train operations: noise from fixed-rail operations (i.e., noise from the PATH train operations emanating from stations, air ventilation openings, and train/subway gratings), and noise from mechanical equipment operations (i.e., substations, HVAC equipment, etc.).

The Permanent WTC PATH Terminal would not directly affect the operation of PATH trains (throughput or number of cars) as compared to future conditions, which were anticipated before September 11, 2001. Thus, the Project Alternatives would not result in significant adverse noise impacts to existing land uses along PATH's right-of-way. However, with the development of a memorial at the WTC site, there would be a change in land use from FTA Category 3 to FTA Category 1 adjacent to the location of the Permanent WTC PATH Terminal. Thus a general noise assessment was performed per FTA guidance to determine operational-period noise levels and to examine potential impacts to the WTC Memorial (see Table E-1).

Table E-1
Computation of L_{eq} and L_{dn} at 50 feet: Fixed-Guideway Sources

Hourly L_{eq} at 50 ft:	$LeqC(h) = SEL_{ref} + 10\log(Ncars) + 20\log\left(\frac{S}{50}\right) + 10\log(V) - 35.6$
COMBINED Daytime L_{eq} at 50 ft:	$Leq(day) = Leq(h)\|_{v=vd}$
Nighttime L_{eq} at 50 ft:	$Leq(night) = Leq(h)\|_{v=vn}$
L_{dn} at 50 ft:	$Ldn = 10\log\left[(15)\cdot 10^{\left(Leq(day)/10\right)} + (9)\cdot 10^{\left(Leq(night)+10/10\right)}\right] - 13.8$

Notes:
N_{cars} = average number of cars per train
S = train speed, in miles per hour
V = average hourly daytime volume of train traffic, in trains per hour
V_d = average hourly daytime volume, in trains per hour; (number of trains, 7 AM to 10 PM) / 15
V_n = average hourly nighttime volume, in trains per hour; (number of trains, 10 PM to 7 AM) / 15
SEL_{ref} = 82 dBA for rail

Levels located at 50 feet from the equations above were corrected for distance as follows:

$$Ldn \text{ or } Leq(1) = (Ldn \text{ or } Leq(1))\Big|_{at\ 50\ feet} - 10 * \log\left(\frac{D}{50}\right)$$

where:

D = the distance from the source to the receptor in feet

At the memorial site, noise from rail vehicle operations would reverberate in the enclosed space of the underground tunnels and station. Calculations using the above equation predict noise from this source, but does not account for reverberation from the enclosed spaces nor does it account

for attenuation effects of the ventilation shafts and station entrances. Reverberation effects of the tunnel and terminal would cause significantly higher noise levels resulting from source noise and reflected noise. To account for this phenomenon, noise levels were adjusted by calculating a noise level caused by the reflected portion of the fixed railway noise (which was assumed to bounce off acoustically reflective surfaces in the tunnels and terminal), and adding the noise level calculated for free-field conditions through logarithmic summation. For a conservative analysis, this analysis assumes that all surfaces of the tunnel or terminal are hard reflective surfaces, with little or no sound absorption.

$$L_{eq(1)}^{reflect} = L_{eq(1)} - 10 * \log_{10}(\alpha S) + 42.4$$

Based on the methods of sound propagation in enclosed spaces, i.e., the reflected effect, approximately 6dB was added to the free-field predicted noise levels and adjusted for noise receptor locations based on distance and acoustical attenuation through the terminal entrance or ventilation shaft. The analysis assumes that the design of these system elements would provide approximately 25 dBA attenuation.

D. CALCULATION TABLES

The following tables present the detailed calculation of noise and vibration levels that were presented in Chapter 10, "Noise and Vibration." Construction period tables are presented first followed by the calculation tables for train operations.

Table E-2

2006 Construction Period Noise Levels for the Preferred Alternative Without Mitigation (in dBA)

Receptor Site	Existing Noise Level			Calculated Noise Level				FTA Criteria			
	Leq(1)	L10(1)	Ldn	Leq(1)	Leq(8)	Leq(30ds)	Ldn(30ds)	Land Use	Leq(8)	Leq(30ds)	*Ldn(30ds)
									80/85 (Res/Com)	80.0	75.0
1	72.9	77.8	74	81	80	74	74	Residential	Impact		No Impact
								Commercial	No Impact	No Impact	
2	70.5	69.6	71	82	80	74	74	Residential	Impact		No Impact
								Commercial	No Impact	No Impact	
3	67.3	69.5	72	89	88	81	81	Residential	Impact		No Impact
								Commercial	Impact	Impact	
4	72.5	73.5	70	70	69	62	62	Residential	No Impact		No Impact
								Commercial	No Impact	No Impact	
5	76.0	NA	79	67	66	60	60	Residential	No Impact		No Impact
								Commercial	No Impact	No Impact	

* If existing Ldn noise levels are greater than 65, the FTA Ldn impact criterion = existing Ldn + 10 dBA.

Table E-3

2006 Construction Period Noise Calculations for the Preferred Alternative Without Mitigation - Site 1

Noise Source	Equipment	Hard Ground	Shielding	Emission Level at 50 ft			Usage factor for 1h			Usage factor for 8hs			Usage factor for 30ds			Distance Attenuation		Shielding Attenuation	Ground Factor	Leq (dBA)			Ldn/Leq (30d) Operating 9hs/day
				dBA / Unit	Qty. / 1hr	Total dBA	1h	U.F.	10log (UF)	Hs / Day	U.F.	10log (UF)	Days / Year	U.F	10log (UF)	D (ft)	20log (D/50)			Leq(1)	Leq(8)	Leq(30) Operating 24hs/day	
	Element 1																						
1	Air Compressor for Impact Wrenches	Yes	No	81	2	84	1.0	1.0	0.0	8.0	0.9	-0.5	54	0.2	-7.3	628	22.0	0	0	62	62	55	
2	Air Compressor for Pavement Breakers	Yes	No	81	1	81	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	628	22.0	0	0	59	59	55	
3	Concrete Pump	Yes	No	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	36	0.1	-9.0	628	22.0	0	0	60	60	51	
4	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	628	22.0	0	0	66	66	64	
5	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	628	22.0	0	0	64	64	60	
6	Hydraulic All-terrain Crane	Yes	No	83	1	83	1.0	1.0	0.0	8.0	0.9	-0.5	211	0.7	-1.4	628	22.0	0	0	61	61	60	
7	Hydraulic Excavator with Hoe Ram	Yes	No	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	628	22.0	0	0	58	58	54	
8	Hydraulic Excavator with Thumb*	Yes	No	85	1	85	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	628	22.0	0	0	63	63	59	
9	Impact Wrenches	Yes	No	85	20	98	1.0	1.0	0.0	8.0	0.9	-0.5	134	0.5	-3.3	628	22.0	0	0	76	76	73	
10	Pavement Breakers	Yes	No	88	4	94	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	628	22.0	0	0	72	72	68	
11	Welding Machines**	Yes	No	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	628	22.0	0	0	51	51	49	
12	80 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.2	80	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	628	22.0	0	0	55	46	40	
13	21 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.6	86	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	628	22.0	0	0	61	51	45	
14	66 Heavy Trucks per day	Yes	No	88	6.6	96	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	628	22.0	0	0	71	62	56	
	Sum Element Noise Level																			79	78	75	71
	Element 2a																						
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	684	22.7	0	0	64	64	59	
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	684	22.7	0	0	65	65	65	
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	684	22.7	0	0	63	63	63	
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	684	22.7	0	0	60	60	55	
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	684	22.7	0	0	47	47	47	
6	26 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	75	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	684	22.7	0	0	50	40	40	
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	684	22.7	0	0	54	44	44	
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	684	22.7	0	0	63	53	53	
	Sum Element Noise Level																			71	69	68	64
	Element 2b																						
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	519	20.3	0	0	66	66	61	
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	519	20.3	0	0	68	67	67	
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	519	20.3	0	0	66	65	65	
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	519	20.3	0	0	63	62	58	
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	519	20.3	0	0	50	49	49	
6	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	519	20.3	0	0	52	43	43	
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	519	20.3	0	0	56	47	47	
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	519	20.3	0	0	65	56	56	
	Sum Element Noise Level																			73	72	70	66
	Element 2c																						
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	619	21.9	0	0	65	64	60	
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	619	21.9	0	0	66	66	66	
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	619	21.9	0	0	64	64	64	
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	619	21.9	0	0	61	61	56	
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	619	21.9	0	0	48	48	48	
6	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	619	21.9	0	0	51	41	41	
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	619	21.9	0	0	55	45	45	
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	619	21.9	0	0	64	54	54	
	Sum Element Noise Level																			71	70	69	65
	Element 3																						
1	Air Operated Grout Drills***	Yes	No	90	3	95	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1266	28.1	0	0	67	66	62	
2	Concrete Pump	Yes	No	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	1266	28.1	0	0	54	53	49	
3	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1266	28.1	0	0	60	59	59	
4	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1266	28.1	0	0	58	57	57	
5	Pavement Breakers	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1266	28.1	0	0	60	59	55	
6	Backhoe	Yes	No	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1266	28.1	0	0	52	51	47	
7	Welding Machines**	Yes	No	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1266	28.1	0	0	45	44	44	
8	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1266	28.1	0	0	45	35	35	
9	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1266	28.1	0	0	48	39	39	
10	10 Heavy Trucks per day	Yes	No	88	1.0	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1266	28.1	0	0	57	47	47	
	Sum Element Noise Level																			69	68	65	61
	Element 4 (eliminated)																						
	Total Noise Level																			81	80		74
																				81.4	80.2		73.5

Notes:

* values from Louis Berger Group, ** values from estimated, and *** values from Swedish National Road and Transport Research Institute (VTI).

Sound Pressure Level Leq = E.L. + 10log(U.F) - 20log(D/50) - 10Glog(D/50) - Shielding

E.L. Is the noise emission level of the particular piece of equipment

U.F. Is an usage factor that accounts for the fraction of time that the equipment is in use over the specified time period

D is the distance from the receiver to the piece of equipment, and

G is a constant that for topography and ground effects.

U.F.: Equipment runs 9hs during 10hs daytime, and x days per year (see Chapter 3). The vehicle runs 0.5h per day, and 288 days per year.

Table E-4

2006 Construction Period Noise Calculations for the Preferred Alternative Without Mitigation - Site 2

Noise Source	Equipment	Hard Ground	Shielding	Emission Level at 50 ft			Usage factor for 1h			Usage factor for 8hs			Usage factor for 30ds			Distance Attenuation		Shielding Attenuation	Ground Factor	Leq (dBA)			Ldn/Leq (30d) Operating 9hs/day
				dBA / Unit	Qty. / 1hr	Total dBA	1h	U.F.	10log (UF)	Hs / Day	U.F.	10log (UF)	Days / Year	U.F	10log (UF)	D (ft)	20log (D/50)			Leq(1)	Leq(8)	Leq(30) Operating 24hs/day	
	Element 1																						
1	Air Compressor for Impact Wrenches	Yes	No	81	2	84	1.0	1.0	0.0	8.0	0.9	-0.5	54	0.2	-7.3	767	23.7	0	0	60	60	53	
2	Air Compressor for Pavement Breakers	Yes	No	81	1	81	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	767	23.7	0	0	57	57	53	
3	Concrete Pump	Yes	No	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	36	0.1	-9.0	767	23.7	0	0	58	58	49	
4	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	767	23.7	0	0	64	64	63	
5	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	767	23.7	0	0	62	62	58	
6	Hydraulic All-terrain Crane	Yes	No	83	1	83	1.0	1.0	0.0	8.0	0.9	-0.5	211	0.7	-1.4	767	23.7	0	0	59	59	58	
7	Hydraulic Excavator with Hoe Ram	Yes	No	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	767	23.7	0	0	56	56	52	
8	Hydraulic Excavator with Thumb*	Yes	No	85	1	85	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	767	23.7	0	0	61	61	57	
9	Impact Wrenches	Yes	No	85	20	98	1.0	1.0	0.0	8.0	0.9	-0.5	134	0.5	-3.3	767	23.7	0	0	74	74	71	
10	Pavement Breakers	Yes	No	88	4	94	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	767	23.7	0	0	70	70	66	
11	Welding Machines**	Yes	No	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	767	23.7	0	0	49	49	48	
12	80 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.2	80	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	767	23.7	0	0	54	44	38	
13	21 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.6	86	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	767	23.7	0	0	59	49	44	
14	66 Heavy Trucks per day	Yes	No	88	6.6	96	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	767	23.7	0	0	69	60	54	
	Sum Element Noise Level																			78	76	73	69
	Element 2a																						
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	1003	26.0	0	0	61	60	55	
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1003	26.0	0	0	62	61	61	
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1003	26.0	0	0	60	59	60	
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1003	26.0	0	0	57	56	52	
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1003	26.0	0	0	44	43	43	
6	26 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	75	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1003	26.0	0	0	46	37	37	
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1003	26.0	0	0	50	41	41	
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1003	26.0	0	0	59	50	50	
	Sum Element Noise Level																			67	66	65	60
	Element 2b																						
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	693	22.8	0	0	64	63	59	
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	693	22.8	0	0	65	65	65	
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	693	22.8	0	0	63	63	63	
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	693	22.8	0	0	60	60	55	
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	693	22.8	0	0	47	47	47	
6	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	693	22.8	0	0	50	40	40	
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	693	22.8	0	0	54	44	44	
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	693	22.8	0	0	63	53	53	
	Sum Element Noise Level																			70	69	68	64
	Element 2c																						
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	298	15.5	0	0	71	71	66	
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	298	15.5	0	0	72	72	72	
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	298	15.5	0	0	71	70	70	
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	298	15.5	0	0	68	67	63	
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	298	15.5	0	0	54	54	54	
6	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	298	15.5	0	0	57	48	48	
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	298	15.5	0	0	61	51	51	
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	298	15.5	0	0	70	60	60	
	Sum Element Noise Level																			78	76	75	71
	Element 3																						
1	Air Operated Grout Drills***	Yes	No	90	3	95	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1261	28.0	0	0	67	66	62	
2	Concrete Pump	Yes	No	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	1261	28.0	0	0	54	53	49	
3	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1261	28.0	0	0	60	59	60	
4	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1261	28.0	0	0	58	57	58	
5	Pavement Breakers	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1261	28.0	0	0	60	59	55	
6	Backhoe	Yes	No	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1261	28.0	0	0	52	51	47	
7	Welding Machines**	Yes	No	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1261	28.0	0	0	45	44	45	
8	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1261	28.0	0	0	45	35	35	
9	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1261	28.0	0	0	48	39	39	
10	10 Heavy Trucks per day	Yes	No	88	1.0	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1261	28.0	0	0	57	47	47	
	Sum Element Noise Level																			69	68	66	61
	Element 4 (eliminated)																						
	Total Noise Level																			82	80		74
																				81.5	80.3		74.0

Notes:
* values from Louis Berger Group, ** values from estimated, and *** values from Swedish National Road and Transport Research Institute (VTI).
Sound Pressure Level Leq = E.L. + 10log(U.F) - 20log(D/50) - 10Glog(D/50) - Shielding
E.L. is the noise emission level of the particular piece of equipment
U.F. is an usage factor that accounts for the fraction of time that the equipment is in use over the specified time period
D is the distance from tha receiver to the piece of equipment, and
G is a constant that for topography and ground effects.
U.F.: Equipment runs 9hs during 10hs daytime, and x days per year (see Chapter 3). The vehicle runs 0.5h per day, and 288 days per year.

Table E-5

2006 Construction Period Noise Calculations for the Preferred Alternative Without Mitigation - Site 3

Noise Source	Equipment	Hard Ground	Shielding	Emission Level at 50 ft			Usage factor for 1h			Usage factor for 8hs			Usage factor for 30ds			Distance Attenuation		Shielding Attenuation	Ground Factor	Leq (dBA)			Ldn/Leq (30d) Operating 9hs/day
				dBA / Unit	Qty. / 1hr	Total dBA	1h	U.F.	10log (UF)	Hs / Day	U.F.	10log (UF)	Days / Year	U.F	10log (UF)	D (ft)	20log (D/50)			Leq(1)	Leq(8)	Leq(30) Operating 24hs/day	
	Element 1																						
1	Air Compressor for Impact Wrenches	Yes	No	81	2	84	1.0	1.0	0.0	8.0	0.9	-0.5	54	0.2	-7.3	714	23.1	0	0	61	60	54	
2	Air Compressor for Pavement Breakers	Yes	No	81	1	81	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	714	23.1	0	0	58	57	54	
3	Concrete Pump	Yes	No	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	36	0.1	-9.0	714	23.1	0	0	59	58	50	
4	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	714	23.1	0	0	65	64	63	
5	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	714	23.1	0	0	63	62	59	
6	Hydraulic All-terrain Crane	Yes	No	83	1	83	1.0	1.0	0.0	8.0	0.9	-0.5	211	0.7	-1.4	714	23.1	0	0	60	59	59	
7	Hydraulic Excavator with Hoe Ram	Yes	No	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	714	23.1	0	0	57	56	53	
8	Hydraulic Excavator with Thumb*	Yes	No	85	1	85	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	714	23.1	0	0	62	61	58	
9	Impact Wrenches	Yes	No	85	20	98	1.0	1.0	0.0	8.0	0.9	-0.5	134	0.5	-3.3	714	23.1	0	0	75	74	72	
10	Pavement Breakers	Yes	No	88	4	94	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	714	23.1	0	0	71	70	67	
11	Welding Machines**	Yes	No	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	714	23.1	0	0	50	49	48	
12	80 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.2	80	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	714	23.1	0	0	54	45	39	
13	21 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.6	86	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	714	23.1	0	0	60	50	44	
14	66 Heavy Trucks per day	Yes	No	88	6.6	96	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	714	23.1	0	0	70	61	55	
	Sum Element Noise Level																			78	77	74	70
	Element 2a																						
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	768	23.7	0	0	63	63	58	
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	768	23.7	0	0	64	64	64	
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	768	23.7	0	0	62	62	62	
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	768	23.7	0	0	59	59	54	
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	768	23.7	0	0	46	46	46	
6	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	75	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	768	23.7	0	0	49	39	39	
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	768	23.7	0	0	53	43	43	
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	768	23.7	0	0	62	52	52	
	Sum Element Noise Level																			70	68	67	63
	Element 2b																						
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	823	24.3	0	0	62	62	57	
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	823	24.3	0	0	64	63	63	
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	823	24.3	0	0	62	61	61	
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	823	24.3	0	0	59	58	54	
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	823	24.3	0	0	46	45	45	
6	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	823	24.3	0	0	48	39	39	
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	823	24.3	0	0	52	43	43	
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	823	24.3	0	0	61	52	52	
	Sum Element Noise Level																			69	68	66	62
	Element 2c																						
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	992	26.0	0	0	61	60	56	
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	992	26.0	0	0	62	62	62	
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	992	26.0	0	0	60	60	60	
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	992	26.0	0	0	57	57	52	
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	992	26.0	0	0	44	44	44	
6	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	992	26.0	0	0	47	37	37	
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	992	26.0	0	0	50	41	41	
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	992	26.0	0	0	59	50	50	
	Sum Element Noise Level																			67	66	65	61
	Element 3																						
1	Air Operated Grout Drills***	Yes	No	90	3	95	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	138	8.8	0	0	86	85	81	
2	Concrete Pump	Yes	No	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	138	8.8	0	0	73	73	68	
3	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	138	8.8	0	0	79	79	79	
4	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	138	8.8	0	0	77	77	77	
5	Pavement Breakers	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	138	8.8	0	0	79	79	74	
6	Backhoe	Yes	No	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	138	8.8	0	0	71	71	66	
7	Welding Machines**	Yes	No	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	138	8.8	0	0	64	64	64	
8	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	138	8.8	0	0	64	54	54	
9	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	138	8.8	0	0	68	58	58	
10	10 Heavy Trucks per day	Yes	No	88	1.0	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	138	8.8	0	0	76	67	67	
	Sum Element Noise Level																			88	88	85	80
	Element 4 (eliminated)																						
	Total Noise Level																			89	88		81
																				89.0	88.1		81.0

Notes:
* values from Louis Berger Group, ** values from estimated, and *** values from Swedish National Road and Transport Research Institute (VTI).
Sound Pressure Level Leq = E.L. + 10log(U.F) - 20log(D/50) - 10Glog(D/50) - Shielding
E.L. is the noise emission level of the particular piece of equipment
U.F. is an usege factor that accounts for the fraction of time that the equipment is in use over the specified time period
D is the distance from the receiver to the piece of equipment, and
G is a constant that for topography and ground effects.
U.F.: Equipment runs 9hs during 10hs daytime, and x days per year (see Chapter 3). The vehicle runs 0.5h per day, and 288 days per year.

Table E-6

2006 Construction Period Noise Calculations for the Preferred Alternative Without Mitigation - Site 4

Noise Source	Equipment	Hard Ground	Shielding	Emission Level at 50 ft			Usage factor for 1h			Usage factor for 8hs			Usage factor for 30ds			Distance Attenuation		Shielding Attenuation	Ground Factor	Leq (dBA)			Ldn/Leq (30d) Operating 9hs/day
				dBA / Unit	Qty. / 1hr	Total dBA	1h	U.F.	10log (UF)	Hs / Day	U.F.	10log (UF)	Days / Year	U.F	10log (UF)	D (ft)	20log (D/50)			Leq(1)	Leq(8)	Leq(30) Operating 24hs/day	
	Element 1																						
1	Air Compressor for Impact Wrenches	Yes	Building	81	2	84	1.0	1.0	0.0	8.0	0.9	-0.5	54	0.2	-7.3	793	24.0	10	0	50	49	43	
2	Air Compressor for Pavement Breakers	Yes	Building	81	1	81	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	793	24.0	10	0	47	46	43	
3	Concrete Pump	Yes	Building	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	36	0.1	-9.0	793	24.0	10	0	48	47	39	
4	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	793	24.0	10	0	54	53	52	
5	Hi-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	793	24.0	10	0	52	51	48	
6	Hydraulic All-terrain Crane	Yes	Building	83	1	83	1.0	1.0	0.0	8.0	0.9	-0.5	211	0.7	-1.4	793	24.0	10	0	49	48	48	
7	Hydraulic Excavator with Hoe Ram	Yes	Building	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	793	24.0	10	0	46	45	42	
8	Hydraulic Excavator with Thumb*	Yes	Building	85	1	85	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	793	24.0	10	0	51	50	47	
9	Impact Wrenches	Yes	Building	85	20	98	1.0	1.0	0.0	8.0	0.9	-0.5	134	0.5	-3.3	793	24.0	10	0	64	63	61	
10	Pavement Breakers	Yes	Building	88	4	94	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	793	24.0	10	0	60	60	56	
11	Welding Machines**	Yes	Building	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	793	24.0	10	0	39	38	37	
12	80 Cars per day (1 HT = 47 Cars)	Yes	Building	68	0.2	80	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	793	24.0	10	0	43	34	28	
13	21 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.6	86	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	793	24.0	10	0	49	39	33	
14	66 Heavy Trucks per day	Yes	Building	88	6.6	96	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	793	24.0	10	0	59	50	44	
	Sum Element Noise Level																			67	66	63	59
	Element 2a																						
1	Concrete Pump	Yes	Building	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	559	21.0	10	0	56	55	51	
2	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	559	21.0	10	0	57	57	57	
3	Hi-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	559	21.0	10	0	55	55	55	
4	Backhoe	Yes	Building	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	559	21.0	10	0	52	52	47	
5	Welding Machines**	Yes	Building	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	559	21.0	10	0	39	39	39	
6	26 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.1	75	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	559	21.0	10	0	41	32	32	
7	5 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	559	21.0	10	0	45	36	36	
8	11 Heavy Trucks per day	Yes	Building	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	559	21.0	10	0	54	45	45	
	Sum Element Noise Level																			62	61	60	56
	Element 2b																						
1	Concrete Pump	Yes	Building	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	863	24.7	10	0	52	52	47	
2	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	863	24.7	10	0	53	53	53	
3	Hi-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	863	24.7	10	0	51	51	51	
4	Backhoe	Yes	Building	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	863	24.7	10	0	48	48	43	
5	Welding Machines**	Yes	Building	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	863	24.7	10	0	35	35	35	
6	26 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	863	24.7	10	0	38	28	28	
7	5 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	863	24.7	10	0	42	32	32	
8	11 Heavy Trucks per day	Yes	Building	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	863	24.7	10	0	51	41	41	
	Sum Element Noise Level																			59	57	56	52
	Element 2c																						
1	Concrete Pump	Yes	Building	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	1272	28.1	10	0	49	48	43	
2	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1272	28.1	10	0	50	49	49	
3	Hi-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1272	28.1	10	0	48	47	47	
4	Backhoe	Yes	Building	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1272	28.1	10	0	45	44	40	
5	Welding Machines**	Yes	Building	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1272	28.1	10	0	32	31	31	
6	28 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1272	28.1	10	0	35	25	25	
7	5 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1272	28.1	10	0	38	29	29	
8	11 Heavy Trucks per day	Yes	Building	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1272	28.1	10	0	47	38	38	
	Sum Element Noise Level																			55	54	53	48
	Element 3																						
1	Air Operated Grout Drills***	Yes	Building	90	3	95	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	741	23.4	10	0	61	61	57	
2	Concrete Pump	Yes	Building	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	741	23.4	10	0	49	48	43	
3	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	741	23.4	10	0	55	54	54	
4	Hi-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	741	23.4	10	0	53	52	52	
5	Pavement Breakers	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	741	23.4	10	0	55	54	50	
6	Backhoe	Yes	Building	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	741	23.4	10	0	47	46	42	
7	Welding Machines**	Yes	Building	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	741	23.4	10	0	40	39	39	
8	28 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	741	23.4	10	0	39	30	30	
9	5 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	741	23.4	10	0	43	33	33	
10	10 Heavy Trucks per day	Yes	Building	88	1.0	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	741	23.4	10	0	52	42	42	
	Sum Element Noise Level																			64	63	60	58
	Element 4 (eliminated)																						
	Total Noise Level																			70	69		62
																				70.2	69.1		62.3

Notes:

* values from Louis Berger Group, ** values from estimated, and *** values from Swedish National Road and Transport Research Institute (VTI).

Sound Pressure Level Leq = E.L + 10log(U.F) - 20log(D/50) - 10Glog(D/50) - Shielding

E.L. is the noise emission level of the particular piece of equipment

U.F. is an usage factor that accounts for the fraction of time that the equipment is in use over the specified time period

D is the distance from the receiver to the piece of equipment, and

G is a constant that for topography and ground effects.

U.F.: Equipment runs 9hs during 10hs daytime, and x days per year (see Chapter 3). The vehicle runs 0.5h per day, and 288 days per year.

Table E-7

2006 Construction Period Noise Calculations for the Preferred Alternative Without Mitigation - Site 5

Noise Source	Equipment	Hard Ground	Shielding	Emission Level at 50 ft			Usage factor for 1h			Usage factor for 8hs			Usage factor for 30ds			Distance Attenuation		Shielding Attenuation	Ground Factor	Leq (dBA)			Ldn/Leq (30d) Operating 9hs/day
				dBA / Unit	Qty. / 1hr	Total dBA	1h	U.F.	10log (UF)	Hs / Day	U.F.	10log (UF)	Days / Year	U.F	10log (UF)	D (ft)	20log (D/50)			Leq(1)	Leq(8)	Leq(30) Operating 24hs/day	
	Element 1																						
1	Air Compressor for Impact Wrenches	Yes	Building	81	2	84	1.0	1.0	0.0	8.0	0.9	-0.5	54	0.2	-7.3	1034	26.3	10	0	48	47	40	
2	Air Compressor for Pavement Breakers	Yes	Building	81	1	81	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	1034	26.3	10	0	45	44	40	
3	Concrete Pump	Yes	Building	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	36	0.1	-9.0	1034	26.3	10	0	46	45	37	
4	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	1034	26.3	10	0	52	51	50	
5	HI-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	1034	26.3	10	0	50	49	45	
6	Hydraulic All-terrain Crane	Yes	Building	83	1	83	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	1034	26.3	10	0	47	46	45	
7	Hydraulic Excavator with Hoe Ram	Yes	Building	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	211	0.7	-1.4	1034	26.3	10	0	44	43	39	
8	Hydraulic Excavator with Thumb*	Yes	Building	85	1	85	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	1034	26.3	10	0	49	48	44	
9	Impact Wrenches	Yes	Building	85	20	98	1.0	1.0	0.0	8.0	0.9	-0.5	134	0.5	-3.3	1034	26.3	10	0	62	61	58	
10	Pavement Breakers	Yes	Building	88	4	94	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	1034	26.3	10	0	58	57	53	
11	Welding Machines**	Yes	Building	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	1034	26.3	10	0	37	36	35	
12	80 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.2	80	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	1034	26.3	10	0	41	31	26	
13	21 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.6	86	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	1034	26.3	10	0	46	37	31	
14	66 Heavy Trucks per day	Yes	Building	88	6.6	96	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	1034	26.3	10	0	57	47	41	
	Sum Element Noise Level																			65	64	61	56
	Element 2a																						
1	Concrete Pump	Yes	Building	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	1138	27.1	10	0	50	49	44	
2	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1138	27.1	10	0	51	50	50	
3	HI-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1138	27.1	10	0	49	48	48	
4	Backhoe	Yes	Building	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1138	27.1	10	0	46	45	41	
5	Welding Machines**	Yes	Building	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1138	27.1	10	0	33	32	32	
6	26 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.1	75	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1138	27.1	10	0	35	26	26	
7	5 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1138	27.1	10	0	39	30	30	
8	11 Heavy Trucks per day	Yes	Building	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1138	27.1	10	0	48	39	39	
	Sum Element Noise Level																			56	55	54	49
	Element 2b																						
1	Concrete Pump	Yes	Building	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	921	25.3	10	0	51	51	46	
2	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	921	25.3	10	0	53	52	52	
3	HI-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	921	25.3	10	0	51	50	50	
4	Backhoe	Yes	Building	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	921	25.3	10	0	48	47	43	
5	Welding Machines**	Yes	Building	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	921	25.3	10	0	35	34	34	
6	28 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	921	25.3	10	0	37	28	28	
7	5 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	921	25.3	10	0	41	32	32	
8	11 Heavy Trucks per day	Yes	Building	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	921	25.3	10	0	50	41	41	
	Sum Element Noise Level																			58	57	55	51
	Element 2c																						
1	Concrete Pump	Yes	Building	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	814	24.2	10	0	53	52	47	
2	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	814	24.2	10	0	54	53	53	
3	HI-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	814	24.2	10	0	52	51	51	
4	Backhoe	Yes	Building	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	814	24.2	10	0	49	48	44	
5	Welding Machines**	Yes	Building	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	814	24.2	10	0	36	35	35	
6	28 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	814	24.2	10	0	39	29	29	
7	5 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	814	24.2	10	0	42	33	33	
8	11 Heavy Trucks per day	Yes	Building	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	814	24.2	10	0	51	42	42	
	Sum Element Noise Level																			59	58	57	52
	Element 3																						
1	Air Operated Grout Drills***	Yes	Building	90	3	95	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1665	30.4	10	0	54	54	50	
2	Concrete Pump	Yes	Building	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	1665	30.4	10	0	42	41	36	
3	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1665	30.4	10	0	48	47	47	
4	HI-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1665	30.4	10	0	46	45	45	
5	Pavement Breakers	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1665	30.4	10	0	48	47	43	
6	Backhoe	Yes	Building	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1665	30.4	10	0	40	39	35	
7	Welding Machines**	Yes	Building	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1665	30.4	10	0	33	32	32	
8	28 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1665	30.4	10	0	32	23	23	
9	5 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1665	30.4	10	0	36	26	26	
10	10 Heavy Trucks per day	Yes	Building	88	1.0	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1665	30.4	10	0	45	35	35	
	Sum Element Noise Level																			57	56	53	49
	Element 4 (elliminated)																						
	Total Noise Level																			67	66		60
																				67.4	66.1		59.5

Notes:
* values from Louis Berger Group, ** values from estimated, and *** values from Swedish National Road and Transport Research Institute (VTI).
Sound Pressure Level Leq = E.L. + 10log(U.F) - 20log(D/50) - 10Glog(D/50) - Shielding
E.L. is the noise emission level of the particular piece of equipment
U.F. is an usage factor that accounts for the fraction of time that the equipment is in use over the specified time period
D is the distance from the receiver to the piece of equipment, and
G is a constant that for topography and ground effects.
U.F.: Equipment runs 9hs during 10hs daytime, and x days per year (see Chapter 3). The vehicle runs 0.5h per day, and 288 days per year.

Table E-8

2006 Construction Period Noise Levels for the Preferred Alternative With Mitigation (in dBA)

Receptor Site	Existing Noise Level			Calculated Noise Level				FTA Criteria			
	Leq(1)	L10(1)	Ldn	Leq(1)	Leq(8)	Leq(30ds)	Ldn(30ds)	Land Use	Leq(8)	Leq(30ds)	*Ldn(30ds)
									80/85 (Res/Com)	80.0	75.0
1	72.9	77.8	74	80	78	72	72	Residential	No Impact		No Impact
								Commercial	No Impact	No Impact	
2	70.5	69.6	71	81	79	73	73	Residential	No Impact		No Impact
								Commercial	No Impact	No Impact	
3	67.3	69.5	72	86	84	79	79	Residential	Impact		No Impact
								Commercial	No Impact	No Impact	
4	72.5	73.5	70	68	67	61	61	Residential	No Impact		No Impact
								Commercial	No Impact	No Impact	
5	76.0	NA	79	66	64	58	58	Residential	No Impact		No Impact
								Commercial	No Impact	No Impact	

* If existing Ldn noise levels are greater than 65, the FTA Ldn impact criterion = existing Ldn + 10 dBA.

Table E-9

2006 Construction Period Noise Calculations for the Preferred Alternative With Mitigation - Site 1

Noise Source	Equipment	Hard Ground	Shielding	Emission Level at 50 ft			Usage factor for 1h			Usage factor for 8hs			Usage factor for 30ds			Distance Attenuation		Shielding Attenuation	Ground Factor	Leq (dBA)			Ldn/Leq (30d) Operating 9hs/day	Mitigation Method	Source
				dBA / Unit	Qty. / 1hr	Total dBA	1h	U.F.	10log (UF)	Hs / Day	U.F.	10log (UF)	Days / Year	U.F	10log (UF)	D (ft)	20log (D/50)			Leq(1)	Leq(8)	Leq(30) Operating 24hs/day			
	Element 1																								
1	Air Compressor for Impact Wrenches	Yes	No	81	2	84	1.0	1.0	0.0	8.0	0.9	-0.5	54	0.2	-7.3	628	22.0	0	0	62	62	55			
2	Air Compressor for Pavement Breakers	Yes	No	81	1	81	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	628	22.0	0	0	59	59	55			
3	Concrete Pump	Yes	No	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	36	0.1	-9.0	628	22.0	0	0	60	60	51			
4	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	628	22.0	0	0	66	66	64			
5	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	628	22.0	0	0	64	64	60			
6	Hydraulic All-terrain Crane	Yes	No	83	1	83	1.0	1.0	0.0	8.0	0.9	-0.5	211	0.7	-1.4	628	22.0	0	0	61	61	60			
7	Hydraulic Excavator with Hoe Ram	Yes	No	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	628	22.0	0	0	58	58	54			
8	Hydraulic Excavator with Thumb*	Yes	No	85	1	85	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	628	22.0	0	0	63	63	59			
9	Impact Wrenches	Yes	No	82	20	95	1.0	1.0	0.0	8.0	0.9	-0.5	134	0.5	-3.3	628	22.0	0	0	73	73	70		Use quieter wrenches (82 dBA at 50 feet)	Goodson Tools & Suppliers for Engine Builders, www.goodson.com, 1-800-533-8010
10	Pavement Breakers	Yes	No	75	4	81	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	628	22.0	0	0	59	59	55		Strap-on muffler enclosing the cylinder (13 dBA reduction)	Worker's Compensation Board of BC, Engineering Section Report
11	Welding Machines**	Yes	No	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	628	22.0	0	0	51	51	49			
12	80 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.2	80	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	628	22.0	0	0	55	46	40			
13	21 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.6	86	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	628	22.0	0	0	61	51	45			
14	66 Heavy Trucks per day	Yes	No	88	6.6	96	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	628	22.0	0	0	71	62	56			
	Sum Element Noise Level																			77	75	72	68		
	Element 2a																								
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	684	22.7	0	0	64	64	59			
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	684	22.7	0	0	65	65	65			
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	684	22.7	0	0	63	63	63			
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	684	22.7	0	0	60	60	55			
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	684	22.7	0	0	47	47	47			
6	26 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	75	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	684	22.7	0	0	50	40	40			
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	684	22.7	0	0	54	44	44			
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	684	22.7	0	0	63	53	53			
	Sum Element Noise Level																			71	69	68	64		
	Element 2b																								
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	519	20.3	0	0	66	66	61			
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	519	20.3	0	0	68	67	67			
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	519	20.3	0	0	66	65	65			
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	519	20.3	0	0	63	62	58			
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	519	20.3	0	0	50	49	49			
6	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	519	20.3	0	0	52	43	43			
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	519	20.3	0	0	58	47	47			
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	519	20.3	0	0	65	56	56			
	Sum Element Noise Level																			73	72	70	66		
	Element 2c																								
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	619	21.9	0	0	65	64	60			
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	619	21.9	0	0	66	66	66			
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	619	21.9	0	0	64	64	64			
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	619	21.9	0	0	61	61	56			
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	619	21.9	0	0	48	48	48			
6	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	619	21.9	0	0	51	41	41			
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	619	21.9	0	0	55	45	45			
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	619	21.9	0	0	64	54	54			
	Sum Element Noise Level																			71	70	69	65		
	Element 3																								
1	Air Operated Grout Drills***	Yes	No	72	3	77	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1266	28.1	0	0	48	48	44		Acoustical enclosure for the drill (18 dBA reduction)	Worker's Compensation Board of BC, Engineering Section Report
2	Concrete Pump	Yes	No	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	1266	28.1	0	0	54	53	49			
3	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1266	28.1	0	0	60	59	59			
4	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1266	28.1	0	0	58	57	57			
5	Pavement Breakers	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1266	28.1	0	0	60	59	55			
6	Backhoe	Yes	No	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1266	28.1	0	0	52	51	47			
7	Welding Machines**	Yes	No	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1266	28.1	0	0	45	44	44			
8	26 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1266	28.1	0	0	45	35	35			
9	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1266	28.1	0	0	48	39	39			
10	10 Heavy Trucks per day	Yes	No	88	1.0	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1266	28.1	0	0	57	47	47			
	Sum Element Noise Level																			66	65	63	59		
	Element 4 (eliminated)																								
	Total Noise Level																			80	78		72		
																				78.9	78.4		72.1		

Notes: * values from Louis Berger Group, ** values from estimated, and *** values from Swedish National Road and Transport Research Institute (VTI).

Sound Pressure Level Leq = E.L. + 10log(U.F) - 20log(D/50) - 10Glog(D/50) - Shielding

E.L. is the noise emission level of the particular piece of equipment

U.F. is an usage factor that accounts for the fraction of time that the equipment is in use over the specified time period

D is the distance from the receiver to the piece of equipment, and

G is a constant that for topography and ground effects.

U.F.: Equipment runs 9hs during 10hs daytime, and x days per year (see Chapter 3). The vehicle runs 0.5h per day, and 288 days per year.

Table E-10

2006 Construction Period Noise Calculations for the Preferred Alternative With Mitigation - Site 2

Noise Source	Equipment	Hard Ground	Shielding	Emission Level at 50 ft dBA / Unit	Qty. / 1hr	Total dBA	Usage factor for 1h 1h	U.F.	10log (UF)	Usage factor for 8hs Hs / Day	U.F.	10log (UF)	Usage factor for 30ds Days / Year	U.F	10log (UF)	Distance Attenuation D (ft)	20log (D/50)	Shielding Attenuation	Ground Factor	Leq (dBA) Leq(1)	Leq(8)	Leq(30) Operating 24hs/day	Ldn/Leq (30d) Operating 8hs/day	Mitigation Method	Source
	Element 1																								
1	Air Compressor for Impact Wrenches	Yes	No	81	2	84	1.0	1.0	0.0	8.0	0.9	-0.5	54	0.2	-7.3	767	23.7	0	0	60	60	53			
2	Air Compressor for Pavement Breakers	Yes	No	81	1	81	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	767	23.7	0	0	57	57	53			
3	Concrete Pump	Yes	No	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	36	0.1	-9.0	767	23.7	0	0	58	58	49			
4	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	767	23.7	0	0	64	64	63			
5	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	767	23.7	0	0	62	62	58			
6	Hydraulic All-terrain Crane	Yes	No	83	1	83	1.0	1.0	0.0	8.0	0.9	-0.5	211	0.7	-1.4	767	23.7	0	0	59	59	58			
7	Hydraulic Excavator with Hoe Ram	Yes	No	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	767	23.7	0	0	56	56	52			
8	Hydraulic Excavator with Thumb*	Yes	No	85	1	85	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	767	23.7	0	0	61	61	57			
9	Impact Wrenches	Yes	No	82	20	95	1.0	1.0	0.0	8.0	0.9	-0.5	134	0.5	-3.3	767	23.7	0	0	71	71	68		Use quieter wrenches (82 dBA at 50 feet)	Goodson Tools & Suppliers for Engine Builders, www.goodson.com, 1-800-533-8010
10	Pavement Breakers	Yes	No	75	4	81	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	767	23.7	0	0	57	57	53		Strap-on muffler enclosing the cylinder (13 dBA reduction)	Worker's Compensation Board of BC, Engineering Section Report
11	Welding Machines**	Yes	No	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	767	23.7	0	0	49	49	48			
12	60 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.2	80	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	767	23.7	0	0	54	44	38			
13	21 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.6	88	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	767	23.7	0	0	59	49	44			
14	66 Heavy Trucks per day	Yes	No	88	8.6	96	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	767	23.7	0	0	89	60	54			
	Sum Element Noise Level																			75	73	70	66		
	Element 2a																								
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	1003	26.0	0	0	61	60	55			
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1003	26.0	0	0	62	61	61			
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1003	26.0	0	0	60	59	60			
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1003	26.0	0	0	57	56	52			
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1003	26.0	0	0	44	43	43			
6	26 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	75	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1003	26.0	0	0	46	37	37			
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1003	26.0	0	0	50	41	41			
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1003	26.0	0	0	58	50	50			
	Sum Element Noise Level																			67	66	65	60		
	Element 2b																								
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	693	22.8	0	0	64	63	59			
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	693	22.8	0	0	65	65	65			
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	693	22.8	0	0	63	63	63			
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	693	22.8	0	0	60	60	55			
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	693	22.8	0	0	47	47	47			
6	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	693	22.8	0	0	50	40	40			
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	693	22.8	0	0	54	44	44			
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	693	22.8	0	0	63	53	53			
	Sum Element Noise Level																			70	69	68	64		
	Element 2c																								
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	298	15.5	0	0	71	71	66			
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	298	15.5	0	0	72	72	72			
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	298	15.5	0	0	71	70	70			
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	298	15.5	0	0	68	67	63			
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	298	15.5	0	0	54	54	54			
6	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	298	15.5	0	0	57	46	46			
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	298	15.5	0	0	61	51	51			
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	298	15.5	0	0	70	60	60			
	Sum Element Noise Level																			78	78	75	71		
	Element 3																								
1	Air Operated Grout Drills***	Yes	No	72	3	77	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1261	28.0	0	0	49	48	44		Acoustical enclosure for the drill (18 dBA reduction)	Worker's Compensation Board of BC, Engineering Section Report
2	Concrete Pump	Yes	No	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	1261	28.0	0	0	54	53	49			
3	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1261	28.0	0	0	60	59	60			
4	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1261	28.0	0	0	58	57	58			
5	Pavement Breakers	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1261	28.0	0	0	60	59	55			
6	Backhoe	Yes	No	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1261	28.0	0	0	52	51	47			
7	Welding Machines**	Yes	No	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1261	28.0	0	0	45	44	45			
8	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1261	28.0	0	0	45	35	35			
9	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1261	28.0	0	0	48	39	39			
10	10 Heavy Trucks per day	Yes	No	88	1.0	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1261	28.0	0	0	57	47	47			
	Sum Element Noise Level																			66	65	63	59		
	Element 4 (eliminated)																								
	Total Noise Level																			81	79		73		
																				80.5	79.1		73.2		

Notes:
* values from Louis Berger Group, ** values from estimated, and *** values from Swedish National Road and Transport Research Institute (VTI).
Sound Pressure Level Leq = E.L. + 10log(U.F) - 20log(D/50) - 10Glog(D/50) - Shielding
E.L. is the noise emission level of the particular piece of equipment
U.F. is an usage factor that accounts for the fraction of time that the equipment is in use over the specified time period
D is the distance from the receiver to the piece of equipment, and
G is a constant that for topography and ground effects.
U.F.: Equipment runs 9hs during 10hs daytime, and x days per year (see Chapter 3). The vehicle runs 0.5h per day, and 288 days per year.

Table E-11
2006 Construction Period Noise Calculations for the Preferred Alternative With Mitigation - Site 3

Noise Source	Equipment	Hard Ground	Shielding	Emission Level at 50 ft dBA / Unit	Emission Level at 50 ft Qty. / 1hr	Emission Level at 50 ft Total dBA	Usage factor for 1h 1h	Usage factor for 1h U.F.	Usage factor for 1h 10log (UF)	Usage factor for 8hs Hs / Day	Usage factor for 8hs U.F.	Usage factor for 8hs 10log (UF)	Usage factor for 30ds Days / Year	Usage factor for 30ds U.F	Usage factor for 30ds 10log (UF)	Distance Attenuation D (ft)	Distance Attenuation 20log (D/50)	Shielding Attenuation	Ground Factor	Leq (dBA) Leq(1)	Leq (dBA) Leq(8)	Leq(30) Operating 24hs/day	Ldn/Leq (30d) Operating Shs/day	Mitigation Method	Source
	Element 1																								
1	Air Compressor for Impact Wrenches	Yes	No	81	2	84	1.0	1.0	0.0	8.0	0.9	-0.5	54	0.2	-7.3	714	23.1	0	0	61	60	54			
2	Air Compressor for Pavement Breakers	Yes	No	81	1	81	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	714	23.1	0	0	58	57	54			
3	Concrete Pump	Yes	No	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	36	0.1	-9.0	714	23.1	0	0	59	58	50			
4	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	714	23.1	0	0	65	64	63			
5	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	714	23.1	0	0	63	62	59			
6	Hydraulic All-terrain Crane	Yes	No	83	1	83	1.0	1.0	0.0	8.0	0.9	-0.5	211	0.7	-1.4	714	23.1	0	0	60	59	59			
7	Hydraulic Excavator with Hoe Ram	Yes	No	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	714	23.1	0	0	57	56	53			
8	Hydraulic Excavator with Thumb*	Yes	No	85	1	85	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	714	23.1	0	0	62	61	58			
9	Impact Wrenches	Yes	No	82	20	95	1.0	1.0	0.0	8.0	0.9	-0.5	134	0.5	-3.3	714	23.1	0	0	72	71	69		Use quieter wrenches (82 dBA at 50 feet)	Goodson Tools & Suppliers for Engine Builders, www.goodson.com, 1-800-533-8010
10	Pavement Breakers	Yes	No	75	4	81	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	714	23.1	0	0	58	57	54		Strap-on muffler enclosing the cylinder (13 dBA reduction)	Worker's Compensation Board of BC, Engineering Section Report
11	Welding Machines**	Yes	No	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	714	23.1	0	0	50	49	48			
12	80 Cars per day (1 HT = 47 Cars)	Yes	No	86	0.2	80	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	714	23.1	0	0	54	45	39			
13	21 Light Trucks per day (1LH =13 Cars)	Yes	No	86	0.6	86	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	714	23.1	0	0	60	50	44			
14	66 Heavy Trucks per day	Yes	No	88	6.6	96	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	714	23.1	0	0	70	61	55			
	Sum Element Noise Level																			76	74	71	67		
	Element 2a																								
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	768	23.7	0	0	63	63	58			
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	768	23.7	0	0	64	64	64			
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	768	23.7	0	0	62	62	62			
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	768	23.7	0	0	59	59	54			
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	768	23.7	0	0	46	46	46			
6	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	75	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	768	23.7	0	0	49	39	39			
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	768	23.7	0	0	53	43	43			
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	768	23.7	0	0	62	52	52			
	Sum Element Noise Level																			70	68	67	63		
	Element 2b																								
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	823	24.3	0	0	62	62	57			
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	823	24.3	0	0	64	63	63			
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	823	24.3	0	0	62	61	61			
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	823	24.3	0	0	59	58	54			
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	823	24.3	0	0	46	45	45			
6	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	823	24.3	0	0	48	38	38			
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	823	24.3	0	0	52	43	43			
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	823	24.3	0	0	61	52	52			
	Sum Element Noise Level																			69	66	66	62		
	Element 2c																								
1	Concrete Pump	Yes	No	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	992	26.0	0	0	61	60	56			
2	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	992	26.0	0	0	62	62	62			
3	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	992	26.0	0	0	60	60	60			
4	Backhoe	Yes	No	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	992	26.0	0	0	57	57	52			
5	Welding Machines**	Yes	No	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	992	26.0	0	0	44	44	44			
6	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	992	26.0	0	0	47	37	37			
7	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	992	26.0	0	0	50	41	41			
8	11 Heavy Trucks per day	Yes	No	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	992	26.0	0	0	59	50	50			
	Sum Element Noise Level																			67	66	65	61		
	Element 3																								
1	Air Operated Grout Drills***	Yes	No	72	3	77	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	138	8.8	0	0	68	67	63		Acoustical enclosure for the drill (18 dBA reduction)	Worker's Compensation Board of BC, Engineering Section Report
2	Concrete Pump	Yes	No	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	138	8.8	0	0	73	73	68			
3	Crawler Crane	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	138	8.8	0	0	79	79	79			
4	Hi-Lift (Forklift)	Yes	No	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	138	8.8	0	0	77	77	77			
5	Pavement Breakers	Yes	No	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	138	8.8	0	0	79	79	74			
6	Backhoe	Yes	No	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	138	8.8	0	0	71	71	66			
7	Welding Machines**	Yes	No	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	138	8.8	0	0	64	64	64			
8	28 Cars per day (1 HT = 47 Cars)	Yes	No	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	138	8.8	0	0	64	54	54			
9	5 Light Trucks per day (1LH =13 Cars)	Yes	No	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	138	8.8	0	0	68	58	58			
10	10 Heavy Trucks per day	Yes	No	88	1.0	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	138	8.8	0	0	76	67	67			
	Sum Element Noise Level																			85	84	82	78		
	Element 4 (eliminated)																								
	Total Noise Level																			86	84		79		
																				85.7	84.5		78.6		

Notes: * values from Louis Berger Group, ** values from estimated, and *** values from Swedish National Road and Transport Research Institute (VTI).

Sound Pressure Level Leq = E.L. + 10log(U.F) - 20log(D/50) - 10Glog(D/50) - Shielding

E.L. is the noise emission level of the particular piece of equipment

U.F. is an usage factor that accounts for the fraction of time that the equipment is in use over the specified time period

D is the distance from the receiver to the piece of equipment, and

G is a constant that for topography and ground effects.

U.F.: Equipment runs 8hs during 10hs daytime, and x days per year (see Chapter 3). The vehicle runs 0.5h per day, and 288 days per year.

Table E-12

2006 Construction Period Noise Calculations for the Preferred Alternative With Mitigation - Site 4

Noise Source	Equipment	Hard Ground	Shielding	Emission Level at 50 ft: dBA / Unit	Qty. / 1hr	Total dBA	Usage factor for 1h: 1h	U.F.	10log (UF)	Usage factor for 8hs: Hs / Day	U.F.	10log (UF)	Usage factor for 30ds: Days / Year	U.F	10log (UF)	Distance Attenuation: D (ft)	20log (D/50)	Shielding Attenuation	Ground Factor	Leq (dBA): Leq(1)	Leq(8)	Leq(30) Operating 24hs/day	Ldn/Leq (30d) Operating 9hs/day	Mitigation Method	Source
	Element 1																								
1	Air Compressor for Impact Wrenches	Yes	Building	81	2	84	1.0	1.0	0.0	8.0	0.9	-0.5	54	0.2	-7.3	793	24.0	10	0	50	49	43			
2	Air Compressor for Pavement Breakers	Yes	Building	81	1	81	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	793	24.0	10	0	47	46	40			
3	Concrete Pump	Yes	Building	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	36	0.1	-9.0	793	24.0	10	0	48	47	39			
4	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	793	24.0	10	0	54	53	52			
5	Hi-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	793	24.0	10	0	52	51	48			
6	Hydraulic All-terrain Crane	Yes	Building	83	1	83	1.0	1.0	0.0	8.0	0.9	-0.5	211	0.7	-1.4	793	24.0	10	0	49	48	48			
7	Hydraulic Excavator with Hoe Ram	Yes	Building	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	793	24.0	10	0	46	45	42			
8	Hydraulic Excavator with Thumb*	Yes	Building	85	1	85	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	793	24.0	10	0	51	50	47			
9	Impact Wrenches	Yes	Building	82	20	95	1.0	1.0	0.0	8.0	0.9	-0.5	134	0.5	-3.3	793	24.0	10	0	61	60	58		Use quieter wrenches (82 dBA at 50 feet)	Goodson Tools & Suppliers for Engine Builders, www.goodson.com, 1-800-533-8010
10	Pavement Breakers	Yes	Building	75	4	81	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	793	24.0	10	0	47	47	43		Strap-on muffler enclosing the cylinder (13 dBA reduction)	Worker's Compensation Board of BC, Engineering Section Report
11	Welding Machines**	Yes	Building	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	793	24.0	10	0	39	38	37			
12	80 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.2	80	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	793	24.0	10	0	43	34	28			
13	21 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.6	86	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	793	24.0	10	0	49	39	33			
14	66 Heavy Trucks per day	Yes	Building	88	6.6	96	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	793	24.0	10	0	59	50	44			
	Sum Element Noise Level																			65	63	60	56		
	Element 2a																								
1	Concrete Pump	Yes	Building	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	559	21.0	10	0	56	55	51			
2	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	559	21.0	10	0	57	57	57			
3	Hi-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	559	21.0	10	0	55	55	55			
4	Backhoe	Yes	Building	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	559	21.0	10	0	52	52	47			
5	Welding Machines**	Yes	Building	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	559	21.0	10	0	39	39	39			
6	26 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.1	75	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	559	21.0	10	0	41	32	32			
7	5 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	559	21.0	10	0	45	36	36			
8	11 Heavy Trucks per day	Yes	Building	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	559	21.0	10	0	54	45	45			
	Sum Element Noise Level																			62	61	60	56		
	Element 2b																								
1	Concrete Pump	Yes	Building	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	863	24.7	10	0	52	52	47			
2	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	863	24.7	10	0	53	53	53			
3	Hi-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	863	24.7	10	0	51	51	51			
4	Backhoe	Yes	Building	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	863	24.7	10	0	48	48	43			
5	Welding Machines**	Yes	Building	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	863	24.7	10	0	35	35	35			
6	28 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	863	24.7	10	0	38	28	28			
7	5 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	863	24.7	10	0	42	32	32			
8	11 Heavy Trucks per day	Yes	Building	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	863	24.7	10	0	51	41	41			
	Sum Element Noise Level																			59	57	56	52		
	Element 2c																								
1	Concrete Pump	Yes	Building	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	1272	28.1	10	0	49	48	43			
2	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1272	28.1	10	0	50	49	49			
3	Hi-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1272	28.1	10	0	48	47	47			
4	Backhoe	Yes	Building	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1272	28.1	10	0	45	44	40			
5	Welding Machines**	Yes	Building	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1272	28.1	10	0	32	31	31			
6	28 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1272	28.1	10	0	35	25	25			
7	5 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1272	28.1	10	0	38	29	29			
8	11 Heavy Trucks per day	Yes	Building	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1272	28.1	10	0	47	38	38			
	Sum Element Noise Level																			55	54	53	48		
	Element 3																								
1	Air Operated Grout Drills***	Yes	Building	72	3	77	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	741	23.4	10	0	43	43	39		Acoustical enclosure for the drill (18 dBA reduction)	Worker's Compensation Board of BC, Engineering Section Report
2	Concrete Pump	Yes	Building	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	741	23.4	10	0	49	48	43			
3	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	741	23.4	10	0	55	54	54			
4	Hi-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	741	23.4	10	0	53	52	52			
5	Pavement Breakers	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	741	23.4	10	0	55	54	50			
6	Backhoe	Yes	Building	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	741	23.4	10	0	47	46	42			
7	Welding Machines**	Yes	Building	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	741	23.4	10	0	40	39	39			
8	28 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	741	23.4	10	0	39	30	30			
9	5 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	741	23.4	10	0	43	33	33			
10	10 Heavy Trucks per day	Yes	Building	88	1.0	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	741	23.4	10	0	52	42	42			
	Sum Element Noise Level																			60	59	58	53		
	Element 4 (eliminated)																								
	Total Noise Level																			68	67		61		
																				68.4	66.9		60.7		

Notes:
* values from Louis Berger Group, ** values from estimated, and *** values from Swedish National Road and Transport Research Institute (VTI).
Sound Pressure Level Leq = E.L. + 10log(U.F) - 20log(D/50) - 10Glog(D/50) - Shielding
E.L. is the noise emission level of the particular piece of equipment
U.F. is an usage factor that accounts for the fraction of time that the equipment is in use over the specified time period
D is the distance from the receiver to the piece of equipment, and
G is a constant that for topography and ground effects.
U.F.: Equipment runs 9hs during 10hs daytime, and x days per year (see Chapter 3). The vehicle runs 0.5h per day, and 288 days per year.

Table E-13

2006 Construction Period Noise Calculations for the Preferred Alternative With Mitigation - Site 5

Noise Source	Equipment	Hard Ground	Shielding	Emission Level at 50 ft dBA / Unit	Qty. / 1hr	Total dBA	Usage factor for 1h 1h	U.F.	10log (UF)	Usage factor for 8hs Hs / Day	U.F.	10log (UF)	Usage factor for 30d Days / Year	U.F	10log (UF)	Distance Attenuation D (ft)	20log (D/50)	Shielding Attenuation	Ground Factor	Leq (dBA) Leq(1)	Leq(8)	Leq(30) Operating 24hs/day	Ldn/Leq (30d) Operating 9hs/day	Mitigation Method	Source
	Element 1																								
1	Air Compressor for Impact Wrenches	Yes	Building	81	2	84	1.0	1.0	0.0	8.0	0.9	-0.5	54	0.2	-7.3	1034	26.3	10	0	48	47	40			
2	Air Compressor for Pavement Breakers	Yes	Building	81	1	81	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	1034	26.3	10	0	45	44	40			
3	Concrete Pump	Yes	Building	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	36	0.1	-9.0	1034	26.3	10	0	46	45	37			
4	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	1034	26.3	10	0	52	51	50			
5	Hi-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	1034	26.3	10	0	50	49	45			
6	Hydraulic All-terrain Crane	Yes	Building	83	1	83	1.0	1.0	0.0	8.0	0.9	-0.5	211	0.7	-1.4	1034	26.3	10	0	47	46	45			
7	Hydraulic Excavator with Hoe Ram	Yes	Building	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	1034	26.3	10	0	44	43	39			
8	Hydraulic Excavator with Thumb*	Yes	Building	85	1	85	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	1034	26.3	10	0	49	48	44			
9	Impact Wrenches	Yes	Building	82	20	95	1.0	1.0	0.0	8.0	0.9	-0.5	134	0.5	-3.3	1034	26.3	10	0	59	58	55		Use quietor wrenches (82 dBA at 50 feet)	Goodson Tools & Suppliers for Engine Builders, www.goodson.com, 1-800-533-8010
10	Pavement Breakers	Yes	Building	75	4	81	1.0	1.0	0.0	8.0	0.9	-0.5	108	0.4	-4.3	1034	26.3	10	0	45	44	40		Strap-on muffler enclosing the cylinder (13 dBA reduction)	Worker's Compensation Board of BC, Engineering Section Report
11	Welding Machines**	Yes	Building	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	194	0.7	-1.7	1034	26.3	10	0	37	36	35			
12	80 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.2	80	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	1034	26.3	10	0	41	31	26			
13	21 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.6	86	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	1034	26.3	10	0	46	37	31			
14	66 Heavy Trucks per day	Yes	Building	88	6.6	96	0.5	0.5	-3.0	0.5	0.1	-12.6	75	0.0	-18.4	1034	26.3	10	0	57	47	41			
	Sum Element Noise Level																			63	61	58	54		
	Element 2a																								
1	Concrete Pump	Yes	Building	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	1138	27.1	10	0	50	49	44			
2	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1138	27.1	10	0	51	50	50			
3	Hi-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1138	27.1	10	0	49	48	48			
4	Backhoe	Yes	Building	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1138	27.1	10	0	46	45	41			
5	Welding Machines**	Yes	Building	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1138	27.1	10	0	35	32	32			
6	26 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.1	75	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1138	27.1	10	0	35	26	26			
7	5 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1138	27.1	10	0	39	30	30			
8	11 Heavy Trucks per day	Yes	Building	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1138	27.1	10	0	48	39	39			
	Sum Element Noise Level																			56	55	54	49		
	Element 2b																								
1	Concrete Pump	Yes	Building	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	921	25.3	10	0	51	51	46			
2	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	921	25.3	10	0	53	52	52			
3	Hi-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	921	25.3	10	0	51	50	50			
4	Backhoe	Yes	Building	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	921	25.3	10	0	48	47	43			
5	Welding Machines**	Yes	Building	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	921	25.3	10	0	35	34	34			
6	28 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	921	25.3	10	0	37	28	28			
7	5 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	921	25.3	10	0	41	32	32			
8	11 Heavy Trucks per day	Yes	Building	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	921	25.3	10	0	50	41	41			
	Sum Element Noise Level																			58	57	55	51		
	Element 2c																								
1	Concrete Pump	Yes	Building	82	3	87	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	814	24.2	10	0	53	52	47			
2	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	814	24.2	10	0	54	53	53			
3	Hi-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	814	24.2	10	0	52	51	51			
4	Backhoe	Yes	Building	80	2	83	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	814	24.2	10	0	49	48	44			
5	Welding Machines**	Yes	Building	70	1	70	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	814	24.2	10	0	36	35	35			
6	28 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	814	24.2	10	0	39	29	29			
7	5 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	814	24.2	10	0	42	33	33			
8	11 Heavy Trucks per day	Yes	Building	88	1.1	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	814	24.2	10	0	51	42	42			
	Sum Element Noise Level																			59	58	57	52		
	Element 3																								
1	Air Operated Grout Drills***	Yes	Building	72	3	77	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1685	30.4	10	0	36	36	32		Acoustical enclosure for the drill (18 dBA reduction)	Worker's Compensation Board of BC, Engineering Section Report
2	Concrete Pump	Yes	Building	82	1	82	1.0	1.0	0.0	8.0	0.9	-0.5	86	0.3	-5.2	1685	30.4	10	0	42	41	36			
3	Crawler Crane	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1685	30.4	10	0	48	47	47			
4	Hi-Lift (Forklift)	Yes	Building	83	2	86	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1685	30.4	10	0	46	45	45			
5	Pavement Breakers	Yes	Building	88	1	88	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1685	30.4	10	0	48	47	43			
6	Backhoe	Yes	Building	80	1	80	1.0	1.0	0.0	8.0	0.9	-0.5	95	0.3	-4.8	1685	30.4	10	0	40	39	35			
7	Welding Machines**	Yes	Building	70	2	73	1.0	1.0	0.0	8.0	0.9	-0.5	259	0.9	-0.5	1685	30.4	10	0	33	32	32			
8	28 Cars per day (1 HT = 47 Cars)	Yes	Building	88	0.1	76	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1685	30.4	10	0	32	23	23			
9	5 Light Trucks per day (1LH =13 Cars)	Yes	Building	88	0.1	79	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1685	30.4	10	0	36	28	28			
10	10 Heavy Trucks per day	Yes	Building	88	1.0	88	0.5	0.5	-3.0	0.5	0.1	-12.6	288	0.1	-12.6	1685	30.4	10	0	45	35	35			
	Sum Element Noise Level																			53	52	51	46		
	Element 4 (eliminated)																								
	Total Noise Level																			66	64		58		
																				65.9	64.4		58.2		

Notes:
* values from Louis Berger Group, ** values from estimated, and *** values from Swedish National Road and Transport Research Institute (VTI).
Sound Pressure Level Leq = E.L. + 10log(U.F) - 20log(D/50) - 10Glog(D/50) - Shielding
E.L. is the noise emission level of the particular piece of equipment
U.F. is an usage factor that accounts for the fraction of time that the equipment is in use over the specified time period
D is the distance from the receiver to the piece of equipment, and
G is a constant that for topography and ground effects.
U.F.: Equipment runs 8hs during 10hs daytime, and x days per year (see Chapter 3). The vehicle runs 0.5h per day, and 288 days per year.

Table E-8
Operational Transit Noise Calculations

Existing Noise Exposures	
Category 1 and 2	
Impact	65.30
Severe Impact	65.30
Category 3	
Impact	65.30
Severe Impact	65.30

Threshold of Impact - Land Use Categories 1 and 2

L_E<42	Lp=	11.450+0.953LE		
42<=L_E<=71	Lp=	$71.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	61.0
L_E >71	Lp=	65		

Threshold of Severe Impact - Land Use Categories 1 and 2

L_E<44	Lp=	17.322+0.940LE		
44<=L_E<=77	Lp=	$96.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043x10^{-4}L_E^3$	=	66.4
L_E >77	Lp=	75		

Threshold of Impact - Land Use Category 3

L_E<42	Lp=	$16.450+0.953L_E$		
42<=L_E<=71	Lp=	$76.662 - 1.164L_E + 0.018L_E^2 - 4.088x10^{-5}L_E^3$	=	66.0
L_E >71	Lp=	70		

Threshold of Severe Impact - Land Use Category 3

L_E<44	Lp=	22.322+0.940LE		
44<=L_E<=77	Lp=	$101.725 - 1.992L_E + 3.02x10^{-2}L_E^2 - 1.043xx10^{-4}L_E^3$	=	71.4
L_E >77	Lp=	80		

where: L_E is the existing noise exposure
Lp is the project-generated noise exposure

Table E-8 (Continued)
Operational Transit Noise Calculations

EXISTING CONDITION

Computation of Noise Exposure at 50 feet - Peak Hour[1]

LOCOMOTIVES

$L_{eqL\ (peak)}$	=	*SEL ref*	+	*10log(N_{locos})*	-	*10log(S/50)*	+	*10log(Vp)*	-	*35.6*
	=	90.0	+	0.0	-	-7.0	+	14.8	-	35.6
	=	0.0								

CARS (SEL ref for Rail Cars)

$L_{eqC\ (Peak)}$	=	*SEL ref*	+	*10log(N_{cars})*	+	*20log(S/50)*	+	*10log(Vp)*	-	*35.6*
	=	82.0		13.0	+	-14.0	+	14.8	-	35.6
	=	60.2								

COMBINED

WITHOUT WARNING HORNS

$L_{eq\ (Peak)}$	=	*10log*	[	*10^($L_{eqL(day)}$/10)*	+	*0^($L_{eqC(day)}$/1(*	]
	=	60.2					

Existing Noise Monitoring at Parks

Park	Leq	Year	Performed by
Vietnam Veteran Plaza	66.9	2000	AKRF
A park on Water St. btw Fulton & Beek Streets	68.8	1997	AKRF
Seward Park	66:9	1997	AKRF
Battery Park	68.0	1995	AKRF
Hudson River Park	66.1	1996	AKRF
Battery Park City	65.3	1996	AKRF

where:				
	SELref (Electric)		=	90.0
	SELref Warning Horn(Transit Car)		=	93.0
	SELref (Cars)		=	82.0
	Nlocos =	average number of locomotives per train	=	0.0
	Ncars =	average number of cars per train	=	20.0
	S =	train speed, in miles per hour	=	10.0
	Vp =	number of trains	=	30.0

ON SITE

Leq (Train)[1]	=	L_{eq}	+	Reflection	-	Attenuation
	=	60.2		6.0		25.0
	=	41.2				

Existing Measured = 65.3 (estimated existing noise level)

Note:

1. Estimated a distance between the ground level and the PATH tracks would be 50 feet.

Table E-8 (Continued)
Operational Transit Noise Calculations

BUILD CONDITION

Computation of Noise Exposure at 50 feet - Peak Hour[1]

LOCOMOTIVES

$L_{eqL\ (peak)}$	=	*SEL ref*	+	*10log(N_{locos})*	-	*10log(S/50)*	+	*10log(Vp)*	-	*35.6*
	=	90.0	+	0.0	-	-7.0	+	14.8	-	35.6
	=	0.0								

CARS (SEL ref for Rail Cars)

$L_{eqC\ (Peak)}$	=	*SEL ref*	+	*10log(N_{cars})*	+	*20log(S/50)*	+	*10log(Vp)*	-	*35.6*
	=	82.0		13.0	+	-14.0	+	14.8	-	35.6
	=	60.2								

COMBINED

WITHOUT WARNING HORNS

$L_{eq\ (Peak)}$	=	*10log*	[	*10^($L_{eqL(day)}$/10)*	+	*10^($L_{eqC(day)}$/10)*	]	
	=	60.2						

where:

SELref (Electric)	=	90.0
SELref Warning Horn(Transit Car)	=	93.0
SELref (Cars)	=	82.0
Nlocos = average number of locomotives per train	=	0.0
Ncars = average number of cars per train	=	20.0
S = train speed, in miles per hour	=	10.0
Vp = number of trains	=	30.0

ON SITE

Leq (Train)[1]	=	L_{eq}	+	Reflection	-	Attenuation
	=	60.2		6.0		25.0
	=	41.2				
Leq (Equipment)[2]	=	50.0				
Total	=	50.5				

Note:
1. Estimated a distance between the ground level and the PATH tracks would be 50 feet.
2. Noise from mechanical equipment operations, i.e., substations, HVAC equipment, etc. (estimated no exceed 50 dBA)

Table E-8 (Continued)
Operational Transit Noise Calculations

TRAIN NOISE ANALYSIS RESULTS

	Descriptor	Existing (dBA)	Build Increment (dBA)	FTA Impact Criterion (dBA)	Impact?	Total Build (dBA)
Memorial Site (Category 1)	Leq	65.3	50.5	61.0	No	65.4

TRAIN INPUT (Existing & Build)

Location	Peak Hour	Number of Trains			Locomotive	Number of Cars		Speed
	# of Trains	# of Cars	7am-10pm	10pm-7am	per train	7am-10pm	10pm-7am	(mph)
Memorial Site	30	20	0	0	0	0	0	10

15

Table E-9

Operational Period: Train Vibration Impact Calculations

WTC Memorial receptor located 50 feet from PATH tracks									Vibration			Ground-Borne Noise		
Equivalent Land Use	Reference Vibration Level Lv, at 10 feet	Distance Adjustment 20log(10/50)	Tunnel Founded In Rock	Track Crossover	Foundation Coupling (Founded in Rock)	Resonance Amplification	Floor to floor Attenuation -2 dB/floor	Radiated Sound Adjustment	Vibration Level (VdB)	Lowest Impact Criterion (VdB)	Impact?	Noise Level dB	Lowest Impact Criterion (dBA)	Impact?
Concert Halls TV Studios Recording Studios	81.0	-14.0	-15.0	10.0	0.0	6.0	-8.0	-20.0	60.0	65.0	No	40.0	25.0	Yes

Appendix F

Contaminated Materials

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The report meets the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. Search distances are per ASTM standard or custom distances requested by the user.

TARGET PROPERTY INFORMATION

ADDRESS

WORLD TRADE CENTER
NEW YORK, NY 10007

COORDINATES

Latitude (North):	40.711500 - 40° 42' 41.4"
Longitude (West):	74.012450 - 74° 0' 44.8"
Universal Tranverse Mercator:	Zone 18
UTM X (Meters):	583418.4
UTM Y (Meters):	4506989.0
Elevation:	11 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:	2440074-F1 JERSEY CITY, NJ NY
Source:	USGS 7.5 min quad index

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

FEDERAL ASTM STANDARD

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
CORRACTS ---------- Corrective Action Report
RCRIS-TSD ---------- Resource Conservation and Recovery Information System

STATE ASTM STANDARD

SHWS ---------- Inactive Hazardous Waste Disposal Sites in New York State
CBS UST ---------- Chemical Bulk Storage Database
MOSF UST ---------- Major Oil Storage Facilities Database

EXECUTIVE SUMMARY

SWTIRE..... Registered Waste Tire Storage & Facility List
SWRCY..... Registered Recycling Facility List

FEDERAL ASTM SUPPLEMENTAL

CONSENT..... Superfund (CERCLA) Consent Decrees
ROD..... Records Of Decision
Delisted NPL..... National Priority List Deletions
HMIRS..... Hazardous Materials Information Reporting System
MLTS..... Material Licensing Tracking System
MINES..... Mines Master Index File
NPL Liens..... Federal Superfund Liens
PADS..... PCB Activity Database System
US BROWNFIELDS..... A Listing of Brownfields Sites
DOD..... Department of Defense Sites
RAATS..... RCRA Administrative Action Tracking System
TRIS..... Toxic Chemical Release Inventory System
TSCA..... Toxic Substances Control Act
SSTS..... Section 7 Tracking Systems
FTTS..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

STATE OR LOCAL ASTM SUPPLEMENTAL

HSWDS..... Hazardous Substance Waste Disposal Site Inventory

EDR PROPRIETARY HISTORICAL DATABASES

Coal Gas..... Former Manufactured Gas (Coal Gas) Sites

BROWNFIELDS DATABASES

US BROWNFIELDS..... A Listing of Brownfields Sites
Brownfields..... Brownfields Site List

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

Done

FEDERAL ASTM STANDARD

CERCLIS: The Comprehensive Environmental Response, Compensation and Liability Information System contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).
CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

A review of the CERCLIS list, as provided by EDR, and dated 06/16/2003 has revealed that there is 1 CERCLIS site within approximately 0.625 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
EPA BUILDING	290 BROADWAY	1/4 - 1/2 ENE	AP217	254

CERCLIS-NFRAP: As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund Action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

A review of the CERC-NFRAP list, as provided by EDR, and dated 06/11/2003 has revealed that there is 1 CERC-NFRAP site within approximately 0.375 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
RADIUM LUMINOUS MATERIALS CO	55 LIBERTY STREET	1/4 - 1/2 SE	AD162	202

Done

RCRIS: Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs): generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs): generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs): generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

A review of the RCRIS-LQG list, as provided by EDR, and dated 07/11/2003 has revealed that there are 8 RCRIS-LQG sites within approximately 0.375 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
MTA NYCT - WORLD TRADE CENTER	*PARK PL & CHURCH ST*	*1/8 - 1/4 NE*	*M121*	*158*
222 BROADWAY LLC	*222 BROADWAY*	*1/8 - 1/4 E*	*R129*	*170*
MTA NYCT - RECTOR STREET STATI	*RECTOR & GREENWICH ST*	*1/4 - 1/2 SSW*	*AA154*	*195*
MTA NYCT - CITY HALL STATION	*BROADWAY & MURRAY ST*	*1/4 - 1/2 ENE*	*AE171*	*208*
TRIBECA CONDOMINIUM THE	*303 GREENWICH ST*	*1/4 - 1/2 NNE*	*AI185*	*225*
ANACOMP INC	*157 CHAMBERS ST - 2ND F*	*1/4 - 1/2 NNE*	*AN198*	*240*

EXECUTIVE SUMMARY

Lower Elevation	Address	Dist / Dir	Map ID	Page
CUSHMAN & WAKEFIELD - AMER	*200 VESEY ST*	*1/8 - 1/4 NNW*	*J87*	*113*
BLACK DIAMOND LLC	*19 RECTOR ST*	*1/4 - 1/2 SSW*	*T153*	*195*

RCRIS: Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs): generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs): generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs): generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

A review of the RCRIS-SQG list, as provided by EDR, and dated 07/11/2003 has revealed that there are 62 RCRIS-SQG sites within approximately 0.375 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
US CUSTOMS LABORATORY	*6 WORLD TRADE CENTER RM*	*0 - 1/8 E*	*A7*	*15*
FUJI PHOTO FILM USA INC	*3 WORLD TRADE CTR - HH*	*0 - 1/8 E*	*A8*	*16*
US CUSTOMS HOUSE	*6 WORLD TRADE CENTER-BA*	*0 - 1/8 E*	*A9*	*16*
METROPOLITAN LIFE INSURANCE CO	*22 CORTLANDT ST*	*0 - 1/8 SE*	*F27*	*39*
130 LIBERTY STREET LLC	*130 LIBERTY ST*	*0 - 1/8 SSE*	*G39*	*57*
CON EDISON - BARCLAY STREET SU	*66 BARCLAY ST*	*1/8 - 1/4 NNE*	*I56*	*79*
CON EDISON - DEY STREET SERVIC	*2 DEY ST*	*1/8 - 1/4 ESE*	*O96*	*121*
195 PROPERTY ASSOCIATES	*195 BROADWAY*	*1/8 - 1/4 ESE*	*O98*	*123*
NYCTA - FULTON STREET STATION	*BROADWAY & FULTON ST*	*1/8 - 1/4 ESE*	*O104*	*138*
CONTRACT APPLICATIONS INC	*75 PARK PL*	*1/8 - 1/4 NNE*	*K109*	*143*
NYCTA - SPECIAL EQUIP LUBRICAT	*400 CHURCH ST & PARK PL*	*1/8 - 1/4 NE*	*Y136*	*181*
68 TRINITY PLACE MEZZANINE	*68 TRINITY PL*	*1/8 - 1/4 S*	*AA139*	*184*
120 CHURCH STREET IRS SERVICE	*120 CHURCH STEET*	*1/8 - 1/4 NE*	*Y140*	*184*
140 BROADWAY MSDW PROPERTIES L	*140 BROADWAY*	*1/8 - 1/4 SSE*	*S141*	*185*
EQUITABLE TOWER SILVERSTEIN LL	*120 BROADWAY*	*1/8 - 1/4 SSE*	*X144*	*187*
NEW YORK CITY SPORTSMANS CLUB	*24 MURRAY ST*	*1/4 - 1/2 ENE*	*Y151*	*194*
MTA NYCT - JOHN STREET PUMP RO	*JOHN & NASSAU ST*	*1/4 - 1/2 ESE*	*W152*	*195*
MTA NYCT - RECTOR STREET PUMP	*RECTOR ST & TRINITY PL*	*1/4 - 1/2 S*	*AA156*	*197*
KOSHERS HARRY	*93 NASSAU ST*	*1/4 - 1/2 ESE*	*AB158*	*199*
NYCTA	*WALL ST & BROADWAY*	*1/4 - 1/2 S*	*AC159*	*200*
FEDERAL RESERVE BANK	*33 LIBERTY ST*	*1/4 - 1/2 SE*	*AD161*	*201*
CON EDISON - 1 WALL ST	*1 WALL ST*	*1/4 - 1/2 SSE*	*AC164*	*203*
CITY OF NEW YORK THE	*253 BROADWAY 6TH FLOOR*	*1/4 - 1/2 ENE*	*AE167*	*205*
NYC DEPT OF GENERAL SERVICE	*253 BROADWAY - ROOM 130*	*1/4 - 1/2 ENE*	*AE168*	*206*
EQUITABLE BLUEPRINT & PHOTOPRI	*116 NASSAU ST*	*1/4 - 1/2 E*	*170*	*207*
NYCHA - CENTRAL OFFICE	*250 BROADWAY*	*1/4 - 1/2 ENE*	*AE172*	*208*
NEW YORK STOCK EXCHANGE	*11 WALL ST*	*1/4 - 1/2 SSE*	*AG177*	*215*
FIRST TECHNOLOGIES INC	*14 WALL ST*	*1/4 - 1/2 SSE*	*AG179*	*216*
MORGAN GUARANTY TRUST CO	*15 BROAD ST*	*1/4 - 1/2 SSE*	*AG180*	*216*
WINTOR PRESS DBA MINUTEMAN PRE	*157 CHAMBERS ST*	*1/4 - 1/2 NNE*	*AI183*	*223*
CHASE MANHATTAN BANK	*1 CHASE MANHATTAN PLZ*	*1/4 - 1/2 SE*	*AJ187*	*227*
CHASE MANHATTAN BANK	*1 CHASE PLZ BASEMENT 2*	*1/4 - 1/2 SE*	*AJ188*	*228*
CON EDISON - CHASE PLAZA	*1 CHASE PL*	*1/4 - 1/2 SE*	*AJ189*	*228*
MC WALTERS J P INC	*106 FULTON ST*	*1/4 - 1/2 ESE*	*AK191*	*230*
PACE UNIVERSITY HASKINS LAB	*41 PARK ROW*	*1/4 - 1/2 E*	*AH192*	*230*

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
NATIONAL PARK SERVICE	*26 WALL ST - FEDERAL HA*	*1/4 - 1/2 SSE*	*AG193*	*231*
SEA-PATH MEDICAL LABORATORY	*150 NASSAU ST*	*1/4 - 1/2 E*	*AH195*	*232*
270 BROADWAY ASSOCIATES LLC	*270 BROADWAY*	*1/4 - 1/2 ENE*	*AO201*	*242*
ALMARK HOLDING CO - EMPTY LOT	*121 READE ST*	*1/4 - 1/2 NE*	*206*	*246*
CON EDISON - 65TH FLOOR VAULT	*40 WALL ST*	*1/4 - 1/2 SSE*	*208*	*248*
MRC MGMT LLC - 20 BROAD STREET	20 BROAD ST	1/4 - 1/2 SSE	209	248
NEW YORK CITY PUBLIC DEVELOPME	*161 WILLIAMS ST*	*1/4 - 1/2 ESE*	*AK210*	*248*
NYC TWEED COURTHOUSE	*52 CHAMBERS ST*	*1/4 - 1/2 ENE*	*AO212*	*250*
NEW YORK DOWNTOWN HOSPITAL	*170 WILLIAM ST*	*1/4 - 1/2 ESE*	*213*	*250*

Lower Elevation	Address	Dist / Dir	Map ID	Page
EBASCO SERVICES INC	*TWO WORLD TRADE CENTER*	*0 - 1/8 WNW*	*C13*	*20*
NYNEX MATERIEL ENTERPRISES CO	*2 WORLD TRADE CENTER*	*0 - 1/8 WNW*	*C14*	*21*
ZIM-AMERICAN ISRAELI SHIPPING	*1 WORLD TRADE CTR STE 2*	*0 - 1/8 WSW*	*E29*	*41*
WPIX FM & TV TRANSMITTER	*#1 WORLD TRADE CENTER*	*0 - 1/8 WSW*	*E30*	*41*
EVERGREEN MARINE CORP	*1 WORLD TRADE CENTER RM*	*0 - 1/8 WSW*	*E34*	*53*
MERRILL LYNCH & CO	*225 LIBERTY ST*	*0 - 1/8 WSW*	*E35*	*53*
FITCH GRAPHICS	*130 CEDAR ST*	*0 - 1/8 SSW*	*H43*	*66*
REALISTIC PRINTING CORP	*130 CEDAR ST7TH FLOOR*	*0 - 1/8 SSW*	*H46*	*70*
CON EDISON AT BELL ATLANTIC	*140 WEST ST*	*1/8 - 1/4 NNW*	*J83*	*110*
NEW YORK TELEPHONE CO	*140 WEST ST*	*1/8 - 1/4 NNW*	*J86*	*113*
BATTERY PARK CC TOWERA	*200 LIBERTY ST*	*1/8 - 1/4 WSW*	*N88*	*114*
BROOKFIELD PROPERTIES LLC	*1 LIBERTY PLAZA*	*1/8 - 1/4 WSW*	*N89*	*114*
OLYMPIA & YORK PROPERTIES	*200 LIBERTY ST*	*1/8 - 1/4 WSW*	*N90*	*115*
75 WEST CONSTRUCTION CORP	*110 WASHINGTON ST*	*1/8 - 1/4 SSW*	*T127*	*169*
MERRILL LYNCH WORLD FINANCIAL	*250 VESEY ST*	*1/4 - 1/2 NW*	*166*	*205*
BATTERY PARK CITY PARKS CORP	*2 S END AVE 1ST FLOOR W*	*1/4 - 1/2 SW*	*AL194*	*231*
FOUR SEASONS DRY CLEANERS	*21 SOUTH END AVE*	*1/4 - 1/2 SW*	*AL204*	*245*
SOUTH COVE CLEANER	*2 S.END AVE*	*1/4 - 1/2 SW*	*AL211*	*249*

ERNS: The Emergency Response Notification System records and stores information on reported releases of oil and hazardous substances. The source of this database is the U.S. EPA.

A review of the ERNS list, as provided by EDR, and dated 12/31/2002 has revealed that there are 2 ERNS sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
HUDSON RIVER CLOSE TO WORLD TR	HUDSON RIVER CLOSE TO W	0 - 1/8 ENE	A1	6
72 S 1 WORLD TRADE CENTER	72 S 1 WORLD TRADE CENT	0 - 1/8 ENE	A2	6

STATE ASTM STANDARD

SWF/LF: The Solid Waste Facilities/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. The data come from the list.

A review of the SWF/LF list, as provided by EDR, has revealed that there are 6 SWF/LF sites within approximately 0.625 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
EDGEMERE SLF	125 WORTH STREET	1/2 - 1 NE	AU231	280

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
PENNSYLVANIA AVE DEMO SLF	125 WORTH STREET	1/2 - 1 NE	AU232	280
FERRY POINT SLF	125 WORTH STREET	1/2 - 1 NE	AU234	282
FOUNTAIN AVENUE SLF	125 WORTH STREET	1/2 - 1 NE	AU235	282
BROOKFIELD AVENUE SLF	125 WORTH STREET	1/2 - 1 NE	AU236	283
Lower Elevation	**Address**	**Dist / Dir**	**Map ID**	**Page**
BERGEN BASIN FUEL	1 WORLD TRADE CENTER	0 - 1/8 WSW	E32	45

LTANKS: Leaking Storage Tank Incident Reports. These records contain an inventory of reported leaking storage tank incidents reported from 4/1/86 through the most recent update. They can be either leaking underground storage tanks or leaking aboveground storage tanks. The causes of the incidents are tank test failures, tank failures or tank overfills

A review of the LTANKS list, as provided by EDR, and dated 01/01/2002 has revealed that there are 33 LTANKS sites within approximately 0.625 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
NEW YORK CITY FD ENG 10	124 LIBERTY ST	0 - 1/8 SSE	G42	65
82-23 BROADWAY/QUNS/NYTEL	82-23 BROADWAY	1/4 - 1/2 S	AC165	204
75 WARREN ST	75 WARREN ST	1/4 - 1/2 NE	169	206
1 NASSAU PL/S.I/ATNT NASS	1 NASSAU PLACE	1/4 - 1/2 SSE	AG182	222
63=07 BROADWAY/QUNS/EXXON	63-07 BROADWAY	1/4 - 1/2 S	AM196	232
55-02 BROADWAY	55-02 BROADWAY	1/4 - 1/2 S	AM207	247
READE-CHURCH EQUITIES	78 - 82 READE ST	1/4 - 1/2 NE	214	250
49-60 BROADWAY	49-60 BROADWAY	1/4 - 1/2 S	AM215	251
32-12 BROADWAY/CHASE MANH	32-12 BROADWAY	1/4 - 1/2 S	216	252
OVERFILL ON NEW ST&BEAVER	50 NEW ST.BY BEAVER ST.	1/4 - 1/2 S	AQ218	254
62 THOMAS STREET	***62 THOMAS STREET***	***1/4 - 1/2 NE***	***219***	***255***
305 BROADWAY/MANHATTAN	305 BROADWAY	1/4 - 1/2 NE	AP220	257
60 BROAD ST/MANH/MCI BLDG	60 BROAD STREET	1/4 - 1/2 S	AQ221	258
60 BROAD ST/NEW YORK/RCA	60 BROAD ST.	1/4 - 1/2 S	AQ222	259
AT & T	33 THOMAS ST	1/4 - 1/2 NE	AR224	265
Not reported	16 LAFAYETTE ST	1/2 - 1 ENE	AS227	276
NYC PD HEADQUATERS	1 POLICE PLAZA	1/2 - 1 E	AT228	277
51 LEONARD STREET	51 LEONARD STREET	1/2 - 1 NE	229	278
NYPD	109 PARK ROW	1/2 - 1 E	AT230	279
Not reported	125 WORTH ST	1/2 - 1 NE	AU233	281
60 CENTRE ST	60 CENTRE ST	1/2 - 1 ENE	AV237	283
250 CHURCH ST	250 CHURCH ST	1/2 - 1 NE	239	284
Not reported	211 WEST BROADWAY	1/2 - 1 NNE	242	288
SMITH	***7 ST JAMES PLACE***	***1/2 - 1 E***	***AW243***	***289***
SMITH HOUSES	***3 ST. JAMES PLACE***	***1/2 - 1 E***	***AW244***	***291***
358 BROADWAY	59 FRANKLIN ST	1/2 - 1 NE	AX245	302
54 FRANKLIN ST/BKLYN	54 FRANKLIN ST	1/2 - 1 NE	AX246	303
80 CENTRE ST/STATE OFFICE	80 CENTRE ST	1/2 - 1 ENE	247	304
Lower Elevation	**Address**	**Dist / Dir**	**Map ID**	**Page**
CHECKER SERVICE STA. INC	165-25 LIBERTY AVE	0 - 1/8 SSW	B12	19
90 WEST ST	90 WEST ST	1/8 - 1/4 SW	L79	106
BARCLAYS BANK BUILDING	***75 WALL ST***	***1/4 - 1/2 SSE***	***226***	***273***
38 PEARL ST/MANHATTAN	38 PEARL STREET	1/2 - 1 S	240	286
34 STATE RD./BREEZY PT./S	34 STATE RD.	1/2 - 1 S	241	287

EXECUTIVE SUMMARY

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Environmental Conservation's Petroleum Bulk Storage (PBS) Database

A review of the UST list, as provided by EDR, and dated 01/01/2002 has revealed that there are 37 UST sites within approximately 0.375 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
ENGINE 10 / LADDER 10	***124 LIBERTY STREET***	***0 - 1/8 SSE***	***G41***	***59***
THE BANK OF NEW YORK	101 BARCLAY ST	1/8 - 1/4 NNE	I70	94
176 BWAY OWNERS	176 BROADWAY	1/8 - 1/4 SE	Q95	120
195 BROADWAY	195 BROADWAY(BETWEEN DE	1/8 - 1/4 ESE	O99	123
170 BROADWAY	***170 BROADWAY***	***1/8 - 1/4 SE***	***Q100***	***131***
WFP ONE LIBERTY PLAZA CO., L.P	***165 BROADWAY***	***1/8 - 1/4 SE***	***Q103***	***136***
COLLEGIATE CHURCH CORPORATION	198 BROADWAY	1/8 - 1/4 ESE	O107	140
160 BROADWAY	160 BROADWAY	1/8 - 1/4 SE	Q111	144
15 PARK ROW	15 PARK ROW	1/8 - 1/4 E	R125	162
225 BROADWAY	225 BROADWAY	1/8 - 1/4 E	V133	178
INSURANCE SOCIETY OF NY	101 MURRAY STREET	1/8 - 1/4 NNE	Z142	185
87 NASSAU STREET	87 NASSAU STREET	1/4 - 1/2 ESE	AB155	196
THE FRANKLIN BUILDING CONDOMIN	9-15 MURRAY STREET	1/4 - 1/2 ENE	AE163	202
HIGHLAND DEVELOPMENT LLC	71 BROADWAY	1/4 - 1/2 S	AC173	209
31 PARK ROW	31 PARK ROW	1/4 - 1/2 E	AH178	215
BATTERY PARKING GARAGE	***70 GREENWICH STREET***	***1/4 - 1/2 SSW***	***181***	***217***
HUDSON-CHAMBERS CO	157 CHAMBERS ST	1/4 - 1/2 NNE	AI184	223
CHASE MANHATTAN BANK	ONE CHASE MANHATTAN PLA	1/4 - 1/2 SE	AJ186	225
38 PARK ROW RESIDENCE CORP	145 NASSAU ST	1/4 - 1/2 E	AH190	229
SHANGHAI COMMERCIAL BANK BLDG	135 WILLIAM STREET	1/4 - 1/2 ESE	AK199	240
KEVIN J STEPHEN CORP	13 HUDSON ST	1/4 - 1/2 NNE	AN200	241
ARTHUR LEVITT SOB	270 BROADWAY	1/4 - 1/2 ENE	AO202	243
ONE HUDSON PARK	16 HUDSON STREET	1/4 - 1/2 NNE	AN205	245

Lower Elevation	Address	Dist / Dir	Map ID	Page
SEVEN WORLD TRADE CENTER	7 WORLD TRADE CENTER	0 - 1/8 WSW	E20	26
SALOMON SMITH BARNEY	7 WORLD TRADE CENTER	0 - 1/8 WSW	E21	28
PORT AUTHORITY OF NEW YORK / N	***1 WORLD TRADE CENTER 88***	***0 - 1/8 WSW***	***E33***	***46***
130 CEDAR STREET	130 CEDAR STREET	0 - 1/8 SSW	H45	68
J. HILL ASSOCIATES/POST TOWERS	75 WEST STREET	1/8 - 1/4 SW	L113	146
BANK OF NEW YORK	***110 WASHINGTON ST***	***1/8 - 1/4 SSW***	***T126***	***163***
111 PKG. CORP.	111 WASHINGTON STREET	1/8 - 1/4 SSW	T130	174
RESIDENTIAL APARTMENT BLD	350 ALBANY ST	1/4 - 1/2 WSW	U150	193
40 RECTOR STREET	***40 RECTOR STREET***	***1/4 - 1/2 SSW***	***157***	***197***
PARC PLACE	225 RECTOR PLACE	1/4 - 1/2 SW	160	200
LIBERTY TERRACE	380 RECTOR PLACE	1/4 - 1/2 WSW	AF174	210
RIVER ROSE	333 RECTOR PLACE	1/4 - 1/2 WSW	AF175	212
LIBERTY HOUSE	377 RECTOR PLACE	1/4 - 1/2 WSW	AF176	213
THE REGATTA CONDOMINIOM	21 SOUTH END AVE	1/4 - 1/2 SW	AL203	244

NY VCP: Voluntary Cleanup Agreements. The voluntary remedial program uses private monies to get contaminated sites remediated to levels allowing for the sites' productive use. The program covers virtually any kind of site and contamination.

A review of the VCP list, as provided by EDR, and dated 06/17/2003 has revealed that there is 1 VCP

site within approximately 0.625 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
CON EDISON - CROSS/LITTLE WATE	60 CENTRE ST	1/2 - 1 ENE	AV238	284

FEDERAL ASTM SUPPLEMENTAL

FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.

A review of the FINDS list, as provided by EDR, and dated 07/25/2003 has revealed that there are 15 FINDS sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
US CUSTOMS LABORATORY	*6 WORLD TRADE CENTER RM*	*0 - 1/8 E*	*A7*	*15*
FUJI PHOTO FILM USA INC	*3 WORLD TRADE CTR - HH*	*0 - 1/8 E*	*A8*	*16*
US CUSTOMS HOUSE	*6 WORLD TRADE CENTER-BA*	*0 - 1/8 E*	*A9*	*16*
CON ED V 0256	1 W BROADWAY	0 - 1/8 NNE	D16	22
METROPOLITAN LIFE INSURANCE CO	*22 CORTLANDT ST*	*0 - 1/8 SE*	*F27*	*39*
130 LIBERTY STREET LLC	*130 LIBERTY ST*	*0 - 1/8 SSE*	*G39*	*57*

Lower Elevation	Address	Dist / Dir	Map ID	Page
EBASCO SERVICES INC	*TWO WORLD TRADE CENTER*	*0 - 1/8 WNW*	*C13*	*20*
NYNEX MATERIEL ENTERPRISES CO	*2 WORLD TRADE CENTER*	*0 - 1/8 WNW*	*C14*	*21*
ZIM-AMERICAN ISRAELI SHIPPING	*1 WORLD TRADE CTR STE 2*	*0 - 1/8 WSW*	*E29*	*41*
WPIX FM & TV TRANSMITTER	*#1 WORLD TRADE CENTER*	*0 - 1/8 WSW*	*E30*	*41*
EVERGREEN MARINE CORP	*1 WORLD TRADE CENTER RM*	*0 - 1/8 WSW*	*E34*	*53*
MERRILL LYNCH & CO	*225 LIBERTY ST*	*0 - 1/8 WSW*	*E35*	*53*
FITCH GRAPHICS	*130 CEDAR ST*	*0 - 1/8 SSW*	*H43*	*66*
REALISTIC PRINTING CORP	*130 CEDAR ST7TH FLOOR*	*0 - 1/8 SSW*	*H46*	*70*
STAR BRITE PRESS INCORPORATED	130 CEDAR STREET 10TH F	0 - 1/8 SSW	H52	76

STATE OR LOCAL ASTM SUPPLEMENTAL

AST: The Aboveground Storage Tank database contains registered ASTs. The data come from the Department of Environmental Conservation's Petroleum Bulk Storage (PBS) Database.

A review of the AST list, as provided by EDR, and dated 01/01/2002 has revealed that there are 5 AST sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
ENGINE 10 / LADDER 10	*124 LIBERTY STREET*	*0 - 1/8 SSE*	*G41*	*59*
114 LIBERTY CONDO C/O A.S. WAR	114 LIBERTY STREET	0 - 1/8 SSE	G48	71

EXECUTIVE SUMMARY

Lower Elevation	Address	Dist / Dir	Map ID	Page
BELL ATLANTIC	2 WORLD TRADE CENTER	0 - 1/8 SSW	B6	10
ONE WORLD TRADE CENTER	1 WORLD TRADE CENTER	0 - 1/8 WSW	E31	42
PORT AUTHORITY OF NEW YORK / N	***1 WORLD TRADE CENTER 88***	***0 - 1/8 WSW***	***E33***	***46***

CBS AST: Chemical Bulk Storage Database. Registration data collected as required by 6 NYCRR Part 596. It includes facilities storing hazardous substances listed in 6 NYCRR Part 597, in aboveground tanks with capacities of 185 gallons or greater, and/or in underground tanks of any size. Includes facilities registered (and closed) since effective date of CBS regulations (July 15, 1988) through the date request is processed.

A review of the CBS AST list, as provided by EDR, and dated 01/01/2002 has revealed that there are 2 CBS AST sites within approximately 0.375 miles of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
WORLD TRADE CENTER	RIVER WATER PUMP STATIO	0 - 1/8 WNW	C24	33
OLYMPIA AND YORK PROPERTIES	4 WORLD FINANCIAL CENTE	0 - 1/8 WNW	C26	38

MOSF AST: Major Oil Storage Facilities Database. Facilities are licensed pursuant to Article 12 of the Navigation Law, 6 NYCRR Part 610 and 17 NYCRR Part 30. These facilities may be onshore facilities or vessels, with petroleum storage capacities of 400,000 gallons or greater. Includes MOSF's licensed or closed since April 1, 1986, (responsibility was transferred from DOT on October 13, 1985) plus available data obtained from DOT facilities licensed since Article 12 became law on April 1, 1978.

A review of the MOSF AST list, as provided by EDR, and dated 01/01/2002 has revealed that there is 1 MOSF AST site within approximately 0.625 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
AT&T	33 THOMAS STREET	1/4 - 1/2 NE	AR223	260

SPILLS: Data collected on spills reported to NYSDEC. is required by one or more of the following: Article 12 of the Navigation Law, 6 NYCRR Section 613.8 (from PBS regs), or 6 NYCRR Section 595.2 (from CBS regs). It includes spills active as of April 1, 1986, as well as spills occurring since this date.

A review of the NY Spills list, as provided by EDR, has revealed that there are 87 NY Spills sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
MANHOLE #TM3387	WEST 3RD 7 WEST BROADWA	0 - 1/8 NE	A11	18
VESSEY ST/WEST BROADWAY	VESSEY ST/WEST BROADWAY	0 - 1/8 NNE	D15	21
WORLD TRADE CENTER	VESEY ST / WEST BROAD	0 - 1/8 NNE	D17	22
WTC	VESEY ST / W BROADWAY	0 - 1/8 NNE	D18	23
MANHOLE #59942	FULTON ST / CHURCH ST	0 - 1/8 E	19	25
VAULE 2522	22 COURTLAND ST	0 - 1/8 SE	F28	40
132-06 LIBERTY AVE/QUEENS	132-06 LIBERTY AVENUE	0 - 1/8 SSE	G36	54
Not reported	130 LIBERTY ST	0 - 1/8 SSE	G37	55
Not reported	130 LIBERTY ST	0 - 1/8 SSE	G38	56
DEUTSCHE BANK	130 LIBERTY	0 - 1/8 SSE	G40	58
Not reported	114 LIBERTY ST	0 - 1/8 SSE	G47	70
111-04 LIBERTY AVE/QUEENS	111-04 LIBERTY AVENUE	0 - 1/8 SSE	G49	73

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
BARCLAY ST & W BROADWAY	BARCLAY ST / W BROADW	1/8 - 1/4 NE	I53	76
81 BARCLY ST	81 BARCLY ST	1/8 - 1/4 NE	I54	77
WORLD TRADE CENTER SUB	66 BARCLAY ST	1/8 - 1/4 NNE	I55	78
TRADE CTR SUBSTATION	66 BARCLAY ST	1/8 - 1/4 NNE	I57	80
TRADE CENTER # 1 SUBSTATI	66 BARKLEY ST	1/8 - 1/4 NNE	I58	81
FEEDER 38M13	66 BARCKLEY ST	1/8 - 1/4 NNE	I59	82
TRADE CENTER SUB STATION	66 BARCLAY ST	1/8 - 1/4 NNE	I60	83
TRADE CENTER SUBSTATION	66 BARCLAY ST	1/8 - 1/4 NNE	I61	84
WORLD TRADE CENTER SS	66 BARCLAY ST	1/8 - 1/4 NNE	I62	85
TRADE CENTER #1 SUB STA	66 BARKLEY ST	1/8 - 1/4 NNE	I63	86
FEEDER 38M11	66 BARKLAY ST	1/8 - 1/4 NNE	I64	87
TRADE CENTER	66 BARCLAY STREET	1/8 - 1/4 NNE	I65	88
TRADE CENTER SUB STATION	66 BARKLEY ST	1/8 - 1/4 NNE	I66	89
TRADE CENTER #1	66 BARCLAY ST	1/8 - 1/4 NNE	I67	90
CON ED SUB STATION	66 BARCLAY ST	1/8 - 1/4 NNE	I68	91
TRADE CENTER SUB STATION	66 BARCLAY ST	1/8 - 1/4 NNE	I69	92
Not reported	101 BARKLEY ST	1/8 - 1/4 NNE	I71	97
TRADE CENTER SUBSTATION	65 BARCLAY ST	1/8 - 1/4 NE	I72	98
CENTURY 21	22 CORTLAND	1/8 - 1/4 SE	F80	107
VAULT #4646	46 BARCLAY ST	1/8 - 1/4 ENE	M81	108
VAULT 0581	CHURCH ST/BARCLAY ST	1/8 - 1/4 ENE	M92	116
220 TH ST. BROADWAY	220TH ST. BROADWAY	1/8 - 1/4 ESE	O93	118
137 GREENWICH STREET	137 GREENWICH STREET	1/8 - 1/4 S	P94	119
Not reported	195 BROADWAY	1/8 - 1/4 ESE	O97	122
170 BROADWAY	***170 BROADWAY***	***1/8 - 1/4 SE***	***Q100***	***131***
90 CHURCH ST/US POSTALSVC	90 CHURCH ST	1/8 - 1/4 ENE	M101	133
US POST OFFICE	90 CHURCH ST	1/8 - 1/4 ENE	M102	135
MANHOLE 35350	FULTON ST/BROADWAY	1/8 - 1/4 ESE	O105	138
COLLEGIATE DUTCH REFORM C	198 BROADWAY	1/8 - 1/4 ESE	O106	139
MANHOLE DM27035	160.BROADWAY	1/8 - 1/4 SE	Q110	143
Not reported	43 PARK PLACE	1/8 - 1/4 NE	M112	145
ANN ST AND PARKROW	ANN ST / PARKROW	1/8 - 1/4 E	R114	151
VAULT 359	BROADWAY/ANN ST	1/8 - 1/4 E	R115	152
BARCLAY ST. OF CHURCH ST.	BARCLAY ST. OF CHURCH S	1/8 - 1/4 ENE	M116	153
MAN HOLE DM58173	BROADWAY / LIBERTY ST	1/8 - 1/4 SSE	S117	154
MH 0033	LIBERTY / BROADWAY	1/8 - 1/4 SSE	S118	155
TMR 0033	BRAODWAY/LIBERTY ST	1/8 - 1/4 SSE	S119	156
VAULT #8917 IN FRONT OF	86 TRININTY PL	1/8 - 1/4 S	P120	157
145 BROADWAY	145 BROADWAY	1/8 - 1/4 SSE	S122	159
85 TRINITY PLACE / BROOKL	85 TRINITY PLACE	1/8 - 1/4 S	P123	160
Not reported	25 PARK PLACE	1/8 - 1/4 ENE	M124	161
VAULT 4307	17 JOHN ST	1/8 - 1/4 ESE	Q128	169
MANHOLE 421	225 SO BROADWAY	1/8 - 1/4 E	V132	177
MANHOLE #51070	MAIDEN LN / LIBERTY P	1/8 - 1/4 SE	W134	179
132 BROADWAY	132 BROADWAY	1/8 - 1/4 SSE	X135	180
42-08 MURRAY ST/QUEENS	42-08 MURRAY STREET	1/8 - 1/4 NE	Y137	182
Not reported	MURRAY ST / GREENWICH	1/8 - 1/4 NNE	Z138	183
COLLEGE OF INSURANCE	101 MURRAY ST	1/8 - 1/4 NNE	Z143	186
WEST 36TH ST AND	BROADWAY	1/8 - 1/4 SSE	X145	188
280	BROADWAY	1/8 - 1/4 SSE	X146	189
BROADWAY & LAFAYETTE	BROADWAY / LAFAYETTE ST	1/8 - 1/4 SSE	X147	190
FROM 23 TO 31ST ST	BROADWAY	1/8 - 1/4 SSE	X148	191
116TH ST SUBWAY STATION	BROADWAY	1/8 - 1/4 SSE	X149	192

Lower Elevation	Address	Dist / Dir	Map ID	Page
WORLD TRADE CENTER B-7	7 WORLD TRADE CENTER	0 - 1/8 SSW	B3	6

EXECUTIVE SUMMARY

Lower Elevation	Address	Dist / Dir	Map ID	Page
WORLD TRADE CENTER #7	7 WORLD TRADE CENTER	0 - 1/8 SSW	B4	7
WORLD TRADE CENTER #7	7 WORLD TRADE CENTER	0 - 1/8 SSW	B5	8
MH 47895	LIBERTY/WASHINGTON ST	0 - 1/8 SW	B10	17
WEST ST AND LIBERTY ST	WEST ST / LIBERTY ST	0 - 1/8 WSW	E22	31
WEST & LIBERTY AVENUE	WEST / LIBERTY AVE.	0 - 1/8 WSW	E23	32
MANHOLE #61063	VESEY ST / WASHINGTON S	0 - 1/8 N	D25	37
WTC	130 CEDAR STREET	0 - 1/8 SSW	H44	66
ONE WORLD TRANDE CENTER	1 WORLD TRADE CENTER	0 - 1/8 WNW	C50	74
HUDSON RIVER	1 WORLD TRADE CENTER	0 - 1/8 WNW	C51	75
Not reported	VESEY ST/WEST ST	1/8 - 1/4 NNW	J73	99
MANHOLE 60860	WEST ST / VESEY ST	1/8 - 1/4 NNW	J74	100
FDNY	VESEY/WEST	1/8 - 1/4 NNW	J75	102
VERIZON MANHOLE 102	BARCLAY/WASHINGTON ST	1/8 - 1/4 N	K76	103
Not reported	90 BARKLEY ST	1/8 - 1/4 N	K77	104
90 WEST STREET	90 WEST STREET	1/8 - 1/4 SW	L78	105
VERIZON BLDG	140 WEST ST	1/8 - 1/4 NNW	J82	109
VERIZON	140 WEST ST	1/8 - 1/4 NNW	J84	110
Not reported	140 WEST ST	1/8 - 1/4 NNW	J85	112
DOW JONES	200 LIBERTY ST	1/8 - 1/4 WSW	N91	115
Not reported	BARKLEY ST/WEST ST	1/8 - 1/4 NNW	J108	141
Not reported	ALBANY ST/S. END AVE	1/8 - 1/4 WSW	U131	176

BROWNFIELDS DATABASES

NY VCP: Voluntary Cleanup Agreements. The voluntary remedial program uses private monies to get contaminated sites remediated to levels allowing for the sites' productive use. The program covers virtually any kind of site and contamination.

A review of the VCP list, as provided by EDR, and dated 06/17/2003 has revealed that there is 1 VCP site within approximately 0.625 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
CON EDISON - CROSS/LITTLE WATE	60 CENTRE ST	1/2 - 1 ENE	AV238	284

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
~~S & T ASSOCIATES~~	SHWS, INST CONTROL
~~BARETTO POINT~~	Brownfields
~~NORTHEAST MARINE TERMINAL~~	SWF/LF
~~VARLOTTA CONSTRUCTION CORP.~~	SWF/LF
~~NHE REALTY~~	LTANKS
~~BARGE E-15/HUDSON RIVER~~	LTANKS
~~LEHMAN COLLEGE CUNY/BX~~	LTANKS
~~HERBERT LEHMAN COLLEGE/BX~~	LTANKS
~~6645 BROADWAY/BX/OMNI~~	LTANKS
~~HENRY HUDSON BRIDGE BLD~~	LTANKS
~~HENRY HUDSON BRIDGE~~	LTANKS
~~HENRY HUDSON BRIDGE~~	LTANKS
~~HENRY HUDSON BRIDGE~~	LTANKS
~~HUDSON RIVER PKWY SO/BX~~	LTANKS
~~398 KINGS H'WAY/ISLAND TR~~	LTANKS
L.I.E. WEST AT 48TH ST	LTANKS
1180 MORRIS PARK AVE/BX	LTANKS
NEW DORP AVE & HYLAND BLV	LTANKS
43 NEW DORP PLAZA NORTH	LTANKS
54 NEW DORP PLAZA/S.I.	LTANKS
STATUE OF LIBERTY	LTANKS
~~THROGS NECK ENTRANCE RAMP~~	LTANKS
CHASE BUILDING SERVICES	UST
313-315 BROADWAY	AST
120 LIBERTY STREET LLC	AST
~~STRATA REALTY~~	RCRIS-SQG, FINDS
20 BROAD STREET CO INC	RCRIS-SQG, FINDS
~~SUNOHIO PCBX UNIT-LONG ISLAND RAIL~~	RCRIS-SQG, FINDS
E C TECHNOLOGIES INC	RCRIS-SQG, FINDS
~~MTA NYCT - 2ND AVE SUBWAY~~	RCRIS-SQG, FINDS
~~NYC BD OF ED - NEW STUYVESANT HIGH~~	RCRIS-SQG, FINDS
UNITED STATES POSTAL SERVICE	RCRIS-SQG, FINDS
MENDIK REALTY - 100 CHURCH STREET	RCRIS-SQG, FINDS
GUARDIAN LIFE INSURANCE CO	RCRIS-SQG, FINDS
~~LYNN ART~~	RCRIS-SQG, FINDS
~~CREST STUDIOS~~	RCRIS-SQG, FINDS
~~HUDSON TELEGRAPH ASSOCIATES~~	RCRIS-SQG, FINDS
~~HUDSON PRINTING CO INC~~	RCRIS-SQG, FINDS
TRINITY CHURCH	RCRIS-SQG, FINDS
~~TRINITY REAL ESTATE - 205 HUDSON S~~	RCRIS-SQG, FINDS
~~MTA NYCT - 2ND AVE SUBWAY~~	RCRIS-SQG, FINDS
~~NATIONAL PARK SERVICE STATUE OF LI~~	RCRIS-SQG, FINDS
KELLARDS	RCRIS-SQG, FINDS
STATE-WHITEHALL CO THE	RCRIS-SQG, FINDS
NYC DEPT OF PARKS & RECREATION	RCRIS-SQG, FINDS
~~CLIPPER DIAMOND TOOL CO INC~~	RCRIS-SQG, FINDS
~~RUBIN BOB~~	RCRIS-SQG, FINDS
MENDIK REALTY - 110 WILLIAM STREET	RCRIS-SQG, FINDS
NYCDOT BATTERY PLACE #2232000	FINDS, RCRIS-LQG
CON ED AT 7 WTC AREA	FINDS, RCRIS-LQG
~~103 ST. & EAST RIVER~~	NY Spills
~~4083 NORTH 0740218 WEST~~	NY Spills
~~43TH ST & HUDSON RIVER~~	NY Spills
~~METHANE ODORS/15 RD. BROA~~	NY Spills
~~HUDSON DEPOT~~	NY Spills
~~CONED CONEY IS OIL IN LOT~~	NY Spills
~~171ST & WEST SIDE HWY~~	NY Spills
~~106 STREET~~	NY Spills
~~ARTHUR KILL RIVER/S.I.~~	NY Spills

EXECUTIVE SUMMARY

160 3RD AV &CROSS BAY BLV	NY Spills
MANHOLE #26166	NY Spills
BATTERY PARK CITY/ NEW YO	NY Spills
BATTERY PARK PIER/STATUE	NY Spills
BAYONNE, NEW JERSEY	NY Spills
SPRAINBROOK SUB-STATION	NY Spills
TUCKAHOE PARK	NY Spills
AMTRAK	NY Spills
1972,74 CEDAR AVENUE. / B	NY Spills
CENTRAL PARK POND	NY Spills
CENTRAL PARK LAKE,WEST	NY Spills
CON/EDISON 20 JAY ST.& JO — 1 mi	NY Spills
GATEWAY NATL/CROSS BAY BL	NY Spills
HARLEM RIVER DRIVE / W.24	NY Spills
HELLGATE EAST RIVER	NY Spills
HENRY HUDSON BRIDGE	NY Spills
HENRY HUSON BRIDGE	NY Spills
SHEEN ON HUDSON BY WTC — 1 mile	NY Spills
HUDSON RIVER/G.W.BRIDGE	NY Spills
37-50 HUDSON MANOR TERRAC	NY Spills
HUDSON RIVER	NY Spills
HUDSON RIVER/HARLEM RIVER	NY Spills
HUDSON RIVER/BATT.PARK CI	NY Spills
HUDSON & HARLEM RIVER/BX	NY Spills
HUDSON RIVER/G.WASH BRIDG	NY Spills
HUDSON RIVER&PIER 59/18TH	NY Spills
HUDSON RIVER/PIER 2632	NY Spills
HUTCHINSON RIVER/BX	NY Spills
JOHN STREET / BROOKLYN	NY Spills
SEWER ODOR	NY Spills
COCAINE CHEMISTS IN PARK	NY Spills
40 W MOSHUL0 PKWY/BX	NY Spills
2 MURRAY HOLBART ST/S.I.	NY Spills
N BND HUTCHINSON RIVER PK	NY Spills
NORTH RIVER BYPASS 5/16	NY Spills
NORTH RIVER STP BYPASS	NY Spills
WEST STREET	NY Spills
MH 1503	NY Spills
NEW LAME RD	NY Spills
NEW DOUGLASTON PUMP STATI	NY Spills
NEW DOUGLASTON P.S./ QUEE	NY Spills
STAPLETON ANCHORAGE	NY Spills
NEW DOUGLASTON PUMP STATI	NY Spills
NEW YORK HARBOR/MANHATTAN	NY Spills
15TH STREET AT PROSPECT	NY Spills
PARK DRIVE EAST PUMPING S	NY Spills
PARK DRIVE EAST / QUEENS	NY Spills
PARK DRIVE EAST PUMP STAT	NY Spills
PARK DRIVE EAST BYPASS	NY Spills
PARK DRIVE E PUMPING STA	NY Spills
PELHAM BAY PARK/RT 95/BX	NY Spills
BUNKERS GO BONKERS,BRONX	NY Spills
PIER 17 EAST RIVER	NY Spills
PIER 6/NEW YORK BAY/S.I.	NY Spills
PIER 90 & WEST 50TH ST	NY Spills
PIER 90 &WEST 50TH ST/MAN	NY Spills
PIER 63/N RIVER RD/MANH	NY Spills
PIER 16 EAST RIVER	NY Spills
URINE IN RANDALLS ISLAND	NY Spills
RANDALLS ISLD/E RAMP STOR	NY Spills
VAN BRUNT ST PUMP STATION	NY Spills
REG M49/E 49TH&E RIVER RD	NY Spills

EXECUTIVE SUMMARY

E RIVER BET 14TH ST & UN	NY Spills
E RIVER N OF MANN. BRIDGE	NY Spills
N RIVER WTP	NY Spills
BRUCKNER BLVD/BX RIVER AV	NY Spills
103RD & FDR DRIVE	NY Spills
EAST RIVER/72ND ST&FDR DR	NY Spills
NY POWER AUTHORITY BLDG	NY Spills
RAW SEWAGE NORTH RIVER WP	NY Spills
NORTH RIVER BETWEEN W.138	NY Spills
EAST RIVER AT HELL'S GATE	NY Spills
HARLEM RIVER DRIVE / NEW	NY Spills
NORTH RIVER PLANT	NY Spills
NORTH RIVER PLANT/MANHATT	NY Spills
W 138TH ST & 145TH ST/NOR	NY Spills
NORTH RIVER INTO THERIVER	NY Spills
E 16TH ST &	NY Spills
NORTH RIVER WWTP / NEW YO	NY Spills
EAST RIVER/QUEENS/TTLI	NY Spills
EAST RIVER/ASTORIA/QUEENS	NY Spills
EAST RIVER/BUOY #28	NY Spills
E RIVER/HELLS GATE TO U N	NY Spills
NO OF TRIBORO BRIDGE/QUNS	NY Spills
NORTH RIVER/NYCDEP	NY Spills
EAST RIVER/R'SEVELT IS. M	NY Spills
EAST RIVER/TRIBOROUGH	NY Spills
SETON FALLS PARK/BX	NY Spills
W SIDE OF SOUTH ST/QUEENS	NY Spills
M52 FEEDER LINE	NY Spills
3808 171ST ST/MANHATTAN	NY Spills
180 1ST ST/FT WASHINGTON	NY Spills
34 STATE RD./BREEZY POINT	NY Spills
WEST STREET / MANHATTEN	NY Spills
1604 BROADWAY & 49TH ST	NY Spills
TEXAS EASTERN/RIVER RD/SI	NY Spills
BARGE HITS PIER AT CASTLE	NY Spills
NO.TOWER/WORLD TRADE CENT	NY Spills
FT TRYON PARK/CORBIN DR	NY Spills
OWLS HEAD BYPASS/REGULATO	NY Spills
STAPLETON ANCHORAGE	NY Spills
VAN CORTLANDT PARK/BX	NY Spills
VAN CORTLAND PARK/PKWY SO	NY Spills
MANHOLE TM6539	NY Spills
955 WASHINGTON AVE	NY Spills
MANHOLE 59896	NY Spills
MANHOLE 829	NY Spills
3RD AND WILLIS AVE. BRIDG	NY Spills
PORT AUTHORITY	NY Spills
1 WORLD TRADE CENTER/MANH	NY Spills
CON EDISON - WEST 18TH ST. GAS WOR	VCP
CON EDISON - ROOSEVELT ST. STATION	VCP
BROOKLYN GAS LIGHT CO.	Coal Gas

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL ASTM STANDARD								
~~NPL~~		1.125	0	0	0	0	0	0
Proposed NPL		1.125	0	0	0	0	0	0
CERCLIS		0.625	0	0	1	0	NR	1
CERC-NFRAP		0.375	0	0	1	NR	NR	1
CORRACTS		1.125	0	0	0	0	0	0
RCRIS-TSD		0.625	0	0	0	0	NR	0
RCRIS Lg. Quan. Gen.		0.375	0	3	5	NR	NR	8
RCRIS Sm. Quan. Gen.		0.375	13	16	33	NR	NR	62
ERNS		0.125	2	NR	NR	NR	NR	2
STATE ASTM STANDARD								
State Haz. Waste		1.125	0	0	0	0	0	0
State Landfill		0.625	1	0	0	5	NR	6
LTANKS		0.625	2	1	15	15	NR	33
UST		0.375	5	13	19	NR	NR	37
CBS UST		0.375	0	0	0	NR	NR	0
MOSF UST		0.625	0	0	0	0	NR	0
VCP		0.625	0	0	0	1	NR	1
SWTIRE		0.625	0	0	0	0	NR	0
SWRCY		0.625	0	0	0	0	NR	0
FEDERAL ASTM SUPPLEMENTAL								
CONSENT		1.125	0	0	0	0	0	0
ROD		1.125	0	0	0	0	0	0
Delisted NPL		1.125	0	0	0	0	0	0
FINDS		0.125	15	NR	NR	NR	NR	15
HMIRS		0.125	0	NR	NR	NR	NR	0
MLTS		0.125	0	NR	NR	NR	NR	0
MINES		0.375	0	0	0	NR	NR	0
NPL Liens		0.125	0	NR	NR	NR	NR	0
PADS		0.125	0	NR	NR	NR	NR	0
US BROWNFIELDS		0.625	0	0	0	0	NR	0
DOD		1.125	0	0	0	0	0	0
RAATS		0.125	0	NR	NR	NR	NR	0
TRIS		0.125	0	NR	NR	NR	NR	0
TSCA		0.125	0	NR	NR	NR	NR	0
SSTS		0.125	0	NR	NR	NR	NR	0
FTTS		0.125	0	NR	NR	NR	NR	0
STATE OR LOCAL ASTM SUPPLEMENTAL								
HSWDS		0.625	0	0	0	0	NR	0
AST		0.125	5	NR	NR	NR	NR	5
CBS AST		0.375	2	0	0	NR	NR	2

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
MOSF AST		0.625	0	0	1	0	NR	1
NY Spills		0.250	22	65	NR	NR	NR	87
EDR PROPRIETARY HISTORICAL DATABASES								
Coal Gas		1.125	0	0	0	0	0	0
BROWNFIELDS DATABASES								
US BROWNFIELDS		0.625	0	0	0	0	NR	0
Brownfields		0.625	0	0	0	0	NR	0
VCP		0.625	0	0	0	1	NR	1

NOTES:

AQUIFLOW - see EDR Physical Setting Source Addendum

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

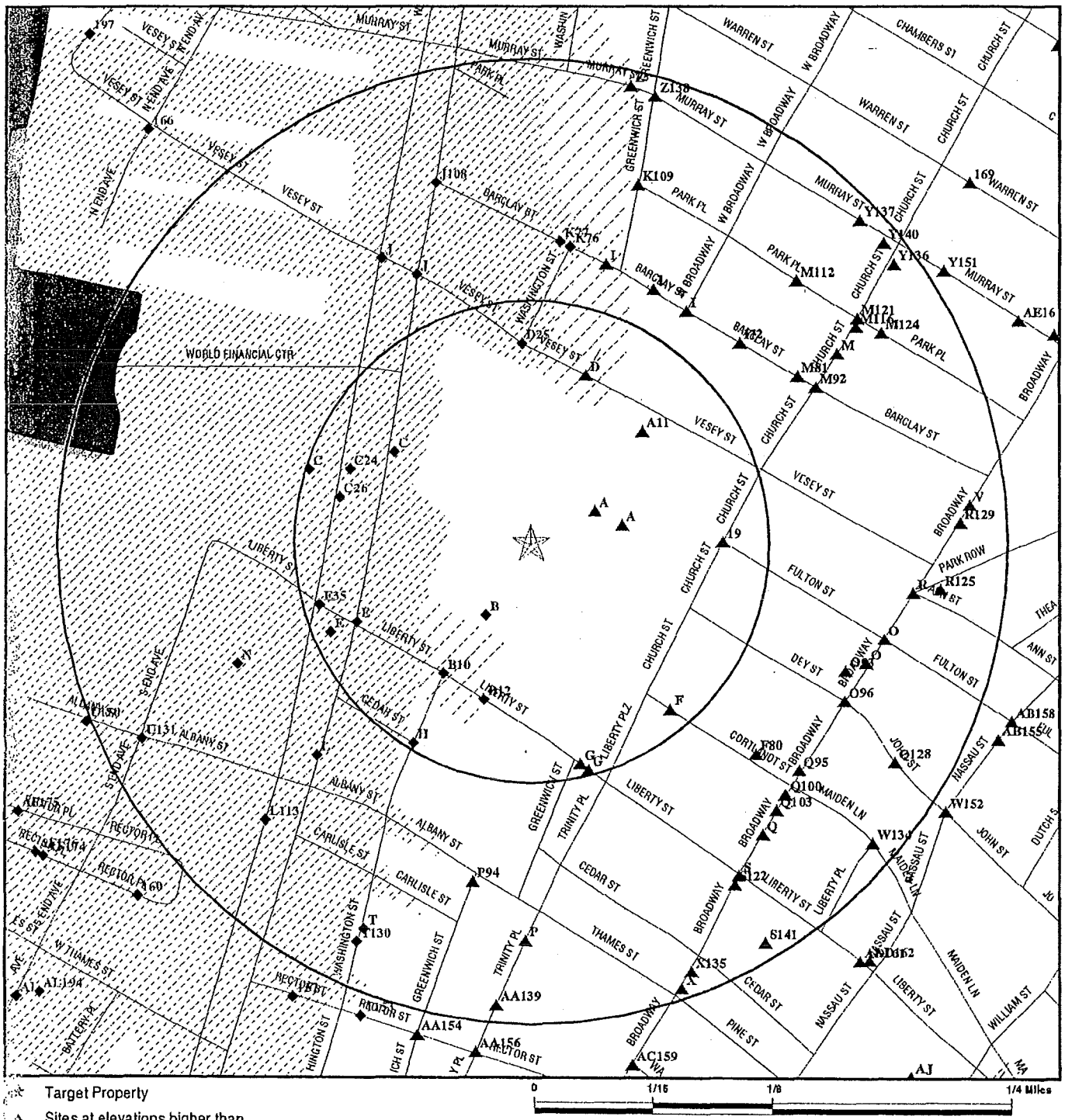
OVERVIEW MAP - 01052696.1r - Hatch Mott McDonald

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Coal Gasification Sites
- National Priority List Sites
- *Landfill Sites*
- Dept. Defense Sites
- County Boundary
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Federal Wetlands

TARGET PROPERTY:	WTC E15	CUSTOMER:	Hatch Mott McDonald
ADDRESS:	World Trade Center	CONTACT:	Brian Kennedy
CITY/STATE/ZIP:	New York NY 10007	INQUIRY #:	01052696.1r
LAT/LONG:	40.7115 / 74.0125	DATE:	September 24, 2003 11:13 am

Copyright © 2003 EDR, Inc. © 2003 GDT, Inc. Rel. 07/2002. All Rights Reserved.

DETAIL MAP - 01052696.1r - Hatch Mott McDonald



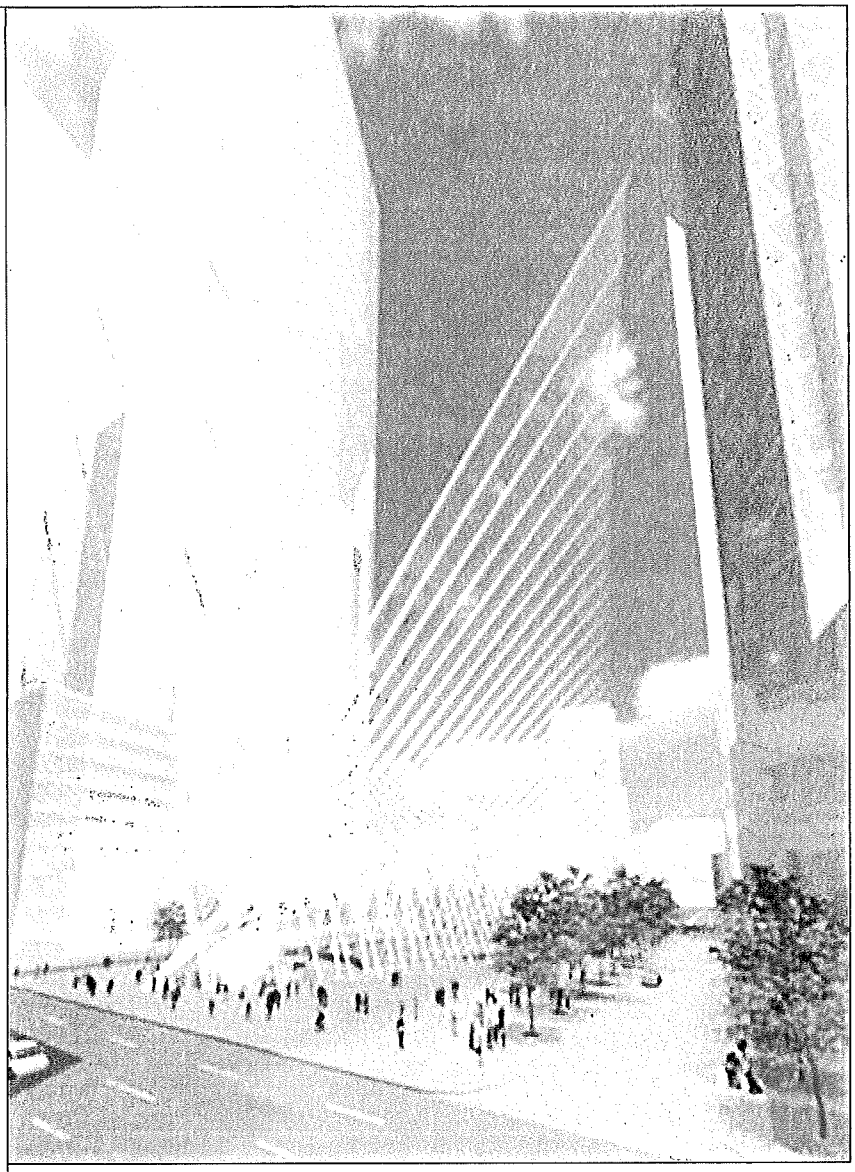
- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Coal Gasification Sites
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- County Boundary
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Federal Wetlands

TARGET PROPERTY:	WTC E15	CUSTOMER:	Hatch Mott McDonald
ADDRESS:	World Trade Center	CONTACT:	Brian Kennedy
CITY/STATE/ZIP:	New York NY 10007	INQUIRY #:	01052696.1r
LAT/LONG:	40.7115 / 74.0125	DATE:	September 24, 2003 11:14 am

Copyright © 2003 EDR, Inc. © 2003 GDT, Inc. Rel. 07/2002. All Rights Reserved.

PERMANENT WTC PATH TERMINAL

FINAL ENVIRONMENTAL IMPACT STATEMENT



VOLUME II

APPENDICES

Part 2 of 2
Appendices G through I

United States Department of Transportation
Federal Transit Administration

THE PORT AUTHORITY OF NY & NJ

PATH

MAY 2005

PATH Appendices Table of Contents

Appendix A: Land Use, Neighborhood Character, and Public Policy **A-1**

Appendix B: Cultural Resources **B-1**

B-1: Coordinated Determination of National Register Eligibility—World Trade Center Site, New York City, New York.

B-2: Permanent WTC PATH Terminal Memorandum of Agreement

B-3: Phase 1A Archaelological Assessment: World Trade Center Property

B-4: Topic Intensive Archaelogical Study: World Trade Center Property

B-5: Route 9A Reconstruction Project: Cultural Resources Summary Report

B-6: Programmatic Agreement among the United States Army Corps of Engineers, the New York State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Development of the Hudson River Park Along Manhattan's West Side in New York City, New York

B-7: Correspondence

Appendix C: Transportation **C-1**

C-1: PATH Ridership Estimates

C-2: Platform and Truck Planning Requirements

C-3: Vehicular Traffic and Parking

C-4: Pedestrians

C-5: Cumulative Construction Traffic

Appendix D: Air Quality **D-1**

Appendix E: Noise and Vibration **E-1**

Appendix F: Contaminated Materials **F-1**

Appendix G: Natural and Water Resources **G-1**

Appendix H: Process, Agency Coordination, and Public Participation **H-1**

H-1: Response to Comments on Draft Scope

H-2: DEIS Public Hearing Transcripts

H-3: Written Comments on the DEIS

H-4: Section 106 Review Meeting Transcripts

H-5: Written Comments from Section 106 Consulting Parties

Appendix I: Construction Analysis and Management Framework **I-1**

I-1: Environmental Analysis Framework and Environmental Performance Commitments

I-2: Executive Order Establishing the Lower Manhattan Construction Command Center

Appendix G

Natural and Water Resources

National Marine Fisheries Service
Habitat Conservation Division
Milford Field Office, 212 Rogers Avenue
Milford, Connecticut 06460

TO: Ms. Sandra Collins
Sr. Scientist
AKRF, Inc.
7250 Parkway Drive, Suite 210
Hanover, MD 21076

DATE: 26 August 2003

SUBJECT: **FTA Information request for Replacement PATH Terminal Development at the World Trade Center, Manhattan, New York**

Diane Rusanowsky
(Reviewing Biologist)

We have reviewed the information provided to us regarding the above subject project. We offer the following preliminary comments pursuant to the Endangered Species Act, the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act:

Endangered and Threatened Species

There are no endangered or threatened species in the immediate project area.

__XX__ The following endangered or threatened species may be present in the project area

__XX__ shortnose sturgeon (*Acipenser brevirostrum*) [In Hudson River]

sea turtles: __XX__ loggerhead (*Caretta caretta*) __XX__ Kemp's ridley (*Lepidochelys kempii*)
__XX__ green (*Chelonia mydas*) __XX__ leatherback (*Dermochelys coriacea)*

Other: Habitat use of the Hudson River by these resources is seasonal. Whether or not the federal action agency must consult with NOAA/Fisheries pursuant to Section 7 of the ESA will be determined after more detailed project plans become available.

Fish and Wildlife Coordination Act Species

__XX__ The following are present in the general project area: Anadromous and resident fish, forage and benthic species

Please contact the appropriate Regional Office of the New York State DEC to confirm the presence of anadromous or resident aquatic populations. Habitat use by some species or life stages may be seasonal

---

Essential Fish Habitat

__XX__ The project area has been designated as Essential Fish Habitat (EFH) for one or more species. When details of the project are made available and permit applications have been made, conservation recommendations may be given. For a listing of EFH and further information, please go to our website at: http://www.nero.nmfs.gov/ro/doc/webintro.html . The nature and scope of EFH assessment required of the federal action agency will be determined after more detailed project information becomes available.

____ No EFH presently designated in the immediate project area; however, impacts to anadromous fish may have an indirect effect on EFH and may require assessment pursuant to the implementing regulations of the Magnuson Stevens Fishery Conservation and Management Act. .

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

August 26, 2003

Ms. Sandra Collins
Senior Scientist
AKRF, Inc.
7250 Parkway Drive, Suite 210
Hanover, MD 21076

Dear Ms. Collins:

This responds to your letter of August 14, 2003, requesting information on the presence of Federally listed or proposed endangered or threatened species in the vicinity of the PATH Terminal at the World Trade Center Site on Manhattan Island, New York County, New York.

Except for occasional transient individuals, no Federally listed or proposed endangered or threatened species under our jurisdiction are known to exist in the project impact area. In addition, no habitat in the project impact area is currently designated or proposed "critical habitat" in accordance with provisions of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). Therefore, no further Endangered Species Act coordination or consultation with the U.S. Fish and Wildlife Service (Service) is required. Should project plans change, or if additional information on listed or proposed species or critical habitat becomes available, this determination may be reconsidered. The most recent compilation of Federally listed and proposed endangered and threatened species in New York* is available for your information.

The above comments pertaining to endangered species under our jurisdiction are provided pursuant to the Endangered Species Act. This response does not preclude additional Service comments under other legislation.

For additional information on fish and wildlife resources or State-listed species, we suggest you contact the appropriate New York State Department of Environmental Conservation regional office(s),* and:

New York State Department of Environmental Conservation
New York Natural Heritage Program Information Services
625 Broadway
Albany, NY 12233
(518) 402-8935

If you require additional information or assistance please contact Michael Stoll at (607) 753-9334.

Sincerely,

Acting For

David A. Stilwell
Field Supervisor

*Additional information referred to above may be found on our website at: http://nyfo.fws.gov/es/esdesc.htm.

cc: NYSDEC, Long Island City, NY (Environmental Permits)
NYSDEC, Albany, NY (Natural Heritage Program)

New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **FAX:** (518) 402-8925
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

August 27, 2003

Sandra Collins
AKRF Environmental and Planning Consultants
7250 Parkway Dr, Suite 210
Hanover, MD 21076

Dear Ms. Collins:

In response to your recent request, we have reviewed the New York Natural Heritage Program databases with respect to an Environmental Assessment for the proposed Rebuilding Project of the Port Authority Trans Hudson (PATH) Terminal at the World Trade Center, including possible construction barges in the Hudson river, area as indicated on the map you provided, located in lower Manhattan, New York City.

> We have no records of <u>known</u> occurrences of rare or state-listed animals or plants, significant natural communities, or other significant habitats, on or in the immediate vicinity of your site.

The absence of data does not necessarily mean that rare or state-listed species, natural communities or other significant habitats do not exist on or adjacent to the proposed site. Rather, our files currently do not contain any information which indicates their presence. For most sites, comprehensive field surveys have not been conducted. For these reasons, we cannot provide a definitive statement on the presence or absence of rare or state-listed species, or of significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

This response applies only to known occurrences of rare or state-listed animals and plants, significant natural communities and other significant habitats maintained in the Natural Heritage Databases. Your project may require additional review or permits; for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

Sincerely,

Nicholad B. Conrad, Information Services
New York Natural Heritage Program

Enc.
cc: Reg. 2, Wildlife Mgr.

DIVISION OF ENVIRONMENTAL PERMITS

June 2001

REGION	COUNTIES	REGIONAL PERMIT ADMINISTRATORS
	Nassau & Suffolk Telephone: (631) 444-0365	John Pavacic NYS-DEC BLDG. 40 SUNY at Stony Brook Stony Brook, NY 11790-2356
2	New York City (Boroughs of Manhattan, Brooklyn, Bronx Queens, & Staten Island Telephone: (718) 482-4997	John Cryan NYS-DEC One Hunters Point Plaza 47-40 21st Street Long Island City, NY 11101-5407
3	Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster & Westchester Telephone: (845) 256-3054	Margaret Duke (Peg) NYS-DEC 21 South Putt Corners Road New Paltz, NY 12561-1696
4	Albany, Columbia, Greene, Montgomery, Rensselaer & Schenectady Telephone: (518) 357-2069	William Clarke NYS-DEC 1150 North Wescott Road Schenectady, NY 12306-2014
4 (sub-office)	Delaware, Otsego & Schoharie Telephone: (607) 652-7741	John Feltman NYS-DEC Route 10 HCR#1, Box 3A Stamford, NY 12167-9503
5	Clinton, Essex, Franklin & Hamilton Telephone: (518) 897-1234	Richard Wild NYS-DEC Route 86, PO Box 296 Ray Brook, NY 12977-0296
5 (sub-office)	Fulton, Saratoga, Warren & Washington Telephone: (518) 623-1281	Thomas Hall* NYS-DEC County Route 40 PO Box 220 Warrensburg, NY 12885-0220
6	Jefferson, Lewis & St. Lawrence Telephone: (315) 785-2245	Brian Fenlon NYS-DEC State Office Building 317 Washington Street Watertown, NY 13601-3787
6 (sub-office)	Herkimer & Oneida Telephone: (315) 793-2555	J. Joseph Homburger* NYS-DEC State Office Building 207 Genesee Street Utica, NY 13501-2885

7	Broome, Cayuga, Chenango, Cortland, Madison, Onondaga, Oswego, Tioga & Tompkins Telephone: (315) 426-7438	Ralph Manna NYS-DEC 615 Erie Blvd. West (Env.Permits Room 206) Syracuse, NY 13204-2400
7 (sub-office)	 Telephone: (607) 753-3095	Michael Barylski* NYS-DEC 1285 Fisher Avenue Cortland, NY 13045-1090
8	Chemung, Genesee, Livingston, Monroe, Ontario, Orleans, Schuyler, Seneca, Steuben, Wayne & Yates Telephone: (716) 226-5390	Peter Lent NYS-DEC 6274 East Avon Lima Road Avon, NY 14414-9519
9	Allegany, Cattaraugus, Chautauqua, Erie, Niagara & Wyoming Telephone: (716) 851-7165	Steve Doleski NYS-DEC 270 Michigan Avenue Buffalo, NY 14203-2999
9 (sub-office)	 Telephone: (716) 372-0645	Ken Taft* NYS-DEC 182 East Union, Suite 3 Allegany, NY 14706-1328

* Deputy Regional Permit Administrator

Appendix H

Process, Agency Coordination, and Public Participation

Appendix H-1: Response to Comments on Draft Scope

A. INTRODUCTION

This memorandum summarizes and responds to all substantive comments on the Draft Scope published in September 2003 for the Permanent WTC PATH Terminal. Public review for the Draft Scoping Document began on September 26, 2003, with the posting of the document on the project's website. The Port Authority of New York and New Jersey (Port Authority) held four public meetings to receive comments. Two meetings were held at the Hudson County Administrative Annex in Jersey City, New Jersey on October 8, 2003 and two were held at the Alexander Hamilton U.S. Custom House in New York, New York on October 9, 2003. The public comment period remained open until October 29, 2003.

The Draft Scoping Document was circulated to involved and interested agencies and other parties and was posted on the Port Authority's website. A notice of its availability and the public meeting dates were published in the *Federal Register* on September 26, 2003.

Advertisements for the public meetings were published in the following local newspapers:

- *The Battery Park City Broadsheet* (Thursday, September 25, 2003)
- *New York Daily News* (Monday, October 6, 2003)
- *El Nuevo Hudson* (Thursday, October 2, 2003)
- *The Jersey Journal and Waterfront Journal* (Wednesday, September 24, 2003)
- *The New York Times* (Tuesday October 7, 2003)
- *The Star-Ledger* (Monday, October 6, 2003)
- *Hoy* (Monday, October 6, 2003)
- *Newsday* (Tuesday, October 7, 2003)
- *Downtown Express* (Tuesday October 7, 2003)
- *el diario La Prensa* (Monday, October 6, 2003)
- *The Hudson Reporter (Hoboken, Jersey City, Union City, West New York, North Bergen, Secaucus, Hudson Current, The Secaucus Outlet Center)* (Thursday, October 2 and Sunday, October 5, 2003)
- *New York Post* (Tuesday October 7, 2003)

Information on the public meeting was also posted on the Port Authority's website; notices were mailed to public officials and interested parties in the PATH service area; and a press release announcing the hearing was sent to local media outlets. Meeting announcements were posted on the Port Authority Trans-Hudson's visual communication system at each station (PATHVision), and brochures were distributed at the major PATH stations in New Jersey.

This document identifies the organizations and individuals who commented on the draft scoping document, and then summarizes and responds to their comments. It considers comments made at the public meetings; telephone, written, e-mail, and fax comments received through October 29, 2003; and comments received after the close of the public comment period.

Section B, below, lists all individuals and organizations that commented on the Draft Scope. Following each name is a list of the comments made, referenced by number. Section C contains a summary of all comments and a response to each. These summaries convey the spirit of the comments made, but do not quote the comments verbatim.

The comments are organized by subject area, as follows:

- General
- Project Alternatives
- Analysis Methodology
- Construction
- Operation
- Pedestrians
- WTC Memorial and Redevelopment Plan
- Miscellaneous

Following each comment is a list in parentheses of people or organizations that made the comment. If multiple comments were made on the same subject, they are summarized into a single comment with all commenters listed afterward.

B. LIST OF COMMENTERS

SPOKEN

1. Anderson, Richard—New York Building Congress. (Comments 1 and 7)
2. Centolanzi, Patrick—Kew Gardens resident. (Comments 1, 2, 5, 15, 22, 24 and 55); Comments were also submitted by e-mail and in writing.
3. Clift, Joseph—Manhattan resident. (Comments 14 and 22)
4. Cook, Michael—Downtown Manhattan resident. (Comments 37, 62 and 63)
5. Delgado, Ryan—New York Central Labor Council. (Comments 11, 15 and 42)
6. Dennehy, Thomas—Committee 4 Better Transit. (Comment 55)
7. Epstein, Louis—World Trade Center Restoration Movement. (Comments 21 and 27); Comments were also submitted in writing.
8. Gualtieri, Richard. (Comment 14)
9. Haikalis, George—President, Institute for Rational Urban Mobility. (Comments 3, 14, 16, and 55)
10. Hensley, Jennifer—Downtown Alliance. (Comments 15, 49 and 54)
11. McCardle, Frank—General Contractors Association. (Comments 13, 15, 31, 38, 39, 40, 41 and 54)
12. Papp, Albert—New Jersey Association of Railroad Passengers. (Comments 14 and 16)
13. Reilly, Patricia—Coalition of 9/11 Families. (Comments 3, 19 and 20)
14. Sheth, A.D.—KS Engineering. (Comments 27 and 35)

15. Slippen, Dan—Pace University Center for Downtown. (Comment 7)

E-MAIL

16. Abramson, Steven. (Comment 37)
17. Bill. (Comment 16)
18. Butziger, Alexander. (Comments 6 and 17)
19. Dillon, Patricia—Independence Plaza Tenants Association. (Comments 32 and 33)
20. Gelb, Stephanie—Battery Park City Authority. (Comments 18, 58 and 61); Comments were also submitted in writing.
21. Graham, Barry. (Comment 53)
22. Horning, Diane. (Comments 3 and 9)
23. Nita-Gallo, Manuela—wife of victim. (Comment 3)
24. Santora, Maureen—mother of victim. (Comment 3)
25. Seaman, Daniel—brother of victim. (Comment 3)
26. Thorpe, Jennifer. (Comment 17)

WRITTEN

27. Anonymous—concerned family member. (Comment 4)
28. Baker, Marianne—Supporters of World Trade Center Preservation. (Comments 3, 9 and 25)
29. Bell, Patricia A.—Coalition of 9/11 Families. (Comment 3)
30. Carlson, David—U.S. Environmental Protection Agency. (Comments 23 and 26)
31. Coughlin, Mary . (Comment 3)
32. Delaney, Colleen M. —rescue worker, World Trade Center. (Comment 3)
33. Desmarais, Cheryl—wife of victim. (Comments 3, 9, 19 and 25)
34. Diehl, Loisanne—wife of victim. (Comment 3)
35. Forsythe, Tessie Molina—Support Group of St. James Church. (Comment 3)
36. Hughes, Catherine M. (Comment 60)
37. Ielpi, Lee—Coalition of 9/11 Families. (Comments 3, 9, 19 and 25)
38. Jackman, Barbara. (Comments 3, 9 and 25)
39. Jain, Sneh—wife of victim. (Comment 3)
40. Kolpak, Alexis D. (Comment 3)
41. Lynch, Kathleen A. —sibling of victim. (Comments 3, 9, 19 and 25)
42. Lyon, John—Jersey City resident. (Comments 1, 8, 48, 50, 51 and 52)
43. Martin, Caroline—Family Association of Tribeca East. (Comments 10, 12, 32, 33 and 34)

44. Milanowycz, Adele—mother of victim. (Comment 3)
45. Nedd, Roxanne—wife of victim. (Comments 3 and 19)
46. Parks, Diane Keating . (Comments 3 and 19)
47. Pisano, Fran. (Comment 3)
48. Rappleye, Karen—sibling of victim. (Comments 3, 19, 20 and 25)
49. Regenhard, Sally—Skyscraper Safety Coalition of 9/11 Families. (Comments 9 and 19)
50. Santillan, Expedito C.—Coalition of 9/11 Families. (Comment 3)
51. Seims, Erik—NYCDCP Transportation Division. (Comment 43)
52. Tamuccio, James W.—father of victim. (Comment 3)
53. Tamuccio, Patricia—mother of victim. (Comment 3)
54. Taylor, Bruce and Connie—parents of victim. (Comments 3, 9, 19 and 25)
55. Wah Low, Seu—Coalition of 9/11 Families. (Comments 3, 19 and 25)
56. Weiser, Anatoly S. (Comments 3 and 19)
57. Wengerchuk, Oksana—wife of victim. (Comments 3 and 25)
58. Wiley, Caryn—daughter of victim. (Comments 3, 19 and 25)
59. Zelman, Barry—sibling of victim. (Comment 3)
60. Zuccala, Madeleine A.—wife of victim. (Comment 3)
61. Pattison, Kathleen—mother of victim. (Comment 3)
62. Brandt-Young, Christina and Jennifer K. Brown—NOW Legal Defense and Education Fund. (Comment 44)
63. Anonymous—Spina resident. (Comments 3, 9 and 19)
64. Oliff, Andrew. (Comments 6, 32 and 64)
65. Weiss-Little, Michelle—sister of victim. (Comments 3 and 9)
66. Olmsted, Robert A. (Comments 56 and 57)
67. Thorpe, Raymond—father of victim. (Comment 3)
68. Meehan III, Thomas J.—father of victim. (Comment 3)
69. Lachman, Senator Seymour P.—New York State Senate, 23rd District. (Comments 3, 28, 29, 30 and 55)
70. Kornfeld, Robert—Coalition of 9/11 Families. (Comments 1, 36, 45, 46 and 47)
71. Gardner, Anthony—President of WTC United Family Group. (Comments 3, 9, 19 and 25).

C. COMMENTS RECEIVED

GENERAL

Comment 1: Every graphic that you present as part of this project should have the footprints of the tower shown. (Centolanzi, 2; Lyon, 42; Kornfeld, 70)

Response: Comment noted. This will be reflected in the Environmental Impact Statement.

Comment 2: We need to know specifically what elements of the station might be within the footprints of the towers, and information should be given as to why these elements must be within these areas. (Centolanzi, 2)

Response: The Environmental Impact Statement will provide a detailed description of the proposed terminal and its physical location within the World Trade Center site.

Comment 3: No building, including infrastructure, should be erected upon the footprints of the World Trade Center Towers. The addition of more tracks and infrastructure on the footprints encroaches on a site that should be historically preserved. Allow maximum access to the bedrock footprints for visitors. (Coughlin, 31; Diehl, 34; Horning, 22; Santora, 24; Seaman, 25; Pisano, 47; Santillan, 50; J.Tamuccio, 52; P.Tamuccio, 53; Bell, 29; Delaney, 32; Jackman, 38; Jain, 39; Kolpak, 40; Wah Low, 55; Lynch, 41; Milanowycz, 44; Weiser, 56; Wengerchuk, 57; Wiley, 58; Zuccala, 60; Desmarais, 33; Forsythe, 35; Nedd, 45; Zelman, 59; Ielpi, 37; Rappleye, 48; Baker, 28; Nita-Gallo, 23; Haikalis, 9; Reilly, 13; Taylor, 54; Weiss-Little, 65; Thorpe, 67; Meehan III, 68, Lachman, 69, Pattison, 61; Anonymous, 63; Parks, 46; Gardner, 71)

Response: The Federal Transit Administration, Federal Highway Administration, U.S. Department of Housing and Urban Development, Port Authority, Lower Manhattan Development Corporation, and New York State Department of Transportation are preparing documentation for review under Section 106 of the National Historic Preservation Act. This documentation will be used by federal and state oversight agencies to make a determination of the historical significance of the site. This process will follow the Advisory Council on Historic Preservation regulations (36 CFR 800); appropriate National Register Bulletins; and National Historic Landmark Regulations (36 CRF 65). Based on the findings of this review, a memorandum of agreement or a programmatic agreement would be developed to describe the findings and any necessary mitigation. This agreement would be signed by the preparers of the review documentation as well as the federal oversight agencies.

Comment 4: "Ground Zero" is a burial ground and therefore a sacred, hallowed place upon which nothing should be built or expanded. (Anonymous, 27).

Response: See above response to Comment 3.

Comment 5: For those track elements within the footprint area, propose architectural treatments that will clearly define to passengers on trains and in the terminal what tracks and tunnels are in the footprint memorial area. For example, unique and dramatic lighting can be used in those tunnel sections. (Centolanzi, 2)

Response: Comment noted. See above response to Comment 4 also.

Comment 6: It would be a good idea to build the new World Trade Center PATH station at least partly on the Twin Towers' footprints. We must take the World Trade Center site back from bin Laden to reintegrate it into the urban fabric. Keeping the footprints completely empty of development would encourage terrorists to litter our cities with more footprint memorials. (Butziger, 18; Oliff, 64)

Response: Comment noted.

Comment 7: Inconvenient transportation options will impede the revitalization of Lower Manhattan. The restoration of the PATH and the city's mass transit system is a greater good that must reach completion as soon as possible. Every effort should be made to expedite the completion of the environmental review process and construction of the new terminal. (Slippen, 15; Anderson, 1)

Response: As per President Bush's Executive Order 13274 (September 18, 2002) and the recent inclusion of the Lower Manhattan Recovery Effort to the list of Priority Projects (February 27, 2003) by U.S. Secretary of Transportation Mineta, the Federal Transit Administration, the Metropolitan Transportation Authority, and the Port Authority are coordinating to complete a comprehensive and expeditious environmental review process.

Comment 8: The Jersey Journal headline on the issue of 10/9/03 says: "World Trade Center station will be deluxe." With Exchange Place and Journal Square stations in good shape, what about the other stations that look quite shabby? (Lyon, 42)

Response: A program exists to rehabilitate the PATH stations system-wide to provide modern facilities while expanding to meet the travel demand. However, these projects are outside the scope of this Environmental Impact Statement.

Comment 9: The blueprints illustrating the original PATH train configuration and new plans should be made available to the public. (Horning, 22; Regenhard, 49; Jackman,

38; Lynch, 41; Desmarais, 33; Taylor, 54; Ielpi, 37; Baker, 28; Weiss-Little, 65; Anonymous, 63; Gardner, 71)

Response: Schematics of the proposed Permanent WTC PATH Terminals will be provided in the Environmental Impact Statement.

Comment 10: The Federal Register announcement is not enough public outreach. NEPA regulations require a much more substantial outreach. The few people at the scoping meeting are ample testimony of this. (Martin, 43)

Response: The public scoping meetings were also advertised in 13 local newspapers (see the introduction herein), and additional public outreach efforts were conducted, including briefings to public agencies, elected officials and key private firms; publication of project information on the Port Authority's website; printing and distribution of a flyer and project newsletter to more than 2,000 individuals and groups on the project's mailing list; postings on PATHVision; and the staffing of mobile information centers at PATH stations on two separate days.

Comment 11: The Permanent WTC PATH Terminal must be seamlessly integrated with other World Trade Center projects as well as the existing Lower Manhattan area. This includes accessibility and visibility at street level, unimpeded flow of pedestrian traffic once inside the hub and facilitated connections to the City's major public transportation modes. (Anderson, 1; Delgado, 5)

Response: The Port Authority is coordinating with the Lower Manhattan Development Corporation; Metropolitan Transportation Authority; New York State Department of Transportation; the City of New York; Studio Daniel Libeskind (Master Plan architect); Silverstein Properties, and others to provide for the coordinated redevelopment of the World Trade Center site and in support of other revitalization efforts planned for Lower Manhattan.

Comment 12: The public should be given a chance to comment on and have input into the development of the Environmental Performance Commitments. (Martin, 43)

Response: The Environmental Impact Statement will include a description and assessment of the Environmental Performance Commitments that will be implemented as part of the project. The public will be given the opportunity to comment on this portion of the Draft Environmental Impact Statement along with any other aspects of the analysis.

PROJECT ALTERNATIVES

Comment 13: The interim PATH as the No Build, long-term solution to the problems of Downtown has to be examined in the document and the notion that you could preserve it dispelled more clearly. (McCardle, 11)

Response: The Environmental Impact Statement will describe the temporary PATH station and its long-term limitations.

Comment 14: The Port Authority should consider routing a new track connection between the Downtown PATH under Fulton Street and constructing a new PATH No. 6 station with a mezzanine that will connect all six New York City subway stations and PATH, effectively merging all 14 transit lines within a single underground transportation complex in Lower Manhattan. Please add this program to one of the alternatives that will be considered in the scoping document. (Papp, 12; Clift, 3; Gualtieri, 8; Haikalis, 9)

Response: The Permanent WTC PATH Terminal will connect with the proposed Fulton Street Transit Center at Dey Street. The PATH system and NYCT's IRT No. 6 route are not compatible and to connect the two is technically infeasible. A connection between these systems would require major infrastructure improvements including new tracks and tunnels; communications systems upgrades; and the integration of fleets; operating agreements; and personnel. Such a proposal would require a longer and more difficult construction process with greater potential for adverse impacts to the environment than would the proposed Permanent WTC PATH Terminal. Therefore, this alternative will not be considered for further study in this EIS. Furthermore, a direct connection between New Jersey and East Midtown, Manhattan is not a goal of this proposal and is, therefore, outside the scope of this project.

Comment 15: The transportation improvements made in Lower Manhattan today must be built not only to accommodate existing capacity but also to support the increased capacity anticipated throughout the following decades as other Downtown development projects move forward. (Hensley, 10; Centolanzi, 2; McCardle, 11; Delgado, 5)

Response: The Permanent WTC PATH Terminal will be built to accommodate approximately 50 percent greater ridership than existed before September 11, 2001. It is anticipated that this capacity will support anticipated demand through 2025.

Comment 16: The Permanent PATH Station and the Fulton Street Transit complex should be combined into one. Fulton Street would serve as a pedestrian-only street and an

entranceway to Lower Manhattan extending between the South Street Seaport and the Winter Garden. (Papp, 12; Bill, 17; Haikalis, 9)

Response: A direct connection between the stations will be provided beneath Dey Street as part of the Fulton Street Transit Center project. Pedestrian improvements along Fulton Street are planned as part of New York City's Vision for Lower Manhattan; however, these efforts are not part of the scope of this project.

Comment 17: It is important that the new World Trade Center PATH Terminal allows for the construction of office towers different from those currently proposed, particularly towers taller and thus heavier than those now conceived. The PATH Terminal must be designed flexible enough in case the current World Trade Center design gets improved and scaled up. Particular attention needs to be paid to column strength and placement. (Thorpe, 26; Butziger, 18)

Response: The Port Authority is and will continue to coordinate with the Lower Manhattan Development Corporation; Studio Daniel Libeskind; Silverstein Properties; and others in the development and implementation of design standards for the redevelopment of the World Trade Center site. The design of the Permanent WTC PATH Terminal will comply with these standards.

Comment 18: There should be a way to keep vent shafts out of the open space on the surface of Route 9A. (Gelb, 20)

Response: Two (north and south) ventilation structures for PATH were located within the median of Route 9A prior to September 11, 2001. As part of this project, a new ventilation structure would be constructed in approximately the same location of the north ventilation structure that existed prior to September 11, 2001. The Port Authority is also currently studying two locations for a south vent. One option would be the construction of a vent in approximately the same location as the south vent that existed before September 11, 2001. The second option would locate the ventilation structure within a newly constructed building on the former site of Deutsche Bank site. The EIS will examine the potential effects of the north vent structure as well as both of options for the south vent.

Comment 19: Please recreate the PATH station to its design prior to the September 11, 2001 attacks. Do not increase the number of tracks or platforms (Parks, 46; Regenhard, 49; Wah Low, 55; Lynch, 41; Wiley, 58; Desmarais, 33; Nedd, 45; Taylor, 54; Ielpi, 37; Rappleye, 48; Reilly, 13; Weiser, 56; Anonymous, 63; Gardner, 71)

Response: The pre-September 11, 2001 PATH station would not have adequate capacity to support the anticipated ridership growth in Lower Manhattan over the next several decades, including future visitors to the proposed memorial. Therefore,

additional infrastructure has been planned as part of the Permanent WTC PATH Terminal.

Comment 20: A provision to protect the footprints must be incorporated into the Environmental Impact Statement. The creation of a transportation hub, a Permanent PATH Train Station and preservation of the footprints are not mutually exclusive. (Reilly, 13; Rappleye, 48)

Response: See above response to Comment 3.

Comment 21: The Draft Scope needs to be more flexible in terms of build alternatives, given that what is built below ground has to be integrated with what is built above ground and considering possible evolutions of the aboveground plan that may change what is needed below. (Epstein, 7)

Response: The Environmental Impact Statement will consider the various alternatives being prepared for concurrent environmental review processes for Route 9A (New York State Department of Transportation), the World Trade Center Memorial and Redevelopment Plan (Lower Manhattan Development Corporation), and Fulton Street Transit Center (Metropolitan Transportation Authority). These alternatives will be considered not only for their implications in the No Action condition, but also for their potential impacts to the design of the Permanent WTC PATH Terminal.

Comment 22: The current scoping plan seems to commit more financial support to architecture than to transit. Please include alternatives that focus on commitment of resources to transportation improvements. (Clift, 3; Centolanzi, 2)

Response: The proposed plan commits to the construction of the above-grade terminal facility; sub-grade levels will include pedestrian connections and other structural elements, as well as the extension of platforms to accommodate 10-car trains. The majority of the project costs are associated with the integration of the Terminal with the surrounding uses, including the proposed pedestrian connections.

Comment 23: We do not believe that analyzing one alternative is sufficient for the Environmental Impact Statement. For example, instead of a five level terminal, examine a four level terminal or different walkway schemes. (Carlson, 30)

Response: The Environmental Impact Statement will consider alternatives for the provision of off-site pedestrian connections and any other appropriate alternatives developed during the scoping process.

Comment 24: Historical information should be provided as to how the track routing came to exist. (Centolanzi, 2)

Response: As described above, a Section 106 review of the project site is currently being undertaken. The original configuration of the PATH tracks and subsequent iterations of their alignment will be described as part of the supporting documentation for the Section 106 review.

Comment 25: Incorporate the station into the memorial design (Jackman, 38; Wah Low, 55; Lynch, 41; Wengerchuk, 57; Wiley, 58; Desmarais, 33; Taylor, 54; Ielpi, 37; Rappleye, 48; Baker, 28; Gardner, 71).

Response: As proposed, the Permanent WTC PATH Terminal is consistent with the intentions of the current planning for the World Trade Center site, including the proposed memorial.

Comment 26: We recommend that the Permanent WTC PATH Terminal Draft Environmental Impact Statement should recognize that there are two "west connection" options currently proposed for the transit center. The Draft Environmental Impact Statement should discuss if either the Dey Street or the John Street Connection is chosen as part of the Fulton Transit Center, the design of the PATH Terminal can retain that connection. (Carlson, 30)

Response: At present, the Dey Street connection is being considered as part of the Fulton Street Transit Center Environmental Impact Statement. The Permanent WTC PATH Terminal will coordinate with the selected design for the Fulton Street Transit Center.

Comment 27: Some consideration should be given to enabling trains to pass beyond the current terminal to future evolution of the mass transit system. This may involve a number of possibilities (Long Island Rail Road connection, subway system integration, airport access) and again design consideration should not prejudge. The impact area of the Environmental Impact Statement does not need to be extended beyond the World Trade Center site but a strategy for eastward trackage should be offered for potential future construction. (Epstein, 7)

Response: The project will restore PATH system to its pre-September 11, 2001 service conditions. However, the new Terminal will provide for enhanced mobility through pedestrian connections to Lower Manhattan subways and Hudson River ferries. The proposed action does not preclude the development of the LIRR or JFK AirTrain service connection.

Comment 28: The World Trade Center station project should not be limited to PATH but should include the Cortlandt Street-World Trade Center Station (1 and 9); the Cortlandt Street Station (N, R, and W); and the World Trade Center-Church Street Station (E). There should be a single, unified station on the World Trade Center site and connections to the existing subway platforms should be fully integrated. (Seymour, 69)

Response: Connections to the Cortlandt Street (N, R, and W Lines) and Chambers Street-World Trade Center Station (A, C, E, 2, and 3 Lines) would be provided at or near them same location as provided prior to September 11, 2001. A direct connection to the Cortlandt Street Station (1 and 9 Lines) will also be provided. This connection is being coordinated with MTA's rehabilitation of the Cortlandt Street Station.

Comment 29: The connections to the Fulton Street Transit Center should be considered as part of the Permanent WTC PATH Terminal project. Including these connections as part of the Fulton Street project serves only the bureaucrats desire to keep the Port Authority and the Metropolitan Transportation Authority projects separate at the expense of logic, efficiency, and the best interest of commuters. (Seymour, 69)

Response: The Permanent WTC PATH Terminal and the Fulton Street Transit Center are being funded by the federally-sponsored, $4.55-billion Lower Manhattan Transportation Recovery Effort. The environmental review of these projects is being coordinated on both the local and federal levels, and each is considering the proposed elements of all projects being proposed for Lower Manhattan. While the physical construction of the Dey Street underpass will be part of the MTA Fulton Street Transit Center, its planning and design is a coordinated effort between MTA and Port Authority.

Comment 30: The Port Authority and Metropolitan Transportation Authority should use this opportunity to connect the PATH tubes with the 1 and 9 train line under Greenwich Street. PATH and the New York City Transit IRT (Interborough Rapid Transit) lines have a similar rolling stock, so a track connection could be useful in the future. (Seymour, 69)

Response: A direct connection between PATH and the 1 and 9 train line at Greenwich Street would not meet the goals and objectives of this project. Such a connection is also not technically feasible. The grade between the portals of the PATH's Hudson Tubes and the Greenwich Street line would be steep and would not meet the minimum operating criteria of PATH or New York City Transit. Furthermore, a direct connection between PATH's Lower Manhattan service and New York City Transit's 1 and 9 train line would not benefit a significant number of Lower Manhattan's commuters or visitors. PATH already provides

service along Sixth Avenue between 9th and 33rd Streets via its Uptown Lines and New York City Transit's 1 and 9 train lines terminate at the South Ferry Station, which is only two stops south of the World Trade Center site. Therefore, this proposal will not be considered for further study in this Environmental Impact Statement.

ANALYSIS METHODOLOGY

Comment 31: When considering the future growth of the downtown business community, the Permanent PATH Station projections should incorporate a long-term, 50-year horizon rather than the current projection, which only looks to 2020. (Sheth, 14; McCardle, 11)

Response: The Permanent WTC PATH Terminal Environmental Impact Statement will consider a design year of 2025. The evaluation of a transit project 20 years in the future is consistent with other environmental reviews being recently undertaken by the Federal Transit Administration. Furthermore, a 2025 design year is being considered for the transportation projects being planned in Lower Manhattan to be consistent with current population and employment forecasts prepared by the New York Metropolitan Transportation Commission.

Comment 32: The new PATH station is imperiled by the fact that no infrastructure will be allowed to take root at the site and by the environmental hazard posed by the Libeskind's pit with its exposed slurry wall. The Environmental Impact Statement should include an analysis of the safety and stability of the slurry wall. (Dillon, 19; Martin, 43, Oliff, 64).

Response: The Permanent WTC PATH Terminal project includes infrastructure elements, including slurry wall stabilization, that are needed to support the elements of the Terminal within the WTC "bathtub." These infrastructure elements will be addressed and assessed in the Environmental Impact Statement.

Comment 33: The Environmental Impact Statement should include a longer period than one opening year. (Dillon, 19; Martin, 43).

Response: The Environmental Impact Statement will consider the construction-period; the opening year; and the project's design year, which is over 20 years into the future.

Comment 34: The Environmental Impact Statement should consider a large part of Lower Manhattan. It should at least cover the whole area river to river south of Canal and Pike Streets. This is the area being studied for the World Trade Center

Memorial and Redevelopment Plan Generic Environmental Impact Statement. (Martin, 43)

Response: The Environmental Impact Statement will consider secondary impacts within all of Lower Manhattan south of Canal Street and west of Pike Street.

Comment 35: The environmental impact should be considered not only in association with the federal regulation but also with the New York State, New York City and any other local government agency involved. (Sheth, 14)

Response: The Environmental Impact Statement will consider a range of impact criteria under the direction of the Federal Transit Administration and in consultation with appropriate federal, state, and local agencies and authorities.

Comment 36: Section D of the Draft Scope, The Affected Environment, is deficient because it omits mention of the tower footprints as a resource and fails to identify the existing features or describe the physical impact of proposed changes to existing features (Kornfeld, 70).

Response: See above response to Comment 3.

CONSTRUCTION

Comment 37: The Environmental Impact Statement must contain measures to ensure that construction is done in an environmentally safe, health-protective manner. The following must be specified in the Environmental Impact Statement: (a) All contracts must require that all construction equipment use ultra-low-sulfur diesel fuel and/or new technologies, to reduce harmful diesel emissions. Contracts should contain financial incentives (using federal September 11, 2001 Recovery funds) to enable contractors to meet this requirement, whether they own their equipment or rent it. The cumulative effects of highly toxic diesel emissions on people's health during the many years of the World Trade Center re-building, using current standards, will be catastrophic. The problem can and must be addressed. (b) The site of the new PATH station must be tested comprehensively and stringently for existing contaminants in the soil. If such tests have been done since September 11, 2001, the Environmental Impact Statement should contain the results of the testing. (c) The Environmental Impact Statement must specify that the most stringent federal, state and city regulations be applied in the control of dust during construction. (d) The Environmental Impact Statement must provide for comprehensive ongoing, state-of-the-art air monitoring for all World Trade Center "Contaminants of Concern" (list developed by the federal EPA with several other environmental agencies, and available on the EPA web-site) in all neighborhoods of Lower

Manhattan (river to river, south of Canal and Pike Streets). Federal EPA standards should be used and the EPA should oversee this monitoring. (Dillon, 19) With the many construction parties involved, how will the Port Authority enforce the adherence to a green standard? (Cook, 4; Abramson, 16)

Response: A detailed analysis of construction activity will be included in the Environmental Impact Statement. This analysis will include an assessment of contaminated materials and air quality. The Port Authority will evaluate the cumulative construction impacts and implement ways to mitigate these impacts, which will comply with the Environmental Performance Commitments developed by the agencies sponsoring projects in Lower Manhattan. Furthermore, the Port Authority will implement any other measures that are specified in the Environmental Impact Statement in order to mitigate potential construction-period impacts. Also as will be described in the Environmental Impact Statement, the Port Authority and the Lower Manhattan Development Corporation are coordinating to develop sustainable and green design guidelines for the World Trade Center site, including the Permanent WTC PATH Terminal. These standards would be incorporated into the project's design and construction.

Comment 38: The Environmental Impact Statement should address construction traffic not simply from this project but from all others and should consider their affect on pedestrians and other motorized traffic. The document must describe the Port Authority's commitments to mitigate any potential adverse affects to vehicular and pedestrian traffic during construction. (McCardle, 11)

Response: A detailed assessment of vehicular and pedestrian traffic and potential construction-period impacts will be included in the Environmental Impact Statement. Furthermore, an analysis of the cumulative impact of all proposed projects in Lower Manhattan will be conducted. Mitigation measures will be recommended and implemented, if necessary.

Comment 39: The Environmental Impact Statement must address air quality issues that may result from construction in such a confined area. The document should examine the use of cleaner fuels and the filtration of dust, dirt, and other debris that commonly is found around construction sites. (McCardle, 11)

Response: A detailed assessment of air quality will be conducted. This analysis will include the environmental performance commitments developed for the planned projects in Lower Manhattan. Many of the measures recommended here are part of the environmental performance commitments agreed to by the Lower Manhattan agencies, which include the Port Authority.

Comment 40: The Environmental Impact Statement must examine methods to minimize the noise associated with very intense construction. (McCardle, 11)

Response: The Environmental Impact Statement will include a detailed assessment of construction-period noise, including the environmental performance commitments developed for planned projects in Lower Manhattan. Additional mitigation measures will be recommended, as necessary.

Comment 41: The document should address most clearly the ability of the Port Authority and the contracting community to build the Permanent PATH in a community friendly manner. (McCardle, 11)

Response: Comment noted.

Comment 42: Minimizing adverse impacts may be accomplished by using existing infrastructure where available and following green standards when considering design. (Delgado, 5)

Response: As will be described in the Environmental Impact Statement, the Port Authority and the Lower Manhattan Development Corporation are coordinating to develop sustainable and green design guidelines for the World Trade Center site, including the Permanent WTC PATH Terminal. These standards would be incorporated into the project's design and construction.

Comment 43: As you know, New York City Transit has "vacuum trains" for cleaning their roadbeds. PATH may be able to mitigate neighborhood concerns about contaminating the air during construction by purchasing such a train. Feeding contaminants through a giant hose into the train via a hole at the top of each car, sticking the train at the southernmost World Trade Center track during off-peak hours, then hauling the train off to the PATH yards would be an environmentally sound way to proceed with construction. (Seims, 51)

Response: Vacuum trains would not be appropriate for the World Trade Center site to be redeveloped, of which PATH is a component. The World Trade Center site is too large and the physical alignment of the PATH tracks is too small to provide for a significant benefit to air quality during construction.

Comment 44: The rebuilding of Lower Manhattan may result in a New York City construction labor shortage. This shortage can be prevented with a focused equal opportunity initiative. It is critical that all construction contracts and subcontracts include enforceable equal opportunity clauses. We urge the Port Authority to work with NOW Legal Defense and other interested groups to create an on-site, pre-apprenticeship program that will familiarize potential laborers with construction

needs and trade opportunities. The program should include a childcare component to facilitate participation in the program by parents. (Brandt-Young and Brown, 62)

Response: Through the Port Authority's Office of Business and Job Opportunity, the agency has a long-standing practice of encouraging Minority Business Enterprises (MBEs) and Women Business Enterprises (WBEs) to seek business opportunities with it, either directly or as subconsultants and subconstractors. The Chief Engineer sets goals for MBE and WBE participation for Port Authority contracts. Such goals would be established for the construction of the Permanent WTC PATH Terminal.

Comment 45: The Draft Scope fails to describe the impact to the 1 World Trade Center and 2 World Trade Center tower footprints of construction work that commenced after the conclusion of the World Trade Center Emergency Operation in approximately June 2002. (Kornfeld, 70)

Response: The temporary PATH station, including tracks, platforms, and mezzanines, was constructed in the same location as the pre-September 11, 2001 PATH Terminal between July 2002 and November 2003. The temporary station and activities associated with its construction are not part of the scope for the Permanent WTC PATH Terminal.

Comment 46: When will the site be properly cleaned to allow an inventory of existing resources related to the 1 World Trade Center and 2 World Trade Center footprints by U.S. National Park Service, New York State Office of Parks, Recreation, and Historic Preservation, NYCLPC, or interested parties? This is critical for an informal evaluation to begin. (Kornfeld, 70)

Response: See response to Comments 3 and 24.

Comment 47: What measures have been implemented or are planned to protect the historic resources of the 1 World Trade Center and 2 World Trade Center footprints from construction damage. (Kornfeld, 70)

Response: Based on the findings of the Section 106 review process (see response to Comment 3), a memorandum of agreement may be developed to mitigate any potential impacts of the Permanent WTC PATH Terminal to any designated resources on the World Trade Center site.

OPERATION

Comment 48: Once there is again a trans-Hudson route to lower Manhattan, can we get a weekend schedule that allows service to run every fifteen minutes after 7:45pm? And on Sundays, running every twenty minutes via Hoboken to Journal Square is much too long. I realize that PATH considers itself a weekday commuter line, but weekend crowds must stand and be packed like animals. (Lyon, 42)

Response: The PATH system is a 24 hour-a-day, 7 day-a-week operation. System maintenance is undertaken during late night and weekend periods, including rehabilitation and/or replacement of track, signals, and other components. It is necessary to operate with longer headways during these periods to allow for adequate time to maintain the system. However, the Port Authority routinely evaluates its operating plan for PATH. If the future demand for late night and weekend service would warrant shorter headways, schedule adjustments would be made.

Comment 49: Planning must be done now to ensure that the World Trade Center Transportation Hub is built to incorporate the JFK International Airport, Long Island commuter rail connection. (Hensley, 10)

Response: The Permanent WTC PATH Terminal has been designed to provide for additional demand associated with future transit improvements, including the proposed connection to JFK Airport. The proposed action does not preclude the development of this connection.

Comment 50: Are there any plans to return benches and wastebaskets to PATH stations? (Lyon, 42)

Response: The Permanent WTC PATH Terminal will include certain amenities, such as those noted for the convenience of PATH customers, pursuant to security criteria being developed for the terminal.

Comment 51: The noise of the train announcements and the bells ringing to warn of closing doors are too loud and I believe exceed the 85 decibel limit. (Lyon, 42)

Response: Comment noted.

Comment 52: Monitors are programmed to tell us which station we are in. However, the Public Address announces at every station that "the elevators at Pavonia/Newport" are not working. If the station I am in has no elevator, why do I have to listen to this? Can't PATH direct this obnoxious message to only those stations with elevators? (Lyon, 42)

Response: Comment noted.

Comment 53: It would be nice if the new station at the World Trade Center had accurate "NEXT TRAIN" platform indicators, or even had all trains leaving from adjacent platforms so that you don't have to run from platform to platform. It would also be nice if the PATH trains could go fast under the Hudson when going to 33rd St, instead of slowing down dramatically. (Graham, 21)

Response: Comment noted.

Comment 54: We would like to see the PATH's extension to Newark Liberty International Airport, an amenity which has recently been made available to people in the Midtown area. (Hensley, 10; McCardle, 11)

Response: The Port Authority is studying options for the extension of PATH service to Newark Liberty International Airport. However, this project is independent of the Permanent WTC PATH Terminal.

Comment 55: The project should include an assessment of fare integration options. Metropolitan Transportation Authority Metro Cards should quickly replace PATH Quick Cards. With a fully integrated fare, PATH and subway entrances and exits could be consolidated, easing transfers. (Dennehy, 6; Centolanzi, 2; Haikalis, 9; Seymour, 69)

Response: The Port Authority and MTA New York City Transit are currently studying a fare integration program. However, this study is independent of the Permanent WTC PATH Terminal.

Comment 56: The Port Authority should study the feasibility of extending PATH in the future directly to the three terminals at New Liberty International Airport. This would solve the capacity problems of the monorail and would achieve a "one-seat" ride to the airport from the World Trade Center Transportation Hub. (Olmstead, 66)

Response: The Port Authority is studying options for an extension of PATH to Newark Liberty International Airport. This study and its recommendations are not part of the scope of the Permanent WTC PATH Terminal Environment Impact Statement.

Comment 57: If the Lower Manhattan business community believes that a good JFK connection is important to its recovery, the quickest way to achieve that goal is to reinstate a truncated version of the special "JFK Express – Train to the Plane" that New York City Transit operated from 1978 to 1990. The reactivated service

could run between Chambers Street and Howard Beach over the A subway line tracks, stopping at Broadway/Nassau and Jay Street. The Fulton Street Transit Center could include a Lower Manhattan Air Terminal component and a short side platform to provide a dedicated boarding area for JFK passengers. A second step could be to build a direct connection between the A line and the Air Train at Howard Beach and to procure a fleet of cars designed to operate over both systems. (Olmstead, 66)

Response: The Lower Manhattan Development Corporation has commissioned a feasibility study of transit service between JFK and Lower Manhattan in cooperation with the Port Authority, Metropolitan Transportation Authority, and New York City Economic Development Corporation. The Permanent WTC PATH Terminal is being planned to accommodate their recommendation for future service, but specific measures to implement this service are outside the scope of this Environmental Impact Statement.

PEDESTRIANS

Comment 58: We are concerned about pedestrian access to and from the South Residential Neighborhood and the WFC Towers 1 & 2. This critical link for Battery Park City Authority commuters and residents is not shown in the Scoping Document. Moving the 9A by-pass ramps to the south would help. With only one pedestrian tunnel portal to the PATH Terminal west of Route 9A, pedestrians will have to walk out of their way to access the site. (Gelb, 20)

Response: An all-weather connection would be constructed beneath Route 9A for direct access to the World Trade Center PATH Terminal from the Winter Garden. The proposed project will not preclude existing pedestrian bridges across Route 9A nor would it eliminate other above-grade connections proposed by the New York State Department of Transportation.

Comment 59: We would suggest that the Environmental Impact Statement evaluate the following compared to the pre-September 11, 2001 conditions: * Number and location of portals to pedestrian concourse. * Linear distance should be measured for pedestrian trips to and from the new terminal. * Number of traffic lanes to cross. (Gelb, 20)

Response: The Environmental Impact Statement will present a detailed analysis of pedestrian operations using commonly accepted methodologies and impact criteria. Potential impacts will be assessed based on pre-September 11, 2001 conditions.

Comment 60: I am very concerned about a PATH entrance/exit in Liberty Park (where Green Market is currently located). Please handle pedestrian traffic with care and keep the one open block east of Church open. (Hughes, 36)

Response: The Environmental Impact Statement will evaluate a Permanent Terminal both with and without a connection to Liberty Park.

Comment 61: It is important that the portal(s) connecting the World Financial Center site to the PATH Terminal be open and secure at all times. (Gelb, 20)

Response: Comment noted.

WTC MEMORIAL AND REDEVELOPMENT PLAN

Comment 62: In terms of potential contamination, the public would like to be informed on the status of the Deutsche Bank building. The figures on the test results from inside the building need to be included in the Environmental Impact Statement for the World Trade Center development projects. (Cook, 4)

Response: The potential contamination of the Duestche Bank Building is being considered as part of the environmental review process for the World Trade Center Memorial and Redevelopment Plan. This work is independent of the review process for the Permanent WTC PATH Terminal.

Comment 63: Both sites for the proposed tour bus parking garage -- underneath the Deutsche Bank or at site 26 in Battery Park City – seem poorly chosen. There exists great potential for a major traffic bottleneck at the end of Greenwich Street if it is opened up through the World Trade Center. (Cook, 4)

Response: The proposed bus parking garage is being considered as part of the environmental review process for the World Trade Center Memorial and Redevelopment Plan. This work is independent of the review process for the Permanent WTC PATH Terminal.

Comment 64: The Libeskind plan was not the one that the majority of New Yorkers chose or desired as the replacement of the World Trade Center. It is unlikely that the plan will survive if investigation were conducted as to its selection. (Oliff, 64)

Response: Comment noted.

MISCELLANEOUS

A number of commenters provided comments on issues that are not relevant to the scope of this project. These include requests for additional information and requests for career opportunities.

These comments have been retained as part of the public record for this project, but they are not specifically addressed as part of this document. ✷

Appendix H-2: DEIS Public Hearing Transcripts

- - - - - - - - - - - - - - - - - - x

PUBLIC HEARING

RE: PERMANENT WORLD TRADE CENTER PATH TERMINAL DRAFT ENVIRONMENTAL IMPACT STATEMENT

- - - - - - - - - - - - - - - - - - x

City Hall
280 Grove Street
Jersey City, New Jersey

June 22, 2004
4:30 p.m.

B E F O R E :

MICHAEL P. DePALLO, Director and General Manager PATH

ROY ALLEN & ASSOCIATES, INC.
521 FIFTH AVENUE - 17TH FLOOR
NEW YORK, NEW YORK 10175
(212) 840-1167

A P P E A R A N C E S :

LOU MENNO, Program Director World
Trade Center Site Restoration
ARNOLD BLOCH, Moderator

MR. DePALLO: Hello. Let's get started, please. If everyone can have a seat, we'll get ready to go.

My name is Michael P. DePallo, I'm the Director and General Manager of PATH and I'm here today to open up this hearing.

I want to welcome you to this public hearing on the Draft Environmental Impact Statement, that's known as a DEIS, and Section 4(f) evaluation for the Permanent World Trade Center PATH Terminal.

The Federal Transportation Administration and The Port Authority of New York and New Jersey have undertaken this DEIS and Section 4(f) evaluation to reconstruct the permanent terminal at the World Trade Center site in Lower Manhattan.

For The Port Authority Trans-Hudson Corporation, PATH, the project would be funded as part of the Federal Government's 4.55 billion Lower Manhattan transportation recovery effort which was committed to New York City following the terrorist attacks of September 11th, 2001.

The Permanent World Trade Center PATH Terminal is proposed to be a full service regional transportation hub that would be coordinated with the existing and future transportation infrastructure, World Trade Center site development and the surrounding area.

The project is needed to be reevaluated and enhance the transportation facilities and infrastructure that existed at the World Trade Center complex prior to September 11th, 2001 and to ensure the long-term accessibility and economic vitality of Lower Manhattan.

The DEIS has been prepared pursuant to the National Environmental Policy Act, known as NEPA, N-E-P-A.

The alternatives considered in the DEIS include a no action alternative, a terminal with a Liberty Plaza connection alternative and a terminal without a Liberty Plaza connection alternative.

The terminal with and without the Liberty Plaza connection alternatives were

carried forward for detailed evaluation in the DEIS after careful review of a range of alternatives as part of the early planning for a Permanent World Trade Center PATH Terminal and following public comments during the scoping process.

This DEIS also considers design options for components of the terminal, including ventilation structures, a Route 9A pedestrian bridge and river water cooling.

The analysis and impact assessments in the DEIS consider potential effects on transit service and transportation, land use and local planning, social and economic conditions, historic and archeological resources, urban design and visual resources, air quality, noise and vibration, infrastructure and energy, contaminated materials, natural and water resources, coastal zone management, safety and security and cumulative effects.

Environmental performance commitments, preliminary sustainable design guidelines and mitigation measures to reduce

localized impacts are described in the document.

There will be a brief presentation in a few minutes followed by your comments.

I'd first like to introduce Arnold Bloch, our moderator for this evening and this afternoon.

Thank you for being here today.

Arnie.

MR. BLOCH: Thank you, Mike.

And also let me welcome you to this public hearing.

For the record, this meeting is part of an environmental review for the Permanent World Trade Center PATH Terminal.

This EIS, or Environmental Impact Statement, is being prepared in accordance with the National Environmental Policy Act, NEPA, of 1969 and the applicable regulations implementing NEPA as set forth in 23 CFR Part 771 and 40 CFR Parts 1500 through 1508 and 49 CFR Part 622.

This EIS is also being prepared in accordance with Section 106 of the National

Historic Preservation Act of 1966 and Section 4(f) of the U.S. Department of Transportation Act of 1966 and associated laws and regulations.

This is one of two public hearings that are being held to hear public comments on the Draft Environmental Impact Statement.

Tomorrow night we'll be having a meeting, tomorrow afternoon and evening in Manhattan at St. John's University, their Manhattan campus, from 4:00 until 8:00 p.m.

And if you need directions for that, they're on the little flier which is out on the table.

As Mike said earlier, the purpose of this meeting is to solicit public comments on the Draft Environmental Impact Statement, which was published on June 4th, 2004.

Copies of that Draft Environmental Impact Statement are available at various libraries in Lower Manhattan and then in New Jersey, in Jersey City, Bayonne, Harrison, Hoboken and Newark, or at the Port Authority's Website, which is

www.panynj.gov/pathrestoration.

And there's a number of documents out there that have that Website so you don't have to copy it down.

For a list of the libraries, if you'd like to look at it there, just please ask anyone at the sign in desk, and we have a couple of sample copies at the desk as well.

In a few minutes Lou Menno, who is the Program Director for the World Trade Center Site Restoration, will make a brief presentation about this project and about the information that's contained in the Draft Environmental Impact Statement.

After Lou is done, we'll begin the public comment portion of the meeting, which will last until 8:00 p.m.

I'll remind you about this again, but it's important that anyone who wishes to offer comments for the record will need to register as a speaker at the registration desk and you'll be filling out one of these yellow cards and I'll mention that again.

You'll have three minutes to

present at that time and you can also submit written documentation, which you can either do on this blue sheet which is available there or any kind of documentation that you have, you can submit that as well, and either tonight or you can submit it afterwards, up until Wednesday, July 21st, 2004, that's the cut-off date.

I'll go into that in some more detail when it's time to start the public comment period, but for now let me introduce Lou Menno.

MR. MENNO: Thank you, Arnold.

And good afternoon, everyone, and thank you for joining us this afternoon.

My presentation this afternoon will outline an analysis of the alternatives presented in the Draft Environmental Impact Statement for the World Trade Center Transportation Hub or the Permanent World Trade Center Permanent PATH Terminal.

We will first present the purpose and need for the project, including a definition of the problem and goals and the

objectives that the project will strive to achieve.

We will then present and describe the three alternatives that were evaluated in the Draft EIS.

Then we will describe the findings of the environmental analysis for the three alternatives, as well as the proposed mitigation measures to alleviate the adverse impacts for the project.

And finally, we will review the environmental process and the upcoming milestones for our project.

A Permanent World Trade Center PATH Terminal is needed to reestablish and enhance the transportation facilities and infrastructure that existed at the World Trade Center site before September 11th of 2001 and to ensure the long-term accessibility and economic vitality of Lower Manhattan.

If this project were not to happen, four distinct problems would occur.

The first one is the economic recovery would be affected.

Several current and proposed projects contribute to the economic recovery of Lower Manhattan, the proposals for the World Trade Center site to rebuild that site with a memorial, cultural facilities, office space, retail space, as well as a new headquarters that is planned in Battery Park City for Goldman Sachs, new residential buildings that will happen in Battery Park City, as well as other offices and residential communities throughout Lower Manhattan. All of these developments restore facilities that were lost on September 11th of 2001.

And they will also attract new residents, office workers and visitors to Lower Manhattan and high capacity transit services are needed to safely and efficiently transport these workers, visitors and residents to and from Lower Manhattan.

The ridership growth. The development in Lower Manhattan will increase the demand for PATH over time, and by the year 2025, that's in approximately 20 years, it is anticipated that the daily PATH ridership will

increase by 25 percent above the pre-September 11th, 2001 ridership levels.

And then commuting to Lower Manhattan without PATH will result in longer, less convenient and more expensive trips than with direct PATH service.

Additional ridership some commuters and visitors to Lower Manhattan would have to take, they would have to drive to this area. The additional vehicle trips would increase congestion to the city streets and to the river crossings and would worsen air quality.

And if they go to other modes of mass transit, in time those mass transit facilities would have to make some capital improvements to handle this ridership.

And finally, the limitation of the temporary PATH service that we recently restored, it's temporary, and by "temporary," it does not restore the capacity that existed before September 11th.

The station has fewer access points than our original PATH Station.

The platforms can only accommodate eight-car trains, not ten-car trains as the original station had.

The temporary station is open air, it's not climate controlled.

And certain elements of the station have a very limited service life.

And that the design does not fit in with the full redevelopment of the World Trade Center site.

There are four goals and supporting objectives that were developed to guide the alternative development process for the Permanent World Trade Center PATH Terminal.

The first goal is to effectively restore PATH service between New Jersey and Lower Manhattan.

And to successfully address this goal, the project must meet the following objectives:

Accommodate the pre-September 11, 2001 ridership levels;

To provide for the additional

capacity at the terminal;

To support the ridership growth to support the rebuilding of downtown;

To provide a modern station design with ADA accessibility, climate controlled station and station security;

And to minimize the disruption of the temporary PATH service as we build this project.

The second goal is to establish an intermodal transportation facility in Lower Manhattan.

Our project should enhance transportation connections to, from and within the World Trade Center site and within Lower Manhattan as compared to the pre-September 11, 2001 conditions that existed there at the Trade Center.

The opportunity to rebuild a PATH terminal should take advantage of connections to existing and future transit infrastructure and should allow for improved at grade and below grade pedestrian connections as compared to what we had before and also compared to the

temporary PATH facilities we presently have.

And to successfully address this goal, our project must improve street level visibility and access;

Provide for adequate and state-of-the-art pedestrian circulation within the facility;

And to provide for connections to New York City Transit subways and other major origination and destination points.

The third goal is to plan and construct a terminal that is consistent with the redevelopment of Lower Manhattan.

This project should support the physical and economic recovery of Lower Manhattan, including proposals for the reconstruction and rehabilitation of other transportation infrastructure, redevelopment at the World Trade Center site and the construction of all other off-site projects, all of which are undergoing their separate environmental reviews.

To successfully address this goal, the project must meet the following

objectives:

First is to construct a facility that is coordinated with the master plan for the World Trade Center site;

To provide for future connections to the World Trade Center buildings, all of the functions that will happen there, the commercial office space, especially the proposed memorial, and to coordinate the PATH facilities with other subgrade uses at the World Trade Center site;

And to plan and coordinate PATH elements with proposals for the reconstruction of Route 9A, the Fulton Street Transit Center and other off-site development.

And the fourth goal is to minimize the adverse impacts on the environment.

The construction and operation of the project should, to the extent possible, minimize the effects to the local and regional environment in the short-term and in the long-term.

The desired alternatives would not only minimize adverse effects but would also

provide for the greatest positive benefits to both the built and natural environment.

To successfully address this goal, the project must do the following:

Reuse existing infrastructure to the extent possible;

Provide for efficient and environmentally friendly construction techniques;

Minimize the disruption to PATH and New York City Transit Authority subway service during construction;

And to provide for green and sustainable design.

The Environmental Impact Statement considered three alternatives for a Permanent World Trade Center PATH Terminal.

The first was a no action alternative, the second one was a terminal with a connection to Liberty Plaza and the third, a new terminal without a connection to Liberty Plaza.

I'll now take you through each of those alternatives.

For the no action alternative, under the NEPA, a no action alternative is typically evaluated. The no action alternative is used as a baseline to evaluate the potential future impacts of a proposed project.

The no action alternative assumed that the temporary station would remain in service until the construction of the World Trade Center Memorial, cultural buildings, the office towers would not allow for the operation of PATH in its present location or configuration.

The demand for PATH service would exceed the station's capacity, meaning that its continued operation would not be safe, and major components of the station would exceed their service life.

The assessment as presented in our Environmental Impact Statement assumes that the station would have to cease operation anywhere between the year 2009 and the year 2025.

The other project alternatives

would result in a new PATH Terminal on the World Trade Center site.

There is one principal difference between these two next alternatives so, therefore, I will begin by describing the components that would be the same for both.

The new World Trade Center Permanent PATH Terminal would provide for a five-track, four-platform station for PATH to accommodate ten-car trains and the forecasted passenger growth.

The intermodal connections to all will have -- I'm sorry, intermodal connections to virtually all subways that service Lower Manhattan, the World Financial Center ferries and local and commuter bus services.

It will have a transportation hall with pedestrian connections to all proposed World Trade Center redevelopment facilities, subways and streets.

The terminal would be fully climate controlled and be designed to maximize natural lighting.

The terminal will provide numerous

intermodal connections. It will provide for east-west connections through the World Trade Center site, including connections to the MTA, New York City Transit Dey Street concourse that will be built as part of their Fulton Street Transit Center and that Transit Center will serve nine subway lines that converge in that area.

It will also connect with the Fulton Street Station of the R, W subway line and the World Trade Center Station on the E line and the future Cortlandt Street Station on the 1 and 9 line.

Connections with the World Trade Center site will allow for site access to the future World Trade Center Memorial, the cultural facilities and the office towers.

A concourse across Route 9A will allow for access between the PATH Terminal and the World Financial Center, Battery Park City and The Port Authority's new Trans-Hudson Ferry Terminal.

And under the terminal with a Liberty Plaza connection, this alternative

terminal would also provide for a subgrade concourse beneath Church Street between the World Trade Center site and Liberty Place.

The concourse will serve the numerous commuters who travel between PATH and the Financial District to the southeast of the site.

And under the next alternative, the terminal without a Liberty Plaza connection alternative, the terminal would not provide a subgrade concourse beneath Church Street between the World Trade Center site and Liberty Plaza.

Other than that, it is the same design as the terminal with the Liberty Plaza connection.

And in addition, there is no change in the construction schedule.

And I'll be going over the impacts of each of these.

As you may have seen on the display boards in this room and the videos as you entered, the terminal consists of a magnificent transportation hall, which will be

a grand architectural statement for Lower Manhattan, visible from the street, very accessible, it will be a Grand Central like terminal for Lower Manhattan.

And in addition, there are four additional levels, not just at street level but four additional levels of pedestrian infrastructure that connect directly to the subways and to the nearby development on and near the World Trade Center site.

And if you haven't had a chance to look at the boards and the videos, I please ask that you take a look at them after the hearing.

From a schedule point of view, the project would begin construction next year, in 2005, and would continue through 2009, and construction will be constructed in -- the construction will be done in phases and portions of the terminal will be open as those phases are completed.

And the construction of the terminal is expected to peak in 2006, as you can see here on this slide, which was selected

as the year for the construction period analysis in the EIS.

I'll now go through the benefits and the impacts of each of the alternatives.

The no action alternative would not result in the construction of a new terminal but it would eventually result in the full closure of the Temporary PATH Station.

Although the no action alternative would have little or no construction period impacts, it would have adverse impacts in the long-term.

The economic revitalization of Lower Manhattan incorporates transportation, infrastructure and development projects. A failure to construct a Permanent PATH Terminal is inconsistent with these revitalization plans.

It is estimated that absent a Permanent PATH Terminal, approximately 5 percent of the diverted PATH riders would drive to Lower Manhattan, and by the year 2025, this would result in 1200 additional vehicle trips in the a.m. peak hour.

These vehicles would cause congestion on the roadways and also generate substantial levels of pollutant emissions and would also create noise with all these vehicles on the road.

The diversion of the PATH riders would also cause congestion on other modes of transportation. It is anticipated that the diverted PATH riders would use commuter trains, buses, ferries and other subways to reach Lower Manhattan and the diversion of large numbers of passengers to these modes would require future capacity improvements by those other facilities.

The terminal with a Liberty Plaza connection has substantial long-term benefits as compared to the no action alternative but there would be impacts during construction.

In the long-term, the terminal with a Liberty Plaza connection would support the economic development of Lower Manhattan.

Since customers would continue to use PATH between New Jersey and Lower Manhattan, the terminal would not generate new

vehicle trips, vehicle emissions or the vehicular noise.

The terminal would also improve access between PATH and the other modes of transit but its operation would not result in adverse impacts in these other modes.

The pedestrian connections that will be provided as part of the terminal will improve street level pedestrian and vehicle circulation and will reduce street level congestion within and through the World Trade Center site, including the intersection of Liberty and Church Street.

The terminal's construction will generate truck trips to and from Lower Manhattan and it will require the use of construction equipment.

Thus, during the terminal's construction, there will be increased truck traffic on area roadways as compared to the no alternative -- to the no action alternative.

The terminal's construction will also generate emissions and noise from construction vehicles and the use of

construction equipment.

The terminal will also have both short- and long-term impacts to archeological and historic resources.

The terminal's construction may alter or remove portions of the Hudson River bulkhead under Route 9A and the remaining remnants and structures on the World Trade Center site.

The terminal's construction may also result in vibration impacts to five historic structures within 90 feet of the construction zone.

The terminal's construction may not allow for long-term preservation of portions of the Hudson River bulkhead and the remaining remnants of the World Trade Center site that exist today.

As will be discussed a little bit later on, the FTA and The Port Authority are working closely with preservation groups and the interested parties to draft mitigation measures to avoid, minimize and mitigate these effects to archeological and historic

resources.

Generally, the benefits and potential impacts of the terminal without a Liberty Plaza connection would be very similar or identical to those of the alternative with the Liberty Plaza connection.

Because the terminal without a Liberty Plaza connection would not require construction across Church Street, it would reduce the level of emissions, noise, vibration impacts near the southeast corner of the site as compared to the terminal with the Liberty Plaza connection but impacts may still occur.

This alternative would also have impacts to historic and archeological resources on and near the World Trade Center site.

In the long-term, the terminal without a Liberty Plaza connection would support the economic recovery of Lower Manhattan, however, because of the higher number of pedestrians, it would increase Church Street at grade pedestrian access and

this alternative does not provide for the same long-term benefits to vehicular and pedestrian circulation, vehicle emissions and the noise as would the terminal with a Liberty Plaza connection.

This is a slide where we are working with many of our other sponsors in Lower Manhattan for the coordination of the cumulative effects during construction.

The FTA and The Port Authority have been coordinating with the sponsors of other Lower Manhattan recovery projects to develop a coordinated set of mitigation measures to address the potential cumulative impacts of these projects during the construction period.

During the spring and summer of last year, the FTA prepared a methodology and approach to the study of cumulative effects for all of the projects in Lower Manhattan.

And in response, the Lower Manhattan project sponsors worked together in a collaborative way to develop environmental performance commitments, EPCs, commitments

intended to proactively address potential construction period impacts since they would be implemented and integrated as part of each of the federally sponsored recovery projects.

Although the EPCs reduce the potential impacts of the recovery projects, preliminary analysis for the individual environmental assessments showed that additional measures would be needed.

And in response, the project sponsors worked to investigate additional commitments for the reduction of air emissions and noise, with particular attention to areas that would be impacted by overlapping construction.

These efforts by the Lower Manhattan project sponsors continue to focus on actively researching the availability and practicality of new technologies to reduce air emissions and noise.

This includes an investigation of particulate filters, noise abatement measures and electrification of certain construction equipment.

As these projects move forward toward their individual Records of Decision, the project sponsors will continue to coordinate their research and will work together to minimize the potential cumulative impacts to the local community during the construction period.

And in the next slides I will present the specific mitigation measures that were identified as part of our work for the Permanent World Trade Center PATH Terminal.

These are the mitigations during the construction period.

Concerning the cultural resources, the EIS identified these six impact areas.

The FTA and The Port Authority are engaged in a Section 106 review process for the project which will result in a Memorandum of Agreement, an MOA, to mitigate any adverse effects to the archeological and historic resources.

This process follows the rules and regulations established by the National Historic Preservation Act.

Throughout the process, which began this past December, the FTA and The Port Authority have actively sought the participation of the Federal Advisory Council on Historic Preservation, the New York State Historic Preservation Officer and approximately 74 consulting parties that represent the interest of victims of the attacks, community groups and preservation groups, as well as federal, state and city agencies.

The Draft EIS identifies preliminary measures that the FTA and The Port Authority are considering to avoid, minimize and mitigate the project's effects to archeological and the historic resources.

Currently the FTA and The Port Authority are working with the various consulting parties to develop mitigation measures for the project.

These measures and commitments will be incorporated into a Memorandum of Agreement for the project among the FTA, the New York State Historic Preservation Officer

and The Port Authority, which will be executed prior to the publication of the Final EIS for our project.

Concerning the economic conditions, The Port Authority will work with other sponsors of Lower Manhattan recovery projects to ensure that businesses near the project sites in Lower Manhattan will remain visible, accessible and viable during the construction of the various federally funded recovery projects.

They will include a signage plan to indicate the location of affected businesses, as well as a comprehensive plan to ensure that businesses remain accessible both for their customers and for their delivery vehicles.

Concerning transportation, the maintenance and protection of traffic plan will not only ensure access to businesses but it will also assure the safe accessibility of Lower Manhattan streets and sidewalks for residents, workers and visitors.

The plan will include measures to

protect vehicles that travel near the construction zone while maintaining the most efficient traffic flow possible.

It will also ensure that access is maintained to residences and businesses and will provide for travel routes to, from and within Lower Manhattan and to keep people moving as construction proceeds.

And it will assure that all of this work will be accomplished while maintaining PATH service.

Air quality. The Lower Manhattan project sponsors have been working very hard to investigate measures to reduce emissions during construction.

A combination of techniques have been researched to reduce the effects of construction vehicles and equipment. These measures include retrofits to engines that reduce particulate emissions, the electrification of certain equipment to reduce emissions by portable generators and the use of ultra-low sulfur fuels and a monitoring program during construction.

The Port Authority is continuing to work with other project sponsors to research available technologies and to determine additional measures that would be undertaken to further reduce the potential construction period effects to air quality.

Noise and vibration. In tandem with our continued efforts to reduce air quality emissions during construction, The Port Authority is also working with other Lower Manhattan project sponsors to investigate strategies to reduce construction generated noise.

Strategies that we are currently researching include equipment retrofits such as mufflers and the use of noise walls, barriers and enclosures around construction zones.

The Port Authority will also work with the New York State Historic Preservation Officer and other preservation groups to develop construction protection plans for historic structures that may be impacted by vibrations from the construction of our

project.

This plan will include monitoring to predict acceptable vibration levels and measures to address exceedance of these levels should they occur during the project's construction.

And concerning contaminated materials, the Draft EIS generally found that contaminated materials were not found on the World Trade Center site.

However, the areas under Route 9A and Church Street have the potential for residual contaminated materials.

The Port Authority will develop a Health and Safety Plan to provide for specific protocols for testing, removal and disposal of these soils if they are encountered during our construction.

These protocols will incorporate all applicable federal, state and local regulations.

The plan will also provide for measures to protect the construction workers and local residents if and when contaminated

soils are found.

Now, concerning mitigations during operation, this will occur during the opening year of 2009 of the terminal and through our design year of 2025.

As we previously mentioned about the Memorandum of Agreement that will be developed to identify specific measures to avoid, minimize and to mitigate the adverse effects to historic resources, the MOA will not only address the potential impacts during the project's construction but it will also provide for measures to ensure the long-term preservation of the archeological and historic resources to the greatest extent possible.

Pedestrian circulation. If a Liberty Plaza connection is not constructed, there may be modifications to accommodate additional pedestrian traffic at street level at the intersection of Liberty and Church streets.

This may involve the physical widening of crosswalks and sidewalks or may require the relocation or removal of street

furniture, sign posts and other obstructions in order to increase the area of the sidewalk that can be used for pedestrian.

And for natural resources, the terminal building will be glass, steel and concrete. Special landscaping and glass treatments and lighting will be incorporated into the terminal's design to reduce the potential for fatal bird strikes.

And in addition, we'll be incorporating sustainable design principles that will allow construction and operation of an environmentally friendly terminal.

The NEPA process for the Permanent World Trade Center PATH Terminal began in September 2003.

The scoping meetings were held in October of last year and the scoping process was closed in mid-December.

We published our DEIS in late May of 2004 and with a Notice of Availability on June 4th.

Our public hearings are being held both today and tomorrow, June 23rd, and the

public comment period will be closed on July 21st.

Our Section 106 review process is also being conducted concurrently. The FTA, the U.S. Department of Housing and Urban Development and the Federal Transit Administration entered into a coordinated Section 106 process that began in December of 2003.

A coordinated Determination of National Register Eligibility was released by these federal agencies in draft form in January 2004 and the Final DOE was circulated on March 31.

Following the publication of the Final DOE, the federal agencies and the local project sponsors continued their Section 106 processes independently.

A Draft Finding of Effects was published by the FTA and The Port Authority in May of 2004 concurrent with the distribution of the DEIS.

A consulting parties meeting was held on June 20 -- I'm sorry, on June 14th to

present these findings and to begin a discussion of the mitigation measures.

The FTA and The Port Authority will now prepare a Memorandum of Agreement that will specifically -- that will specify the specific mitigation measures for effects to historic resources.

This MOA will be executed prior to the publication of the FEIS and we hope to publish the Final Environmental Impact Statement in September and have our Record of Decision in October of this year.

I thank you for listening to me through this brief presentation.

And we will be accepting comments on the DEIS until July 21st of 2004 and comments may be made at this public hearing and at tomorrow's public hearings and can be submitted by fax, E-mail or in writing.

And also please feel free to contact us if you need any additional information on the Draft EIS.

I'd like to thank you very much for your attention and I'd like to now turn it

over to Arnold for the comment period.

Thank you very much.

MR. BLOCH: Thank you, Lou.

So I'll now be calling up people, and they're names of the people who have registered to speak at the meeting.

You can register to speak at any time just by filling out one of these forms at the desk.

We'll be calling you in the order in which you've registered unless we get some elected officials and then as a courtesy to them we'll be allowing them to speak first.

When it's your turn to speak, please approach the microphone that we've just set up over here and clearly state your name for the record and if you have an organization that you represent, please tell us that as well.

I'm going to ask that you keep your comments to three minutes. If you find that your comments are going to go longer than three minutes, I'll ask you to cut that statement down.

You can submit it in writing, either to myself, to the stenographer over here or at the desk in the back where you signed in.

Or if we have time, and I'm sure we will, at the end you can return as a speaker, reregister and complete your remarks if you'd like to.

If you do have a written version, again, you can submit those to any of the three people I noted or actually anybody who's wearing one of these white and blue badges around their neck.

Also, if we take a brief recess at any point, please feel free, as Lou mentioned, to go to any of the boards or the monitors there, and if you need any help, have any questions, just -- there will be people around there wearing one of these and they'll be glad to help you in any way.

As Lou mentioned, there are many different ways to do your comments if you don't want to give them orally today. We ask that you can send them in mail to that address

there, by fax to that phone number there and by E-mail to the E-mail address there.

Remember, if you're going to be mailing it, to postmark it by Wednesday, July 21st, and if you're going to be faxing or E-mailing it, just fax or E-mail by that same date, by 5:00 p.m. of that date.

So I'm going to start by calling the first speaker and we have Douglas John Bowen from the New Jersey Association of Railroad Passengers.

MR. BOWEN: Thank you.

Do I need to repeat that for the record?

My name is Douglas John Bowen, I'm the President of the New Jersey Association of Railroad Passengers, that's a statewide rail passenger advocacy group.

And seldom have we felt so conflicted in a situation like this and I would be lying if I said that our members and other people won't be using this fine upgrade and this fine facility. Inside the box it's an improvement and we applaud The Port

Authority and PATH for the effort.

That said, it is still within the box and an opportunity has been missed. I suppose we should thank The Port Authority for including in its DEIS a mention of NJR's PATH-Lex proposal on pages 2-11 and 2-12 in which you review, analysis and then, of course, subsequently dismiss the proposal to connect New Jersey not just to Lower Manhattan but to the Upper East Side of Manhattan where the CBD is, the number one CBD, central business district, in the United States.

We still feel that's a missed opportunity, and because of that, we'll be presenting our written testimony along with more oral testimony at tomorrow's hearing that will be presented by Al Papp.

We do thank you again for the effort. Again, I would lying if I said I personally or organization members will not be riding the new and improved PATH, but again, it could have been more.

Thank you.

MR. BLOCH: Thank you very much.

Do we have any other registered speakers at the moment?

If not, what we'll do is just take a brief recess.

And as cards come in, I'll just call that person and ask you to come back and we'll have that speaker speak.

So in the meantime, if you'd like to go to the boards and the monitors, please feel free and see any of us who are wearing this and we'll help you out with any questions.

Thank you.

(Time noted: 5:25 p.m.)

(A recess was taken)

(Time noted: 6:30 p.m.)

MR. BLOCH: All right. We're going to reconvene and do a brief presentation, myself and Lou Menno, for those who weren't here for the earlier one and then open it up for any comments that people would like to make.

I wanted to thank you, welcome you to this public hearing.

For the record, this meeting is part of the environmental review for the Permanent World Trade Center PATH Terminal.

This EIS is being prepared in accordance with the National Environmental Policy Act, NEPA, and the applicable regulations which implement NEPA which are set forth in the Code of Federal Regulations 23 CFR Part 771 and 40 CFR Parts 1500 through 1508 and 49 CFR Part 622.

The EIS is also being prepared in accordance with Section 106 of the National Historic Preservation Act of 1966 and Section 4(f) of the U.S. DOT, Department of Transportation, Act of 1966 and associated laws and regulations.

This is one of two public hearings that are being held to hear public comments on the Draft Environmental Impact Statement.

Tomorrow evening in Manhattan at St. John's University, their Manhattan campus Downtown, will also be having a public hearing from 4:00 to 6:00, and we have a little flier outside if you're interested in attending

that, there are direction on how to get there.

The purpose of this meeting is to solicit public comment on the Draft EIS, the Draft Environmental Impact Statement, which was published on June 4th, 2004.

Copies of that statement, the Draft Environmental Impact Statement, are available in libraries in Lower Manhattan, as well as various libraries in Jersey City, Bayonne, Harrison, Hoboken and Newark.

And if you want to know which libraries they're at, you can ask at the front desk where you signed in.

They're also available on The Port Authority's Website, and I won't bother to read it, it's available on all the different literature that we have, the Website, you can download it there.

And we have a couple of sample copies of the EIS, fairly thick, out there on the desk as well.

In a few minutes Lou Menno, who is the Program Director for the World Trade Center Site Restoration, will make a

presentation about this project and the information that's contained in the Draft Environmental Impact Statement.

When Lou is done, we'll begin the public comment portion and that will go until 8 o'clock.

And at that point when Lou is done, I'll tell you about the rules about speaking, but this is the important document you just have to fill out and you can just decide to fill this out after Lou's speech, presentation, or at any point until 8 o'clock and we'll allow you to speak.

And I'll also tell you a little bit later about how you can submit written documentation as well.

But for now let me introduce Lou to go through a power point presentation about the EIS.

MR. MENNO: Thank you. Thank you, Arnold.

And good afternoon -- I should say good evening, everyone, and thank you for joining us this evening.

My presentation will outline the analysis of the alternatives presented in the Draft Environmental Impact Statement for the World Trade Center Transportation Hub or the World Trade Center Permanent PATH Terminal.

First we will present the purpose and need for the proposed project, including a definition of the problem and the goals and objectives that the project will strive to achieve.

Next we will present and describe the three alternatives that were evaluated in the Draft EIS.

I will also describe the findings of the environmental analysis for the three alternatives, as well as the proposed mitigation measures to alleviate adverse impacts from the project.

And I will finally review the environmental process and the upcoming milestones.

A Permanent World Trade Center PATH Terminal is needed to reestablish and enhance the transportation facilities and

infrastructure that existed at the World Trade Center site prior to September 11, 2001 and to ensure the long-term accessibility and economic vitality of Lower Manhattan.

And four distinct problems would exist if this project were not undertaken.

From an economic recovery point of view, several current and proposed projects contribute to the economic recovery of Lower Manhattan, proposals for a memorial, cultural facilities, office spaces and retail at the World Trade Center site, a new headquarters building that is planned in Battery Park City for Goldman Sachs, as well as the 7 World Trade Center which is under construction, offices and residential projects throughout Lower Manhattan.

All of these developments restore facilities that were lost on September 11th of 2001 but they will also attract new residents, workers and visitors to Lower Manhattan.

High capacity transit services are needed to safely and efficiently transport these workers, visitors and residents to and

from Lower Manhattan.

Ridership growth. The development in Lower Manhattan will increase the demand for PATH over the period of time, and by the year 2025, it is anticipated that daily PATH ridership will exceed the September 11, 2001 ridership levels by approximately 25 percent.

And commuting to Lower Manhattan without PATH will result in longer, less convenient and more expensive trips than with direct PATH service.

Additional ridership on other transit modes may require that capacity of these systems be enhanced, and without PATH, some of our commuters and visitors to Lower Manhattan would drive to the area and the additional vehicle trips would increase congestion on city streets and river crossings and worsen air quality.

And then there are the limitations of the Temporary PATH Station, which was recently restored. By its title, "temporary," the temporary station does not restore the capacity that existed before September 11th.

The station has fewer access points than we had originally in the original station and the platforms can only accommodate eight-car trains. The original station was able to accommodate ten-car trains.

The temporary station is open air and it's not climate controlled and certain elements of the station have a limited service life and the station's design does not easily support the full redevelopment of the World Trade Center site.

The four goals and supporting objectives were developed to guide us through the alternative development process for the Permanent PATH Station Terminal.

The first goal is to effectively restore long-term PATH service between New Jersey and Lower Manhattan.

And to successfully address this goal, the project must meet the following objectives:

Accommodate the pre-September 11, 2001 PATH ridership levels;

Provide for additional capacity at

the terminal to support ridership growth;

Provide for a modern station design with ADA accessibility, climate control and station security;

And to minimize the disruption to temporary PATH service during construction of our project.

The second goal is to establish an intermodal transportation facility in Lower Manhattan.

This project should enhance transportation connections to, from and within Lower Manhattan as compared to the pre-September 11, 2001 conditions in Lower Manhattan.

And the opportunity to rebuild a PATH facility should take advantage of connections to existing and future transit infrastructure and should allow for improved at grade and below grade pedestrian connections as compared to the original pre-September 11, 2001 station as well as our temporary facilities that we have now.

To successfully address this goal,

the project must meet the following objectives:

Improve street level visibility and access;

Provide for adequate and state-of-the-art pedestrian circulation within the facility;

And to provide for connections to New York City Transit subways and other major origination and destination points.

The third goal is to plan and construct a terminal that would support the redevelopment of Lower Manhattan.

The project would support the physical and economic recovery of Lower Manhattan, including proposals for the reconstruction or rehabilitation of other transportation infrastructure, redevelopment of the World Trade Center site and construction of other off-site projects, all of which are undergoing their separate environmental reviews.

To successfully address this goal, the project must meet the following

objectives:

We must construct the facility that is coordinated with the master plan for the World Trade Center site;

We must provide for future connections to the World Trade Center buildings and functions, including the proposed memorial, that will be built at the World Trade Center site;

Coordinate the PATH facilities with other subgrade uses at the World Trade Center site;

And to plan and to coordinate the PATH elements with proposals for the reconstruction of Route 9A, the Fulton Street Transit Center and other off-site development.

And the fourth goal is to minimize adverse impacts to the environment.

The construction and operation of the project should, to the extent possible, minimize effects to the local and regional environment in both the short-term and in the long-term.

The desired alternative should not

only minimize adverse effects but would also provide for the greatest positive benefits to both the built and the natural environment.

To successfully address this goal, the project must meet the following objectives:

Reuse existing infrastructure to the extent possible;

Provide for efficient and environmentally friendly construction techniques;

Minimize disruption to PATH and New York City subway service during construction;

And provide for green and sustainable design.

Our EIS considered three alternatives for the Permanent World Trade Center PATH Terminal. The first one is a no action alternative, the second one is a new terminal with a connection to Liberty Plaza and the third is a terminal but without a connection to the Liberty Plaza.

I'll now take you through each of

these alternatives to give you an overview of what they are.

Under the NEPA process, a no action alternative is typically evaluated. The no action alternative is used as a baseline to evaluate the potential future impacts of a proposed project.

The no action alternative assumed that a temporary station would remain in service until the construction of the World Trade Center Memorial, the cultural buildings and office towers, that would not allow for the continued operation of the PATH Station in its present location or configuration.

The demands for PATH service would exceed the station's capacity, meaning that its continued operation would not be safe, and major components of the station would exceed their service life.

The assessment presented in the EIS assumes that the station would cease its operation sometime between the year 2009 and the year 2025.

The other project alternatives

would result in a new PATH terminal on the World Trade Center site.

There is one principal difference between these alternatives, therefore, I will be begin by describing the components that would be the same for both alternatives.

The new terminal would provide a new PATH Station that would have five tracks and four platforms to accommodate ten-car trains and the forecasted passenger growth.

The terminal will also have intermodal connections to virtually all of the subways that service Lower Manhattan, the World Financial Center ferries and local and commuter bus services.

It will have a transportation hall with pedestrian connections to all proposed World Trade Center redevelopment facilities, subways and streets.

The terminal would be fully climate controlled and be designed to maximize natural lighting.

The terminal will provide numerous intermodal connections. It will provide for

east-west connections through the World Trade Center site, including connecting with the MTA, New York City Dey Street concourse of the Fulton Street Transit Center and the Transit Center will serve nine subway lines. This is where there are nine subway lines that converge in Lower Manhattan.

It will also connect with the Cortlandt Street Station on the R and W subway line and the World Trade Center Station on the E line, as well as the future Cortlandt Street Station on the 1 and 9 line.

Connections within the World Trade Center site will allow for access to future World Trade Center Memorial, cultural facilities, retail and the office towers.

A concourse across Route 9A will allow for access between the PATH Terminal and the World Financial Center, Battery Park City and The Port Authority's new Trans-Hudson Ferry Terminal.

And under the terminal with a Liberty Plaza connection, this alternative terminal design would also provide a subgrade

concourse beneath Church Street between the World Trade Center site and Liberty Plaza.

The concourse will serve the numerous commuters who travel between PATH and the Financial District to the south of the World Trade Center site.

Under the terminal without a Liberty Plaza connection, the terminal would not provide a subgrade concourse beneath Church Street between the World Trade Center site and Liberty Plaza.

Other than that, it is the same design as the terminal with the Liberty Plaza connection.

In addition, there is no change in the construction schedule.

And in a few moments I will talk about the impacts of all of these options.

The Permanent PATH Terminal, as you may have seen on the display boards and videos as you entered, is a terminal that consists of a magnificent transportation hall, which will be a grand architectural statement for Lower Manhattan, visible from the street,

a Grand Central Terminal for Lower Manhattan.

In addition, there are four additional levels of pedestrian infrastructure below the street level connecting directly to the subways and the other nearby developments on or near the site.

And if you haven't had a chance to take a look at these displays and look at the video, I please invite you to take a look at them at the end of the presentation.

Our project would begin construction next year, in 2005, and will continue through 2009. Construction will be in phases and portions of the terminal will open as they are completed.

The construction of the terminal is expected to peak in 2006, which was selected as the year for construction period analysis in our Environmental Impact Statement.

The next few slides will compare the benefits and the impacts of the three project alternatives.

The no action alternative would

not result in the construction of a new terminal but it would eventually result in the full closure of the Temporary PATH Station, and although the no action alternative would have little or no construction period impacts, it would have adverse impacts in the long-term.

The economic revitalization of Lower Manhattan incorporates transportation, infrastructure and development projects, and the failure to construct a Permanent PATH Terminal is inconsistent with these revitalization plans.

It is estimated that absent a Permanent PATH Terminal, approximately 5 percent of the diverted PATH riders would drive to Lower Manhattan, and by the year 2025, this could result in 1200 additional vehicle trips in the a.m. peak hours.

These vehicles would cause congestion on area highways, generate substantial levels of pollutant emissions and would create noise.

The diversion of PATH riders would

also cause congestion on other modes of transportation. It is anticipated that the diverted PATH riders would use commuter trains, buses, ferries and other city subway lines to reach Lower Manhattan.

The diversion of a large number of passengers to these modes may require future capacity enhancements by these other facilities.

The terminal with a Liberty Plaza connection has substantial long-term benefits as compared to the no action alternative, but there would be no impacts during construction -- excuse me, but there would be impacts during construction.

In the long-term, the terminal with a Liberty Plaza connection will support the economic development of Lower Manhattan.

Since customers would continue to use PATH between New Jersey and Lower Manhattan, the terminal would not generate new vehicle trips, vehicle emissions or vehicular noise.

The terminal would improve access

between PATH and other modes of transit but its operation would not result in adverse impacts to these other modes.

But pedestrian connections that will be provided as part of the terminal will include street level pedestrian and vehicle circulation and will reduce street level congestion within and through the World Trade Center site, including at the intersection of Liberty and Church streets.

The terminal's construction will generate truck trips to and from Lower Manhattan and it will require the use of construction equipment.

Thus, during the terminal's construction, there would be increased truck traffic on area roadways as compared to the no action alternative.

The terminal's construction would also generate emissions and noise from construction vehicles and the use of construction equipment.

The terminal will also have both short- and long-term impacts to archeological

and historic resources.

The terminal's construction may alter or improve -- may alter or remove portions of the Hudson River bulkhead under Route 9A and remaining remnants and structures on the World Trade Center site.

The terminal's construction may also result in vibration to five historic structures within 90 feet of the construction zone.

The terminal's construction may not allow for the long-term preservation of portions of the Hudson River bulkhead and the remaining remnants of the World Trade Center site that exist today.

As will be discussed a little later, the FTA and The Port Authority are working closely with preservation groups and the interested parties to draft mitigation measures to avoid, minimize or mitigate these effects to the archeological and the historical resources.

Generally, the benefits and the potential impacts of the terminal without a

Liberty Plaza connection would be very similar or identical to those of the alternative with the Liberty Plaza connection.

Because the terminal without a Liberty Plaza connection would not require construction across Church Street, it would reduce the level of emissions, noise and vibration impacts near the southeast corner of the World Trade Center site as compared to the terminal with a Liberty Plaza connection but impacts may still occur.

This alternative would also have impacts to historic and archeological resources on or near the World Trade Center site.

In the long-term, the terminal without a Liberty Plaza connection would support the economic recovery of Lower Manhattan, however, because of the higher number of pedestrians who would cross Church Street at grade, this alternative will not provide for the same long-term benefits to vehicle and pedestrian circulation, vehicle emissions and the noise that would -- the

terminal would -- that the terminal with a Liberty Plaza connection would have.

The coordination of cumulative effects. The FTA and The Port Authority have been coordinating with the sponsors of the other Lower Manhattan recovery projects to develop a coordinated set of mitigation measures to address the potential cumulative impacts of these projects during the construction period.

During the spring and summer of last year, the FTA prepared a methodology and approach to the study of cumulative effects for its projects in Lower Manhattan.

In response, the Lower Manhattan project sponsors worked together to develop environmental performance commitments, EPCs, commitments intended to proactively address potential construction period impacts since they would be implemented and integrated as part of each of the federally sponsored recovery projects.

Although the EPCs reduce the potential impact of the recovery projects,

preliminary analysis for the individual environmental assessments showed that additional measures would be needed.

And in response, the project sponsors worked to investigate additional commitments for the reduction of air emissions and noise, with particular attention to areas that would be impacted by overlapping construction.

These efforts by the Lower Manhattan project sponsors continue, focusing on actively researching the availability and the practical use of new technologies to reduce air emissions and noise.

This includes an investigation of particulate filters, noise abatement measures, the electrification of certain construction equipment.

As these projects move forward toward their individual Records of Decision, the project sponsors will continue to coordinate their research and will work together to minimize the potential cumulative effects to the local community during the

construction period.

And in the next few slides I will present the specific mitigation measures that were identified for our Permanent World Trade Center PATH Terminal that are in our Draft EIS.

Concerning the mitigation measures during construction, the first one is for cultural resources.

The FTA and The Port Authority are engaged in a Section 106 review process for our project which will result in a Memorandum of Agreement, MOA, to mitigate any adverse effects to the archeological and historic resources.

This process follows the rules and regulations established by the National Historic Preservation Act.

Throughout the process, which began this past December, the FTA and The Port Authority have actively sought the participation of the Federal Advisory Council on Historic Preservation, the New York State Historic Preservation Officer and

approximately 74 consulting parties that represent the interested -- that represent the in -- I'm sorry, that represent the interests of victims of the attacks, community groups and preservation groups and federal, state and city agencies.

The Draft EIS identifies preliminary measures that the FTA and The Port Authority are considering to avoid, minimize and mitigate the project's effects to archeological and historic resources.

Currently the FTA and The Port Authority are working with the various consulting parties to develop mitigation measures into -- mitigation measures that will be -- and commitments that will be incorporated into this Memorandum of Agreement for the project.

And that will be among the FTA, the New York State Historic Preservation Officer and The Port Authority and it will be executed prior to the publication of the Final EIS for our project.

Concerning the economic

conditions, The Port Authority will work with the other sponsors of the Lower Manhattan recovery projects to ensure that businesses near the project sites in Lower Manhattan remain viable and accessible during the construction of the various federally funded recovery projects.

These efforts include a signage plan to indicate the location of affected businesses, as well as a comprehensive plan to ensure that businesses remain accessible to both their customers and their delivery vehicles.

Transportation. The maintenance and protection of traffic plan will not only ensure access to businesses but would also assure the safe accessibility of Lower Manhattan streets and sidewalks for residents, workers and visitors.

This plan will include measures to protect vehicles that travel near the construction zone while maintaining the most efficient traffic flow possible.

It will also ensure that access is

maintained to residences and businesses and will provide for travel routes to, from and within Lower Manhattan to keep people moving as construction proceeds.

And it will assure that all of this work will be accomplished while maintaining PATH service.

Air quality. The Lower Manhattan project sponsors have been working very hard to investigate measures to reduce emissions during construction.

A combination of techniques have been researched to reduce the effects of construction vehicles and equipment.

These measures include retrofits to engines that reduce particulate emissions, the electrification of certain equipment to reduce emissions by portable generators and the use of ultra-low sulfur fuels and a monitoring program during construction.

The Port Authority is continuing to work with other project sponsors to research available technologies and to determine additional measures that could be

undertaken to further reduce the potential construction period effects to air quality.

Noise and vibration. In tandem with our continued efforts to reduce air quality emissions during construction, The Port Authority is also working with other Lower Manhattan project sponsors to investigate strategies to reduce construction generated noise.

Strategies that we are currently researching include equipment retrofits such as mufflers and the use of noise walls, barriers and enclosures around the construction zones.

The Port Authority will also work with the New York State Historic Preservation Officer and other preservation groups to develop construction protection plans for the historic structures that may be impacted by vibration from construction equipment.

This plan will include monitoring to predictable -- this plan will include monitoring to predictable acceptable vibration levels and measures to address exceedance of

these levels should they occur during the project's construction.

Contaminated materials. The Draft EIS generally found that contaminated materials were not found on the World Trade Center site, however, the areas under Route 9A and Church Street may have the potential for residual contaminated materials.

The Port Authority will develop a Health and Safety Plan to provide for specific protocols for the testing, removal and disposal of these soils if they are encountered during construction.

These protocols will incorporate all applicable federal, state and local regulations.

The plan will also provide for measures to protect the construction workers and the local residents if and when contaminated soils are found.

Concerning the mitigation measures during the operation, we talk about operation as during the opening year of 2009 and our design year of 2025.

As described previously, a Memorandum of Agreement will be developed to identify specific measures to avoid, minimize and mitigate adverse effects to historic resources.

The MOA will not only address potential impacts during the project's construction but it will also provide for measures to ensure the long-term preservation of historic and historic -- and archeological resources to the greatest extent possible.

Concerning pedestrian circulation, if a Liberty Plaza connection is not constructed, there may be modifications to accommodate additional pedestrian traffic at street level at the intersection of Liberty and Church streets.

This may involve the physical widening of crosswalks and sidewalks or may require the relocation or the removal of the street furniture, sign posts or other obstructions in order to increase the area of the sidewalk that can be used by pedestrians.

Natural resources. The terminal

building will be glass, steel and concrete. Special landscaping, glass treatments and lighting will be incorporated into the terminal design to reduce the potential for fatal bird strikes.

In addition, we will be incorporating sustainable design principles that will allow construction and operation of an environmentally friendly terminal.

The NEPA process for the Permanent World Trade Center Terminal began in September of 2003.

The scoping meetings were held in October of 2003 and the scoping process was closed in mid-December of last year.

We published our DEIS in late May of 2004 and with a Notice of Availability on June 4th.

Our public hearings are being held today and tomorrow, June 23rd, and the public comment period will be closed on July 21.

Our Section 106 review process is being conducted concurrently.

The FTA, the United States

Department of Housing and Urban Development and the Federal Transit Administration entered into a coordinated Section 106 process beginning in December of 2003.

A coordinated Determination of National Register Eligibility was released by these federal agencies in draft form in January of 2004 and the Final DOE was circulated on March 31st of this year.

Following the publication of the Final DOE, the federal agencies and the local project sponsors continued their Section 106 processes independently.

A Draft Finding of Effects was published by the FTA and The Port Authority in May of this year and concurrent with the distribution of the DEIS.

And a consulting parties meeting was held on June 14th of this year to present these findings and to begin a discussion of mitigation measures.

The FTA and The Port Authority will prepare a Memorandum of Agreement that will specify mitigation measures for effects

to historic resources.

The MOA will be executed prior to the publication of the FEIS and we hope to publish the Final Environmental Impact Statement in September and have our Record of Decision in October of this year.

I'd like to thank you very much for taking the time to listen to my presentation.

I'd like to now turn it over to Arnold because we will now be accepting your comments on the DEIS until July 21st.

Comments can be made at this public hearing or tomorrow at the public hearing in New York or can be submitted by fax, E-mail or in writing.

And please feel free to contact us if you have any additional information concerning our Draft EIS.

Thank you very much.

Arnold.

MR. BLOCH: Thanks, Lou.

We don't yet have anyone who's signed up for speakers to speak, but you have

until 8 o'clock to do so.

We just ask that you keep your remarks to about three minutes, and if you -- we also are looking for you to submit any written comments, either today on these blue sheets that were available at the desk, and you can submit those to myself or at the desk or to the court reporter over here, and you can also submit written comments beyond this date through July 21st.

You can see here and in any of the documents that we have up front there are addresses both for mail and for E-mail and fax numbers.

We only ask that you please postmark, if you're mailing it, by Wednesday, July 21st, and if you're faxing or E-mailing, please do so before 5 o'clock on Wednesday, July 21st.

So if you would like to make any comments, please just go to the desk there and submit one of these cards.

If you would like to talk informally with anybody here about anything

that you've heard today or see on these boards, we'll just call a brief recess and anyone who's wearing one of these tags will be glad to talk with you, any members of the public, while we're still waiting for any speakers.

We'll be here till 8:00.

So thank you.

And I guess right now we'll just have a brief recess until anyone wants to speak.

Thank you.

(Time noted : 7:15 p.m.)

(A recess was taken)

MR. BLOCH: Okay. It's now 8:00 and we have no more speakers so I'm going to close this public hearing for tonight.

Thank you very much.

(Time noted: 8:00 p.m.)

C E R T I F I C A T E

STATE OF NEW YORK)
ss.
COUNTY OF NEW YORK)

I, Ann Brunetti, a shorthand reporter and notary public of the State of New York, do hereby certify:

That the foregoing, pages 1 through 79, taken at the time and place aforesaid, is a true and correct transcription of my stenographic notes, to the best of my ability.

IN WITNESS WHEREOF, I have hereunto set my hand this 9th day of July 2004.

Ann Brunetti

- - - - - - - - - - - - - - - - - x

PUBLIC HEARING

RE: PERMANENT WORLD TRADE CENTER PATH TERMINAL DRAFT ENVIRONMENTAL IMPACT STATEMENT

- - - - - - - - - - - - - - - - - x

St. John's University
101 Murray Street
New York, New York

June 23, 2004
4:30 p.m.

B E F O R E :

MICHAEL PETRALIA, Chief of Public and Government Affairs, PATH

ROY ALLEN & ASSOCIATES, INC.
521 FIFTH AVENUE - 17TH FLOOR
NEW YORK, NEW YORK 10175
(212) 840-1167

A P P E A R A N C E S :

TONY CRACCHIOLO, Director of Priority
Capital Programs, PATH

ARNOLD BLOCH, Moderator

MR. PETRALIA: Good afternoon.

My name is Michael Petralia, I'm the Chief of Public and Government Affairs for The Port Authority of New York and New Jersey.

I want to welcome you to this public hearing on the Draft Environmental Impact Statement and Section 4(f) evaluation of the Permanent World Trade Center PATH Terminal.

The Federal Transit Administration and The Port Authority of New York and New Jersey have undertaken the DEIS and Section 4(f) evaluation to reconstruct the permanent terminal at the World Trade Center site in Lower Manhattan.

For The Port Authority Trans-Hudson, PATH, system, the project will be funded as part of the Federal Government's 4.55 billion Lower Manhattan transportation recovery effort which was committed to New York City following the terrorist attacks of September 11th, 2001.

The Permanent World Trade Center PATH Terminal, designed by Architect Santiago

Calatrava, is proposed to be a full-service regional transportation hub that would be coordinated with the existing and future transportation infrastructure, the World Trade Center site development and the surrounding area.

The project is needed to reestablish and enhance transportation facilities and infrastructure that existed at the World Trade Center complex prior to September 11th, 2001 and to ensure the long-term accessibility and economic vitality of Lower Manhattan.

This DEIS has been prepared pursuant to the National Environmental Policy Act, or NEPA.

The alternatives considered in the DEIS include a no action alternative, a terminal with a Liberty Plaza connection alternative, a terminal with -- a terminal without a Liberty Plaza connection alternative.

The terminal with and without the Liberty Plaza connection alternatives were

carried forward for detailed evaluation in this DEIS after careful review of a range of alternatives as part of the early planning for the Permanent World Trade Center PATH Terminal and following public comments during the scoping process.

This DEIS also considers design options for components of the terminal, including ventilation structures, a Route 9A pedestrian bridge and river water cooling.

The analyses and impact assessments in the DEIS considered potential effects on transit service and transportation, land use and local planning, social and economic conditions, historic and archeological resources, urban design and vital resources, air quality, noise and vibration, infrastructure and energy, contaminated materials, natural and water resources, coastal zone management, safety and security and cumulative effects.

Environmental performance commitments, preliminary sustainable design guidelines and mitigation measures to reduce

localized impacts are described in the documents.

There will now be a brief presentation followed by your comments, but before the presentation I would like to introduce Arnold Bloch, our moderator for this afternoon and through this evening.

Thank you again for being here today.

MR. BLOCH: Thank you, Mike.

And also let me welcome you to our public hearing.

For the record, this meeting is part of the environmental review for the Permanent World Trade Center PATH Terminal.

This Environmental Impact Statement is being prepared in accordance with the National Environmental Policy Act, known as NEPA, and the applicable regulations which implement NEPA as set forth in 23 CFR Part 771 and 40 CFR Parts 1500 through 1508 and 49 CFR Part 622.

The EIS is also being prepared in accordance with Section 106 of the National

Historic Preservation Act of 1966 and Section 4(f) of the U.S. Department of Transportation Act of 1966 and associated laws and regulations.

This is one of two public hearings that are being held to hear public comments on the Draft Environmental Impact Statement.

Last night we were in Jersey City at City Hall from 4:00 until 8:00 p.m.

As Mike said earlier, the purpose of this meeting is to solicit public comment on the Draft EIS, which was published on June 4th, 2004.

Copies of the Draft Environmental Impact Statement are available at various libraries in Lower Manhattan, Jersey City, Bayonne, Harrison, Hoboken and Newark or at the Port Authority's Website.

The Website address is available on the newsletter, which hopefully you picked up, it's on the back so I won't try and read it for you so you can just get it there.

For a list of the libraries that the EIS is available at, you can please ask at

the sign in desk downstairs.

We have a number of sample copies at the registration desk as well.

In a few minutes Tony Cracchiolo, who is the Director of Priority Capital Programs for The Port Authority, will make a brief presentation about this project and about the information contained in the Draft Environmental Impact Statement.

After Tony is done, we will begin the public comment portion of this meeting, which will last until 8:00 p.m.

I'll remind you about this again but it's important that anyone who wishes to offer comments, please register downstairs at the sign in desk and you have to fill out one of these yellow forms. A number of people have done that.

But if you'd like to do that and you haven't done that, at any point this evening you can go down and register and we'll call you at that point. You'll have three minutes to present at that time.

You can also submit written

documentation either tonight or afterwards and all the way through Wednesday, July 21st, 2004.

So let me now introduce Tony Cracchiolo and he'll give you a presentation about the EIS.

MR. CRACCHIOLO: Thank you and good afternoon.

This presentation will outline the analysis of the alternatives presented in the Draft Environmental Impact Statement for the World Trade Center Transportation Hub.

First I will present the purpose and need for the project, including a definition of the problem and the goals and objectives that the project will strive to achieve.

Next I will present and describe the three alternatives that were mentioned to you just a minute ago that were evaluated in the Draft EIS.

And then I will describe the findings of the environmental analysis for the three alternatives, as well as the proposed

mitigation measures to alleviate any adverse impacts from the project.

Finally, I'll review the environmental process and upcoming milestones.

A Permanent World Trade Center PATH Terminal is needed, number one, to establish and enhance transportation facilities and infrastructure that existed at the World Trade Center complex prior to September 11, 2001, and second, to ensure the long-term accessibility and economic vitality of Lower Manhattan.

Four distinct problems would exist if the problem were not undertaken.

First, economic recovery. Several current and proposed projects contribute to the economic recovery of Lower Manhattan, proposals for memorial, cultural facilities, offices and retail development on the World Trade Center site, a new headquarters building being planned in Battery Park City by Goldman Sachs, as well as No. 7 World Trade Center which is currently under construction and offices and residential projects throughout

Lower Manhattan.

These developments restore facilities that were lost on September 11, 2001 but they also attract new residents, office workers and visitors to Lower Manhattan.

High capacity transit services are needed to safely and efficiently transport these workers, visitors and residents to and from Lower Manhattan.

Second, ridership growth. This development in Lower Manhattan will increase the demands for PATH over time. By 2025, it is anticipated that the daily PATH ridership will exceed pre-September 11, 2001 levels by approximately 25 percent.

Commuting to Lower Manhattan without PATH will result in longer, less convenient and more expensive trips than with direct PATH service.

Anyone who remembers how it was getting to Lower Manhattan prior to the opening of our temporary PATH service will know what I'm talking about.

Additional ridership on other transit modes may require that the capacity of these systems be enhanced, and without PATH, some commuters and visitors to Lower Manhattan would drive to the area. The additional vehicle trips would increase congestion on city streets and river crossings and worsen air quality.

There are limitations of temporary PATH service recently restored. The temporary station does not restore the capacity that existed in the pre-9/11 terminal.

The station has fewer points of access than did the pre-September 11 terminal.

Platforms accommodate only eight-car trains as compared to the ten-car platforms that existed prior to September 11.

And the temporary station is open air, it is not climate controlled.

Certain elements of the station have a limited service life and the station as designed does not easily support the full development of the World Trade Center site.

Four goals and supporting

objectives were developed to guide the alternatives development process for the Permanent World Trade Center Terminal.

Goal number one, effectively restore long-term PATH service between New Jersey and Lower Manhattan.

To successfully address this goal, the project must meet the following objectives.

Accommodate pre-September 11, 2001 PATH ridership;

Provide for additional capacity at the terminal to support ridership growth;

Provide for modern station design with full ADA accessibility, climate control and station security;

And minimize disruption to temporary PATH service during construction.

Goal two, establish an intermodal transportation facility in Lower Manhattan.

This project should enhance transportation connections to, from and within Lower Manhattan as compared to the September 11 -- pre-September 11, 2001

conditions.

The opportunity to rebuild the PATH facility should take advantage of connections to existing and future transit infrastructure and should allow for improved at grade and below grade pedestrian connections as compared to the pre-September 11th and temporary PATH facilities.

To successfully address this goal, the project must meet the following objectives:

Improve street level visibility and access;

Provide for adequate and state of the art pedestrian circulation within the facility;

And provide for connections to New York City Transit subways and other origination and destination points.

Third, plan and construct the terminal that would support the redevelopment of the Lower Manhattan.

The project should support the

physical and economic recovery of Lower Manhattan, including proposals for the reconstruction or rehabilitation of other transportation, infrastructure, redevelopment of the World Trade Center site and the construction and occupation of other off-site projects, all of which are undergoing separate environmental reviews.

To successfully address this goal, the project must meet the following objectives:

Construct the facility as coordinated with the master plan for the World Trade Center site;

Provide for future connections to World Trade Center buildings and functions, including the proposed memorial;

Coordinate PATH facilities with other subgrade uses at the site;

And plan and coordinate PATH elements with proposals for reconstruction of the Route 9A, West Street, the Fulton Street Transit Center and other off-site development.

And fourth, minimize adverse

impacts to the environment.

Construction and operation of the project should, to the extent possible, minimize effects to the local and regional environment in the short-term and in the long-term.

The desired alternative would not only minimize adverse effects but would also provide for the greatest positive benefits to both the built and natural environments.

To successfully address this goal, the project must meet following objectives:

Reuse existing infrastructure to the degree possible;

Provide for efficient and environmental friendly construction techniques;

Minimize disruption to PATH and New York City Transit subway service during construction;

And provide for a green and sustainable design.

The EIS considered three alternatives for a Permanent World Trade

Center PATH Terminal, a no action alternative, a new terminal with a connection to Liberty Plaza at the corner of Church and Liberty streets and a new terminal without a connection to Liberty Plaza.

The next several slides will describe these alternatives.

Maintain the Temporary PATH Station.

Under NEPA, a no action alternative is typically evaluated. The no action alternative is used as a baseline to evaluate the potential future impacts of the proposed project.

The no action alternative assumed that the temporary station would remain in service until:

One, the construction of the World Trade Center Memorial, cultural buildings and the office towers would not allow for the operation of a PATH Station in its present location or configuration;

Number two, the demand for PATH service would exceed the station's capacity,

meaning that its continued operation would not be safe;

And three, major components of the station would exceed their service life.

The assessment presented in the EIS assumes that the station would need to cease operations under this alternative at some point between 2009 and 2025.

Second, construct a new terminal on the site.

The other project alternatives would result in a new PATH terminal on the World Trade Center site.

There is one principal difference between these two alternatives, therefore, I will begin by describing what the components are in common for both alternatives.

The terminal would provide in both cases five tracks and four platforms to accommodate ten-car trains and forecasted passenger growth.

The intermodal would -- would provide intermodal connections to virtually all subways Downtown, World Trade -- World

Financial Ferry Terminal and local and commuter bus services.

A transportation hall would be provided with pedestrian connections to all proposed World Trade Center redevelopment facilities, subways and surrounding streets and the terminal would be fully climate controlled and be designed to maximize natural lighting.

The terminal will provide numerous intermodal connections. It will provide for an east-west connection through the World Trade Center site, including connecting with the MTA, New York City Transit's Dey Street concourse to the Fulton Transit, Fulton Street Transit Center at Broadway. The Transit Center will serve nine subway lines.

It will also connect with the Cortlandt Street Station on the R and W subway line, the World Trade Center Station on the E line and the future Cortlandt Street Station on the 1 and 9 line which would be reopened.

Connections within the World Trade Center site will allow for access to the

future World Trade Center Memorial, cultural facilities, retail and office towers.

And a concourse across West Street, Route 9A, will allow for access between the PATH terminal and the World Financial Center, Battery Park City and The Port Authority's new Trans-Hudson Ferry Terminal.

And under the terminal with the Liberty Plaza connection alternative, the terminal would also provide a subgrade concourse beneath Church Street between the World Trade Center site and Liberty Plaza.

The concourse will serve the numerous commuters who travel between PATH and the Financial District, the Wall Street District.

Under the terminal without a Liberty Plaza connection, the terminal would not provide a subgrade concourse beneath Church Street between the World Trade Center site and Liberty Plaza.

Other than that, it is the same design as the terminal with the Liberty Plaza

connection.

In addition, there is no change in the construction schedule on either of these alternatives.

We'll discuss the impacts of this option shortly.

As you may have seen on the display boards and video as you entered today, the terminal exists of a magnificent transportation hall, which would be a grand architectural statement for Lower Manhattan, visible from the street, a Grand Central Terminal for Lower Manhattan.

In addition, there are four additional levels of pedestrian infrastructure connecting directly to the subways and the nearby development on and around the site.

If you haven't had a chance to take a look at these displays, I invite you to stop by later to do so. They'll be running throughout the hearing.

Okay. The project would begin in 2005 and would continue to 2009. Construction will be in phases and portions of the terminal

will open as they are completed.

The construction of the terminal is expected to peak in 2006, which was selected as the year for construction period analysis in the EIS.

The no action alternative.

The next few slides compare the benefits and impacts of all the project alternatives.

Starting with the no action alternative, this alternative would not result in the construction of a new terminal but it would eventually result in the full closure of the Temporary PATH Station.

Thus, although the no action alternative will have little or no construction period impacts, it would have adverse impacts in the long-term.

The economic revitalization of Lower Manhattan incorporates transportation, infrastructure and development projects. The failure to construct the Permanent PATH Terminal is inconsistent with these revitalization plans.

It is estimated that absent a permanent terminal, approximately 5 percent of the diverted PATH riders would drive to Lower Manhattan. By 2025, this could result in 1200 additional vehicle trips in the a.m. peak hour.

These vehicles would cause congestion on area roadways, would generate substantial levels of pollutant emissions and will create noise.

The diversion of PATH riders would also cause congestion on other modes of transit. It is anticipated the diverted PATH riders would use commuter trains and buses, ferries and city subways to reach Lower Manhattan.

The diversion of large numbers of passengers to these modes may require future capacity enhancements.

The terminal with the Liberty Plaza connection has substantial long-term benefits as compared to the no action alternative but there would be impacts during its construction.

In the long-term, the terminal with a Liberty Plaza connection would support the economic development of Lower Manhattan.

Since customers could continue to use PATH between New Jersey and Lower Manhattan, the terminal would not generate new vehicle trips, vehicle emissions or vehicular noise.

The terminal would improve access between PATH and the other modes of transit but its operation would not result in adverse impacts to these other modes.

The pedestrian connections that will be provided as part of the terminal will improve street level pedestrian and vehicle circulation and will reduce street level congestion within and through the World Trade Center site, including at the intersection of Liberty and Church streets.

The terminal's construction will generate truck trips, however, to and from Lower Manhattan and will require the use of construction equipment.

Thus, during the terminal's

construction, there will be increased truck traffic on area roadways as compared to the no action alternative.

The terminal's construction will also generate emissions and noise from construction vehicles and the use of construction equipment.

The terminal will also have both short- and long-term impacts to archeological and historical resources.

The terminal's construction may alter or remove portions of the Hudson River bulkhead under Route 9A, the remaining remnants and structures on the World Trade Center site.

And the terminal's construction may also result in vibration impacts to five historic structures within 90 feet of the construction zone.

The terminal's construction may not allow for the long-term preservation of portions of the Hudson River bulkhead and remaining remnants of the World Trade Center site that exist today.

As will be described a bit later, the FTA and The Port Authority are working closely with the preservation groups and interested parties to draft mitigation measures to avoid, minimize or mitigate these effects to archeological and historic resources.

The terminal without the Liberty Plaza connection generally has the same benefits and potential impacts to the terminal with the Liberty Plaza connection.

The difference, basically the difference is that without this connection, there are additional impacts to the intersection at Liberty and Church Street.

Both of these alternatives would support the economic development of Lower Manhattan, however, because a higher number of pedestrians would cross Church Street at grade, this alternative would not provide the same long-term benefits to vehicular and pedestrian circulation, vehicle emissions and noise as would the terminal with the Liberty Plaza connection.

The FTA and The Port Authority have been coordinating with the sponsors of other Lower Manhattan recovery projects to develop a coordinated set of mitigation measures to address the potential cumulative impacts of these projects during the construction period.

During the spring and summer of last year, FTA, the Federal Transit Administration, prepared a methodology and approach to the study of cumulative effects for its projects in Lower Manhattan.

In response, the Lower Manhattan project sponsors worked together to develop environmental performance commitments, EPCs, commitments intended to proactively address potential period -- construction period impacts since they would be implemented and integrated as part of each of the federally sponsored recovery projects.

Although the EPCs reduce the potential impacts of the recovery projects, preliminary analysis for the individual environmental assessments showed that

additional measures would be needed.

In response, the project sponsors worked to investigate additional commitments for the reduction of air emissions and noise, with particular attention to areas that would be impacted by overlapping construction.

These efforts by the Lower Manhattan project sponsors continue, focusing on actively researching the availability and practicality of new technologies to reduce air emissions and noise.

This includes an investigation of particulate filters, noise abatement measures and electrification of certain construction equipment.

As these projects move forward towards their individual periods of Records of Decision, the project sponsors will continue to coordinate their research and will work together to minimize potential cumulative effects to the local community during the construction period.

In the next few slides I will present the specific mitigation measures that

were identified with the Permanent World Trade Center Terminal in the Draft EIS.

The EIS identified six resource areas during the project's construction.

The FTA and The Port Authority are engaged in a Section 106 review process for the project which will result in a Memorandum of Agreement to mitigate any adverse effects to archeological and historic resources.

This project follows the rules and regulations established by the National Historic Preservation Act.

Throughout the process, which began this past December, the FTA and The Port Authority have actively sought the participation of the Federal Advisory Council on Historic Preservation, the New York State Historic Preservation Officer and approximately 74 consulting parties that represent the interests of victims of the attack, community groups and preservation groups and federal, state and city agencies.

The Draft EIS identifies preliminary measures that the FTA and The Port

Authority are considering to avoid, minimize or mitigate the project's effects to archeological and historic resources.

Currently the FTA and The Port Authority are working with the various consulting parties to develop mitigation measures for the project.

These measures and commitments will be incorporated into a Memorandum of Agreement for the project among the FTA, New York State Historic Preservation Officer and The Port Authority, which will be executed prior to the publication of the Final EIS for this project.

Second, The Port Authority will work with the other sponsors of the Lower Manhattan recovery projects to ensure that businesses near the project sites in Lower Manhattan remain viable and accessible during the construction of the various federally funded projects.

These include a signage plan to indicate the location of affected businesses, as well as a comprehensive plan to ensure that

businesses remain accessible to both their customers and delivery vehicles.

Third, the maintenance and protection of traffic plan will not only ensure access to businesses but will also assure the safe accessibility of Lower Manhattan's streets and sidewalks for residents, workers and visitors.

This plan will include measures to protect vehicles that travel near the construction zone while maintaining the most efficient traffic flow possible.

It will also assure that access is maintained to residences and businesses and will provide for travel routes to, from and within Lower Manhattan to keep people moving as construction proceeds.

And it will assure that all of this work will be accomplished while maintaining PATH service.

The Lower Manhattan project sponsors have been working very hard to investigate measures to reduce emissions during construction.

A combination of techniques have been researched to reduce the effects of construction vehicles and equipment.

These measures include retrofits to engines that reduce particulate emissions, the electrification of certain equipment to reduce emissions by portable generators and the use of ultra-low sulfur fuels and a monitoring program during construction.

The Port Authority is continuing to work with the other project sponsors to research available technologies and to determine additional measures that could be undertaken to further reduce construction period effects to air quality.

Fifth, in tandem with our continued efforts to reduce air quality emissions during construction, The Port Authority is also working with the other Lower Manhattan project sponsors to investigate strategies to reduce construction generated noise.

The strategies that we're currently researching include equipment

retrofits such as mufflers and the use of noise walls, barriers and enclosures around construction zones.

The Port Authority will work with the New York State Historic Preservation Officer and other preservation groups to develop construction protection plans for the historic structures that may be impacted by vibration from construction equipment.

This plan will include monitoring to predictable acceptable vibration levels and measures to address exceedance of these levels should they occur during the project's construction.

And six, the Draft EIS generally found that contaminated materials were not found on the World Trade Center site, however, the areas under Route 9A and Church Street have the potential for residual contaminated materials.

The Port Authority will develop a Health and Safety Plan to provide for specific protocols for the testing, removal and disposal of these soils if they are

encountered during construction.

These protocols will incorporate all applicable federal, state and local regulations.

The plan will also provide for measures to protect construction workers and local residents if and when contaminated soils are found.

Now I'd like to take a minute to discuss the mitigation actions we're considering during our opening year, 2009, when we begin operations and our design year, 2025.

As described previously, a Memorandum of Agreement will be developed to identify specific measures to avoid, minimize or mitigate adverse effects to historic resources.

The MOA will not only address potential impacts during the project's construction but it will also provide for measures to ensure the long-term preservation of archeological and historic resources to the greatest extent possible.

If a Liberty Plaza connection is not constructed, there may be modifications to accommodate additional pedestrian traffic at street level at the intersection of Liberty and Church streets.

This may involve the physical widening of crosswalks and sidewalks or may require the relocation or removal of street furniture, sign posts and other obstructions in order to increase the area of the sidewalk that will be available for the use by pedestrians.

The terminal building will be a glass, steel and concrete construction. Several landscaping, glass treatments and lighting will be incorporated -- special landscaping, glass treatments and lighting will be incorporated into the terminal's design to reduce the potential for fatal bird strikes.

In addition, we will be incorporating sustainable design principles that will allow construction and operation in an environmentally friendly terminal.

The NEPA process for the Permanent World Trade Center PATH Terminal began in September 2003.

Scoping meetings were held in October and you can see from the schedule and scoping -- the scoping process was closed in mid-December.

We published our DEIS in late May of this year and with a Notice of Availability on June 4th.

Our public hearings were held yesterday and are being held here today and the public comment period will close on July 21st.

Our Section 106 review process, which is going on concurrently, being sponsored by the FTA, the U.S. Department of Housing and Urban Development, the Federal Transit Administration entered into a coordinated Section 106 process beginning in December of last year.

A coordinated Determination of National Register Eligibility was released by these federal agencies in draft form in

January of 2004 and the Final DOE was circulated on March 31st of this year.

Following the publication of the Final DOE, the federal agencies and local project sponsors continued their Section 106 processes independently.

A Draft Finding of Effects was published by the FTA and The Port Authority in May 2004, concurrent with the distribution of DEIS.

And a consulting parties meeting was held on June 14th this year to present these findings and to begin a discussion of mitigation measures.

FTA and Port Authority will now prepare a Memorandum of Agreement that will specify mitigation measures for effects to historic resources.

This MOA will be executed prior to the publication of the Final EIS for the project. We hope to publish this Final EIS in September and have our Record of Decision in October of this year.

We will be accepting -- besides

your comments today which we invite, we will also be accepting comments that are written or E-mailed on the DEIS until July 21st, 2004.

Comments can be made in a number of forms, as I said, E-mail, fax or in writing, so please, please do so. We welcome and invite your comments.

Thank you very much for your attention.

I'd like to now turn the floor back to Arnold for your comments.

MR. BLOCH: Thank you, Tony.

So now I'm going to begin calling the names of people who have registered to speak at this meeting.

You can register to speak, as I mentioned earlier, at any point during this meeting up through 8 o'clock, and all you have to do, if you haven't done this already, is fill in one of these yellow forms which is downstairs when you came in and we'll take it and I'll be calling you out.

I'll be calling you in the order in which you registered, except if any elected

officials come we will afford them the courtesy of speaking first.

I will call out the names of the speaker and then the next speaker just so that person is aware that his or her turn is coming up.

And there are two microphones here at the bottom here, one here on my right and on the left. If you have any difficulty getting down there, they're wireless, we can always bring them up, so just let us know.

When it's your turn to speak, please approach the microphone, clearly state your name for the record and if you have an organizational affiliation, please do so, tell us that as well.

I ask that you keep your comments to three minutes. If you feel that you need to go longer than that, I'm going to suggest that you cut your statement down a bit or you can submit it in writing or if we have time at the end, you can come back, register to speak again and you could pick up your comment at that point after everyone else has had a

chance to speak.

If you do have a written version of your comments as well as any other documentation that you would like to submit that you think is worthwhile to submit, please hand it either to myself, to the court reporter who's down here on my right or downstairs at the desk where you signed in.

If at any time you'd like to just step out of the room, you can visit any of the boards or the video that Tony mentioned downstairs and talk to any of the project representatives who are wearing these white and blue badges around their neck.

But please remember that those comments and that conversation that goes on is informal and will not be part of the written record. This will be what you say in here.

This is not the only way for you to submit your comments. As Tony mentioned, we have these forms downstairs, you could put comments on this, or you could submit comments or documentation in any other form that you'd like to.

And you can do so at any of these, send it to this address, send it to that fax or E-mail it to that address there.

That information is also available in the small handout that you may have received or got downstairs and also in the larger one on the back page, both of them starting with "Building a New PATH." On the back page it gives the same information so you don't have to be scurrying around to write that down.

But I do want to remind you that there is a closing date. We would ask that if you're mailing anything that you would postmark it no later than Wednesday, July 21st of this year, and if you're going to be faxing or E-mailing it, please do so by 5:00 p.m. on Wednesday, July 21st, 2004.

Okay. Now I'm going to be calling the first speaker and announcing the name of the next speaker.

The first speaker is Chris Ormsby and the next speaker will be Alan Mason.

MR. ORMSBY: My name is Chris

Ormsby, I'm a member of Local Union No. 3, IBW, and I am definitely in favor of the building of this facility.

I can't think of a more grand and proper entrance to Lower Manhattan than this facility.

It will also create countless temporary construction jobs and countless permanent jobs.

Thank you.

MR. BLOCH: Thank you, Mr. Ormsby.

Mr. Mason.

And after he speaks, Louis Epstein will be the next speaker.

MR. MASON: My name is Alan Mason, I'm also with Local 3, IBW. We're the electricians union in the City of New York.

When the Trade Center was attacked, we will lost 17 members that were electricians and another four that were in our union that weren't -- incurred a personal loss.

Not only does the building of Lower Manhattan continue but New York is the

heart of the U.S. and it's really important that it's not only rebuilt but it's rebuilt bigger, better, more grand and also safer.

You know, so for me, it's not my backyard. I know there are people here who have co-ops, condos, houses right inside of it.

I come in every day, I work right there, which makes it as important to me as anyone who does live there.

If we don't make commuting and transportation to Lower Manhattan efficient, safe, comfortable, what's going to happen is the same thing that happened right after 9/11.

You're going to have businesses leaving, you're going to have businesses taking their employees across the river and weakening New York.

Right now we're in global economy. If we take jobs out of New York, there's very little that will keep us as the heart of America.

We really have to keep America strong, we have to keep this city strong and I

mean we can't let people who attack us show us, you know, you can shut America down, it just can't happen.

As far as which plan, it seems like the Liberty with the connection is going to have the most long-term benefits. Yes, there might be trucks and construction noise that would be greater during building, but this is Lower Manhattan, you're going to have trucks and construction noise anyway.

The reality is the long-term effects are less pollution, more comfort, more safety, less need for vehicles in the long-term to be in the area.

I just want to ask everybody to remember that this city belongs to the world. This is truly the heart of America, this city, and try not to think about what's in your own backyard and remember that what you decide as far as the building is what the rest of the world sees of this country.

Thank you.

MR. BLOCH: Thank you, Mr. Mason.

The next speaker, our next speaker

is Louis Epstein and after him will come Jen Hensley.

MR. EPSTEIN: The proposed terminal would be more environmentally appropriate if it did not seek to accommodate the appalling Daniel Libeskind site plan or the indefensible priorities dictated by the Development Corporation that required the Libeskind plan to be as bad as it is.

We must never forget that in the official public poll of the planning process the Libeskind plan finished dead last and it was comfortably won by neither, which is the public's repudiation of the entire priorities that made these plans that, for instance, force vehicular traffic through the site, which has been cited as one of the reasons why we need this terminal.

A new transportation system should be with the aim of furthering the "devehicularization" of Lower Manhattan, not opening more streets.

Scrapping the official plan that is no more close to being financed in favor of

a plan centered on fewer taller buildings which would have their construction impact more localized and more in the spirit of what was destroyed in 2001 would be more appropriate for many reasons, including environmentally.

To the extent that the proposed PATH terminal makes this more difficult is a problem rather than a solution.

The WTC planned Final EIS failed absolutely to made a credible response to the sprawling and numerous arguments that the restoration alternative of new, better twin towers would be better than the Libeskind plan.

The physical manifestation of the Calatrava design is one that is extravagant and strange.

A more understated and physically responsible terminal would free valuable public resources for better uses, such as paying the severance fee for those who continue to obstruct gigantic twin towers greater than before and return them to their

rightful place on the Manhattan skyline.

The murderers of thousands wish those towers gone forever. We must have no part in granting their wishes.

MR. BLOCH: Thank you, Mr. Epstein.

I just want to remind others to give their affiliation.

Yours was?

MR. EPSTEIN: The World Trade Center Restoration Movement.

MR. BLOCH: Okay. And the next speaker is Jen Hensley and after her will be Petra Todorovich.

MS. HENSLEY: Thank you for the opportunity to speak here today on the Draft EIS for the Permanent PATH Station at the World Trade Center site.

I am Jen Hensley, Director of Governmental and Community Affairs for the Downtown Alliance, Lower Manhattan's business improvement district.

We represent thousands of property owners and businesses and several hundred

thousand workers south of Chambers Street.

The PATH Station at the World Trade Center site is an important part of Lower Manhattan's transportation network, providing convenient and affordable access to and from New Jersey for more than 30,000 commuters daily.

The opening of the Temporary PATH Station at the World Trade Center site last November marked a significant milestone in Lower Manhattan's recovery after the September 11th attacks.

And the subsequent unveiling of Santiago Calatrava's magnificent design for the permanent station is further proof that Lower Manhattan's revitalization is well underway.

The Downtown Alliance is thrilled with the plans for the Permanent PATH Station, which will undoubtedly serve as a grand point of arrival in Lower Manhattan and a spectacular 21st century transit center.

Of course, a grand station deserves a grand train and we encourage The

Port Authority to continue your work with the LMDC, the city and the state to bring direct, one-seat access from Long Island and Kennedy Airport to Lower Manhattan.

These transportation improvements are critical to maintaining and enhancing Downtown's role as a central business district and a thriving part of the region's economy.

In fact, there is no single issue that is more important to Downtown's major employers.

We believe that Lower Manhattan's transportation infrastructure must be enhanced quickly and efficiently, with a focus on expanding service and connections to labor markets in the suburbs.

The Downtown Alliance does, however, have several concerns as the Permanent PATH project moves forward.

First, we believe the construction of the permanent station should be coordinated to the forthcoming Lower Manhattan Construction Command Center.

It is critical that issues such as

worker transportation to and from the construction site, permitting, movement of materials and other logistical concerns be coordinated with the many other development projects happening in Lower Manhattan at the same time.

Secondly, we believe that the construction of the Permanent PATH Station should occur with minimum disruption to existing PATH service, particularly during the weekday rush hours.

The Downtown Alliance would also like to see the retail plan for the station complement the other retail components on the World Trade Center site and in the surrounding areas.

We envision a complete retail complex with shops and restaurants that serve the worker and residential populations Downtown, as well as commuters and the many visitors that will come to use the cultural and memorial spaces on the site and other attractions throughout the neighboring community.

Finally, I'd like to thank The Port Authority for your hard work and vision both on this Permanent PATH Station and on Lower Manhattan's broader revitalization.

I look forward to working with you as this process continues.

Thanks.

MR. BLOCH: Thank you, Miss Hensley.

The next speaker is Petra Todorovich and after her will be Olaf Olsen.

MS. TODOROVICH: Good afternoon.

My name is Petra Todorovich, I'm an Associate Planner at Regional Planning Association, an 80-year-old non-profit research and planning organization for the tristate region.

RPA strongly supports the construction of the World Trade Center Transportation Hub to restore long-term access to Lower Manhattan and connectivity to the New York City subway system, contributing to the revitalization and economic recovery of Lower Manhattan.

We are particularly pleased by the selection of Santiago Calatrava, the lead architect for the station, and his graceful and symbolic design of the freestanding grand pavilion unveiled in January of this year.

The commitment to rebuilding the public and civic spaces of Lower Manhattan with high quality architecture holds great promise for Lower Manhattan's future.

The design of the pavilion that allows light to reach down to the platform level of PATH trains supports a long-hauled goal of RPA that transit facilities should be open to light and air and to orient the rider to the street above and improve the user experience.

RPA also supports the functionality of the transportation hub described in the DEIS, including the expansion of the station to accommodate five tracks and four ten-car platforms.

Coherent connections to the 9, 1, R, W and E subway lines will enhance connections to the subway system to the

benefit of commuters moving to and through Lower Manhattan.

The preliminary design of the station suggests it will correct the deficiencies of the former station by providing sufficient capacity for the 175,000 people a day that will be making their way on foot from PATH to the subways or buildings on the streets above.

It is imperative that the new station avoid hidden spaces, narrow corridors, steep stairwells, low ceilings and poor ventilation, all mistakes of the PATH Station -- the past station that we now have an opportunity to correct.

Within the context of our strong support for the project, we offer several additional recommendations for your consideration.

We support the terminal without a Liberty Plaza connection alternative for the project.

While the EIS has demonstrated poor pedestrian levels of service at Church

and Liberty streets without the underground passageway, the proposed mitigation measures of widening sidewalks and crosswalks are, in fact, extremely desirable.

In contrast, the Liberty Plaza connection if built would draw pedestrians underground below Church Street, undermining the viability of street level retail, which is an important component of maintaining street life in Lower Manhattan.

The Liberty Plaza connection would also require the appropriation of public open space in Liberty Plaza for access and egress to the passageway and cost $81 million, a price we feel is not justified by its relatively slim benefit.

We also have comments which we'll include in our written statement strongly supportive of preserving and incorporating destroyed elements of the World Trade Center into the design of the new station and comments calling for the strengthening of the environmental performance criteria to mitigate air pollution, noise and vibration during

construction.

Finally, we look forward to greater details from The Port Authority regarding specific design of the outdoor public spaces around the PATH pavilion, as well as the retail mix of the below-grade shops, their plans for a footage and the retail strategy in light of potential slower rates of office space absorption.

While The Port Authority has designed a station that will provide seamless and pleasant underground connections which are important to Lower Manhattan destinations, we believe the success of Lower Manhattan's revitalization will depend greatly on the quality of the pedestrian experience at the street level.

We, therefore, urge you to pay great attention to the design of the public places surrounding the PATH pavilion, as well as the public spaces throughout the World Trade Center site which hold the greatest potential to provide a positive or negative user experience during the decade of

construction that lies ahead of us.

Thank you.

MR. BLOCH: Thank you.

Our next speaker is Olaf Olsen and after him is Jenna Orkin.

Olsen, I'm sorry.

MR. OLSEN: That's quite all right.

Good evening, ladies and gentlemen, members of the panel.

My name is Olaf J. Olsen and I'm speaking on behalf of the dock building Local Union 1456, which is part of the New York City District Council Partners and the Building and Construction Trades Council of New York.

My local represents 1900 members, many of whom live in New York City. Most of my members went to Ground Zero on 9/11 rescuing survivors and helping the community recover.

More recently some worked on the Temporary PATH Station that will be completed in record time at the World Trade Center site.

Thank you for the chance to

comment on the environmental impact studies for the proposed Permanent PATH Station.

We support this critically important transit project.

Santiago Calatrava, the architect chosen by The Port Authority to design the Lower Manhattan PATH Transit Hub, has designed and engineered some of the most brilliant infrastructure projects in the world.

One rider said Calatrava is the only architect who can make a compelling connection between a subway platform and ancient Greece. His buildings are often considered to be works of art.

The design of the PATH Station could not be more fitting for the site of the former World Trade Center, a bird-like, fully functional structure with movable wings that look ready to soar. This design could not be more inspiring.

I would not be surprised if people from around the world flock to Lower Manhattan to see this modern work of art as they flock to see other Calatrava creations in the

countries, in other countries.

The Permanent PATH Station is a critical project for Downtown redevelopment, for the residents of New Jersey who work in Manhattan and for the companies that make up this important business district.

The station will ensure future economic development growth throughout the city and region by linking all the transit services that are now separate in Lower Manhattan.

The station will provide much needed connections and a fully climate controlled environment and provide easy access to New York City subway lines as never before.

This line is the one Downtown transportation project that is fully funded and ready to go into construction immediately. I cannot for the life of me understand why anyone wants to stop this important improvement to our transit system.

We know that other Downtown transit projects are also needed but they might never be fully funded and may be years

away from being in construction, if they are ever built.

Thousands of construction jobs, 10,000 in all, that will be created by this project will be well-paying positions with wages and benefits that can support a family. These are the kinds of jobs and wages that should stay in your communities.

Construction workers like us are the backbone of so many middle-class neighborhoods in the five boroughs. We're the community activists, the Little League coaches and the volunteers at our children's schools.

We need the employment opportunity and a better transit system that comes with projects like this.

We need this project to ensure our economy remains strong.

In closing, I'd like to say that I urge that this project move forward with construction as quickly as possible.

And thank you very much.

MR. BLOCH: Our next speaker is Jenna Orkin and after that comes Bernard

Goetz.

MS. ORKIN: Thank you.

I'm not going to discuss the project itself but simply how it's going to be executed.

And I apologize to people who've heard me make similar comments at similar hearings.

I only had the opportunity to see the DEIS downstairs this afternoon but I noticed that the language was vague and made very few, if any, promises.

You talked about expected exceedance in the particulate matter 2.5, which is the highly respirable kind, and where you have exceedance in the PM 2.5, we know from after 9/11 that you also can have exceedance in very and ultra-fine particulates, which are even smaller and which EPA and other agencies don't even measure, however, they may be even more dangerous to human health.

Particulate matter 2.5 sounds like a long scientific name with, you know, vague

attributes that don't have any relationship to human beings, but, in fact, it is the kind of potentially toxic dust that it penetrates deep into the lungs and alveoli and stays there, it does not get exhaled.

Your DEIS says, "Substantial additional reductions beyond those contemplated by the EPCs would be needed to assure compliance with air quality criteria. The Port Authority of New York and New Jersey and FTA are investigating options available for further reductions in PM emissions."

To say that you're investigating options gives no information and even fewer promises.

You talk about reducing or mitigating harmful effects to the extent possible.

Who will determine what is possible and according to what criteria, is it simply going to be a criteria of expense and when you don't feel like it anymore, then the health of the people of Lower Manhattan get sacrificed to the economics of the project?

You say, "Effectiveness depends on compliance. Verification measures would be implemented."

Who will be verifying, who will be monitoring?

Will Port Authority and FTA be monitoring themselves?

You need to have a third-party monitor who is objective to do the monitoring, otherwise it's a conflict of interest.

And then suppose you verify that there are exceedance, then what happens, do you simply impose a fine?

Truck companies will only incorporate the cost of those fines into their contracts as a necessary business expense, pay the fines and continue to emit excessive particulates.

A few weeks ago Kevin Rampe was asked a similar question and he said oh, well, if there are exceedance the EPA will make us shut down that portion of the site.

So then I called EPA. That is not what they said. They said we don't do that,

that's up to the state and local authorities.

So I think everybody should get their act together.

Regarding the removal of the hazardous materials, I'm concerned that, you know, you say there's very little left, I'm concerned that you're relying on EPA data.

EPA is a highly compromised agency in this disaster. Just yesterday on this stage the World Trade Center Expert Technical Review Panel met to discuss in one of many, many meetings what should be done now to mitigate the disaster that was left by EPA.

EPA's own Inspector General found that they lied about air quality after 9/11.

So if you rely on EPA and their monitoring equipment and what they say, then I would caution you, for instance, that in January of '02 an article by Andrew Schneider the St. Louis Post Dispatch found that their testing equipment after 9/11 was twenty years behind the times. For every asbestos fiber the EPA found, independent contractors found nine.

So in closing, I found that what I read of this EIS was vague and not reassuring at all.

I hope that the Final EIS will be specific and will take into account that this population in Lower Manhattan has had its immune system severely compromised by 9/11 and there is evidence of that in respiratory symptoms and other symptoms. So all that must be taken into account in the methods that you use in this construction.

Thank you.

MR. BLOCH: Thank you.

Our next speaker is Bernard Goetz and after him comes George Haikalis.

MR. GOETZ: Good evening.

My name is Bernie Goetz and I'm concerned about the Calatrava center being good full-service hub.

I'm a long-term resident of New York and support the construction of this transportation facility but I do not support the extension of Greenwich Street.

One of my former jobs was a

building contractor. I built 130 houses and was responsible for their site plans.

The Calatrava transportation center is supposed to be a full-service hub.

On the proposed site plan both Church and Fulton streets are narrow streets and do not have room for bus parking.

How can the Calatrava center be a full-service hub if there is no room for street buses to park?

I think this is basically the result of siting the Freedom Tower north of Fulton Street. I personally think super skyscrapers like the Freedom Tower or other large towers are better sited south of Fulton Street.

I'm asking that this panel recommend site plan changes that widen Fulton and Church streets so that buses have room to park.

Here's a site plan analysis which shows the situation. I have several copies I'd like to submit.

Thank you.

MR. BLOCH: Thank you.

Our next speaker is George Haikalis and after him is Ken Lustbader.

MR. HAIKALIS: My name is George Haikalis, I'm losing my microphone here, I'm Chair of the Regional Rail Working Group, which is a consortium of all kinds of activists in the New York area.

The tragic events of 9/11 have created an extraordinary opportunity to reconfigure the region's rail transit system to better serve Lower Manhattan.

With a replacement plan for the World Trade Center under review, it becomes possible to consider linking the Downtown PATH line with the No. 6 Lexington Avenue local subway, the PATH-Lex connection, as we call it.

Both rapid transit lines, which are nearly identical in most physical characteristics, terminate at stations in Lower Manhattan less than 3,000 feet apart.

Most of the rapid transit lines pass through Lower Manhattan making multiple

stops, reducing walking time and improving service for transit passengers.

The Regional Rail Working Group has developed a wide range of options for the PATH-Lex connection and two representative examples are shown in the material that we'll be submitting today. We'll be submitting additional material later.

The advantages of this connection are significant for passengers. Residents from Manhattan's Upper East Side neighborhoods could use the less congested No. 6 local to reach workplaces in the World Financial Center and the rebuilt World Trade Center without transferring to congested No. 4 and 5 trains at Brooklyn Bridge.

Residents from these neighborhoods could also more easily reach the growing workplaces in New Jersey's waterfront in Jersey City, Hoboken and also Newark.

In turn, this access also benefits New Jersey residents who could access the many workplaces in retail districts that are well-served by the No. 6 local.

Extending the reach of the PATH line to East Midtown will also ease travel to Newark's Liberty International Airport.

Businesses on both sides of the Hudson will also benefit from this improved access.

A direct link from Manhattan's East Side will be an important incentive to market the substantial amount of office space planned for the World Trade Center and along the New Jersey waterfront as well.

Stores and restaurants in Chinatown and in SoHo would gain improved access to customers that are filling the new apartment houses along the waterfront.

Port Authority and New Jersey -- excuse me, the MTA officials argued that the PATH-Lex connection is not feasible because it required steeper grades and sharper curves than are considered "best practice" for new construction.

It also requires underpinning of subway structures, which adds to the cost.

Yet leaving the existing system in

place means the trains must negotiate far sharper curves at the World Trade Center Terminal and the City Hall loop just south of Brooklyn Bridge Station.

Grades of four and a half percent are found at many locations in New York City Transit System and The Port Authority recently completed Kennedy AirTrain that has even steeper grades.

The underpinning proposed for the connection is quite similar to that required for the recently completed local-express connection to the 63rd Street Tunnel in Queens.

Thru routing subway trains from Brooklyn to The Bronx by way of the Manhattan business district has been the operating practice for new lines built in New York City since the five boroughs were consolidated in 1898.

This is the norm for most rapid transit systems throughout the world. The PATH-Lex connection would simply apply this practice to trains crossing the Hudson River.

Consolidating the PATH system with the much larger New York City Transit system could produce annual operating cost savings of 10 to $20 million, which could be shared equally by the two states.

Capital cost gains would be realized through unified procurement of rolling stock and other supplies.

These gains could be -- could occur only after certain agreements are made with managers and labor leaders for a satisfactory plan for The Port Authority to compensate the MTA for the incremental costs for operating the PATH service.

Similar agreements are already in place between MTA and the states of New Jersey and Connecticut for commuter rail service.

Jurisdiction of the PATH system could be readily shifted from the FRA to the FTA since PATH no longer operates on mainline railway tracks.

After the economic downturn resulting from 9/11, transit advocates expected public agencies to collaborate on

improving transit systems serving Lower Manhattan. Exactly the opposite has happened.

While the Downtown PATH line was out of service, many passengers had to use more circuitous routes and often had to pay double fares.

Because of the potential revenue loss, The Port Authority and the MTA chose not to integrate the PATH fares into MTA's citywide MetroCard system to offset this burden.

Furthermore, Port Authority and MTA officials have been less than responsive to efforts by the Regional Rail Working Group to consider connecting the two systems.

It was only through the efforts of U.S. Representative Jerrold Nadler that both agencies even agreed to participate in a nominal discussion of the PATH-Lex connection.

Since The Port Authority has not made information requested by the working group available in a timely manner, we respectfully request a 60-day extension of the comment period so we could review the material

we just received last week.

We can and must do better.

The Governors of the two states must call upon the MTA and The Port Authority to override the institutional prerogatives and cooperate through a comprehensive regional planning process with an opportunity for meaningful public input. Only then can the region make up for the terrible loss that occurred on 9/11.

Thank you.

MR. BLOCH: Thank you.

And the next speaker is Ken Lustbader.

MR. LUSTBADER: Good afternoon.

My name is Ken Lustbader and I represent the Lower Manhattan Emergency Preservation Fund.

The Fund is a coalition of five leading preservation organizations that was formed in response to the events of September 11th, including the Municipal Art Society, the National Trust for Historic Preservation, the New York Landmarks

Conservancy, the Preservation League of New York State and the World Monuments Fund.

The LMEPF support this project and commends the DEIS for addressing historic preservation concerns and for identifying the numerous historic resources that contribute to the character and architectural significance of Lower Manhattan.

Most broadly, we are concerned about the possible impact that vibrations will have on adjacent historic properties and recommend state-of-the-art vibration monitoring and increasing vibration standards.

We are especially concerned about the cumulative impact of numerous construction projects on the surrounding historic properties and recommend that the project be coordinated by a single entity charged with overseeing all of Lower Manhattan construction.

Specifically, we are concerned about the proposed project and its negative impact on a number of surviving elements of the current World Trade Center site itself.

These elements are called out in the National Register Determination of Eligibility and we are requesting that the FTA and PA provide more detailed information regarding why certain elements are proposed for removal and/or demolition.

While we are not promoting the preservation of the site as it currently exists and look forward to rebuilding, we believe that the FTA and PA need to view the site as historic and make attempts to incorporate existing elements into the design goals and provide an analysis and detailed explanation if the preservation of these elements cannot be achieved.

We offer the following specific comments regarding certain elements that may be affected:

We appreciate the attempt to minimize encroachment over the perimeter column bases which outline the footprints of towers one and two, however, we are concerned about the cumulative impact of additional construction activities that will have on

minimizing access to these bases.

Although the MTA and PA are not party to the Programmatic Agreement for the World Trade Center Site Memorial and Redevelopment Plan, we are requesting that they adhere to the design and construction goals outlined in the document.

Additionally, the Memorial Center Advisory Committee recently recommended providing access to these bases and this should be a recognized goal of all coordinated construction activities.

As part of a separate review, we previously commented that the PA consult with museum curators and investigate the possibility of salvaging more than three elements from the northwest remnant subgrade structures.

Additional elements, along with the recently photographed Tito Dupret images, could provide for a more effective interpretation of the World Trade Center site.

As one of the last surviving elements of the World Trade Center site, the

passageway to the E train was recently restored and the PA should revisit the proposed plan to have it demolished.

We are requesting that additional analysis be done with the goal of incorporating it into the new design.

Currently, the PA proposes to remove the steel beam in cross form to an off-site location.

We're requesting that instead of moving the cross off site it be moved temporarily within the World Trade Center site.

Should it have been to be moved to off-site, it should be -- we should be provided with an explanation as to why and confirmation that it will be moved to Hangar 17 at JFK where it will be properly stored.

The plaza and subway entrance at Vesey Street are the only surviving above ground elements of the World Trade Center site and the current plan to have them demolished should be revisited with the goal of possibly

incorporating them in situ into the new design.

This proposed demolition, with no detailed justification or explanation, underscores our request for additional information as to how decisions to demolish elements were made.

The LMEPF recognizes the unprecedented nature of this undertaking and the importance of ensuring for meaningful public input as rebuilding proceeds.

And we appreciate the outreach that the MTA and PA are doing to various interest groups and look forward to our continued participation.

Thank you.

MR. BLOCH: Thank you very much.

That's all the speakers I have right now.

If anyone else would like to speak, please go downstairs and fill out one of these yellow slips.

Remember, you can always mail, E-mail or fax material to us.

We'll take a brief recess.

When we get another speaker we'll reconvene, otherwise we'll be here till 8:00.

(Time noted: 5:50 p.m.)

(A recess was taken)

(Time noted: 6:30 p.m.)

MR. BLOCH: Okay. We're going to get started again.

My name is Arnold Bloch, I'm the moderator for this evening.

I wanted to welcome you to this public hearing.

For the record, this meeting is part of the environmental review for the Permanent World Trade Center PATH Terminal.

This EIS is being prepared in accordance with the National Environmental Policy Act of 1969, known as NEPA, and the applicable regulations implementing NEPA as set forth in 23 CFR Part 771 and 40 CFR Parts 1500 through 1508 and 49 CFR Part 622.

The EIS is also being prepared in accordance with Section 106 of the National Historic Preservation Act of 1966 and

Section 4(f) of the U.S. Department of Transportation Act of 1966 and associated laws and regulations.

This is one of two public hearings that are being held to hear public comments on the Draft Environmental Impact Statement.

Yesterday we had one in Jersey City, at City Hall from 4:00 to 8:00 p.m., and today we began this one at 4:00 p.m. and now we're back in session.

The purpose of this meeting is to solicit public comments on the Draft Environmental Impact Statement, which was published on June 4th, 2004.

Copies of that Draft Environmental Impact Statement are available at certain libraries in Lower Manhattan and also in New Jersey, in Jersey City, Bayonne, Harrison, Hoboken and Newark, or at the Port Authority's Website.

And a little later on we'll show you the Website address but it's also available on various documents that I'm sure you may have picked up, this larger one on the

back page and also on the smaller one also listing a Website there. So the DEIS is available there.

We do have a couple of sample copies downstairs at the registration desk if you wanted to look at those.

In a few minutes Tony Cracchiolo, the Director of Priority Capital Programs for The Port Authority, will make a presentation about this project and the information that's contained in the EIS.

After he's done, we'll begin the public comment portion of the meeting, which will last until 8:00 p.m.

I'll remind you about this again but it's important that anyone who wishes to speak needs to sign one of these small yellow forms downstairs. You can do so at any point between now and 8:00 and we'll allow you to speak.

I'll tell you that we will give you three minutes but if we don't have many speakers you can take a little bit longer and nobody is going to complain.

You can also submit written documentation, and we'll talk about that a little later, either tonight or through Wednesday, July, 21st.

Okay. So let me introduce Tony Cracchiolo.

MR. CRACCHIOLO: Thank you, Arnie.

Good evening.

This presentation will outline the analysis of alternatives presented in the Draft Environmental Impact Statement for the World Trade Center Transportation Hub.

First I will present the purpose and need for the project, including the definition of the problem and the goals and objectives that the project will strive to achieve.

Next I will present and describe the three alternatives that were evaluated in the Draft EIS.

And then I'll describe the findings of the environmental analysis of the three alternatives, as well as the proposed mitigation measures to alleviate adverse

impacts from the project.

Finally, I'll review the environmental process and upcoming milestones.

The Permanent World Trade Center PATH Terminal is needed, one, to establish and enhance the transportation facilities and infrastructure that existed at the World Trade Center complex prior to September 11th, 2001, and second, to ensure the long-term accessibility and economic vitality of Lower Manhattan.

Four distinct problems would exist if the project were not undertaken.

First, economic recovery. Several current and proposed projects contribute to the economic recovery of Lower Manhattan, proposals for a memorial, cultural facilities, offices and retail on the World Trade Center site, a new headquarters building planned in Battery Park City by Goldman Sachs, as well as 7 World Trade Center, which is currently under construction, and offices and residential projects throughout Lower Manhattan.

These developments restore

facilities that were lost on September 11th, 2001 but they also attract new residents, office workers and visitors to Lower Manhattan.

High capacity transit services are needed to safely and efficiently transport these workers, visitors and residents to and from Lower Manhattan.

Ridership growth. This development in Lower Manhattan will increase the demand for PATH over time. By 2025, it is anticipated that the daily PATH ridership will exceed pre-9/11/2001 levels by approximately 25 percent.

Commuting to Lower Manhattan without PATH will result in longer, less convenient and more expensive trips than the direct PATH service.

Additional ridership on other transit modes may require that the capacity of these systems be enhanced.

Without PATH, some commuters and visitors to Lower Manhattan would drive to the area. Additional vehicle trips would increase

congestion on city streets and river crossings and worsen air quality.

And finally, there are limitations of the temporary PATH service recently restored. The temporary station does not restore the capacity that existed prior to 9/11.

The station has fewer points of access than the station did pre-9/11.

The platforms accommodate only eight-car trains as compared to the ten-car platforms that existed before the attacks, and the temporary station is open air, it is not climate controlled.

Certain elements of the station have a limited service life and the station as designed does not easily support the full redevelopment of the World Trade Center site.

Project goals. There are four goals and supporting objectives that were developed to guide the alternatives development process for the Permanent World Trade Center PATH Terminal.

Goal number one is to effectively

restore the long-term PATH service between New Jersey and Lower Manhattan.

To successfully address this goal, the project must meet the following objectives:

Accommodate pre-9/11 PATH ridership;

Provide for additional capacity at the terminal to support ridership growth;

Provide for a modern station designed with full ADA accessibility, climate control and station security;

And minimize disruption to the temporary PATH service during construction.

The second goal, to establish an intermodal transportation facility in Lower Manhattan.

The project should enhance transportation connections to, from and within Lower Manhattan as compared to pre-9/11/2001 conditions.

The opportunity to rebuild the PATH facility should take advantage of connections to existing and future transit

infrastructure and should allow for improved at grade and below grade pedestrian connections as compared to pre-9/11 and the temporary PATH facilities.

To successfully address this goal, the project must meet the following objectives:

To approve -- it should improve street level visibility and access;

It should provide for adequate and state-of-the-art pedestrian circulation within the facility;

And it should provide connections to all New York City subways and other major origin and destination points.

Goal number three, plan and construct a terminal that would support the redevelopment of Lower Manhattan.

The project should support the physical and economic recovery of Lower Manhattan, including proposals for the reconstruction of and rehabilitation of other transportation, infrastructure, redevelopment of the World Trade Center site and

construction and occupation of other off-site projects, all of which are undergoing separate environmental reviews.

To successfully address this goal, the project must meet the following objectives:

Construct a facility that's coordinated with the master plan for the redevelopment of the World Trade Center site;

Provide for future connections to World Trade Center buildings and functions, including the proposed memorial;

Coordinate PATH facilities with other subgrade uses at the World Trade Center site;

And plan and coordinate PATH elements with proposals for the reconstruction of Route 9A, West Street, the Fulton Street Transit Center and other off-site development.

And the fourth goal, to minimize adverse impacts to the environment.

The construction and operation of the project should, to the extent possible, minimize effects to the local and regional

environment in the short- and in the long-term.

The desired alternative would not only minimize adverse effects but would also provide for the greatest positive benefits to both the built and the natural environment.

To successfully address this goal, the project must meet the following objectives:

Reuse existing infrastructure to the extent possible;

Provide for efficient and environmentally friendly construction techniques;

Minimize disruption to PATH and New York City subway service during construction;

And provide for green and sustainable design.

The EIS considered three alternatives for the Permanent World Trade Center PATH Terminal, a no action alternative, a new terminal with a connection to Liberty Plaza at Liberty and Church streets, and a new

terminal without such a connection to Liberty Plaza.

The next several slides will describe these alternatives.

Under NEPA, the no action alternative is typically evaluated. The no action alternative is used as a baseline to evaluate the potential future impacts of the proposed project.

The no action alternative assumed that the Temporary PATH Station will remain in service until one of three things happened.

One, the construction of the World Trade Center Memorial, cultural buildings and office towers would not allow for the operation of the PATH Station in its present location or configuration.

Two, the demand for PATH service would exceed the station's capacity, meaning that its continued operation would not be safe.

Or three, major components of the station would exceed their service life.

The assessment presented in the

EIS assumes that the station would need to cease operations if this alternative is chosen at some point between 2009 and 2025.

The alternative with and without, the terminal development with and without the Liberty Street connection alternatives, these are the -- both of these alternatives would result -- both of these build alternatives would result in a new PATH terminal on the World Trade Center site.

There is one principal difference between these alternatives, therefore, I will begin by describing the components they both have in common.

The terminal would provide five tracks and four platforms to accommodate ten-car trains and to meet the forecasted passenger growth.

Intermodal connections would be provided to virtually all subways, World Financial Center ferries and local and commuter bus services.

A transportation hall with pedestrian connections to all proposed World

Trade Center redevelopment facilities, subways and streets.

And the terminal would be fully climate controlled and be designed to maximize natural light.

The terminal with the Liberty Plaza connection will provide numerous intermodal connections.

It will provide for east-west connections through the World Trade Center site, including connecting with the MTA, New York City Transit's Dey Street concourse of the Fulton Street Transit Center. The Transit Center itself will serve nine subway lines.

It will also connect with the Cortlandt Street Station on the R and W subway line, the World Trade Center Station on the E line and the future Cortlandt Street Station which will be restored on the 1 and 9 line.

Connections within the World Trade Center site will allow access to the future World Trade Center Memorial, cultural facilities, retail and office towers.

A concourse across Route 9A, West

Street, will allow for access between the PATH terminal and the World Financial Center, Battery Park City and The Port Authority's new Trans-Hudson Ferry Terminal.

And finally, the terminal with the Liberty Plaza connection alternative would provide subgrade access beneath Church Street at Liberty Street between the World Trade Center site and Liberty Plaza.

This concourse will serve numerous commuters who travel between PATH and the Wall Street Financial District.

Without the Liberty Plaza connection, everything else on this alternative is the same as I just mentioned except this alternative does not have that subgrade access concourse beneath Church Street to Liberty Plaza. Other than that, it's the same.

In addition, there is no change to the construction schedule.

We'll discuss the impacts of this particular option shortly.

Okay. As you've seen on the

display boards and video as you entered today, the terminal consists of a magnificent transportation hall, which would be a grand architectural statement for Lower Manhattan, visible from the street, a Grand Central Terminal for Lower Manhattan.

In addition, there are four additional levels of pedestrian infrastructure connecting directly to the subways and to the other nearby developments on or near the site.

If you haven't had a chance to look at these displays and the videos that are downstairs, I invite you to do so now or later.

The project would begin in 2005 and would continue to 2009. Construction will be in phases and portions of the terminal will open as they are finished.

The construction of the terminal is expected to compete in 2006 to be -- to peak in 2006, which was selected as the year for construction period analysis in the EIS.

The no action alternative. The next few slides compare the benefits and

impacts of these various alternatives starting with the no action alternative.

This alternative would not result in construction of a new terminal, as I mentioned, but it would eventually result in full closure of the Temporary PATH Station.

Thus, although the no action alternative, this no action alternative will have little or no construction period impacts, it would have adverse impacts in the long-term.

The economic revitalization of Lower Manhattan incorporates transportation, infrastructure and development projects. The failure to construct a Permanent PATH Terminal is inconsistent with these revitalization goals.

It is estimated that absent the permanent terminal, approximately 5 percent of diverted PATH passengers would drive to Lower Manhattan. By 2025, this could result in 1200 additional vehicle trips in the a.m. peak hours.

These vehicles would cause

congestion on area roadways, would generate substantial levels of pollutant emissions and will create noise.

The diversion of PATH riders would also cause congestion on other modes of public transit. It is anticipated that diverted PATH riders would use commuter trains and buses, ferries and city subways to reach Lower Manhattan.

The diversion of large numbers of passengers to these modes may require future capacity enhancements.

The terminal with a Liberty Plaza connection has substantial long-term benefits as compared to the no action alternative but there would be impacts during construction.

In the long-term, the PATH terminal with the Liberty Plaza connection would support the economic redevelopment of Lower Manhattan.

Since customers could continue to use PATH between New Jersey and Lower Manhattan, the terminal would not generate new vehicle trips, emissions or vehicle noise.

The terminal would improve access between PATH and other modes of transit but its operation would not result in adverse impacts to these other modes.

The pedestrian connections that will be provided as part of the terminal will improve street level pedestrian and vehicular circulation and will reduce street level congestion within and through the World Trade Center site, including at the intersection of Liberty and Church.

The terminal's construction will generate, however, truck trips to and from Lower Manhattan and it will require the use of construction equipment.

Thus, during the terminal's construction, there will be increased truck traffic on area roadways as compared to the no action alternative.

The terminal's construction will also generate emissions and noise from construction vehicles and the use of construction equipment.

The terminal will also have both

short- and long-term impacts to archeological and historic resources.

The terminal's construction may alter or remove portions of the Hudson River bulkhead under Route 9A and remaining remnants and structures on the World Trade Center site.

The terminal's construction may also result in vibration impacts to five historic structures within 90 feet of the construction zone.

The terminal's construction may not allow for the long-term preservation of portions of the Hudson River bulkhead and remaining remnants on the Trade Center site that exist today.

As will be described a little later, the FTA and The Port Authority are working closely with the preservation groups and interested parties to draft mitigation measures to avoid, minimize or mitigate these effects to archeological and historic resources.

Generally the benefits and potential impacts of the terminal without a

Liberty Plaza connection will be very similar or identical to those of the alternative with a Liberty Plaza connection.

Because the terminal without a Liberty Plaza connection would require construction across less -- would not require construction across Church Street, it would reduce vehicle emissions, noise and vibration impacts near the southeast corner of the World Trade Center site as compared to the terminal with a Liberty Plaza connection but impacts would still occur.

This alternative would also have impacts to historic and archeological resources on or near the site.

In the long-term, the terminal without a Liberty Plaza connection would support the economic recovery of Lower Manhattan, however, because a higher number of pedestrians would need to cross Church Street at grade, this alternative would not provide the same long-term benefits to vehicular and pedestrian circulation, vehicle emissions and noise as would the terminal with a Liberty

Plaza connection.

The FTA and The Port Authority have been coordinating with the sponsors of other Lower Manhattan recovery projects to develop a coordinating set of mitigation measures to address the potential cumulative impacts of these projects during the construction period.

During the spring and summer of last year, the FTA prepared a methodology and approach to the study of cumulative effects for its projects in Lower Manhattan.

In response, the Lower Manhattan project sponsors worked together to develop environmental performance commitments, EPCs, commitments intended to proactively address potential construction period impacts since they would be implemented and integrated as part of the each of the federally sponsored recovery projects.

Although the EPCs reduce the potential impacts of the recovery projects, preliminary analysis for the individual environmental assessments showed that

additional measures would still be needed.

In response, the project sponsors worked to investigate additional commitments for the reduction of air emissions and noise, with particular attention to areas that would be impacted by overlapping construction.

These efforts by the Lower Manhattan project sponsors continue, focusing on actively researching the availability and practicality of new technologies to reduce air emissions and noise.

This includes an investigation of particulate filters, noise abatement measures and electrification of certain construction equipment.

As these projects move forward toward their individual Records of Decision, the project sponsors will continue to coordinate their research and will work together to minimize potential cumulative effects to the local community during the construction period.

In the next few slides I will present the specific mitigation measures that

were identified for the Permanent World Trade Center PATH Terminal in this Draft EIS.

And there are six, the EIS identified six resource areas during the project's construction.

The FTA and The Port Authority are engaged in a Section 106 review process for the project which will result in a Memorandum of Agreement to mitigate any adverse effects to archeological and historic resources.

This process follows the rules and regulations established by the National Historic Preservation Act.

Throughout the process, which began this past December, the FTA and The Port Authority have actively sought the participation of the Federal Advisory Council on Historic Preservation, the New York State Historic Preservation Officer and approximately 74 consulting parties that represent the interests of victims of the attacks, community groups and preservation groups and federal, state and city agencies.

The Draft EIS identifies

preliminary measures that the FTA and The Port Authority are considering to avoid, minimize or mitigate the project's effects to archeological and historic resources.

Currently, the FTA and The Port Authority are working with the various consulting parties to develop mitigation measures for the project.

These measures and commitments will be incorporated into the MOA for the project among the FTA, the New York State Historic Preservation Officer, The Port Authority which will be executed prior to the publication of the Final EIS for this project.

Second, The Port Authority will work with the other sponsors of Lower Manhattan recovery projects to ensure that businesses near the project sites in Lower Manhattan remain viable and accessible during construction of the various federally funded recovery projects.

These efforts include a signage plan to indicate the location of affected businesses, as well as a comprehensive plan to

ensure that businesses remain accessible at all times to both their customers and delivery vehicles.

Third, the maintenance and protection of traffic plan will not only ensure access to businesses but will also assure the safe accessibility of Lower Manhattan streets and sidewalks for residents, workers and visitors.

This plan will include measures to protect vehicles that travel near the construction zone, while maintaining the most efficient traffic flow possible.

It will also ensure that access is maintained to residences and businesses and will provide for travel routes to, from and within Lower Manhattan to keep people moving as construction proceeds.

And it will assure that all work will be accomplished while maintaining PATH service to Lower Manhattan.

Fourth, air quality. The Lower Manhattan project sponsors have been working very hard to investigate measures to reduce

emissions during construction.

A combination of techniques have been researched to reduce the effects of construction vehicles and equipment.

These measures include retrofits to engines that reduce particulate emissions, the electrification of certain equipment to reduce emissions by portable generators and the use of ultra-low sulfur fuels and a monitoring program during construction.

The Port Authority is continuing to work with the other project sponsors to research available technologies and to determine additional measures that could be undertaken to further reduce the potential construction period effects to air quality, noise and vibration.

In tandem with our continued efforts to reduce air quality emissions during construction, The Port Authority is also working with the other project sponsors to investigate strategies to reduce construction generated noise.

Strategies that we are currently

researching include equipment retrofits such as mufflers, the use of noise walls, barriers and enclosures around construction zones.

The Port Authority will work with the New York State Historic Preservation Officer and other preservation groups to develop construction protection plans for historic structures that may be impacted by vibration from construction equipment.

This plan will include monitoring to predict acceptable vibration levels and measures to address exceedance of these levels should they occur during the project's construction.

And six, contaminated materials. The Draft EIS generally found that contaminated materials were not found on the World Trade Center site, however, the areas under Route 9A, West Street, and Church Street have the potential for residual contaminated materials.

The Port Authority will develop a Health and Safety Plan to provide for specific protocols for the testing and removal and

disposal of these soils if and when they're encountered during construction.

These protocols will incorporate all applicable federal, state and local regulations.

The plan will also provide for measures to protect the construction workers and local residents if and when contaminated soils are found.

During operation, mitigation measures that would be employed, there are three.

Cultural resources. This is the period from when we open in 2009 and through our design year 2025.

As described previously, a Memorandum of Agreement will be developed to identify specific measures to avoid, minimize or mitigate adverse effects to historic resources.

The MOA will not only address potential impacts during the project's construction but will also provide for measures to ensure the long-term preservation

of archeological and historic resources to the greatest extent possible.

Second, pedestrian circulation. If a Liberty Plaza connection is not constructed, there may be modifications to accommodate additional pedestrian traffic at street level at the intersection of Church and Liberty streets.

This may involve the physical widening of sidewalks and crosswalks or may require the relocation or removal of street furniture, sign posts and other obstructions in order to provide an increased area for sidewalk use by pedestrians.

Natural resources. The terminal building will be glass, steel and concrete. Special landscaping, glass treatments and lighting will be incorporated into the terminal's design to reduce the potential for fatal bird strikes.

In addition, we will be incorporating sustainable design principles that will allow the construction and operation of an environmentally friendly terminal.

The NEPA Section 106 review schedule. The NEPA process for the Permanent PATH Terminal began in September of last year.

The scoping meetings were held in October of last year and the scoping process was closed in mid-December.

We published our Draft EIS in late May of this year, with a Notice of Availability on June 4th.

Our public hearings were held yesterday and are being held here today. The public comment period for you to make your comments, if you don't make them today, are through July 21st of this year.

Our Section 106 review process is being conducted concurrently. The FTA and the U.S. Department of Housing and Urban Development and The Port Authority entered into a coordinated Section 106 review process beginning in December of 2003.

A coordinated Determination of National Register Eligibility was released by the federal agencies in draft form in January '04 and the Final DOE was circulated

on March 31st.

Following the publication of the Final DOE, the federal agencies and the local project sponsors, including The Port Authority, continued their 106 processes independently.

A Draft Finding Of Effects was published by FTA and The Port Authority in May of 2004 concurrent with the distribution of this DEIS.

And a consulting parties meeting was held on June 14th to present these findings and begin a discussion of mitigation effects.

The FTA and The Port Authority will now prepare a Memorandum of Agreement that will specify mitigation measures for effects to historic resources.

This MOA will be executed prior to the publication of the Final EIS for this project. We hope to publish that Final EIS this coming September and have our Record of Decision by October of this year.

And finally, and then I'll shut up

and you can talk, we will be accepting comments tonight, as well as you have the ability to make your comments by fax, E-mail and writing, as Arnold said, and feel free to contact us and please, we do invite your comments, you have to July 21st.

Thank you.

Now Arnold.

MR. BLOCH: Thank you, Tony.

In a moment I'll be calling the names of the people who registered to speak. By now we have two speakers.

I just wanted to remind you that any time between now and 8:00 p.m. you can go downstairs, fill out one of these yellow forms and that will allow you to speak.

When it's your turn to speak, I just ask that you come down to a microphone at the bottom here, there's one on either side, whichever is convenient for you, just clearly state your name for the record and any organization or affiliation if you'd like to do that as well.

And if for anyone it's difficult

for them to come down here because of the steps, we'll gladly take the mike and bring it up to you so just let us know if that's an issue.

I'll ask that you keep your comments relatively brief, somewhere around three minutes. If you feel you need to go longer than that and we don't have any other speakers, we can have you come back and finish up your remarks.

You can also submit anything you'd like in written form. We do have that blue comment form downstairs, which is fine, but you could submit any kind of documentation that you feel is appropriate to us.

Just bring it up to the court reporter down here at the base of the hall here or to myself or to the desk up there where Tony is sitting, we'll gladly take that and make that part of the formal record.

If at any time you want to go out of the room and go back and visit the boards or the display downstairs, please feel free.

And you can talk to anyone who is

wearing any one of these white and blue badges who is part of the project team. Just remember that that's an informal discussion. That discussion you have downstairs will not be part of the formal record, only what you present here will be.

And as Tony said, there are other ways that we look forward to getting any material you want to send to us, by mail, you could fax it, you can E-mail.

And you don't have to scramble now and write those numbers. It's available inside this small brochure which you might have picked up, the same information, as well as on this larger one on the last page so you can get it there.

And we do ask that anything you send by mail be postmarked no later than Wednesday, July 21st, 2004, and anything you fax to us or E-mail to us be done by 5:00 p.m. on Wednesday, July 21st, 2004.

Okay. So I'm now going to call the first speaker and that's Francis McArdle.

MR. McARDLE: Good evening.

My name is Frank McArdle, I'm the Managing Director of the General Contractors Association of New York representing the heavy construction industry in New York City.

I come this evening to speak in support of the permanent PATH solution. We as an organization do not believe that the interim PATH Station is in the best interests of the economic and social future for Lower Manhattan.

The PATH system is a critical element in Lower Manhattan. It now carries 15 percent of the daily commuters that come into Lower Manhattan to work, creating the third largest business district in the United States.

The key of all of the projects that are being developed is the enhancement of that economic vitality and the potential to develop Lower Manhattan into a true 24-hour center that accommodates both visitors and residents and commuters each day.

The permanent PATH as you've presented it with the Liberty Street

connection we believe presents an opportunity for Lower Manhattan to compete more effectively for job growth and development in the New York City metropolitan area.

There's no question Lower Manhattan is in competition with other areas, Midtown and areas in New Jersey, for job growth and development in the future.

There is no question that there are a substantial number of advantages that Midtown has now and will have in the future as the art project moves ahead to supplement the development of the Secaucus Transfer Station, which is now open and operating. The PATH enhancement is critical to keeping Lower Manhattan competitive.

We believe the proposal that's before us tonight with a Permanent PATH Station, the kind that Mr. Calatrava has so dramatically presented to us, with a connection of a high-speed line that extends all the way to Newark Airport, will, in fact, enhance the economic vitality of Lower Manhattan.

The interim proposal, the no build alternative that you've presented, is, in fact, exactly that, it's a no build, no future alternative.

It does not restore the capacity that existed. It does not allow the enhancement of service to New Jersey. That's critical.

The net increase in commuters into New York City is all coming from New Jersey. We are not as attractive anymore to people living on Long Island, they find jobs on Long Island, as in the case with Westchester.

If we are to have new people come into New York City from outside of New York City, they are most likely to come, again, from New Jersey. We need to have the capacity to bring them here effectively in a mass transit mode.

We certainly can't have them drive, we don't have the street space for that and, in fact, it's very clear that bus alternatives are not as effective as fixed rail.

This system enhances Lower Manhattan's competitiveness and that's why we support it.

There are no questions there will be impacts and you've laid them out well, but we believe those impacts can be minimized and that the community in Lower Manhattan, both the business community and the residential community, can, in fact, find the construction to be as environmentally effective as possible.

In the area of both noise and air, we believe that plans can be put in place to minimize the impact of this construction on the communities that depend on Lower Manhattan for their homes or for their daily jobs.

We expect to work with The Port Authority and the other owners in Lower Manhattan to put in place the noise plans and the other developments that will allow this construction to go forward in as environmentally sound a fashion as is possible.

We believe that's possible and

it's one of the reasons we support the proposal you've put forward.

Thank you very much.

MR. BLOCH: Thank you.

Our next speaker is Albert Papp, Jr.

MR. PAPP: Good evening.

My name is Albert Papp, Jr. and I am the Director of the New Jersey Association of Railroad Passengers.

Tonight we're here to urge that the environmental impact statement review process reconsider our proposal first vetted on March 31st, 2003 to connect the Downtown PATH with a physical track connection to the No. 6 Lexington Avenue New York City Transit subway line.

Over the past year and a quarter, beginning with the initial meeting on March 31st at the PATH Journal Square headquarters, NJRP has been suggesting that The Port Authority and New York City Transit build a physical track, 3,000 feet in length, between the now refurbished PATH line with the

No. 6 local subway in concert with the rebuilding of the World Trade Center site in Lower Manhattan.

Despite the comments expressed in the March 22nd, 2004 DEIS and statements contained within a June 10th, 2004 Port Authority letter to myself, both detailing reasons why the project isn't feasible, NJR continues to believe that construction of either a track connection or an across the platform transfer be named a viable option to enhance Trans-Hudson mobility and provide new transportation pathways to the residents of both New Jersey and New York.

We believe the benefits of this project far outweigh any of the enumerated challenges in the above two cited references.

While NJR acknowledges these challenges which have been put forth by the consultants to The Port Authority, Parsons, Brinkerhoff, Quaid & Douglas, we humbly suggest they are certainly no more daunting than those the nation faced in the 1960s when President Kennedy tasked the country to land a

man on the moon by the end of that tumultuous decade.

As such, NJR strongly urges The Port Authority and New York City Transit to seriously reconsider the proposal to construct that 3,000 foot connection between the Downtown PATH and the Lexington Avenue No. 6 local subway line.

While we are aware of the political imperatives surrounding the imminent groundbreaking for the construction of the Freedom Tower now scheduled for this upcoming July 4th, Independence Day, we must express our dismay and concern with several of the key assumptions that The Port Authority and New York City Transit used reaching their conclusion not to carry this proposal forward for further consideration.

Principally, New York City Transit's adoption of overly restrictive MW-1 Track Standards and Reference Manual has the net effect of virtually precluding any future subway or regional rail infrastructure construction in the Lower Manhattan area

without major alterations to existing structures and/or properties, not to mention disruption to existing transit operation.

In our proposal we specifically adopted grades, track radii and tunnel separations that are well within existing New York City Transit operating parameters and which have served this city faithfully for almost a century.

The invoking by the NYCT of these rather disingenuous yardsticks not only precludes a PATH-Lex connection but will have the effect of damping the future mobility needs of the public, not to mention hindering the accessibility to the Downtown area and the rebuilding efforts about to get underway.

It may be time to visit these restrictive criteria and permit modification of them in those circumstances where the applicability may prohibit the building of needed infrastructure.

Specifically, MW-1 limits gradients to three percent, curve radii to 350 feet and separations of intersecting subways

to one tunnel diameter where tubes exist.

The proposed connection between the PATH and the No. 6 Lexington subway line that we have proposed employs grades of four and a half percent, curve radii of 200 feet and a minimum rail-to-rail clearance of 17 feet where the proposal link passes under the existing A and C line at Church Street and 14 feet where it passes over the existing 2 and 3 lines at Beekman Street.

We would be grossly remiss and hasten to point out that New York City Transit has operated the No. 6 train around the City Hall loop, which uses 147 foot curve radius for a century and that the PATH has used 115 feet curve radii in its daily operation for almost as long.

We also note that the much vaunted No. 7 line, which is due to be extended west from Times Square, operates on two minute headways and employs four and a half percent grades in the Steinway Tunnel located to the west of Grand Central Terminal and that the recently conducted JFK AirTrain daily

surmounts grades as steep as 5.35 percent.

NJR desires to continue in a constructive dialogue within the EIS process with The Port Authority and New York City Transit regarding our proposed PATH-Lex connection.

This once in a century opportunity can benefit the entire region by concentrating and expanding economic activity in a rebuilt and revitalized Lower Manhattan.

But this opportunity will be realized only if ingrained jurisdictional and institutional impediments can be placed aside.

Generations yet unborn will thank us if we can exercise superior foresight and adopt this transportation improvement in the aftermath of one of the most tragic episodes in American history.

The choice is ours. Let's vote for improved transportation linkages. We can do it now. Again, the choice is ours.

Thank you.

MR. BLOCH: Thank you.

Our next speaker is Kelly

Coangelo.

MS. COANGELO: Hi.

My name is Kelly Coangelo, I'm a resident and a PATH rider.

I live in this neighborhood and since February 2004 I've done the reverse commute of World Trade Center and PATH train to Journal Square with the exception of the 26 months that it was out of service so obviously I fully support this project.

And I also do like the option with the Liberty Plaza connection just because that area can get very congested with traffic and pedestrians during rush hour.

I just have three quick comments, I hadn't planned on speaking, but being a resident down here we had to fight with the EPA to get air monitoring results put on their Website after they put air monitoring equipment after September 11th.

So I would just ask that if the air quality monitoring is going to be taking place in various locations, that one of the locations or a few of the locations actually

be put down in the pit where the PATH riders are walking and standing because I don't know what it's going to be like down there with a lot of construction going on.

And the second one would be that air quality monitoring results are posted on a Website on a daily basis for residents and workers to obtain.

You know, obviously we've breathed a lot of bad stuff down here already and we want to make sure that, you know, the health of our children and of the people who live and work in this area is protected and I think just by making these results public that would be very helpful.

And one other suggestion is noise monitoring. I didn't see on the slide presentation if there was going to be noise monitoring equipment to measure if there's ever a noise violation because I know there's different regulations depending on the day and the time for noise violations. So that's just one other suggestion and that's it.

Thank you.

MR. BLOCH: Thank you very much.

I don't think there are any other speakers right now.

What we'll do is take a short recess. We can reconvene at any time when another speaker comes. We'll be here till 8:00.

Just remember if you want to send in any documentation, this is the way to do it, and please feel free to visit downstairs and talk with anyone about what you see.

Thank you.

(Time noted: 7:20 p.m.)

(A recess was taken)

(Time noted: 7:40 p.m.)

MR. BLOCH: We do have another speaker.

And since you weren't here earlier, I just wanted to let you know we're looking for your remarks, as well as written documentation that you'd like to give us.

And I would like to ask you to keep your remarks to three to five minutes.

So let me read your name --

MR. ADLER: Do you have a timer that I could look at?

MR. BLOCH: No. You know, we'll trust you.

MR. ADLER: I don't have a watch.

MR. BLOCH: Mr. Adler, if you want to repeat your name and --

MR. ADLER: Yes, my name is Steve Adler, telephone number 718-295-3510, E-mail address v, as in Victor, a, n as in Nancy, t-r-a-n613@yahoo.com.

I represent myself and hopefully reasonable people in this city.

MR. BLOCH: Go ahead.

MR. ADLER: Unfortunately, I found out about this hearing only this afternoon and it was some time before I even found out whether I would be able to participate. So I hope you'll excuse me for coming just a bit late.

By a show of hands, could you tell me which -- who among you is just from the general public as opposed to paid staff.

MR. BLOCH: Actually, Mr. Adler --

MR. ADLER: Let the record show that not a single person raised their hand. There are approximately a dozen people altogether.

In any event, here we are again to discuss a massive construction project for the benefit of the transit riders and for the community as a whole under the auspices this time of The Port Authority and its illustrious partners, the MTA, the Lower Manhattan Development Corporation and whatever other agencies there might be.

The one suggestion I would like to make is before considering the design of the various subway stations involved, you should consider methods of fare collection that are barrier free.

So that instead of having various kinds of turnstiles, a person might wear some kind of a badge or other device as they're riding in whatever vehicles, and as they're riding, the badge or device or whatever can accumulate cost units and thereby a person could pay for the service depending on the

time and place, type of vehicle and type of service within the vehicle that the person is using.

Until relatively recently, this hasn't been particularly practicable, but I suggest that before spending enormous amounts of money on various barrier based station systems, which are a tremendous inconvenience to the great flows of people in and out of these various transit facilities, that you put out at least a request for proposals to the community that might be able to provide such technology and see what you come up with.

This could save a substantial amount in fare collection and make the station that much more usable for things other than just transit purposes.

For example, in the New York City subway system, which will be a part of this massive project, there are roughly a million square feet of essentially unutilized subway mezzanine space.

That space could be marketed. It could be rented out on an hourly, daily or

yearly basis to small firms, including street peddlers and the like or larger firms, but as long as you have these barriers in place, the attractiveness of the space is much lower. So I hope you'll bear that in mind.

A second very important point is the long-term impact of road user charges on the demand for both road space, the air used as an open sewer and the many transit facilities.

So if you're planning a transit facility based on existing utilization rates and existing ways of using the streets, in particular where the streets are essentially open sewers for the fumes of the vehicles, and in the future, not to distant I hope, we might have systems of road user charges that charged vehicle users for the pollution that they cause.

The result of such a system might be a massive diversion, particularly in areas such as Lower Manhattan, to pollution free vehicles of various types.

Another point is that the cost of

roads depends disproportionately on the axle weight of the vehicles. So buses, for example, have massive rear axle loads and are responsible for a large percentage of the damage caused to streets in New York City.

If instead of just allowing whatever vehicles can get by on the road within certain limits we charged vehicles for the damage that they cause to roads, we might see a switch to much lighter vehicles and the result might be that we could have different types of road construction.

Also, if we have zero pollution vehicles or almost all zero pollution vehicles, instead of having the streets as they are, with nothing on top of them for the most part, we can envision a system of multi-level streets where you could have subways on one level, mezzanines on another level, individualized vehicles still on another level and ultimately on the top some kind of pedestrian parkway where there would be no vehicles but you could -- or only certain limited types of vehicles.

But as long as you have to use the air as an open sewer to get rid of the pollution, this type of thing is much more expensive.

And also, as long as the vehicles are very heavy, the construction of various levels with vehicles and so forth is relatively expensive as well.

The last point is that, as I mentioned many times before, we should look very carefully at an open market for surface transportation. There's no need for a monopoly in the area of service transportation. You don't need monopolies for buses. We don't need a taxi and medallion system with restricted entry.

If we opened up the market to service transportation, we would get, as I pointed out many times before, as people could discover in detail by sending me an E-mail, we would get a rather ubiquitous, largely van based system of providing on the order of eight to ten times the frequency of services of existing buses, attracting people out of

cars and taxis, reducing the equivalent DMT by on the order of one or two billion miles per year in New York City.

I'd also like to add something that the barrier free fare collection system might help to bring about.

There is a monopoly, a natural monopoly on the transit right-of-way but there's not necessarily a natural monopoly on the vehicles that go on that right-of-way.

If you have a barrier free system that enables one to charge for one's presence in a particular vehicle or part of a vehicle, one can imagine a system where the right-of-way is a monopoly but there might be multiple service providers on that right-of-way providing a whole range of services, from your basic New York sardine effect, to more luxury accommodations.

And this might help to attract people again out of cars and taxis, saving energy and so forth.

So I hope that I've entertained you since you're on government time or other

contract time, nobody here raised their hand when I asked about general public.

And if anybody wants a copy of my press release which says almost nothing about what I've said here, I'd be glad to give you one.

Thank you very much.

MR. BLOCH: Thank you.

Now that there are no other speakers, we'll just take a brief recess.

(Time noted: 7:44 p.m.)

(A recess was taken)

(Time noted: 7:58 p.m.)

MR. BLOCH: I'm just going to bring Mr. Adler back to speak for another 30 seconds.

MR. ADLER: Right. I omitted an entire topic that the World Trade Center, may it rest in peace, was famous for and that is elevators.

The World Trade Center itself had something on the order of 13 mile elevators. These were built without federal funding, believe it or not, except to the extent that

the Federal Government funded The Port Authority projects.

In general, we've had billions of dollars of elevators built in New York City over the last 30 years, almost none of it funded by the Federal Government.

Fast, efficient and automated. The automated elevators in this city have displaced roughly 100,000 elevator operator careers, lifetime careers, but nobody is talking about getting the Federal Government to pay for elevators in New York City and without those elevators in New York City, the subways would hardly make any sense.

So what we need to do is to figure out how to pay for the subways without relying on the people in Nebraska, and I suggest that the people in Nebraska should figure out how to pay for their various farm programs without relying too much on the people in New York City.

Thank you very much.

MR. BLOCH: Thank you again.

Okay. Given that it's 8 o'clock

and we have no other speakers, we are now going to adjourn this public meeting.

Good night.

(Time noted: 8:00 p.m.)

C E R T I F I C A T E

STATE OF NEW YORK)
ss.
COUNTY OF NEW YORK)

I, Ann Brunetti, a shorthand reporter and notary public of the State of New York, do hereby certify:

That the foregoing, pages 1 through 135, taken at the time and place aforesaid, is a true and correct transcription of my stenographic notes, to the best of my ability.

IN WITNESS WHEREOF, I have hereunto set my hand this 9th day of July 2004.

Ann Brunetti

Appendix H-3: Written Comments on the DEIS

LIST OF COMMENTERS

A total of 41 parties commented on the DEIS. Fifteen parties spoke at the public hearings. Their comments are reflected in the transcripts shown in Appendix H-2. The remaining comments were mailed, e-mailed, or faxed to PANYNJ during the public comment period. The following is a list of those commenters, their affiliation, and the date and method in which their written comments were received. This introduction is followed by the written comments, which are sorted alphabetically by surname.

- Anonymous 1. Facsimile dated June 16, 2004.
- Ayer, Sarah M, AT&T. Letter dated July 21, 2004.
- Bachmore, John, Verizon Communications, Inc. Letter dated July 21, 2004.
- Barzilai, Tal, E-mail dated July 21, 2004.
- Blackman, Laura, Hudson River Park Trust. E-mail dated July 8, 2004.
- Butziger, Alexander. E-mail dated July 21, 2004.
- Carey, Timothy S., Battery Park City Authority. Letter dated July 14, 2004.
- Epstein, Louis, The World Trade Center Restoration Movement. Speaker at public hearing dated June 23, 2004 and letter dated July 21, 2004.
- Gardner, Anthony, Coalition of 9/11 Families. Letter dated July 27, 2004. (Comments are herein noted as Gardner.)
- Gardner, Anthony, Coalition of 9/11 Families; Fetchel, Mary, Voice of September 11; Sally Regenhord, Sally, Skyscraper Safety Campaign. Letter dated July 16, 2004. (Comments are herein noted as Gardner et al.)
- Gaull, Marilyn. E-mail dated July 6, 2004.
- Goetz, Bernard. Speaker at public hearing dated June 23, 2004; written comments dated June 23, 2004.
- Gorsky, Steven, Barclay's. Written comments dated June 16, 2004.
- Haikalis, George, Regional Rail Working Group. Speaker at public hearing dated June 23, 2004; written comments dated June 23, 2004; e-mail comments dated August 4, 2004.
- Hargrove, Robert W., U.S. Environmental Protection Agency. Letter dated July 21, 2004.
- Hemric, Benjamin. Letter dated July 20, 2004.
- Hensley, Jen, The Alliance for Downtown New York, Inc. Speaker at public hearing dated June 23, 2004; written comments dated June 23, 2004.

- Jackson, Don, Local Union #3 IBEW. Written comment sheet dated June 23, 2004.
- Kornfeld Jr., Robert, The Historic Districts Council. Written comments dated July 6, 2004.
- Lachman, Seymour P., New York State Senate District 23. Letter dated July 21, 2004.
- Lictro, John. D. E-mail dated July 20, 2004.
- Love, William C., Jr., Coalition to Save West Street. Letter dated July 5, 2004.
- Lustbader, Ken, Lower Manhattan Emergency Preservation Fund. Speaker at public hearing dated June 23, 2004; written comments dated June 23, 2004.
- Morrow, Yvonne. Written comments submitted on July 21, 2004.
- O'Shea, James P. Facsimile dated June 28, 2004.
- Papp Jr., Albert, New Jersey Association of Railroad Passengers. Speaker at public hearing dated June 23, 2004; e-mail comments dated August 4, 2004.
- Pasternack, Scott. E-mail dated June 21, 2004.
- Sanchis III, Frank E., Municipal Art Society; Breen, Peg, New York Landmarks Conservancy; Burnham, Bonnie, World Monument Fund; Merritt, Elizabeth, National Trust for Historic Preservation; Heyl, Scott, Preservation League of New York State. Letter dated July 8, 2004. ((Comments are herein noted as Sanchis III et al 1.)
- Sanchis III, Frank E., Municipal Art Society; Fenollosa, Marilyn, National Trust for Historic Preservation; Breen, Peg, New York Landmarks Conservancy; Burnham, Bonnie, World Monument Fund; Merritt, Elizabeth, National Trust for Historic Preservation; Heyl, Scott, Preservation League of New York State. Letter dated August 2, 2004. ((Comments are herein noted as Sanchis III et al 2.)
- Scian, Paul. E-mail dated June 21, 2004.
- Stilwell, David A., U.S. Department of the Interior, Fish and Wildlife Service. Letter dated June 15, 2004.
- Sulphin, Amanda, New York City Landmarks Preservation Commission. Letter dated June 17, 2004.
- Taylor, Willie R., U.S. Department of the Interior. Letter dated July 30, 2004.
- Todorovich, Petra, Regional Plan Association. Speaker at public hearing dated June 23, 2004; written comments dated June 23, 2004.
- Yaro, Robert D., Regional Plan Association. Letter dated July 21, 2004.

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received: 06/16/04 **Type:** Written Comment
Contact Details: Anonymous 1 **Location:**
The City of New York Administration for Children's Svcs.
Div. Of Legal Svcs.
220 Church Street
New York, NY 10013
P ; F ; E

Comment:
To whom it may concern: I feel that we need at least two bathrooms at WTC PATH terminal for the convenience of the public. Thank you for your consideration in this matter.

AT&T

Third Floor
400 West Avenue
Rochester, NY 14611

BY FAX and E-MAIL to:

Mr. Richard J. Schmalz, P.E, DSEIS by Fax at (212) 267-4114 and
by E-Mail route9A@dot.st.ny.us
WTC Path Terminal by Fax at (212) 435-5514

July 21, 2004

Mr. Richard J. Schmalz, P.E.
Project Director
Route 9A/Lower Manhattan Redevelopment Project
21 South End Avenue
New York, NY 10280

WTC Path Terminal – Comments
115 Broadway, 5th Floor
New York, NY 10006

Re: Route 9A Reconstruction and Permanent WTC Path Terminal

Ladies and Gentlemen:

AT&T Corp. and its wholly owned subsidiaries AT&T Communications of New York, Inc. and Teleport Communications New York ("AT&T") submit this comment letter on the Draft Generic Environmental Impact Statement ("DGEIS") for the Route 9A Reconstruction and the Permanent Path Terminal Projects ("Plans") issued by the New York State Department of Transportation ("NYSDOT") and the Port Authority of New York and New Jersey ("Port Authority"), respectively. In preparing our comments, AT&T reviewed the July 21, 2004 comments submitted to NYSDOT and the Port Authority by Verizon New York Inc. and Empire City Subway Company (Limited) (collectively "Verizon"). AT&T believes Verizon has raised some issues that would benefit from further discussion during the planning process.

USA
PROUD PARTNER

AT&T was directly affected by the September 11, 2001 attacks on the World Trade Center. As one of the major providers of telecommunications services to the financial district and other areas of lower Manhattan, we incurred significant damage to our facilities, extra expenses for emergency response, recovery and restoration efforts to our critical communications services and significant loss of revenue due to service outages. There was also severe impairment to the communications paths linking our lower Manhattan facilities with Verizon's facilities and with our many business and residential customers. AT&T was able to rapidly replicate its lost functionality through alternate facilities and permanent restoration but at significant cost. AT&T would like to ensure that any additional cost to us under the Plan and other lower Manhattan projects is minimized and that vital telecommunications services are not unduly disrupted.

AT&T fully supports the reconstruction of the World Trade Center site and the revitalization of Lower Manhattan. We are pleased to have the opportunity to work with NYSDOT, the Port Authority and other Federal, State and municipal agencies. NYSDOT, PANYNJ and the governmental agencies will base their planning decisions on the DGEIS. In doing so, AT&T believes that certain points raised in the Verizon letter merit further examination.

Specifically, AT&T supports:

(1) establishing a coordinated planning approach for the World Trade Center Memorial and Redevelopment Plan, the Route 9A Project, WTC Path Terminal and the Fulton Transit Hub;

(2) implementing achievable time frames for completion of infrastructure construction related to these projects;

(3) avoiding any permanent impairment of utility infrastructure along the Route 9A pathway;

(4) avoiding unnecessary additional costs to carriers associated with any infrastructure relocation or construction, to the extent carriers may be responsible for such costs. This would include avoiding multiple relocations, identifying any new routes as quickly as possible, providing adequate notice to all affected utilities, enlisting cooperation from building owners and minimizing any disruption of telecom services to business and residential consumers;

(5) treating all carriers with infrastructure in the project areas in a non-discriminatory manner. This would include (but not be limited to) extending to these carriers any benefits Verizon receives with regard to easements, access to facilities, and recovery of restoration costs resulting from reconstruction projects under the Partial Action Plan for Utility Restoration and Infrastructure Rebuilding ("Partial Action Plan").

AT&T looks forward to working with the NYSDOT, the Port Authority, and other governmental agencies and carriers to successfully restore lower Manhattan while avoiding disruption of vital telecommunications facilities and minimizing additional financial burdens on AT&T. Please feel free to call me at (585) 987-3160 if you have any questions.

Sincerely,

Sarah M. Ayer

Sarah M. Ayer
Senior Attorney
AT&T Corp.

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received: 07/21/04 **Type:** Letter

Contact Details:
John Bachmore
Director
Verizon, OSP Engineering - Liberty
230 West 36th Street Rm. 627
New York, NY 10018
P 212-967-1306; **F** 212-279-0417; **E** john.j.bachmore@verizon.com

Location:

Comment:
Letter sent by Verizon sent on 7/21 - Scanned

John Bachmore
Director
OSP Engineering - Liberty

230 West 36th Street, Rm. 627
New York, NY 10018
Phone 212 967-1306
Pager 888 405-4190
Fax 212 279-0417
Cell 631 275-0607
john.j.bachmore@verizon.com

July 21, 2004

Mr. Richard J. Schmalz, P.E.
Project Director, Route 9A/Lower Manhattan Redevelopment Project
21 South End Avenue
New York, New York, 10280

and

WTC PATH Terminal- Comments
115 Broadway, 5th Floor
New York, New York 10006

Re: Route 9A Reconstruction and Permanent PATH Terminal/DGEIS

Ladies and Gentlemen:

Verizon New York Inc. and its wholly-owned subsidiary, Empire City Subway Company (Limited)("ECS"), submit the enclosed consolidated comments on the Draft Environmental Impact Statements pertaining to the Route 9A Reconstruction and the Permanent PATH Terminal projects, issued by the New York State Department of Transportation ("NYSDOT") and the Port Authority of New York and New Jersey ("Port Authority"), respectively.

Please note that Verizon has consolidated its comments to the foregoing projects based on the interdependence of the projects, and the impacts that both projects will potentially have on the ability of Verizon and ECS to deliver telecommunications services to the residents and businesses of Lower Manhattan. Further, it is Verizon's intent that the enclosed comments are reviewed collectively by the NYSDOT and the Port Authority in order to ensure that the two projects are planned in a cooperative and efficient manner.

Verizon supports the reconstruction and revitalization of Lower Manhattan. However, for the reasons outlined in the attached comments, if Verizon's concerns are not adequately addressed, and if the major projects proposed for Lower Manhattan are not properly coordinated, the plans proposed by the NYSDOT and the Port Authority as outlined in the respective Draft Environmental Impact Statements could:

- Delay the restoration projects planned for Lower Manhattan
- Disrupt telecommunications service to Lower Manhattan
- Waste millions of dollars
- Adversely affect the quality of life for the residents of Lower Manhattan

The enclosed comments outline the actions necessary to mitigate these concerns. If our concerns are addressed in a timely manner, we believe the construction of the Route 9A and the Permanent PATH Terminal projects will be expedited and that Lower Manhattan's telecommunications needs will continue to be met with the quality and reliability demanded by businesses and residents.

Very truly yours,

Enclosures

cc: See attached list

cc:

The Port Authority of New York and New Jersey
225 Park Avenue South
New York, New York 10003
Attention: Anthony G. Cracchiolo, Priority Capital Programs Director

Lower Manhattan Development Corporation
One Liberty Plaza, 20th Floor
New York, New York 10006
Attention: Kevin Rampe, President

Federal Highway Administration, New York Division
Leo W. O'Brien Federal Building, Room 719
Clinton Avenue and North Pearl Street
Albany, New York 12207
Attention: David M. Hart, Senior Operations Engineer

Empire State Development Corporation
633 Third Avenue
New York, New York 10017
Attention: Charles A. Gargano, Chairman

Office of the Mayor
City Hall
New York, New York 10007
Attention: Daniel L. Doctoroff, Deputy Mayor for Economic Development and Rebuilding

New York City Department of Transportation
40 Worth Street
New York, New York 10013
Attention: Iris Weinshall, Commissioner
Andrew Salkin, Lower Manhattan Borough Commissioner

New York City Department of City Planning
22 Reade Street
New York, New York 10007-1216
Attention: Amanda M. Burden, Chair
Vishaan Chakrabarti, Manhattan Office Director

New York City Department of Design and Construction
30-30 Thomson Avenue
Long Island City, New York 11101
Attention: David J. Burney, Commissioner

New York City Economic Development Corporation
110 William Street
New York, New York 10038
Attention: Andrew M. Alper, President
Josh Sirefman, Executive Vice President

Community Board No. 1
49-51 Chambers Street, Rm. 715
New York, New York 10007
Attention: Madelyn Wils, Chair
Paul Goldstein, District Manager

Silverstein Properties, Inc.
530 5th Ave.
New York, New York 10036
Attention: Larry Silverstein
Jack Klein

Brookfield Properties Corporation
One Liberty Plaza
165 Broadway, 6th Floor
New York, New York 10006
Attention: John Zuccotti

VERIZON NEW YORK INC.
EMPIRE CITY SUBWAY COMPANY (LIMITED)

CONSOLIDATED COMMENTS

TO

ROUTE 9A

Draft Supplemental Environmental Impact Statement

AND

PERMANENT WTC PATH TERMINAL

Draft Environmental Impact Statement

July 21, 2004

Table of Contents

I. SUMMARY 1

II. SCOPE OF SEPTEMBER 11 DAMAGES 4

A. Overview of 140 West Street Facility 4

B. Physical Damage and Network Disruption 5

C. Emergency Management and Restoration Efforts 5

III. PROPOSED REDEVELOPMENT PLAN 6

A. Redevelopment Concerns 6

B. Lower Manhattan Projects 7

C. Network Relocation 9

D. Impacts of the Route 9A and PATH Terminal Plans 10

E. Proposed Mitigation 11

IV. IMPACTS SPECIFIC TO 140 WEST STREET 14

V. CONCLUSION 15

I. SUMMARY

Verizon New York Inc. and its wholly owned subsidiary, Empire City Subway Company (Limited) (collectively, for purposes of this document, "Verizon") support the redevelopment of the Lower Manhattan area, including the World Trade Center site ("WTC"), Route 9A, and the permanent WTC PATH Terminal (the "Terminal") and do not wish to impede or delay those efforts. Verizon is submitting these consolidated comments to the Route 9A Draft Supplemental Environmental Impact Statement ("Route 9A EIS") and the Permanent WTC PATH Terminal Draft Environmental Impact Statement ("PATH EIS"; Route 9A EIS and the PATH EIS are collectively, "EIS") for the purpose of alerting the New York State Department of Transportation ("NYSDOT"), the Federal Highway Administration, the Port Authority of New York and New Jersey ("PANYNJ"), the Lower Manhattan Development Corporation ("LMDC") and other New York State and New York City agencies whose decisions will be based on the EIS to certain issues which must be addressed in planning for the Route 9A reconstruction, the Terminal construction and for other public projects in Lower Manhattan. In view of the interdependence of the Route 9A Project and the PATH Terminal Project, and the impacts that both projects will have on the ability of Verizon and other infrastructure service providers to deliver utilities to the residents and businesses of Lower Manhattan, the following comments are addressed to both the Route 9A EIS and the PATH EIS so that all of the agencies involved can adequately plan for construction in a cooperative and efficient manner. By working together, we can decrease the risk that the restoration projects planned for Lower Manhattan are delayed or disrupted.

After review of the EIS, Verizon is concerned that telecommunications service, including emergency services, to Lower Manhattan may once again be disrupted or degraded unless:

(1) PANYNJ and the applicable New York State and New York City agencies ensure that the underground pedestrian concourse connecting the WTC site to the World Financial Center (WFC), to be located beneath Route 9A, does not unduly disrupt or prevent Verizon's current and future use of Route 9A as a utility pathway;

(2) NYSDOT ensures that the reconstruction of Route 9A, whether at-grade or below grade, accounts for the Verizon utilities located beneath Route 9A;

(3) NYSDOT promptly notifies Verizon as to the selected Route 9A alternative, because the relocation route of the conduits will vary considerably depending on the chosen alternative;

(4) The PANYNJ ensures that the underground pedestrian concourse connecting the Terminal to Liberty Plaza, to be located beneath Church Street, does not prevent Verizon from utilizing Church Street as a utility pathway;

(5) The applicable New York State and New York City agencies promptly designate one of the routes proposed herein by Verizon for the location of its sub-surface infrastructure;

(6) The location of the designated route is not changed once it is approved;

(7) PANYNJ, NYSDOT and the applicable New York State and New York City agencies ensure that the Route 9A entry point for Verizon conduits is not impeded, to accommodate network diversity for future tenants at the WTC site;

(8) Verizon is granted a permanent easement for its sub-surface infrastructure, to the extent the designated route is located on private property, or on any property (including Port Authority property) that is not within New York City mapped streets or New York State highways;

(9) Verizon is given uninterrupted and unimpeded access to all conduits and manholes located within the project areas in Lower Manhattan, both during construction and thereafter;

(10) PANYNJ, NYSDOT and the applicable New York State and New York City agencies that issue "order out" mandates provide Verizon with sufficient time to plan, remove its existing infrastructure and install the new infrastructure;

(11) There is greater coordination between Verizon and the government agencies involved in the planning process for the rebuilding of Lower Manhattan; and

(12) NYSDOT, PANYNJ and LMDC support Verizon's efforts to recover its restoration costs resulting from the reconstruction projects under the Partial Action Plan.

The September 11, 2001 attacks on the WTC caused extensive damage to Verizon's 1.1 million square foot central office and switching facility located at 140 West Street, immediately north of the WTC site and west of 7 WTC. Through this facility, Verizon supplies telecommunications services to many large financial services firms, financial clearing organizations, government offices and residents in Lower Manhattan. When 7 WTC collapsed directly onto 140 West Street, Verizon's building was severely damaged and telephone and other communications services were cut off to large parts of Lower Manhattan. Verizon, through its wholly-owned subsidiary Empire City Subway Company (Limited), owns and maintains the conduits under the streets that carry the Verizon network (as well as the networks of other large telecom providers such as AT&T, Time Warner Cable and RCN) through the streets of New York City. The Verizon sub-surface infrastructure also suffered major damage when the WTC collapsed.

The financial impact to Verizon of the September 11 attacks has been over one billion dollars. In connection with its restoration efforts, Verizon has installed new conduits in large part based on the coordination and supervision of government agencies such as the City Department of Design and Construction and the City and State Departments of Transportation. As a result of the proposed Route 9A and Terminal projects, cables and conduits which have been installed will have to be moved and reinstalled at great cost and with the risk of additional service disruptions. To date, Verizon has been unable to get clear direction from the governmental agencies involved in the Lower Manhattan redevelopment regarding a permanent location for its cables and equipment. Relocating the sub-surface infrastructure of Verizon involves tens of thousands of lines which are routed through 140 West Street. Moving major cables and equipment is extremely time consuming and expensive, requiring the design and construction of duplicate facilities and the hand splicing of tens of thousands of telephone lines before the existing facilities can be removed. Verizon is appreciative that its comments to the WTC Memorial and Redevelopment Plan Draft Generic Environmental Impact Statement were reviewed and that some of the issues raised, including the need for greater inter-agency

coordination, are discussed in the latest EIS. However, our current comments address certain issues and inconsistencies found while reviewing the EIS, including the continued lack of certainty, feasibility and coordination. Our comments detail the impact that the planning process will have on Verizon's efforts to provide telecommunications service to Lower Manhattan, and our proposed mitigation of those impacts.

II. SCOPE OF SEPTEMBER 11 DAMAGES

A. Overview of 140 West Street Facility

Verizon's central office and switching facility located at 140 West Street is integral to Verizon's ability to provide telephone and other communications services to the thousands of large financial services firms, financial clearing organizations, government offices and residents of Lower Manhattan that comprise Verizon's customer base. The 140 West Street facility contains over a dozen floors of telecommunications equipment and cables, which are used to connect and route voice and data signals throughout the New York Metropolitan area and beyond.

The network equipment located at 140 West Street was comprised of 4 digital switches used to connect and route telephone calls, approximately 500 optical transport systems, 7,600 fiber optic strands of glass used to transmit voice and data, nearly 200,000 voice lines, 111,800 PBX lines which are used by companies to allow multiple employees to share voice lines, 11,100 ISP lines used for internet access, 4.4 million circuits used to transmit data and 500 copper cables. The telephone lines used to transmit voice and data are routed through the building, and then grouped together and encased inside cables. A total of 500 cables are located inside and fed out of 140 West Street through a cable vault in the building in order to provide service to Verizon customers. Each copper cable contains up to 3600 pairs of wires, for a total of up to 7200 individual wires per cable. Cables containing fiber optics would contain on average 216 strands of fiber per cable. Cables fed from 140 West Street through the cable vault to the street are placed inside conduits which are located underground throughout the streets of New York City and routed to customer locations to provide service. Verizon personnel gain access to the conduits via manholes located throughout the streets, and Verizon needs free access to its conduits and manholes in order to install, replace and repair cables, both during construction and thereafter.

B. Physical Damage and Network Disruption

The collapse of the WTC caused a tremendous amount of physical damage to 140 West Street and the phone lines and equipment contained inside the building. 140 West Street suffered major physical impact on 9 critical network floors, with numerous building breaches. Sensitive digital switching equipment, air pressure systems, power panels, cables and other equipment were either smashed, flooded or damaged by dust, smoke and soot from the burning of the WTC and the efforts to extinguish the blaze. The clean-up of 140 West Street was extensive and included debris removal, structural repairs, mechanical and electrical repairs, façade restoration and asbestos clean-up and abatement. Damage to Verizon's external wire network was also extensive. The sub-surface cable vault, conduits, cables, and manhole infrastructure suffered tremendous damage as the collapsing towers and steel beams penetrated the sidewalks and Verizon's underground infrastructure located outside of the building. The extensive damage and flooding of the cable vault located at 140 West Street impacted over 250 cables and caused tens of thousands of businesses and residents in Lower Manhattan to lose telephone service.

The collapse of 7 WTC onto 140 West Street resulted in severe contamination of Verizon's offices and Verizon had to relocate more than 2,200 displaced employees from the WTC and 140 West Street locations to temporary facilities in and around the New York City area. As a result of the attacks on the WTC, Verizon also suffered a sizable loss to its conduit and manhole system, which required the construction of 900,000 duct feet of mainline conduit and 25 new manholes, and extensive repairs to 20 manholes due to structural damage resulting from falling steel and concrete. The repair and replacement of the existing conduit system, and approximately 45 miles of fiber-optic cable and 22 miles of copper cables, was required and is still ongoing.

C. Emergency Management and Restoration Efforts

Verizon's post-September 11 restoration efforts included the repair, rerouting and relocation of extensive amounts of infrastructure, including the construction of duct pathway beneath Route 9A and Church Street. The location of these new conduits and cables, including the decision to by-pass the WTC site and relocate Verizon's infrastructure in the bed of Route 9A, was determined with the coordination and supervision of government agencies such as the New York State Department of Transportation. This work was done by Verizon at a cost of

millions of dollars and, if current proposals to reconfigure Route 9A and the Terminal come to fruition, much of the newly installed infrastructure will have to be replaced and removed. Because of the design of the proposed PATH underground pedestrian concourse between the WTC and WFC, Verizon is now faced with the prospect of expending precious time and resources to undo this work and relocate its Route 9A cables and equipment to locations which have not yet been confirmed with any degree of certainty or permanency. Verizon's cables and equipment located beneath Church Street may also have to be relocated due to the planned Liberty Plaza connection to the Terminal. Unless the mitigation proposed herein is implemented, the projects being contemplated for Lower Manhattan may have an adverse impact on the ability of Verizon to provide telecommunications services to tens of thousands of Lower Manhattan businesses, residents and governmental agencies. The mitigation proposed herein is submitted in order to avoid further negative impacts on these consumers of telecommunications services and on the revitalization of Lower Manhattan.

III. PROPOSED REDEVELOPMENT PLAN

A. Redevelopment Concerns

The pedestrian concourse planned by PANYNJ connects the WTC and WFC sites by an underground passageway under Route 9A in the vicinity of Fulton Street, allowing PATH customers to cross Route 9A without coming above ground. The PATH EIS indicates that the PANYNJ may choose to construct an above ground pedestrian bridge rather than the underground concourse. The PATH EIS seems to indicate that, since the Route 9A short bypass alternative would require Verizon to relocate its Route 9A conduits in any event, the construction of the underground concourse would cause no additional burden to Verizon. However, while the Route 9A short bypass alternative would lead to a temporary disruption of this vital north-south utility pathway during construction, the underground pedestrian concourse has the potential to permanently impair Verizon's use of the Route 9A pathway. We ask that PANYNJ design and construct the underground pedestrian concourse in a manner that preserves the integrity of the two banks of 96 ducts and 84 ducts running north and south along Route 9A.

The Verizon conduits located beneath Church Street provide a back-up system to the Route 9A conduits and are an important fail-safe utility pathway. While the Route 9A pathway is disconnected during the construction of the short bypass, the Church Street pathway will serve

as the primary north-south utility pathway. Unless designed and constructed in concert with the efforts of Verizon, other utility companies and other agencies involved in the Lower Manhattan redevelopment, the Liberty Plaza connection, as proposed in the PATH EIS, could cause interference to telecommunications service to Lower Manhattan.

The Cedar Street portal described in the Route 9A EIS is another area of concern, as the extension of the bypass tunnel would require that Verizon relocate an additional 85,000 duct feet of conduit. It would also require the construction of four additional blocks of conduit and four new manholes. The difficulty is increased by the layout of the city streets located south of Albany Street, as space for infrastructure is severely limited due to the already existing subsurface utilities therein and the narrow street widths. This extension alone could add at least 9 months to the time required to complete the relocation.

Both EIS fail to reveal adverse impacts that may occur unless the mitigation proposed by Verizon is implemented. These include timing delays, service disruptions, disruptions to vehicular and pedestrian traffic, inconvenience to the Lower Manhattan community and wasted costs, all of which can be mitigated if the measures proposed herein are implemented. These comments will address the foregoing adverse impacts and proposed mitigation so that the same will be considered by the public authorities responsible for the planning and coordination of the Route 9A reconstruction, the Terminal project and other proposed projects in Lower Manhattan.

B. Lower Manhattan Projects

In connection with the rebuilding of Lower Manhattan, several large scale projects are proposed. Each of the projects has an ambitious timeframe and, taken as a whole, the scope of the various projects is enormous. Given the magnitude of the projects, the various governmental agencies responsible for development will need to dedicate adequate time and resources in order to coordinate the projects. Currently, the major projects being planned include the WTC Memorial and Redevelopment Plan, the Route 9A Project, the PATH Terminal, the South Ferry Terminal and the Fulton Transit Hub.

The Route 9A Project involves reconstruction of the West Side Highway, which is located west of the WTC site, by either lowering the roadway past the WTC memorial or leaving

the highway at grade but creating a promenade above it to create new Lower Manhattan park space. Regardless of the final plans for the West Side Highway, the existing Verizon facilities below the surface of Route 9A will be greatly impacted. Under the coordination and supervision of State and municipal authorities, after September 11 a significant amount of conduit and cable and its supporting facilities was placed within the bed of Route 9A, which is now an important telecommunications artery that serves the areas south, west and east of the WTC site, including Battery Park City (See Tab 1). These conduits and cables may have to be removed and relocated at a considerable cost to Verizon as a result of the Route 9A Project. Before the existing conduits and cables can be removed, in order to avoid a disruption in telephone service, Verizon will first need to create a duplicate system along a newly designated route that does not yet exist.

The Permanent PATH Terminal Project is aimed at creating a transportation hub for Lower Manhattan. It is broad in scope and will impact multiple streets and consequently the Verizon conduits and the thousands of telecommunications lines located beneath those streets. This project will undoubtedly exacerbate the impact of the other projects that will be ongoing in Lower Manhattan and will likely result in the repetition of work unless the projects are properly managed, coordinated and designed. As discussed above, the underground pedestrian concourse beneath Route 9A and the proposed Liberty Plaza connection beneath Church Street have the potential to severely inhibit Verizon's ability to provide telecommunication services to the residents and businesses in the Lower Manhattan area.

While Verizon is supportive of the redevelopment of Lower Manhattan, the most troubling aspect of the proposed construction is the lack of actual coordination among the utility companies and the project sponsors regarding the relocation of various utilities such as telecommunications, electricity, gas, steam, water and sewer. In planning for these projects, Verizon requests that the applicable governmental agencies increase their communication with Verizon and the other utility companies, in order to increase the synchronization of the proposed projects and to minimize impacts to Verizon and the residents and businesses of Lower Manhattan. Because all of the foregoing projects will be constructed within a small radius, the projects must be managed with an appreciation for their interdependencies. In addition, several utilities will be affected by the various projects. Because Verizon and other service providers, both public and private, often share a common infrastructure for the placement of equipment, and

in fact compete for scarce space, a greater degree of coordination will be necessary to minimize delays and maximize the efficient use of available space.

Also of grave concern to Verizon is the lack of certainty involved in the redevelopment plans for Lower Manhattan. Since each alternative to each of the proposed projects requires a different relocation plan, it is imperative that the alternatives be narrowed, that a final decision regarding the relocation of the utilities be made and communicated to Verizon, and that the decisions made with respect to the relocation be final and permanent. The proposed projects are a difficult engineering challenge for Verizon and, if significant aspects of the plans for the proposed projects continue to change, it becomes impossible to design and complete construction in a timely fashion. In order for Verizon to provide service to its customers in Lower Manhattan without wasting additional funds and without considerable delays and potential disruption in service, the project sponsors must provide Verizon with concrete direction in a timely fashion, as further provided herein.

C. Network Relocation

The process of relocating the infrastructure of Verizon's underground network is a complicated engineering task. In order to replace and relocate existing conduits and cables, Verizon will first need to design and construct a completely new conduit and cable system along a yet to be designated route before the old system can be removed. The intricate nature of splicing the wires within cables requires that adequate time be allotted to perform the work. In the case of copper cables, each cable can hold up to 3600 pairs of wires for a total of up to 7200 individual wires per cable. Once the new cables are in place, Verizon will need to splice the existing wires inside of each cable from the old network and reconnect each individual wire to the corresponding wire with which it forms a matching pair (See Tab 2). In the case of fiber optic cables, the process of relocation is more complex as the cables contain strands of glass that must be spliced by a process called "fusion splicing" which requires heat to cut the lines and fuse them back together when relocated to the new conduit system. Although the cables containing fiber lines contain fewer lines per cable and the splicing is faster than it is with copper cables, each line carries far more high-speed data than the copper lines and splicing of fiber lines will often require Verizon to negotiate "down-time" with its customers. Because construction projects usually require Verizon to complete its work 18 to 24 months before the end date of the project, Verizon will need to receive, well in advance, adequate information regarding a finalized

permanent route and any other relevant factors from the various New York State and New York City agencies.

The process of relocating network and equipment is extremely complicated, costly and time consuming if performed once, and unduly burdensome to Verizon to the extent work will need to be performed repeatedly due to the lack of coordination and certainty. Relocating the network once was unavoidable; however, Verizon should not be required to relocate the infrastructure again based on an absence of coherent planning by the relevant public agencies. As it stands, the cost of relocation in connection with the WTC Memorial and Redevelopment Plan and the Route 9A Project is estimated in excess of $90 million; this will be in addition to the millions of dollars that Verizon spent in connection with the initial placement of the infrastructure in Route 9A. If the proposed projects are not coordinated, the estimated cost to redo the work will be an additional $15 million to $35 million per occurrence. If a new route were designated today, the engineering and construction of the new conduits and cables, and the required splicing of dozens of cables and tens of thousands of lines, would not be complete until approximately 2 to 3 years from now.

Another important consideration is the subsurface space required for the new conduit infrastructure, which is approximately 16 square feet of unobstructed space for the entire length of the designated route. Verizon must have uninterrupted and unimpeded access to the conduit network via manholes, which will need to be suitably located to provide such access to Verizon personnel during construction and thereafter.

D. Impacts of the Route 9A and PATH Terminal Plans

The Route 9A and PATH Terminal redevelopment plans, as well as other proposed projects for Lower Manhattan, will potentially have serious impacts on Verizon and the businesses and residents of Lower Manhattan. If the mitigation proposed herein by Verizon is not employed, the end result could be: (1) the loss of Route 9A and Church Street as viable utility pathways, (2) an impairment of the Verizon Building on 140 West Street as a telecommunication switching facility, (3) timing delays in project completion, (4) the risk of service disruption, including disruption to emergency services, to the crucial business and governmental entities and residents of Lower Manhattan serviced by Verizon and other

telecommunications providers who use Verizon facilities, (5) adverse effects on vehicular and pedestrian traffic in Lower Manhattan, (6) inconvenience to the businesses and residents of Lower Manhattan as a result of the continuous demolition and construction in the streets of Lower Manhattan, and (7) wasted financial resources.

The loss of the utility pathways beneath Route 9A and Church Street would severely limit the effectiveness of the telecommunication switching facility at 140 West Street, thereby requiring Verizon to relocate some of its central office operations in order to provide the current level of service to Lower Manhattan.

The collective effects of the proposed projects in Lower Manhattan will impact Verizon and result in timing delays. In order to effectively contribute to the revitalization of Lower Manhattan, the PANYNJ, NYSDOT and the other New York State and municipal agencies charged with responsibility for the various projects will need to consider the timing of work that Verizon must perform. While Verizon is appreciative of the Early Action Plan proposed in the EIS, the schedules that have been proposed for the projects in Lower Manhattan continue to be extremely ambitious considering the short windows of time allotted not only for Verizon to complete its work, but also for all of the other utility companies to move their imbedded infrastructure. While Verizon is aware of the collective momentum to rebuild Lower Manhattan, the decision-making process should not occur with an indifference to the complex problems of infrastructure installation and relocation.

E. Proposed Mitigation

Coordination: In order to mitigate the impacts that will occur as a result of on-going multiple projects, PANYNJ, NYSDOT and the government agencies responsible for the redevelopment of Lower Manhattan should establish a coordinated planning approach for the proposed projects that will allow all of the respective agencies to promptly designate and approve a new permanent telecommunications route. Verizon must be able to rely on this designation as definitive. If routes are changed or major features altered, replanning and redesign to accommodate these changes can add many months to the redevelopment process. The inclusion of representatives from Verizon and the other utilities in agency planning sessions

can improve the efficiency of the redevelopment process. While the EIS recognized the need for better coordination, such coordination has not yet occurred.

Establish Alternate Telecommunications Route: In order to assist in the designation of such a route in a timely fashion, Verizon proposes the following routes in order of preference, which routes are depicted by maps attached hereto[1]:

- Verizon Proposal #1:

  West out of 140 West Street across Route 9A, then south along the west side of Route 9A, then east on Albany Street, then north on Greenwich Street to Liberty Street (See Tab 3). To the extent this route is selected, the issue of the conflicts with the (a) PATH underground pedestrian concourse between the WTC and WFC, (b) Route 9A Cedar Street Portal short bypass tunnel extension and (c) the northern section of the Route 9A short bypass tunnel extension must be resolved.

- Verizon Proposal #2:

  West out of 140 West Street, then south along the east side of Route 9A (and west of the slurry wall on the west boundary of the WTC), then east on Albany Street, then north on Greenwich Street to Liberty Street (See Tab 4). To the extent this route is selected, the issue of the conflicts with the (a) PATH underground pedestrian concourse between the WTC and WFC, (b) Route 9A Cedar Street Portal short bypass tunnel extension and (c) northern section of the Route 9A short bypass tunnel extension must be resolved.

- Verizon Proposal #3:

  West out of 140 West Street, then north along the east side of Route 9A, then east on Barclay Street, then south on Greenwich Street (through the WTC site) to Liberty Street (See Tab 5). To the extent this route is selected, the issue of the conflict with the PATH Liberty Plaza connection must be resolved.

- Verizon Proposal #4:

  West out of 140 West Street, then south on along the west side of Route 9A, then east across Route 9A in the vicinity of Rector Street,

[1] The maps attached hereto at Tabs 3, 4, 5 and 6 reflect the overall proposed routes for illustrative purposes only, and do not contain engineering detail.

then north along the east side of Route 9A, then east on Albany Street, then, simultaneously, (a) north on Greenwich Street to Liberty Street, and (b) north on Greenwich Street, then east on Albany Street, then north on Church Street to Liberty Street (See Tab 6). To the extent this route is selected, the issue of the conflicts with the (a) PATH underground pedestrian concourse between the WTC and WFC and (b) northern section of the Route 9A short bypass tunnel extension must be resolved.

Grant Adequate Rights: In order to mitigate the impacts of the proposed Lower Manhattan projects, Verizon promptly requires rights to a designated route for the sub-surface placement of conduits and cables. To the extent that the new routes cross private property, and property that is not within New York City mapped streets or state highways (including Port Authority and LMDC property), Verizon's rights to place conduits and cables along a specified route should be granted pursuant to a permanent easement as opposed to a license, because a mere license does not afford Verizon the protection and certainty that it reasonably deserves in order to ensure that it will not continuously be forced to relocate and duplicate costs. Considering Verizon's efforts with respect to the restoration and revitalization of Lower Manhattan, and the sums it has expended in connection with such efforts, it is unreasonable to expect Verizon to install and maintain equipment on the basis of a mere license in such areas that are either privately-owned or not located in New York City mapped streets or State highways.

Establish Realistic Timeframes: Adequate timing is a key element of the mitigation proposed by Verizon in order to alleviate the impacts of the Route 9A reconstruction, Terminal construction and other proposed Lower Manhattan projects. Given the complicated nature of Verizon's network infrastructure, the timing of the proposed projects will be significantly delayed if the applicable government agencies, including New York City agencies that issue "order out" mandates, do not give Verizon adequate access to information and realistic timeframes to complete its work. Considering the quantity and overlapping nature of the various proposed projects, and the fact that Verizon's work will take approximately 2 to 3 years from the date it receives a designated route, Verizon is very concerned that significant project delays will occur. In order to effectively mitigate the impacts to Verizon as well as the developers and future occupants of the proposed Lower Manhattan projects, the applicable government agencies will need to be aware of timing concerns outlined herein and set realistic deadlines with

certainty. Currently, Verizon is forced to make assumptions and plan various alternate routes based on conjecture.

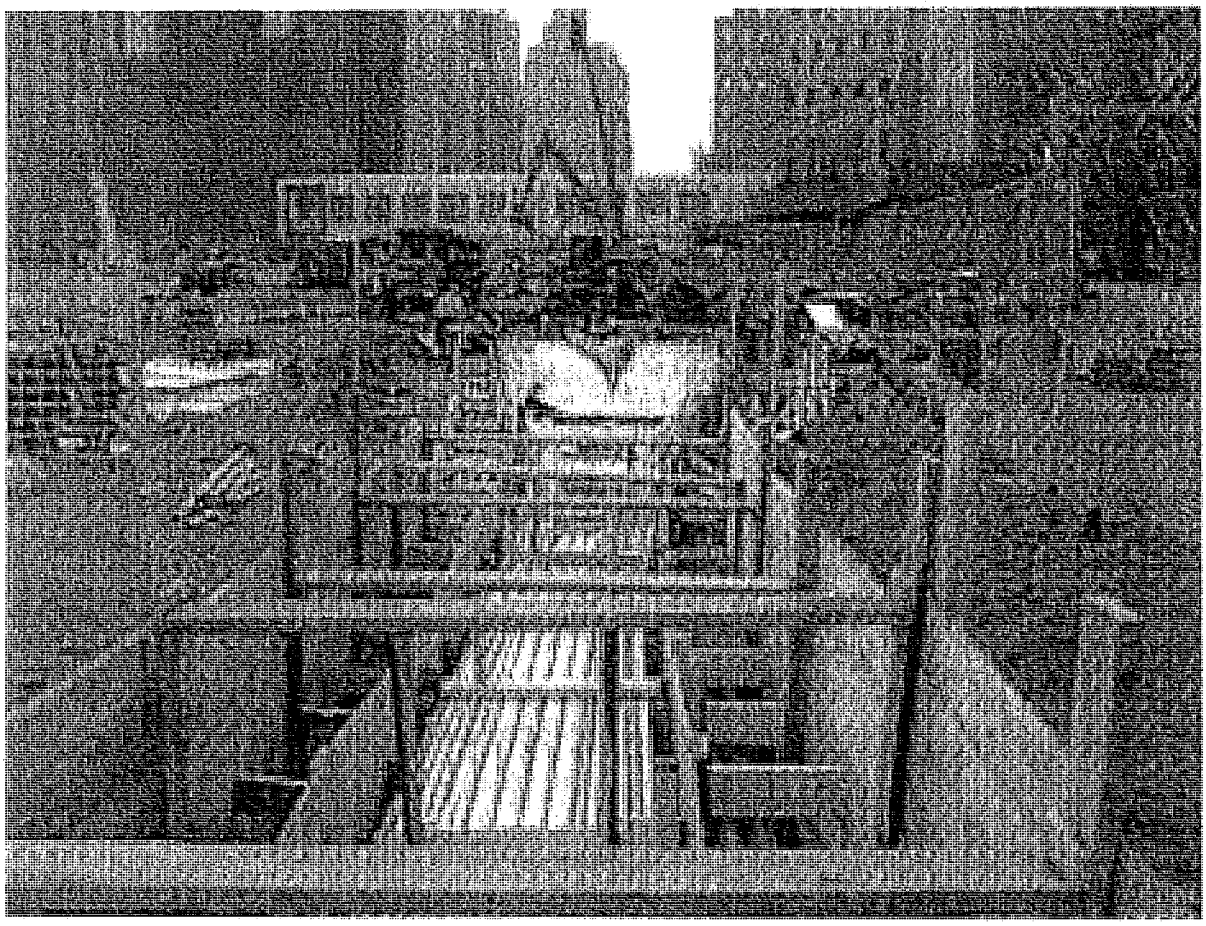
Mitigate Financial Impact – Extension of Tentative Deadline: In connection with the proposed relocation of the Verizon infrastructure due to the Route 9A and Terminal Projects, it is anticipated that Verizon will submit an application for funds from the Permanent Response category of the Partial Action Plan. The Partial Action Plan requires any permanent work to be completed before an application for Permanent Response funds is submitted. Because Verizon has not yet received a designated telecommunications route from the applicable government agencies, Verizon will not complete its permanent work prior to the tentative December 31, 2004 deadline for the submission of applications under the Permanent Response category of the Partial Action Plan. Verizon requests that NYSDOT, PANYNJ and LMDC support its request to the Empire State Development Corporation and the New York City Economic Development Corporation that they extend the tentative deadline for the Permanent Response category of the Partial Action Plan to a date which is 2 years from the date that Verizon receives a certain, permanent route for the relocation of its infrastructure, so as not to preclude Verizon from submitting an application for Permanent Response funds and recovering the costs of such work.

IV. IMPACTS SPECIFIC TO 140 WEST STREET

In furtherance of Verizon's commitment to the rebuilding of Lower Manhattan, Verizon is moving hundreds of its employees that were displaced as a result of the WTC attacks back to the Verizon Building at 140 West Street now that the restoration of the building is nearing completion. Verizon is concerned that potential vibrations due to construction activities, as discussed in each EIS, will have an impact on Verizon's ability to protect the safety of its equipment and personnel and its ability to access key locations. Both EIS state that due to the close proximity of the Verizon Building to the construction location, vibrations could potentially damage the Verizon Building and the sensitive equipment kept therein and result in telephone service outages. Verizon requests that it be kept abreast of the measures taken to mitigate the vibration effects, and that all reasonable safeguards be implemented to prevent injury to its employees or damage to the building and equipment located at 140 West Street.

V. CONCLUSION

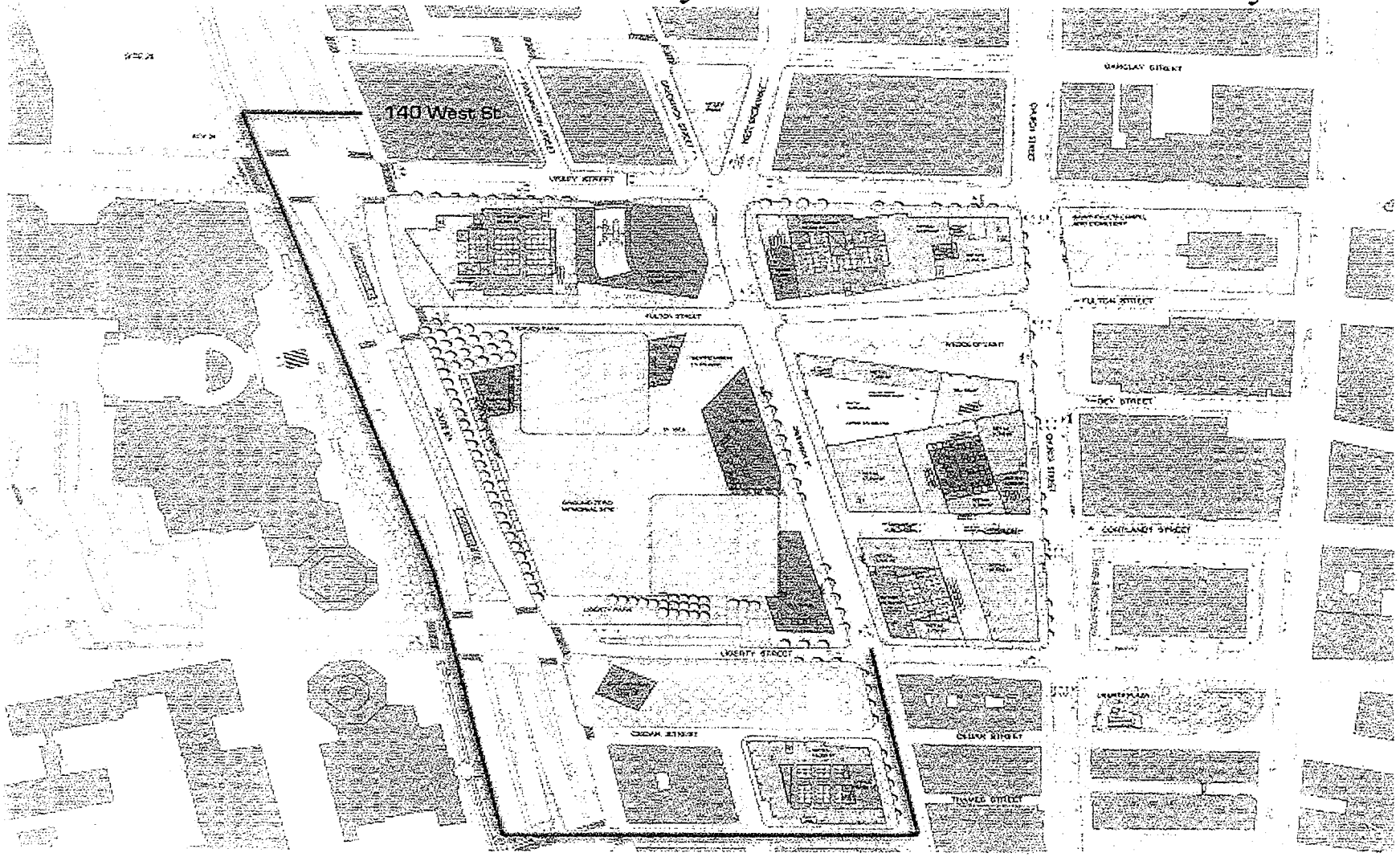
The reconstruction of Route 9A and the creation of a permanent PATH Terminal are important initiatives for the revitalization of Lower Manhattan and New York City. Verizon strongly supports the Lower Manhattan rebuilding effort and wishes to play an active role in that effort. However, if the redevelopment of Lower Manhattan is to be successfully completed without project delays and inconvenience to the Lower Manhattan community, PANYNJ, NYSDOT and the applicable New York State and New York City agencies will need to take into account the issues surrounding the telecommunications infrastructure and act together in order to quickly designate a telecommunications route for Verizon's infrastructure. The key elements going forward will be coordination, certainty, feasibility and timeliness. By adopting the mitigation measures proposed herein, PANYNJ, NYSDOT and the New York State and New York City agencies responsible for the rebuilding can avoid the delays and disruptions that have frustrated the Lower Manhattan community, and provide a higher level of assurance that major projects will proceed as planned and on schedule. The implementation of the mitigation proposed by Verizon will enable Verizon to provide telecommunications service with the quality and reliability demanded by the government offices, businesses and residents of Lower Manhattan and, at the same time, assist the PANYNJ, NYSDOT and other New York State and New York City agencies in their efforts to make Lower Manhattan a premier New York City destination.



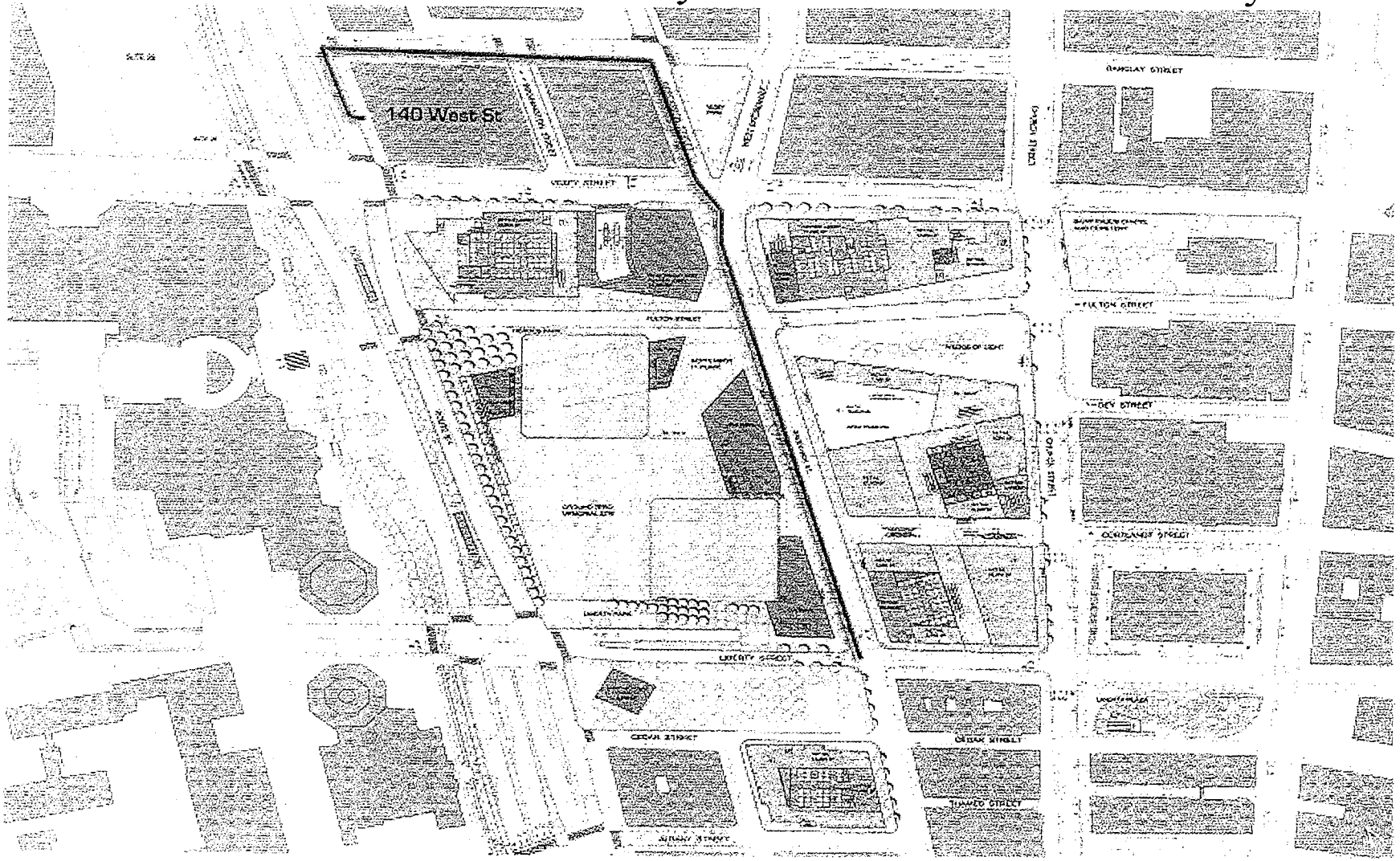
Conduit under Route 9A
(from NYS DOT Route 9A website)

Splicing a copper cable

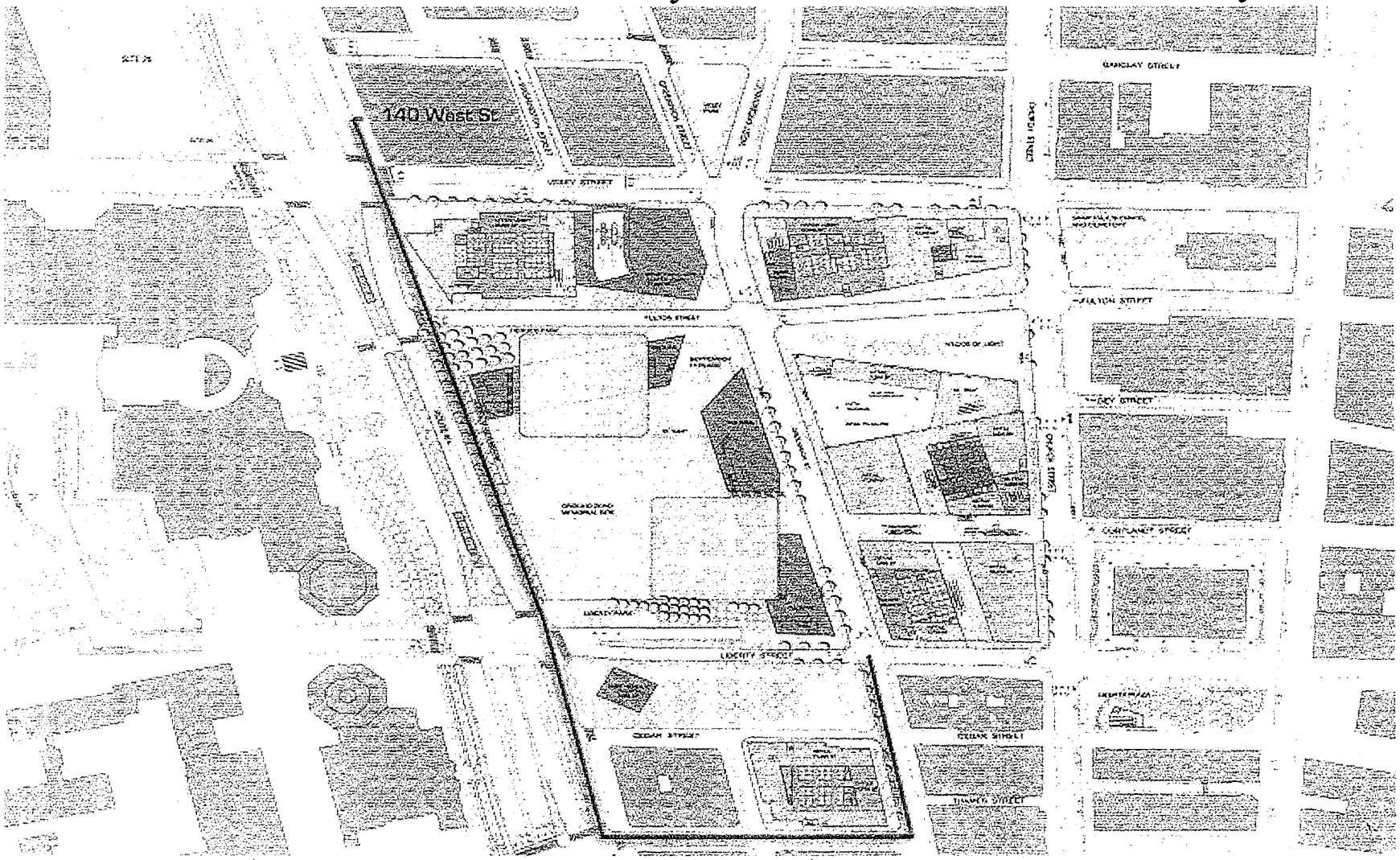
Route 9A and World Trade Center Conduit Map
Verizon Proposal #1
West Side of Route 9A to Albany St to Greenwich St to Liberty St



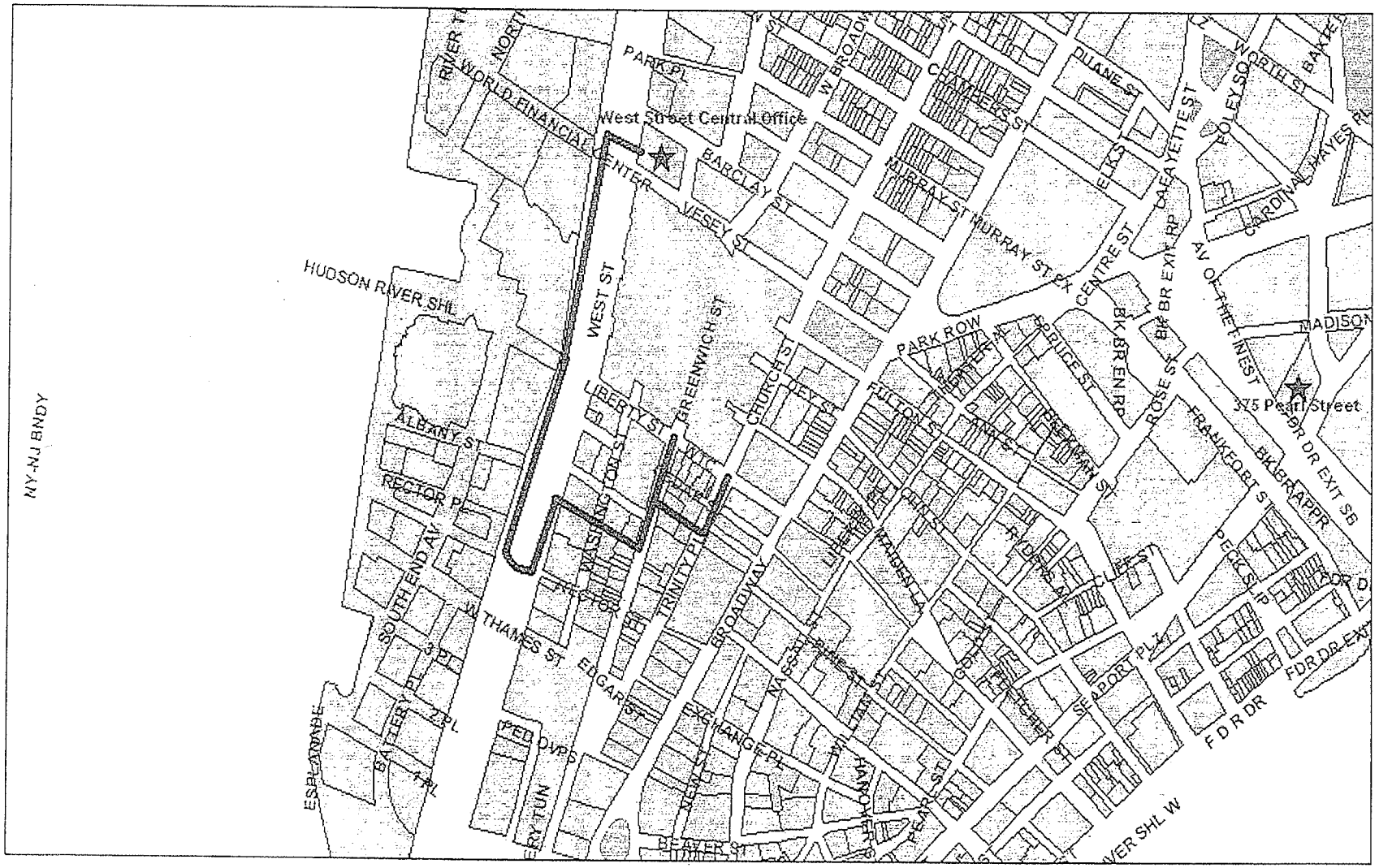
Route 9A and World Trade Center Conduit Map
Verizon Proposal #3
East Side of Route 9A to Barclay St to Greenwich St to Liberty St



Route 9A and World Trade Center Conduit Map
Verizon Proposal #2
East Side of Route 9A to Albany St to Greenwich St to Liberty St



Route 9A and World Trade Center Conduit Map
Verizon Proposal #4 for future Service Requirements
Route 9A South



THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received:	07/21/04	**Type:**	E-mail
Contact Details:	Tal Barzilai	**Location:**	
	P ; **F** ; **E** hacproffdigimon@yahoo.com		

Comment:
This station should be concentrated more on rather than on the plan by Daniel Libeskind. His plan will make this station almost impossible to use as it does right now. Please do not make the thing so expensive. People will take any kind of station that is being built.

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received:	07/08/04	**Type:** Email
Contact Details:	Laura Blackman Deputy Counsel Hudson River Park Trust Pier 40, 2nd Fl. West St. & Houston New York, NY 10014 **P** (917) 661-8740; **F** ; **E** lblackman@hrpt.state.ny.us	**Location:**

Comment:
Having reviewed the Draft Environmental Impact Statement for the World Trade Center PATH Terminal, Hudson River Park Trust has no objections to the document. We would like to remind you that Hudson River Park Trust requests to be included in any discussions involving the exact placement/location of pedestrian bridges, escalators and/or staircases adjacent to the Hudson River Park (which, of course, includes the bikeway west of Rte. 9A). Similarly, the Trust would like to be included in future discussions related to any impacts to the bulkhead and consistency with the existing Programmatic Agreement.

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received:	07/21/04	**Type:** E-mail
Contact Details:	Alexander Butziger **P** ; **F** ; **E** ambutziger@hotmail.com	**Location:**

Comment:
Ladies and gentlemen, the $2 billion price tag of the new WTC PATH Terminal building seems excessive. It would be much wiser to build a simpler terminal and redirect most of these funds to rebuilding 110-story office towres. After all, the terminal is just a means to get to a place. It is the place that has to be great in order to attract tenants, customers, visitors, and tourists, not the railroad depot used to get to the place. Rebuilding office towers by no measurement shorter than those that were taken from us is the sensible thing to fund. It is a moral imperative - the greatest towers in the world must not be replaced with a stumpy 70-story building with a pole on top. It is the right business decision too - build them and we will come.

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received:	07/14/04	**Type:** Letter
Contact Details:	Timothy S. Carey President & CEO Battery Park City Authority One World Financial Center New York, NY 10281-1097 **P ; F ; E**	**Location:**

Comment:
Letter dated 7/14/04 from Battery Park City Authority – Scanned

RECEIVED
JUL 21 2004
PRIORITY CAPITAL PROGRAMS

TIMOTHY S. CAREY
PRESIDENT & CEO

HUGH L. CAREY
BATTERY PARK
CITY AUTHORITY

July 14, 2004

Mr. Shawn T. Lenahan
Program Manager
WTC Transportation Hub
DEIS Comments
115 Broadway, 10th Floor
New York, NY 10006

Re: WTC PATH Terminal – Comments

Dear Mr. Lenahan,

The Battery Park City Authority strongly supports the World Trade Center Transportation Hub, as we support all endeavors to improve the connectivity and the quality of design in Lower Manhattan. The architecture is excellent and we support preserving what is meaningful from the site without encumbering Lower Manhattan's capability as a place to live, work and play. The improvements to PATH will be critical in redevelopment efforts to achieve this goal.

Our concern for this project, and for all of the downtown projects, is that there needs to be a coordination of effort, particularly in the planning of the transportation projects. Without a composite drawing of all projects, it is difficult to know if the projects will mesh. It would be advisable to produce such a plan and include it in the review documents for all lower Manhattan projects. Ideally, the connection between the World Trade Center Transportation Hub and the Fulton Street Center would be seamless. The reintroduction of Fulton and Greenwich Streets and the bypass alternative of the Route 9A project are signs of the overall trend of the area to emphasize pedestrian access. Yet without general decisions made for the Memorial site and the Route 9A project and how they relate to the PATH station, pedestrian access to and from Battery Park City is not yet defined. It is logical to put all these projects together to understand the complete vision of the area.

Because there will be so much construction downtown, it will be important for the viability of the existing communities that there be coordination of construction and that the community be informed on a day to day basis of what is going on. They need to know what works and what doesn't and where they can walk and where they can't.

The Port Authority needs to ensure the implementation of the aggressive environmental program established in the DEIS. We support the stated objectives of detailed monitoring and equipment retrofits. This project as well as all the downtown projects should all respond in a cohesive way to potential problems of noise, air quality and vibration.

Each of these details reflects the strong influence the project has as a vital piece of the redeveloped site for the residents, workers and visitors of Battery Park City. An efficient, coordinated construction process provides the chance to reconnect downtown neighborhoods and allow the entire area to function well as a whole.

Sincerely,

Timothy S. Carey

July 21,2004

R.D. 2
Carmel,New York
10512

I would like,as the comment period closes,to reiterate my views on permanent WTC PATH Station.

This is an important infrastructure project and must be done properly. m not quite convinced that the additional platform is best placed to the t,rather than reclaiming some of the old Hudson Terminal location to the t to extend capacity and shorten the travel to the Fulton Street transit ter in whatever form that is built.

Of the highest importance however is minimizing accomodation of the rageous Daniel Libeskind site plan,regularly and widely beaten in public lls and imposed by Governor Pataki after even his committee of cronies licated to the inappropriate priorities it was designed for had voted ainst it.

Toward this end the more extravagant visible features of the Calatrava sign would best be foregone if the money can be put toward ensuring that e office space on the site is concentrated into fewer,taller buildings an proposed by Mr. Libeskind,along lines more strongly evocative of the st Twin Towers and of no lesser scale.

With regard to the support for the present proposal voiced by various mbers of the construction trades,please be mindful that their primary ncern is securing construction jobs,and that they would rather see this ilt than unbuilt does not mean they would not support a better site plan re it put on the table.A plan with bigger buildings would mean better bs for them.

Governor Pataki's entire approach toward the redevelopment of the World rade Center site has been to do the wrong thing as fast as possible so as o maximize the difficulty for anyone seeking to correct his mistakes.The ATH terminal planning has on the whole been the least error-riddled facet f these endeavors,compared to the site plan,memorial,and West Street redevel- pments.But the choices are still here as to whether the integration of this ransit station into the site hinders or helps the plans many of us are very etermined to see discarded.

On behalf of those of us who think the dead are honored by reclaiming he ground on which they fell for the purposes to which and for which they ave their lives,not by perpetuating the emptiness muderously decreed by heir killers,I'd like to thank you for restoring the PATH tracks to the old Tower footprints,and hope you will resist pressure to extend the killers' hand on our city planning deep underground.

Louis Epstein

World Trade Center Restoration
Movement

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received:	07/16/04	**Type:** Letter
Contact Details:	Anthony Gardner Coalition of 9/11 Families 223 Abingdon Avenue Staten Island, NY 10308 **P** 973-839-7610; **F** ; **E**	**Location:**

Comment:
Letter dated 7/16/04 from Coalition of 9/11 Families – Scanned

Coalition OF 9/11 FAMILIES

July 16, 2004

Mr. Bernard Cohen
Director
Lower Manhattan Recovery Office
Federal Transit Administration
One Bowling Green, Suite 436
New York, New York 10004

RE: WORLD TRADE CENTER TRANSPORTATION HUB (PERMANENT WTC PATH TERMINAL) DRAFT FINDING OF EFFECTS PURSUANT TO SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

Dear Mr. Cohen:

The Coalition of 9/11 Families (the Coalition) has prepared the following comments on your draft document entitled *Permanent World Trade Center PATH Terminal Finding of Effects Pursuant to Section 106 of the National Historic Preservation Act* (the Draft Finding). Detailed line-by-line comments are attached. However, the Coalition has a number of general concerns that can be grouped as follows:

- The description of the undertaking is not detailed enough to permit an independent evaluation of how, and to what degree, the historic resources with the project's Area of Potential Effect will be affected. While the figures in the Draft Finding provide some information, it is not possible to relate how what is being proposed will affect individual resources that contribute to the significance of the WTC Site. Much more detailed descriptions are necessary. For example, in referring to the E-Train passageway, the Draft Finding only says that the station will be reconfigured and that certain elements may be relocated. No description or drawings of the planned reconfiguration are provided, and no mention is made of which elements "may" be relocated. The fact that the FTA and the Port Authority cannot state with certainty which elements are proposed for relocation suggests that any finding of effect is premature.

- The Draft Finding presumes that a final alternative for the project has been selected. In doing so it fails to consider the need for FTA to comply with Section 4(f) of the Department of Transportation Act. As you know, Section 4(f) requires the FTA to avoid harming historic properties unless it can demonstrate that there is no feasible and prudent alternative to the use of the historic property. It also requires that 4(f) evaluations address location alternatives and design shifts that avoid the historic property. FTA's draft 4(f) evaluation included in the Draft Environmental Impact Statement for the project considers only major alternatives to the proposed project. It does not consider variations

17 Grove Place, Wayne, NJ 07470
www.coalitionof911families.org
(973) 839-7610

of, or design alternatives to, the proposed project that would reduce or eliminate use of the various elements that contribute to the historic significance of the WTC Site. We are particularly concerned that project alternatives do not include or evaluate construction of a fourth platform.

- The Draft Finding fails to take into account the other planned and on-going projects at the WTC Site that are associated with the PATH project. The relationship between these various projects, and the involvement of the FTA and the Port Authority in them is especially unclear. Of special concern is the relationship between the PATH project and LMDC's World Trade Center Memorial and Redevelopment Plan. For example, under the terms of the Programmatic Agreement between LMDC and the Advisory Council on Historic Preservation, LMDC is legally bound to provide "reasonable and appropriate access" to the Twin Towers footprints. Neither FTA nor the Port Authority is a signatory to the Programmatic Agreement, even though the final design of the PATH project will be a major factor in determining the extent and quality of access to the footprints. The failure to more adequately consider the cumulative effect of the various projects affecting the WTC Site must be rectified.

- In discussing the "Elements of the WTC Site," the Draft Finding never discusses the footprints of the Twin Towers as a holistic entity. The tower perimeter column bases are discussed separately from the other features located within the footprints proper. Only a single sentence is devoted to the latter. The discussion of how the footprints will be affected must discuss them in total. This is essential if effects are to be properly evaluated, and is especially important if 4(f) considerations are to be properly evaluated. In the absence of an evaluation of the project's effects on the footprints as a single holistic feature, LMDC will not be able to define its Memorial Access Commitments.

- When attempting to discuss the project's effects on specific historically significant elements of the WTC Site, the Draft Finding in many cases employs words such as "could" and "may" suggesting uncertainty as to exactly if and/or how various elements will be affected. This is partially a result of the insufficiently detailed description of the project (noted above), but also because a complete inventory (with maps) of the historically significant elements at the WTC Site has never been prepared as part of the Coordinated Determination of Eligibility which was coauthored by FTA.

- The inclusion of a discussion of the "Northwest Remnant Subgrade Structures" as part of the project would seem to contradict numerous statements by the Port Authority that demolition of these structures is *not* part of the PATH project.

- There is no discussion of what mitigative measures the FTA is proposing to avoid or minimize adverse effects to the WTC Site. Mitigative measures that have been considered and discarded, if any, should be identified.

Mr. Bernard Cohen
July 16, 2004
Page3

We appreciate the opportunity to provide these comments. We hope they will be of help in preparing a revised Finding of Effect, and we look forward to working with you and the Port Authority in regard to those revisions.

Sincerely,

Anthony Gardner, Executive Board Member, Coalition of 9/11 Families

Mary Fetchet, Voices of September 11th

Sally Regenhard, Skyscraper Safety Campaign

cc: A. Cracchiolo (Port Authority)
K. Rampe, (LMDC)
J. Nau (ACHP)
C. Vaughn (ACHP)
R. Pierpont (OPRHP)
C. Shull (NPS)
A. Ferster, Esq.

Attachment: WORLD TRADE CENTER TRANSPORTATION HUB (PERMANENT WTC PATH TERMINAL), DRAFT FINDING OF EFFECTS PURSUANT TO SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

ADDITIONAL COMMENTS OF THE COALITION OF 9/11 FAMILIES

17 Grove Place, Wayne, NJ 07470
www.coalitionof911families.org
(973) 839-7610

WORLD TRADE CENTER TRANSPORTATION HUB (PERMANENT WTC PATH TERMINAL). DRAFT FINDING OF EFFECTS PURSUANT TO SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

ADDITIONAL COMMENTS OF THE COALITION OF 9/11 FAMILIES

Page 1, P3, line 9. The word "help" should be eliminated. The truncated box-beam columns do not "help" define the perimeter of the former Twin Towers, they *do* define it.

Page 2, P5. It is unclear where the ventilation which may be constructed "adjacent to Route 9A" would be located. A graphic showing the location would be helpful, as would a description of the ventilation structure.

Page 3, P2. The discussion of the tower perimeter column bases implies that it is the column bases that constitute the footprints of the Twin Towers. As noted in our transmittal letter, the footprints must be viewed as holistic entities that include the entire area defined by the perimeter columns. Further, we cannot stress the urgent need to remove the few inches of dirt that obstruct the remains of the footprints so that they can be properly inventoried, identified, documented and photographed.

Page 3, P2, line 5. The word "would" should be eliminated.

Page 3, P2, line 12. This sentence needs to be rewritten. The statement that "all of those Tower perimeter columns were removed" is incorrect and contradicts the following phrase which that the bases of the columns remain.

Page 3, P3. This paragraph seems to be saying that physical disturbance of the truncated box beam columns is the only way they will be affected. The statement that the project would impact "some" of the columns is incorrect. They will all be affected in that their associated setting will be altered. The statement that some of the column bases while being made inaccessible could remain *in situ* is not very meaningful. If they become inaccessible they will be adversely affected. (The use of the word "could" is also disturbing. If the FTA and the Port Authority are unable to state with certainty exactly how these features will be affected than the Draft Finding is premature).

Page 3, P3, lines 9-10. How many box beam column bases will be "temporarily" covered during construction. For how long? How will they be affected/protected during construction?

Page 3, P4. The fact that construction of various proposed infrastructure elements will not physically destroy any of the truncated box beam columns is not meaningful in itself. The Draft Finding notes that proposed infrastructure "may somewhat impact visibility and accessibility." Exactly what does this mean? Much more specific information is needed. The inadequacy of existing baseline information is noted in our cover letter.

Page 3, P5, line 3. All of the slurry walls should be considered equally significant.

Page 3, P6. Identify whose undertaking is associated with the west slurry wall.

Page 4, lines 7-9. FTA must determine whether or not bathtub wall reinforcement is or is not part of their project. If it is not, then presumably it is part of LMDC's project. Yet LMDC never discussed it in their FGEIS or ROD for the Memorial and Redevelopment Plan.

Page 4, P1. The discussion of the Northwest Remnant Subgrade Structures would seem to indicate that the "deconstruction" of these remains is part of this project (as would a reading of FTA's Section 4(f) evaluation in the PATH project DEIS. However, on July 9, 2004 the Port Authority advised the Coalition's counsel that there is no FTA involvement in the removal of these structures. This again highlights the need to consider cumulative effects, and clearly identify which agency is responsible for which aspects of the work at the WTC Site.

Page 4, P2. The removal of the recovery and reconstruction ramp, although necessary and unavoidable, should be acknowledged as an adverse effect. Preservation plans for the ramp should be considered.

Page 4, P5. The discussion of how the remains of the Hudson and Manhattan tubes and terminals will be affected needs to be much more detailed. A much more detailed description of these remains than is included in the Coordinated Determination of Eligibility will be needed before this can be done.

Page 5, P2. As already noted, the Draft Finding only says that the station will be reconfigured and that certain elements associated with the E train passageway may be relocated. No description or drawings of the planned reconfiguration are provided, and no mention is made of which elements "may" be relocated. The fact that the FTA and the Port Authority cannot state with certainty which elements are proposed for relocation suggests that any finding of effect is premature.

Page 5, P4. The removal of the Vesey Street stairs is an avoidable adverse effect. The non-functionality and current instability of the Vesey Street stairs is given as a justification for their removal. This is not acceptable. Their non-functionality doesn't diminish their historical significance. FTA should identify the feasibility of stabilizing these remains and consider design modifications that would permit their preservation in place so that they will not be adversely affected.

Page 5, P10. In discussing the setting of the WTC Site, the Draft Finding fails to distinguish between the APE for historic remains and archeological remains. A discussion of the setting associated with the World Trade Center ruins and remains should be included.

Page 6, P2, line 2. Clarify whether the proposed undertaking will or will not require alteration or removal of historically significant features. The use of the word "may" is again indicative of the lack of detail in project description.

Page 6, P2, lines 3-4. Exactly what alterations that would be "additive in nature" are being referred to? While they may not "result in diminution of the physical characteristics of features," they still may adversely affect these features in other ways.

Page 6, P2, lines 6-8. The Coalition strongly disagrees with the statement that "obscuring the features from public view would not necessarily diminish the site's integrity of feeling." The ability to see and possibly touch the remains of the World Trade Center is integral to the feeling associated with the site.

Page 6, P3, line 4. The words "could potentially" should be replaced with "will."

Page 6, P5. The Draft Finding should include "setting" among the characteristics of the WTC Site that will be diminished.

Page 7, P2, line 1. Change the word "may" to "will."
Figure 2. It is unclear exactly what this figure is attempting to show.

Figure 4. This figure should clearly identify the entire area occupied by the footprints of the Twin Towers as a historic resource.

17 Grove Place, Wayne, NJ 07470
www.coalitionof911families.org
(973) 839-7610

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received: 07/27/04 **Type:** Letter

Contact Details:
Anthony Gardner
Coalition of 9/11 Families
17 Gove Street
Wayne, NJ 7470
P ; F ; E

Location:

Comment:
Letter dated 7/27/04 from Coalition of 9/11 Families – Scanned

Coalition of 9/11 FAMILIES

July 27, 2004

Mr. Bernard Cohen
Director
Lower Manhattan Recovery Office
Federal Transit Administration
One Bowling Green, Suite 436
New York, New York 10004

RE: WORLD TRADE CENTER TRANSPORTATION HUB
(PERMANENT WTC PATH TERMINAL)
DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)

Dear Mr. Cohen:

Attached please find the comments of the Coalition of 9/11 Families (the Coalition) on the Federal Transit Administration (FTA)/Port Authority of New York and New Jersey (the Port Authority) DEIS for the Permanent World Trade Center PATH Terminal (the Project). In addition to the attached detailed comments, the Coalition has a number of major, more general concerns about the DEIS. We have previously mentioned some of these in our July 15, 2004 correspondence concerning FTA's draft effects finding prepared as part of your National Historic Preservation Act Section 106 compliance process. As the draft effect finding is part of the DEIS, all of the Coalition's July 15 comments also apply to the DEIS. The Coalition's general comments include the following:

- The description of the undertaking is not detailed enough to permit an independent evaluation of how, and to what degree, the historic resources with the project's Area of Potential Effect will be affected. There are virtually no graphics or drawings in the body of the DEIS at a scale sufficient to clearly show the relationship between components of the Project and the historically significant features at the WTC Site. The various documents that comprise Appendix B (Cultural Resources) of the DEIS are similarly deficient. For example, as we noted in our July 15 correspondence, in referring to the E-Train passageway, the DEIS only says that the station will be reconfigured and that certain elements may be relocated. No description or drawings of the planned reconfiguration are provided, and no mention is made of which elements "may" be relocated. Some of this information was informally presented to the Coalition and others on July 20th. It should be incorporated into the DEIS.

- The DEIS does not include or discuss an evaluation of any of the many feasible and constructible design alternatives that would result in the avoidance or reduction of effects to historic properties. Instead, the alternatives analysis (Chapter 2) is largely confined to "mega" alternatives including three alternate site locations. The evaluation of alternatives to avoid or minimize Project impacts to the E-Train passageway, noted above, is an

excellent example of the kinds of alternatives that should be considered in regard to other historically significant features at the WTC Site, notably the footprints of the Twin Towers. For example, revisions to the DEIS and the project's 4(f) Statement should include discussions of alternatives that do not include a fourth (new/additional) platform and which include variations of the fourth platform that would reduce or minimize impacts to the footprints.

One obvious alternative that is briefly discussed and discarded in Chapter 2 is replacement of the temporary PATH facility with a permanent facility with the same passenger capacity. This should have been treated as the baseline condition for analyses. The Coalition asked the Port Authority during our July 20th meeting what pre-September 11 plans the Port Authority had for dealing with projected increases in passenger ridership. We were advised that the only possible way to allow for an increase in service was improvements in signalization that would permit an increase in the number of trains during peak hours. The DEIS contains no analyses that we can find discussing the increase in system capacity that would result from improved signalization, or the degree to which improved signalization might affect (reduce or eliminate) the need for a fourth platform.

Two factors that dictate the need for a fourth platform, and the configuration of all the platforms, are the need to maximize the number of trains/passengers that can be accommodated during peak hours, and the need to provide for safe passenger entry and egress to-and-from the platforms. Although the pre-9/11 PATH Terminal could accommodate 10-car trains, only 8-car trains were employed because of limitations on other parts of the PATH system. The proposed facility will accommodate 10-car trains, and modifications to other stations would permit 10-car operation for the first time. The effects of this change on system capacity are not described or discussed in the DEIS. Likewise, there is no discussion of how the proposed facility differs from the original facility in terms of the ability to allow for passenger access to and from the platforms (e.g. size, number, and capacity of stairways, escalators, and elevators). The projected number of 2025 peak hour weekday alightings is only 4,045 (18%) more than the pre-9/11 figures. The degree to which this relatively modest increase can be accommodated through improved signalization, use of 10-car trains, lengthening of platforms (beyond pre-9/11 lengths), widening of platforms (beyond pre-9/11 widths), and increase in the size, number, and capacity of stairways, escalators and elevators (beyond 9/11 numbers), *without the need for a fourth platform*, must be evaluated.

The DEIS assumes that proposed facilities must be designed to meet anticipated ridership in the year 2025. However, no information is provided in the DEIS to support the ridership projections provided. It is impossible for a reviewer to evaluate the legitimacy of the methodology or assumptions used to arrive at the ridership projections in the DEIS. An accurate estimate of projected ridership is crucial since it the basis for the proposed expansion of the existing (temporary) and pre-9/11 track and platform configurations. The principal justification for this expansion, especially the addition of a fourth platform which will constitute the only impingement of any kind on the historically significant footprint of One World Trade Center (the north tower), and will significantly increase the size of the impinged area within the historically significant footprint of Two World Trade Center (the south tower), is the projected increase in ridership. Significantly, the DEIS

acknowledges that the new PATH Terminal is not expected to induce ridership beyond the growth projected prior to 9/11.

- On June 17th the Port Authority announced that it has issued a Request-for-Proposals to design and fabricate 246 new rail cars for the PATH system. The announcement did not discuss passenger capacity of the new cars. However, it did note that the new cars would have "three doors on each side to allow for faster loading and unloading." The DEIS fails to take into account how (if) the new cars would allow for an increase in passenger capacity, or the degree to which improved passenger loading and unloading made possible by the new cars would help address this issue. Both changes may affect the need for a fourth platform.

- Several sections of the DEIS, including Chapter 6 (Cultural Resources), the Draft Section 4(f) Evaluation, the Draft Effects Finding Pursuant to NHPA Section 106 (Appendix B-2) assume that the Coordinated Determination of National Register Eligibility (Appendix B-1) are based on the assumption that the determination of eligibility provides a proper basis for subsequent analyses of the Project's impacts on the WTC Site. The Coalition, as we have for many months, continues to reject this assumption. It is our position that the Coordinated Determination is faulty in many regards, including a failure to properly define the period of significance of the WTC Site, the failure to acknowledge the significance of the site under more than one National Register eligibility criterion, and the improper application of the concepts of integrity. In response to an inquire from the Advisory Council on Historic Preservation, the Keeper of the National Register has recently addressed the last of these items and is in substantial agreement with the Coalition. The Keeper has also indicated that she would provide a formal determination of eligibility if requested to do so. **The Coalition strongly urges the FTA to make such a request so that the Coalition's concerns about the Determination of Eligibility can be resolved in a timely manner.**

- The draft Section 4(f) Evaluation included in the DEIS falls far short of demonstrating that that there is no "prudent or feasible alternative" to the proposed alternative that would avoid or minimize use of the historically significant components of the WTC Site—notably the footprints of the Twin Towers. As noted above, the avoidance alternatives to the apparently preferred (Terminal with Liberty Plaza Connection) alternative are "strawmen" that are clearly non-viable on their face. All of the alternatives discussed are described as either failing to meet project goals or of having an exhorbitant cost. Section 4(f) of the Department of Transportation Act requires the FTA to avoid harming historic properties unless it can demonstrate that there is no feasible and prudent alternative to the use of the historic property. It also requires that 4(f) evaluations address location alternatives and design shifts that avoid the historic property. FTA's draft 4(f) evaluation included in the DEIS considers only major alternatives to the proposed project. It does not consider variations of, or design alternatives to, the proposed project that would reduce or eliminate use of the various elements that contribute to the historic significance of the WTC Site. We are particular concerned that project alternatives that do not include construction of a fourth platform have not been evaluated.

Although, as noted above, Chapter 2 of the DEIS briefly discusses and discards the Location 1 WTC "Bathtub" option. The alternatives analysis concludes that the "hybrid" location (subsequently named the Terminal with Liberty Plaza Connection Alternative) is preferable even though it is more expensive, will take longer to construct, would have more below-grade infrastructure in the WTC bathtub, and would not allow for as much commercial development as the Location 1 alternative. No mention is made in the side-by-side comparison of these alternatives in Chapter 2 that the Location 1 alternative would have fewer impacts to historic resources than the Terminal with Liberty Plaza Connection Alternative. **The Location 1 alternative, which would not impinge upon the footprint of One World Trade Center (the north tower) is clearly a "feasible" alternative and must be evaluated in detail as part of the Section 4(f) evaluation of the project.**

The DEIS fails to adequately take into account the cumulative effects of other planned and on-going projects at the WTC Site. The relationship between these various projects, and the involvement of the FTA and the Port Authority in them is especially unclear. Of special concern is the relationship between the PATH project and LMDC's World Trade Center Memorial and Redevelopment Plan. For example, under the terms of the Programmatic Agreement between LMDC and the Advisory Council on Historic Preservation, LMDC is legally bound to provide "reasonable and appropriate access" to the Twin Towers footprints. Neither FTA nor the Port Authority is a signatory to the Programmatic Agreement, even though the final design of the PATH project will be major factor in determining the extent and quality of access to the footprints. As a result, actions taken by the FTA and Port Authority to minimize disturbance to the Twin Tower footprints, enhance the amount and quality of access to the footprints, and avoid or minimize "use" of the footprints in accordance with Section 4(f) may be rendered moot by LMDC's ability to determine access to the footprints. The FTA should have insisted on being signatory to the Programmatic Agreement and should have insisted that the FTA/Port Authority have a more proactive roll in the matter of determining access to the footprints.

Another example of both the failure to adequately consider cumulative effects and the failure to adequately integrate the PATH Project with other projects affecting the WTC Site is found in the DEIS' discussion of the No Action Alternative. The DEIS notes that under that alternative the temporary station would remain in operation until elements of the WTC Memorial preclude operations, the station cannot accommodate passenger demand, or the station exceeds its useful life. The incorporated Draft 4(f) Statement also claims that resulting necessary future modifications would be constrained by the WTC Memorial and Redevelopment Plan. This statement highlights the need for better coordination between FTA and LMDC, and a more thorough consideration of cumulative effects. The FTA has assumed (most likely correctly) that the Memorial may limit options for additional access and egress locations and the construction of ventilation structures. This may be true, but since the LMDC has not yet completed detailed design, FTA should coordinate with them to insure that any Memorial design leaves open options for future improvements to the existing temporary facility so as not to unreasonably eliminate any alternative from the list of viable FTA options.

The Coalition would also note that, to a large extent, this problem has been created by the lack of detailed design information about LMDC's project. The Coalition recognizes that FTA and the Port Authority find themselves in the unusual position of having to assess the effects of a project design that must take into account presently unknown design constraints of a project being proposed by another entity. Had there been better coordination between the FTA/Port Authority and LMDC, it might have been possible to place constraints upon the Memorial design that would not have resulted in the limitation of viable design alternatives for the PATH Project. That having been said, the Coalition does not believe that the need to preserve the maximum amount of the Twin Tower footprints should be compromised because of the failure of FTA/Port Authority and LMDC to properly coordinate their respective undertakings.

When attempting to discuss the project's effects on specific historically significant elements of the WTC Site, the DEIS consistently employs words such as "could" and "may" suggesting uncertainty as to exactly if and/or how various elements will be affected. This is partially a result of the insufficiently detailed description of the project (noted above), but also because a complete inventory (with maps) of the historically significant elements at the WTC Site was never prepared as part of the Coordinated Determination of Eligibility which was coauthored by FTA. The Coalition is pleased that during our July 20th meeting the Port Authority finally committed to clean off the footprints and adequately inventory and document all of the features at the WTC Site that contribute to its significance.

In a July 19th letter to the Advisory Council on Historic Preservation, the Keeper of the National Register of Historic Places noted that the World Trade Center Site "in its entirety in combination with *a complete inventory of its significant features and artifacts* present during the period of significance should be considered in making decisions about the historic property" (emphasis added). The Coalition has been asking since last fall for complete inventories of both site features and off-site artifacts. In the absence of complete inventories any assessment of effects or proposals for mitigation are premature. The DEIS cannot be finalized until thorough an evaluation of project effects based upon complete inventories is prepared. Complete inventories are also necessary precursors to the development of any Programmatic Agreement for the project and for preparation of an adequate Section 4(f) analysis. The results of the inventories may also necessitate the need for a Supplemental DEIS.

In discussing the "Elements of the WTC Site," the Draft Finding never discusses the footprints of the Twin Towers as a holistic entity. The tower perimeter column bases are discussed separately from the other features located within the footprints proper. Only a single sentence is devoted to the latter. The discussion of how the footprints will be affected must discuss them in toto. This is essential if effects are to be properly evaluated, and is especially important if 4(f) considerations are to be properly evaluated. In the absence of an evaluation of the project's effects on the footprints as a single holistic feature, LMDC will not be able to define its Memorial Access Commitments.

We appreciate the opportunity to provide these comments. We hope they will be of help in moving both the NEPA and NHPA process forward. Additionally, we appreciate the FTA's willingness to afford the Consulting Parties an additional week to prepare our comments and take into account the discussions that took place during our July 20th meeting. We look forward to working with you to resolve the issues and concerns raised here.

Sincerely,

Anthony Gardner Jr

Anthony Gardner, Executive Board Member, Coalition of 9/11 Families

cc: A. Cracchiolo (Port Authority)
J. Nau (ACHP)
C. Vaughn (ACHP)
R. Pierpont (OPRHP)
C. Shull (NPS)
A. Ferster, Esq.

WORLD TRADE CENTER TRANSPORTATION HUB (PERMANENT WTC PATH TERMINAL), DRAFT ENVIRONMENTAL IMPACT STATEMENT

ADDITIONAL COMMENTS OF THE COALITION OF 9/11 FAMILIES

Chapter 2

The Coalition's principal comments concerning alternatives are included in our cover letter. We have the following additional comments:

Page 2-25, Table 2-7. The Consulting Parties in the Section 106 process should be added as parties included in future consultations concerning historic properties affected by the project.

Chapter 6

Page 6-4, P2, lines 6-7. The statement that "the bathtub has no potential for archeological resources" is incorrect. The DEIS, as did LMDC's GEIS for the World Trade Center Memorial, fails to acknowledge that the physical remains of the World Trade Center, including the truncated box beam columns that form the perimeter of the Twin Towers' footprints, are archeological features.

Page 6-4, P4. Avoidance of an archeological resource and data recovery are not the only forms of mitigation available for dealing with archeological resources.

Page 6-5. The various National Register criteria are noted and reference is made to the Coordinated Determination of Eligibility co-authored by FTA and included in Appendix B. The DEIS should acknowledge that the WTC Site was found to be eligible only under Criterion A and that consulting parties to the Section 106 process argued that other criteria applied as well. The DEIS should also note that a formal determination of eligibility, including a review of the Coordinated Determination of Eligibility, has never been made by the National Parks Service's Keeper of the National Register of Historic Places. It should also note that FTA has thus far refused to request a formal determination even though the Keeper has indicated a willingness to provide one.

Page 6-6, P2. FTA did not begin the Section 106 process in September 2003, as stated. The first steps in the Section 106 process are the identification of Consulting Parties and the definition of the Area of Potential Effect (APE). Consulting parties were not identified until January 2004, and an APE was not defined until March 2004. The contention of FTA that the earlier scooping process was part of the Section 106 process is not supportable. Section 800.8(c) of the Section 106 implementing regulations note that the NEPA process may be used to comply with Section 106 "if the agency official has notified in advance to SHPO/THPO and the [Advisory] Council [on Historic Preservation] that it intend to do so." No such notification was ever made by FTA.

Page 6-6, P4. The Coalition notes that FTA intends to execute an MOA before finalizing the DEIS. The Coalition has no objection to this provided that the consulting parties are given adequate opportunity for comment and consultation on the draft MOA prior to its finalization. While there is no requirement that an executed MOA be finalized prior to issuance of the FEIS we would hope that issuance of the FEIS would not take place until the consulting parties have had adequate opportunity for input.

Page 6-6, P5. The stated assumption that "the potential for archeological resources would be the same as in the pre-September 11 conditions analysis" is incorrect. As noted above, the remains of the Twin Towers and the World Trade Center complex became an archeological site on September 11, 2001.

Page 6-8, P2. The DEIS cites the various archeological studies (included in DEIS Appendix B) as the basis for assessing impacts to archeological remains. However, the Phase 1A studies are woefully deficient in that the address only the potential for pre-9/11 archeological remains. They never even mention, let alone properly inventory, the remains of the World Trade Center which were readily apparent during the site visits conducted by FTA's archeological consultants. The 1A reports contain no photos of most of the visible features, and cannot be considered to comply with the *Standards for Cultural Resources Investigations and the Curation of Archeological Collections in New York State* issued by the New York Archeological Council.

Page 6-8, P 3-6. Neither the DEIS nor the archeological assessments on which it is based make reference to the most recent reports of geoarcheological research in lower Manhattan (e.g. studies conduoted in connection with the Foley Square Federal Courthouse, and 107-111 Worth Street). Those studies have resulted in the identification of a buried soil horizon that is believed to extend across lower Manhattan and which is a dated to approximately 2000 BP (Before Present). Determining if this soil horizon is present or has been intersected and removed by modern construction is essential to evaluating the archeological sensitivity of the Project Area outside the limits of the bathtub. Unfortunately, the archeological assessment upon which Chapter 6 is based, and which claims to be based in part on an analysis of soil boring data, does not reference or discuss any such data. There is no evaluation of boring data collected for LMDC's World Trade Center Memorial project.

The Coalition made a similar comment in regard to LMDC's GEIS. The LMDC responded that there was no proof that this soil horizon exited at the World Trade Center Site and noted that artifacts had not been recovered from other locations where it is known to exist. While true, that statement is very misleading. Both the New York City Landmarks Commission and the State Historic Preservation Office consistently recommend archeological field investigation of locations where there is reason to believe intact buried land surfaces are extant. The presence of the potentially significant soil horizon cannot be proved or disproved because no one has looked for it. For these reasons the statement that "the Project Site is not considered sensitive for prehistoric archeological resources" is not supportable.

Page 6-9, P1, P4, P5. The DEIS mentions the discovery of the remains of the seventeenth century vessel Tyjger during subway construction across what later became the WTC Site. Only the forward portion of the *Tyjger* was recovered, but it was the subject of considerable study (including subsequent radiocarbon dating of recovered timbers confirming the age of the ship). The DEIS also notes that an unsuccessful attempt was made to discover the remaining portions of the *Tyjger* during the excavation of the WTC "bathtub" using detailed maps made at the time of the original find. It does not consider that it is possible that remains of the *Tyjger* remain might exist between the slurry wall and the wall of the IRT subway. In responding to a similar comment on the LMDC DGEIS, LMDC stated that their consultants reviewed Port Authority drawings that show the slurry wall abutting the subway wall. This seems unlikely on its face since if true it would mean that the east side of the slurry wall trench was the west wall of the IRT subway tunnel. If there is any space between the slurry wall and the subway tunnel wall there is a possibility that some portion of the *Tyjger* may still exist in the intervening area. This needs to be discussed in the DEIS.

Page 6-11, P3. The DEIS states that "the remaining portions of the former H&M Terminal and the cast-iron tubes leading from the station do not meet the criteria for listing on the National Register due to a loss of historic integrity." This statement is not consistent with other findings and is based upon a faulty premise. The remains of the H&M Tubes and Terminal are noted in the Coordinated Determination of Eligibility for the World Trade Center Site but their significance is not discussed or evaluated because they are not associated with the events of September 11. The Programmatic Agreement between LMDC, the State Historic Preservation Officer and the Advisory Council on Historic Preservation includes the remains of the H&M Tubes and Terminal among the "remnants" at the WTC Site that are covered by the terms of the Programmatic Agreement. The Programmatic Agreement states that "LMDC *and, where appropriate the Port Authority*, will seek to minimize or mitigate through reasonable and practicable steps, any potentially adverse effects to such Additional Remnants [including the H&M Tubes and Terminal] . . ."(emphasis added). Finally, the Coalition wishes to point out that the period of significance of the H&M Tubes and Terminals pre-dates the period of significance for the WTC Site discussed in the Coordinated Determination of Eligibility. The Keeper of the National Register of Historic Places, the final authority on matters of eligibility, in a July 19, 2004 letter to the Advisory Council stated that "features within a property do not necessarily need to be functional to convey their significance and to possess aspects of integrity." This effectively negates the State Historic Preservation Officer's basis for the non-eligibility of the H&M Tuibes and Terminal provided in their October 16, 2003 correspondence. (The H&M remnants are also included on DEIS page 6-20 among the historic features that would be affected by the project).

Page 6-12. The description of the elements of the WTC Site that contribute to its significance identifies the "truncated box beam columns that help define the perimeter or 'footprints' of the former Twin Towers. There are several problems with this statement. The Coordinated Determination of Eligibility never addresses the significance of the footprints in their entirety, but it can be read to assume that their significance is not confined to the box beam columns. In addition, the box beam columns do not "help" define the perimeter–they do define it. The text of the DEIS should be revised accordingly. The inadequacy of the Coordinated Determination of Eligibility in regard to this matter is yet another reason that FTA should request a formal review of the determination from the Keeper of the National Register.

Page 6-18, P3. The DEIS states that "Adverse effects to the WTC site are expected under this [Terminal with a Liberty Plaza Connection] alternative, although the extent of these adverse effects has not yet been determined." No statement could more clearly demonstrate the premature nature of both the DEIS and the projects 4(f) statement. The purpose of the NEPA, NHPA Section 106, and DOT Section 4(f) processes is to identify impacts and discuss possible mitigation measures. Yet FTA has issued a DEIS and a Draft 4(f) statement without being able to identify the extent to which, what is arguably the most historically significant resource with the project's Area of Potential Effect, will be affected. Neither the DEIS nor the 4(f) Statement should be finalized until revised draft versions of both documents that do describe the nature of the project's effects on the WTC Site have been made available to the general public.

Page 6-18, P3, lines 11-14. This is the first mention anywhere, that the Coalition is aware of, that "During subsequent construction of the temporary WTC PATH station, all of the column bases within the PATH right-of-way were either obscured to some extent or removed for installation of track sheds, utilities, duct banks, conduits, and other PATH infrastructure". This statement further highlights the inadequacies of the Coordinated Determination of Eligibility, and supports the need for a complete inventory and description of the physical remains of the World Trade Center complex. It is clear from the statement in the DEIS that the WTC Site has already been adversely affected to an unknown degree by PATH-related construction.

Page 6-19, P1. The DEIS notes that WTC Site features within the footprint perimeters "may be covered over to meet infrastructure and other utility needs as part of this Project or other proposed separate undertakings." This again highlights the need for a more precise inventory and description of the WTC Site. What specific features are being referred to? Where are they located? Exactly how will they be affected? What alternatives are available to avoid or minimize impacts to each feature? Will FTA's project, LMDC's, or both affect them?

Page 6-19, P4. This paragraph discusses the remains of 6 WTC. The mere presence of this discussion in the DEIS would seem to confirm that the demolition of 6 WTC is part of the FTA/Port Authority project. There is no suggestion that this is part of a "separate undertaking" as is done in discussions of other aspects of the project. Yet the Port Authority continues to insist, most recently in a July 9, 2004 letter to the Coalition's counsel, that the demolition of 6 WTC is a separate and "private" undertaking and that "there is no FTA funding nor any decision making role for FTA in that undertaking." Leaving aside the matter of the Port Authority speaking for FTA, the resolution of this matter is still unclear. If the demolition of 6 WTC is in no way an FTA-associated undertaking why is it included in both the DEIS and the draft Section 4(f) analysis? Why isn't the construction of Freedom Tower (the reason 6 WTC is being demolished), included among the "Private Development Projects" discussed in the cumulative impacts chapter of the DEIS?

Page 6-20, P3. The DEIS states that remnants of the H&M terminal building and its powerhouse "may" be removed. However, the discussion of cumulative effects in Chapter 15 (page 15-8) and the draft 4(f) statement makes it clear that these remains "will" be removed. The Chapter 6 text should be revised to reflect this. The Coalition has raised numerous concerns about the treatment of the H&M remains in our cover letter, including the failure to properly evaluate its National Register eligibility.

Page 6-26, P1. FTA should explore the desirability of inviting LMDC to become a signatory to any Programmatic Agreement developed for the project. Given the highly inter-related nature of LMDC's Memorial and Redevelopment Plan Project and the PATH Project this will be the only way to insure that mitigation measures to protect or reduce impacts to historic WTC Site remains are not rendered moot by the independent actions of LMDC. It is the Coalition's belief that having LMDC as a signatory to any Programmatic Agreement is absolutely necessary for the Section 106 process for the PATH Project to reach a satisfactory conclusion.

Page 6-26, P8. the proposed photographic documentation of the entire WTC Site should be done to HABS/HAER Level I Standards. The documentation plan should be subject to review and approval by the National Park Service.

Page 6-26, P9. It is unclear what the phrase "to the maximum extent possible" means. Who will determine this? Is the implication that FTA may not be able to preserve the Twin Tower perimeter column bases? There needs to be an acknowledgement by the FTA and the Port Authority that they have committed to preserve a *minimum* of 97% of the area of the north tower footprint and 50% of the south tower footprint.

Page 6-27, P1. The discussion of the E train passageway should be revised to reflect recent alternative proposals to preserve this area.

Page 6-28, Table 6-3. Table 6-3 notes the commitment to coordinate among the various projects affecting the WTC Site to "minimize interruption in access to cultural and historic sites." It also

notes that the CMP for all of the Lower Manhattan Recovery Projects would coordinate the access to cultural resources." These statements are confusing in their use of the term "cultural resources." Common usage in environmental review would include historic properties such as the WTC Site and its significant components. If this interpretation is used than LMDC has already asserted its right to control access to the Twin Tower footprints. How can this be reconciled with the various agencies commitment to cooperate with one another?

Page 6-28, Table 6-3. The Consulting Parties in the Section 106 process should be added as parties included in future consultations concerning historic properties affected by the project.

Chapter 8

The Coalition's principal comments concerning impacts associated with PATH design alternatives are included in our cover letter. We have the following additional comments:

Page 8A-13, P2. The discussion of probable impacts associated with various design options must include a discussion of how the various alternatives will affect historic resources, especially the WTC Site.

Chapter 14

Pages 14-8 – 14-9. The discussion of the Project's consistency with New York City's WRP Policy 10 fails to address the historic WTC Site. A discussion is needed of the how the FTA's proposed action, which will adversely affect the WTC Site, will be consistent with the policy to "Retain and preserve designated historic resources."

Page 10-14, P2. The statement that the project "would not have an adverse impact on coastal resources" is incorrect and inconsistent with other statements in the DEIS. Historic properties are coastal resources in the context of WRP consistency review. The FTA has acknowledged that historic properties will be adversely affected by the project. The WRP consistency review should be revised to reflect this fact.

Chapter 15

The Coalition's principal comments concerning the DEIS' analysis of cumulative effects are included in our cover letter. We have the following additional comments:

Page 15-4, P9. The DESI states that "one set of [National Register] eligible resources" was developed for the study area, and that a coordinated Determination of Eligibility was developed. The Coalition has for many months been critical of the coordinated determination and continues to request that FTA, LMDC, and FHWA request a formal determination from the Keeper of the Register. The existing determination is a "lowest common denominator" document that is badly flawed by the reluctance of at least one of the agency/authors to even acknowledge that the WTC Site is historic in any way. The result is a document designed to eliminate or obscure aspects of the historic nature of the WTC Site that could prove troublesome to deal with during the Section 106 and NEPA processes.

Page 15-7, P3, lines 8-9. The statement that LMDC identified no adverse effects with respect to the WTC Site is incorrect. Although LMDC did make such a determination, it was effectively superseded when LMDC entered into a Programmatic Agreement with the SHPO and the

Advisory Council on Historic Preservation; the purpose of which is to address "adverse effects on historic properties."

Table 15-11. The table fails to note that LMDC's WTC Memorial and Redevelopment Plan project will also affect contributing elements of the WTC Site.

Chapter 16

This chapter should address the fact that the "use" of historic resources at the WTC Site constitutes a permanent, irretrievable and irreversible commitment of historic resources.

Draft Section 4(f) Evaluation

The Coalition's principal comments concerning the draft Section 4(f) evaluation are included in our cover letter. As noted, these relate principally to the failure of the 4(f) statement to even acknowledge, let alone evaluate, feasible alternatives that would result in a reduction of "use" of the historic WTC Site. The draft 4(f) statement discusses four (five if one counts a variation) "avoidance" alternatives. Three of these, the "no action" alternative, the relocation of the PATH projections, and relocating the terminal off-site, are clearly not serious alternatives. Real alternatives, including the Location 1 alternative described in Chapter 2 of DEIS, which according to the DEIS would have numerous advantages over the Terminal with Liberty Plaza Connection Alternative, and a variety of alternatives involving design variations to the latter, must be discussed. Although the DEIS never mentions it directly, all of these alternative would result in reduction of the "use" of the WTC Site.

We have the following additional comments:

Page 4(f)-2, P2, line 5. The word "may" should be replaced with "would." There is no uncertainty about the use of historic properties by the project as described.

Page 4(f)-2. The text notes that the Coordinated DOE states that some physical remnants of the WTC site possess integrity, and then provides an incomplete listing. All of the contributing elements at the WTC Site should be clearly identified. In addition, the list should be expanded to compensate for deficiencies in the Coordinated DOE resulting from the incorrect application of the integrity standard (as determined by the Keeper of the National Register of Historic Places, and noted above), and the failure to include the area within the Twin Tower footprint perimeters.

Page 4(f)-3. In discussing the "no action" alternative the 4(f) statement notes that it still has "the potential to remove or alter contributing elements of the WTC Site." However, this is the case only because it is assumed that the LMDC's Memorial project would result in the need for additional ingress and egress locations, and ventilation structures. If FTA/Port Authority are coordinating with LMDC as claimed, it should be possible to develop a "no action" alternative that would not require the "use" of historically significant WTC Site features *to accommodate the Memorial*. The Coalition recognizes that much of this problem can be attributed to the lack of information from LMDC about the detailed design plans for the Memorial.

Page 4(f)-4, P1. The statement that construction would not alter the setting of the WTC Site is incorrect. The present setting includes full access to and visibility of the north footprint and much of the south footprint. The post-Terminal-construction site will look very different from the site as it appears today. It will definitely evoke less of a feeling of the effects of the events of

9/11. The covering of portions of the footprints by tracks and portions of air space above the footprints by the terminal structure will alter the setting of the WTC Site.

Pages 4(f)-4 – 4(f)-6. This text is a copy of text included in Chapter 6, pages 6-18 – 6-21. All of the Coalition's comments on those pages in DEIS Chapter 6 also apply to these pages in the draft Section 4(f) evaluation.

Figure 4(f)-2. This figure should be modified to clarify that both Twin Tower footprints in their entirety, not just the perimeter box beam columns, are contributing elements to the significance of the WTC Site. Additional detailed figures showing remnant structures within the footprint perimeters should be included.

Figure 4(f)-3. Avoidance alternatives 4A and 4B are incorrectly labeled in the key.

Page 4(f)-13. The proposed "Measures to Minimize Harm" are identical to those presented on DEIS pages 6-26 and 6-27. All of the Coalition's comments on those pages in DEIS Chapter 6 also apply to these pages in the draft Section 4(f) evaluation.

Appendix B-2

Page 1, P3, line 9. The word "help" should be eliminated. The truncated box-beam columns do not "help" define the perimeter of the former Twin Towers, they *do* define it.

Page 2, P5. It is unclear where the ventilation which may be constructed "adjacent to Route 9A" would be located. A graphic showing the location would be helpful, as would a description of the ventilation structure.

Page 3, P2. The discussion of the tower perimeter column bases implies that it is the column bases that constitute the footprints of the Twin Towers. As noted in our transmittal letter, the footprints must be viewed as holistic entities that include the entire area defined by the perimeter columns.

Page 3, P2, line 5. The word "would" should be eliminated.

Page 3, P2, line 12. This sentence needs to be rewritten. The statement that "all of these Tower perimeter columns were removed" is incorrect and contradicts the following phrase which states that the bases of the columns remain.

Page 3, P3. This paragraph seems to be saying that physical disturbance of the truncated box beam columns is the only way they will be affected. The statement that the project would impact "some" of the columns is incorrect. They will all be affected in that their associated setting will be altered. The statement that some of the column bases while being made inaccessible could remain *in situ* is not very meaningful. If they become inaccessible they will be adversely affected. (The use of the word "could" is also disturbing. If the FTA and the Port Authority are unable to state with certainty exactly how these features will be affected than the Draft Finding is premature).

Page 3, P3, lines 9-10. How many box beam column bases will be "temporarily" covered during construction. For how long? How will they be affected/protected during construction?

Page 3, P4. The fact that construction of various proposed infrastructure elements will not physically destroy any of the truncated box beam columns is not meaningful in itself. The Draft Finding notes that proposed infrastructure "may somewhat impact visibility and accessibility." Exactly what does this mean? Much more specific information is needed. The inadequacy of existing baseline information is noted in our cover letter.

Page 3, P5, line 3. All of the slurry walls should be considered equally significant.

Page 3, P6. Identify whose undertaking is associated with the west slurry wall.

Page 4, lines 7-9. FTA must determine whether or not bathtub wall reinforcement is or is not part of their project. If it is not, then presumably it is part of LMDC's project. Yet LMDC never discussed it in their FGEIS or ROD for the Memorial and Redevelopment Plan.

Page 4, P1. The discussion of the Northwest Remnant Subgrade Structures would seem to indicate that the "deconstruction" of these remains is part of this project (as would a reading of FTA's Section 4(f) evaluation in the PATH project DEIS. However, on July 9, 2004 the Port Authority advised the Coalition's counsel that there is no FTA involvement in the removal of these structures. This again highlights the need to consider cumulative effects, and clearly identify which agency is responsible for which aspects of the work at the WTC Site.

Page 4, P2. The removal of the recovery and reconstruction ramp, although necessary and unavoidable, should be acknowledged as an adverse effect.

Page 4, P5. The discussion of how the remains of the Hudson and Manhattan tubes and terminals will be affected needs to be much more detailed. A much more detailed description of these remains than is included in the Coordinated Determination of Eligibility will be needed before this can be done.

Page 5, P2. As already noted, the Draft Finding only says that the station will be reconfigured and that certain elements associated with the E train passageway may be relocated. No description or drawings of the planned reconfiguration are provided, and no mention is made of which elements "may" be relocated. The fact that the FTA and the Port Authority cannot state with certainty which elements are proposed for relocation suggests that any finding of effect is premature.

Page 5, P4. The removal of the Vesey Street stairs is an avoidable adverse effect. The non-functionality and current instability of the Vesey Street stairs is given as a justification for their removal. This is not acceptable. Their non-functionality does diminish their historical significance. FTA should identify the feasibility of stabilizing these remains and consider design modifications that would permit their preservation in place so that they will not be adversely affected.

Page 5, P10. In discussing the setting of the WTC Site, the Draft Finding fails to distinguish between the APE for historic remains and archeological remains. A discussion of the setting associated with the World Trade Center ruins and remains should be included.

Page 6, P2, line 2. Clarify whether the proposed undertaking will or will not require alteration or removal of historically significant features. The use of the word "may" is again indicative of the lack of detail in project description.

Page 6, P2, lines 3-4. Exactly what alterations that would be "additive in nature" are being referred to? While they may not "result in diminution of the physical characteristics of features," they still may adversely affect these features in other ways.

Page 6, P2, lines 6-8. The Coalition strongly disagrees with the statement that "obscuring the features from public view would not necessarily diminish the site's integrity of feeling." The ability to see and possibly touch the remains of the World Trade Center is integral to the feeling associated with the site.

Page 6, P3, line 4. The words "could potentially" should be replaced with "will."

Page 6, P5. The Draft Finding should include "setting" among the characteristics of the WTC Site that will be diminished.

Page 7, P2, line 1. Change the word "may" to "will."
Figure 2. It is unclear exactly what this figure is attempting to show.

Figure 4. This figure should clearly identify the entire area occupied by the footprints of the Twin Towers as a historic resource.

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received:	07/06/04	**Type:**	Email
Contact Details:	Marilyn Gaull **P** ; **F** ; **E** mg49@nyu.edu	**Location:**	

Comment:
E-mail sent by Marilyn Gaull on 7/6 - Scanned

Morera, Margarita

From: Marilyn Gaull [mg49@nyu.edu]
Sent: Tuesday, July 06, 2004 2:41 PM
To: Morera, Margarita
Subject: Revised version

Thank you for sending this to me. I attended the meeting and made a simple but important point: the residents south of the site love the plans and believe that PA as done a brilliant and professional job -- with one major exception: your deference to the so-called "families." We don't know who these people are nor do we acknowledge their authority, emotional or artistic, to take over our lives and properties.They are a small group of representatives who seem to be unemployed, well-financed, and coached--who never show up unless they get face-time on tv and who have no concern for the pain they are causing in the names of the dead.

They have appropriated our tragedy and our neighborhood. Yet they are a minority of those who lost loved ones, and they do not represent the victims, the surviviors, or those of us who were there, escaped with our lives, and returned, bearing witness daily as we crossed the site, as we overcame the horrors that haunt us still.

The neighborhood is poorly represented in Section 106 in part because most of us were disabled by 9/11, some dislocated, and without financial assistance, forced to earn a living (if we were lucky enough to have a job) and therefore unable to attend your meetings, or maintain a web-site, or hang around the LMDC. Unlike these so-called families (are there more than thirty?), while we are not your friends and on a first-name basis, while we have no history of meetings and conversations, we have a much larger stake in your project than they do. We live there; we shall use it.

Speaking for the 10,000 or 15,000 residents in BPC and on the West Side of West Street, because of the memorial (about which none of us were consulted), there will be no access to the transportation center, no recognition that we even should have access. For the elderly and physically challenged, who moved there because of easy access to transportation, reaching the trains will be a major obstacle. That is a major problem now and it will get even worse. A member of the staff believed that we could cross over: in fact, no one will be able to cross the memorial which is nothing but a vacant pit.

At a recent meeting with DOT, we learn that they are considering a tunnel under West Street, which will depress your pedestrian underpass even further--a great hardship of those who are forced to use it to get to the subways.

I was particularly disturbed at the conclusion to the meetings when these so-called "families" began to bully the speakers about what happened to the remains,the debris, the state of the "footprints," and other remanants. I have been on other committees where they have raised similar issues. What I found disturbing were the defensive responses of the Port Authority. If these "families" are so concerned with what happened to the debris, they might have cleaned my apartment or any of the apartments which had a full array of dust, body parts, personal items, paper, and toxic waste and were uninhabitable for over a year.

What is left at the site is not what is valuable--merely what is left,

streaks of smoke or bits of metal or even to account for memories fact, it is unhealthy and pointless. History is well-served by the films and pictures, documented in real-time. No one will forget. The "remains" They are only sacred to the criminals who flew the planes into the towers in the mistaken belief that they were on a holy mission.

Again, you are all highly competent professional people, with great skills and a great vision. Have the courage to follow it and stop defending yourself against a handful of ignorant bullies who do not speak either for the living or the dead.

Sincerely,

Marilyn Gaull Howard

--
Dr. Marilyn Gaull
Editor, The Wordsworth Circle
Professor of English
New York University
19 University Pl., Room 536
New York, NY 10003
Phone: 212-998-8812

Morera, Margarita wrote:

> As a Consulting Party participating in the Section 106 process for the
> WTC Transportation Hub
>
> project (PATH Terminal and pedestrian connections), attached for your
> use is an unverified
>
> transcript and the slide presentation from the Consulting Parties
> meeting on June 14, 2004.
>
> These materials are for your reference only - - to inform your
> comments on the draft Finding of
>
> Effects document. The transcript and slide presentation are not meant
> for further distribution
>
> and remain as drafts for discussion purposes only.
>
>
>
> As discussed amongst those present at the June 14th meeting, the Port
> Authority would like to
>
> receive the written comments from the Consulting Parties to the draft
> Finding of Effects
>
> documents by close of business, Thursday, July 8, 2004.
> (Email mmorera@panynj.gov <mailto:mmorera@panynj.gov> or
>
> fax to (212) 435-5514.) As noted, provision of your comments by
> July 8th would facilitate the
>
> Section 106 process, and would not preclude further written comments

> on the draft Finding of
>
> Effects by Consulting Parties or the general public as part of the
> overall DEIS process that are
>
> due by Wednesday, July 21, 2004.
>
>
>
> We would also like to schedule the next Consulting Parties meeting on
> Tuesday, July 20, 2004
>
> at either 12 noon - 2pm or from 3pm - 5pm. Please respond with any
> preference for either of
>
> these times by Thursday, July 8, 2004. We will confirm the
> meeting date, time and place via
>
> e-mail by Friday, July 9, 2004.
>
>
>
> Thank you for your continued participation and input in the Section
> 106 process.
>
>
>
>
>
>
> ----------
>
> <cid:part1.07000404.04030808@netscape.com>
>

Fax: 212-995-4019

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received: 06/23/04 **Type:** Written Comment

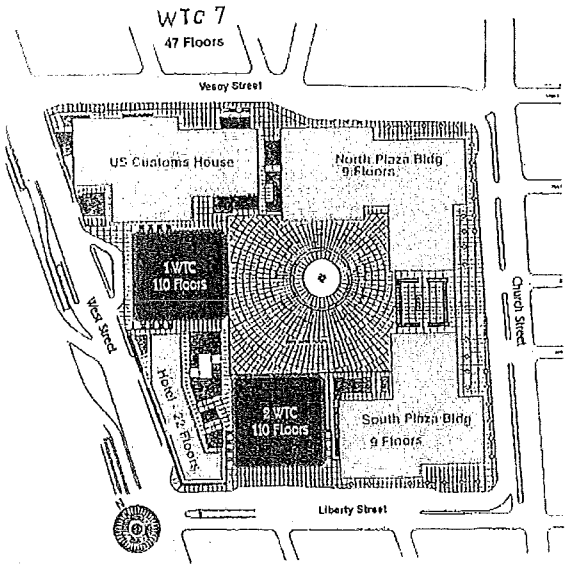
Contact Details: Bernard Goetz **Location:**
55 West 14th Street
New York, NY 10011
P 212-243-7964; **F** ; **E** berniepie@aol.com

Comment:
On the proposed official plan both Church and Fulton are narrow streets and do not allow for parking for buses. Please see attached site plans for detailed explanation. Diagrams with problems and suggestions for WTC site - Scanned

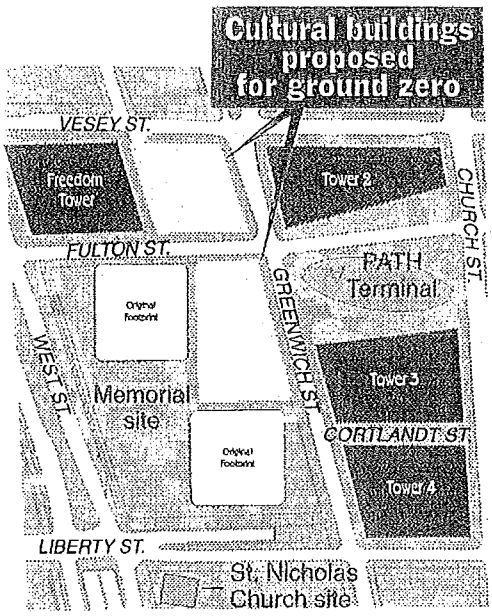
FULTON AND CHURCH STREETS COULD BE WIDER – COMPARISON OF SITE PLANS

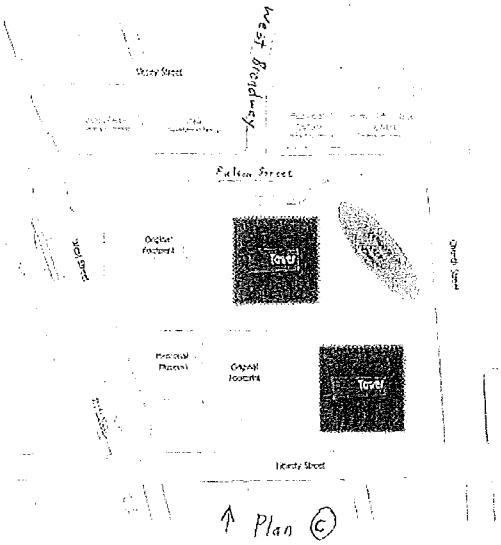
South of Fulton Street is a better place to build super-skyscrapers like the Freedom Tower

Plan (A), Original WTC Site by Yamasaki



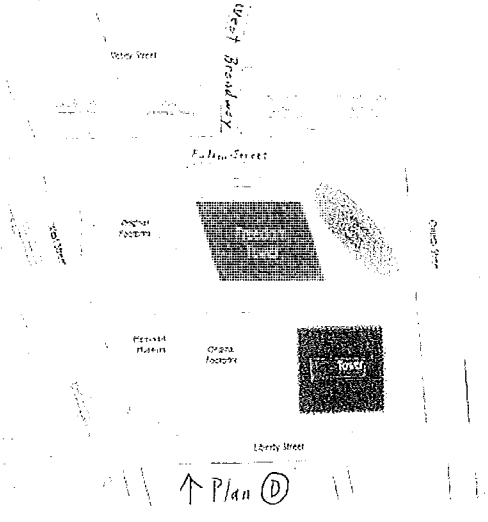
Plan (B), Official proposed plan (NY Times)





↑ Plan (C)

One revision of Gardner-Belton plan
www.MAKENYNYAGAIN.com
Ken Gardner cell: 732-887-9310



↑ Plan (D)

This plan shows the Freedom Tower south of Fulton Street. Fulton Street and Church Street are wider.

Problems with Plan (B)

1. On Plan (B) Church Street is made more narrow, and there is no room for buses to park on Church Street.
2. On Plan (B) Fulton Street is located farther south to accommodate the Freedom Tower, and hence Fulton Street is narrow and "squeezes" the WTC 1 Footprint Memorial.
3. Plan (C) and (D) do not have these problems, and both plans are very flexible north of Fulton Street. Fulton Street (or Vesey Street) could be made wider. North of Fulton Street is a good place for underground parking. If traffic permits, Fulton Street might go underground west of West Broadway. Greenwich Street had little traffic.

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received:	06/16/04	**Type:**	Written Comment
Contact Details:	Steven Gorsky Barclay's **P** 212-412-2329; **F** 212-412-7386; **E**	**Location:**	

Comment:
I find that the sound system for announcements at the WTC facility is absolutely terrible. I cannot understand any of the messages.

Regional Rail Working Group
A Consortium of Transit Advocacy Organizations:
New Jersey Association of Rail Passengers
Empire State Passengers Association
Committee for Better Transit
Institute for Rational Urban Mobility, Inc.

George Haikalis, Chair
One Washington Square Village, Suite 5D
New York, NY 10012
212-475-3394
geohaikalis@juno.com

April 23, 2004

Mr. Lou Venech
Sr. Manager Transportation Policy Development
Port Authority of NY and NJ
233 Park Avenue South, 11th Floor
New York, NY 10003

Mr. William Wheeler
Director, Planning
Metropolitan Transportation Authority
347 Madison Avenue
New York, NY 10019

Re: Recommended Alignment for the PATH-Lex Connection

Dear Lou and Bill:

Thank you for arranging the March 26, 2004 meeting with representatives of our respective organizations to discuss the geometric characteristics of the proposed PATH-Lex connection. Based on suggestions made at the meeting, the Regional Rail Working Group (RRWG) has carefully reworked its plan and produced a revised alignment, which is feasible using design practices that are well within the parameters of the existing subway and PATH systems. This "Basic Alignment (2.8)" is shown in the attached drawing. Clearly, Lower Manhattan's colonial era street pattern and its densely developed structures prevent an alignment that completely meets the "best practices" for building new rapid transit routes. None of the existing rapid transit lines serving this area, including the newly rebuilt PATH line, meets these ideal standards.

The substantial benefits of this connection were enumerated at the RRWG's October 22, 2003 meeting with Congressman Jerrold Nadler, and are described in statements made by several of the group's member organizations at the environmental hearings for both the new PATH station and the World Trade Center redevelopment. Given the unanticipated opportunity to achieve these benefits, because of the extraordinary and tragic losses resulting from the 9/11 terrorist attack, taking some liberties from the "best practices" standards is certainly justified.

Alignment issues

The Regional Rail Working Group's proposed connection uses a minimum 200 foot radius curve and a minimum *bottom of rail to bottom of rail* clearance of 17 feet where the new line passes under the existing A and C line at Church Street, and 14 feet where it passes over the existing 2 and 3 line at Beekman Street.

The RRWG's plan is a considerable improvement over the "no build" plan, which leaves both PATH and NYC Transit operating on existing 115 foot and 147 foot radius curves, respectively at the WTC terminal and the City Hall loop. Note also that the PANYNJ's recently completed AirTrain at

Kennedy International Airport includes a 225 foot radius curve. This line was built to handle specially-designed "one-seat-ride" trains that could also operate on NYC Transit or the LIRR.

The RRWG plan requires a 4.5% grade, identical to grades experienced on the #7 Flushing subway line just west of Grand Central, and in Queens after crossing the East River approaching the Vernon-Jackson Station. NYC Transit operates very reliable service at two-minute headways through much of the peak hour on this busy line. Even steeper grades are found at several other locations in the NYC Transit subway system. The maximum grade on the Kennedy AirTrain is 5.35%.

Constructability

The attached drawing shows the proposed connection shifted slightly to the north at Church Street, avoiding the tube section of the A and C subway line. Clearly, this will require a careful underpinning and reconstruction of the cut-and-cover segment of the existing subway for 50 to 100 feet. This would be an ambitious, but not unprecedented effort, not unlike NYC Transit's recently completed local-express connection of the 63rd Street subway with the Queens Boulevard line. At Beekman Street the connection crosses over the 2 and 3 subway line. Since this construction would involve excavation downward from Park Row, a tight vertical clearance over an operating railroad is feasible. It is between these two crossing points, under the A and C line and over the 2 and 3, that the steepest grade is experienced. By minimizing the vertical clearances at these two points and by beginning vertical curves after these two critical crossing points are cleared, a 4.5% grade is achieved on this segment. The crossing under the 4 and 5 subway at Park Row is less constrained, with about 30 feet bottom of rail to bottom of rail clearance. A similar clearance is available for the crossing under the R and W lines at Vesey Street.

The City Hall loop of the #6 subway would be severed by the proposed southbound connecting track. This interruption would occur as a final step after all other work is completed. The connection would pass over the new temporary PATH terminal, cutting off the northern portion of the concourse. When the PATH-Lex connection is completed and placed in service, the existing PATH terminal could be removed and the space released to accommodate other subsurface activities at the WTC site. In this "basic alignment" all service would flow through Lower Manhattan, just as it now does on the 2 and 3 lines or the 4 and 5 lines. Instead of crossing the East River, the PATH-Lex connection crosses the Hudson River, greatly easing travel between the two states. Going beyond the "basic alignment", the RRWG has identified a wide range of more complex options, permitting turn-back of trains or including more platform tracks. The RRWG would be happy to share these concepts with you.

The December 11, 2003 Parsons Brinckerhoff plan distributed at the meeting calls for more generous clearances than suggested by the RRWG, resulting in a 10.8% grade. This grade is clearly unacceptable, and should not be attributed to the RRWG or NJ-ARP. The central issue is the feasibility of constructing these limited clearance crossings without disturbing service on these busy subway lines. RRWG would welcome an opportunity to discuss this matter with PANYNJ and NYCT engineers and planners.

Request for Additional Information

Finally, we would like to repeat our request for two studies conducted by PANYNJ. One is the study of possible extension of platforms at the Hoboken PATH Station to accommodate longer

trains, done in the mid-1980s. The other is the analysis of procurement of new PATH cars similar to NYC Transit 'A" Division subway cars, done prior to 9/11. At the meeting we also asked if we could obtain detailed vertical elevations that were described in the Parsons Brinckerhoff analysis distributed at the meeting.

Conclusion

This revised plan for the PATH-Lex connection offers substantial benefits for the riding public. While it does not adhere to current "best practices" design standards, the proposed alignment is well within the parameters of existing transit facilities operated by PANYNJ and NYC Transit. The connection is feasible and the question to be decided is whether the benefits are significant enough to outweigh the costs.

Thank you for your assistance.

George Haikalis
Chair, Regional Rail Working Group

cc Norman Silverman, NYCT
John Dean, MTA
Shawn Lenahan, PANYNJ
Kevin Lejda, PATH
Kieran Spillane, Parsons Brinckerhoff
Members of RRWG
Congressman Jerrold Nadler

Regional Rail Working Group
A Consortium of Transit Advocacy Organizations:
New Jersey Association of Rail Passengers
Empire State Passengers Association
Committee for Better Transit
Institute for Rational Urban Mobility, Inc.

George Haikalis, Chair
One Washington Square Village, Suite 5D
New York, NY 10012
212-475-3394
geohaikalis@juno.com

Comments on Draft EIS for Permanent WTC PATH Terminal -- June 23 , 2004

New rail transit options should be considered with the tragic loss of the World Trade Center

The tragic events of 9/11 have created an extraordinary opportunity to reconfigure the region's rail transit system to better serve Lower Manhattan. With a replacement plan for the World Trade Center under review, it becomes possible to consider linking the Downtown PATH line with the #6 Lexington Avenue local subway line – **the PATH-Lex connection**. Both rapid transit lines, which are nearly identical in most physical characteristics, terminate at stations in Lower Manhattan less than 3,000 feet apart. Most other rapid transit lines *pass through* Lower Manhattan, making multiple stops reducing walking time and improving service for transit passengers.

The Regional Rail Working Group, a consortium of transit advocacy groups and individual transit professionals, has developed a wide range of options for **the PATH-Lex connection**. Two representative examples are shown in the attached drawings:

(1) a simple two-track track connection, where PATH is consolidated into the much larger NYC Transit system with trains from Manhattan's East Side coming directly to the World Trade Center site and then continuing to Newark or Hoboken (Alignment 2.8)
(2) a cross platform transfer, where the #6 line is extended from the Brooklyn Bridge Station to the WTC site (Alignment 4.1), easing the connection while still maintaining two separate rail systems.

The PATH-Lex Connection benefits transit riders and the public at large

The advantages of this connection are significant for transit passengers. Residents from Manhattan's Upper East Side, Murray Hill, Gramercy Park, Union Square, NoHo, SoHo and Chinatown neighborhoods could use the less congested #6 Lexington Avenue local to reach workplaces in the World Financial Center and the rebuilt World Trade Center without transferring to congested #4 and #5 express trains at the Brooklyn Bridge Station. Residents from these neighborhoods could also more easily reach the growing workplaces on New Jersey's waterfront in Jersey City, Hoboken and Newark. In turn, this access also benefits New Jersey residents who could access the many workplaces and retail districts that are well served by the #6 local. Extending the reach of the PATH line to East Midtown will also ease travel to Newark Liberty International Airport.

Businesses on both sides of the Hudson would also benefit from this improved access. A direct link from Manhattan's East Side will be an important incentive to market the substantial amount of office space planned for the WTC site and along the New Jersey waterfront. Stores and restaurants in Chinatown in SoHo would gain vastly improved access to customers filling the many new residential towers on the New Jersey waterfront.

The PATH-Lex Connection is feasible from an engineering and operating perspective

PANYNJ and MTA officials have argued that **the PATH-Lex connection** is not feasible because it requires steeper grades and sharper curves than are considered "best practice" for new construction. It also requires underpinning of subway structures, which adds to the cost. Yet, leaving the existing system in place means that trains must negotiate far sharper curves at the WTC terminal and the City Hall loop just south of Brooklyn Bridge Station. Grades of 4.5% are found at many locations in the NYC Transit system and the PANYNJ's recently completed Kennedy AirTrain has even steeper grades. The underpinning proposed for the connection is quite similar to that required for the recently completed local-express connection of the 63rd Street tunnel in Long Island City.

Thru routing subway trains from Brooklyn to the Bronx by way of the Manhattan business district has been the operating practice for new lines built in NYC since the five boroughs were consolidated in 1898. This is the norm for most rapid transit systems throughout the world. **The PATH-Lex connection** would simply apply this practice to trains crossing the Hudson River.

Consolidating the PATH system with the much larger NYC Transit system could produce annual operating cost savings of $10 to 20 million, which would be shared equally by the two states. Capital cost gains could be realized through unified procurement of rolling stock and other supplies. These gains could be realized only after agreements with managers and labor leaders were made and a satisfactory plan for the PANYNJ to compensate the MTA for the incremental costs of operating the PATH service was devised. Similar agreements are already in place between MTA and the States of New Jersey and Connecticut for commuter rail service. Jurisdiction of the PATH system could be readily shifted from the FRA to FTA oversight, since PATH no longer operates on mainline railway tracks.

Better planning can produce projects that benefit transit riders and the region's economy

After the economic downturn resulting from the calamitous events of 9/11, transit advocates expected public agencies to collaborate on improving transit systems serving Lower Manhattan. Exactly the opposite has happened. While the Downtown PATH line was out of service, many passengers had to use more circuitous routings and often had to pay double fares. Because of the potential revenue loss, the PANYNJ and MTA chose not to integrate the PATH fares into MTA's citywide MetroCard system to offset this burden.

Furthermore, PANYNJ and MTA officials have been less than responsive to efforts by the Regional Rail Working Group to consider connecting the two systems. It was only through the efforts of U.S. Representative Jerrold Nadler that both agencies even agreed to participate in a nominal discussion of **the PATH-LEX Connection.**

We can, and must do better! The Governors of the two states must call upon the MTA and the PANYNJ to override institutional prerogatives and cooperate through a comprehensive regional planning process with an opportunity for meaningful public input. Only then can the region make up for the terrible loss that occurred on 9/11.

PATH–Lex Connection

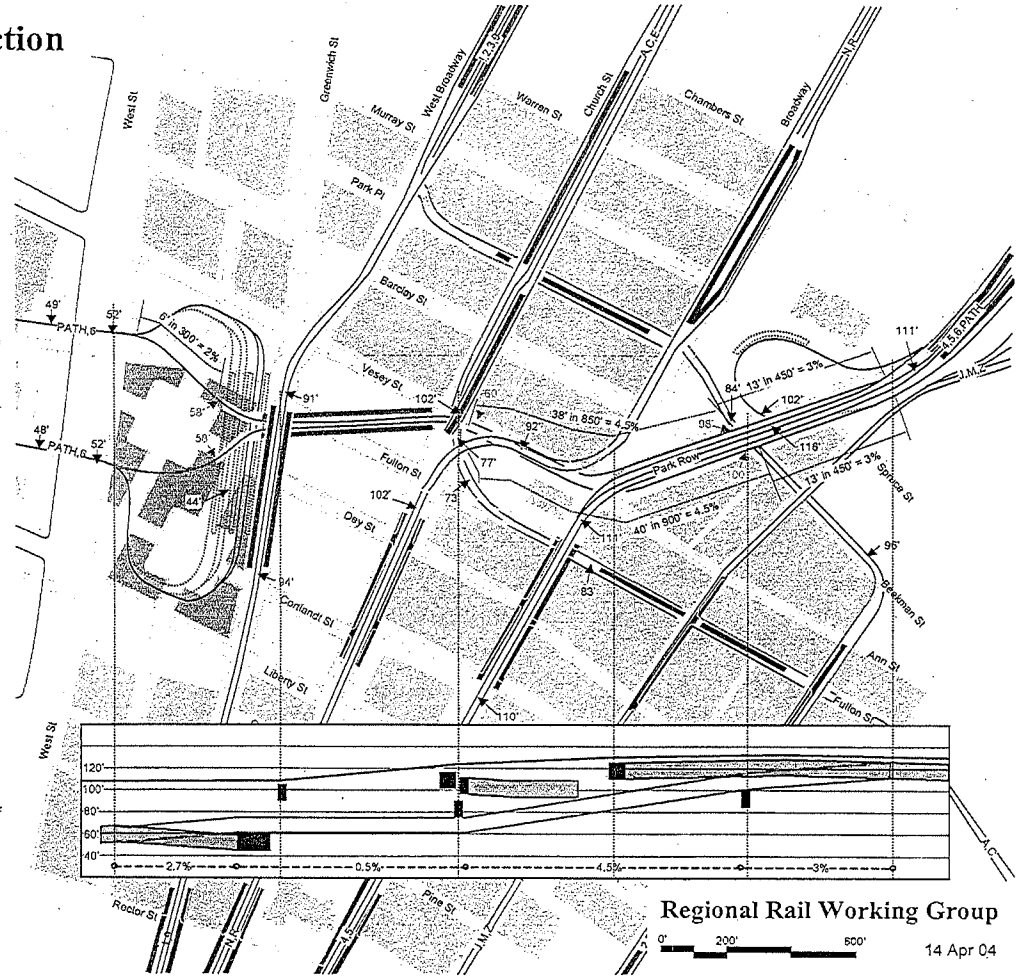
Basic Alignment (2.8)

This alignment connects the PATH tracks at the west side of the World Trade Center cellar with the Lexington Avenue local tracks just south of the Brooklyn Bridge - City Hall station. The new tracks rise from the PATH tunnel portals, pass over the tracks and platforms of the temporary PATH station, under the 1 & 9 in Greenwich Street, under the A & C at Church and Vesey Streets, the northbound track passes under the 4 & 5 at Broadway and Park Row, the tracks then rise on either side of the 4 & 5, pass over the 2 & 3 at Beekman Street, sever the loop used by the 6 at City Hall and connect to the local tracks just south of the station.

The critical points are to pass as high as possible under the A & C and as low as possible over the 2 & 3 in order to achieve a slope of not more than approximately 4.5%.

The new PATH – Lex station at Fulton Street is shown as a basic two track , side platform facility. It is close to and formally aligned with the proposed station entrance just south of Fulton Street.

The alignment avoids the footprints of the World Trade Center towers. The temporary PATH station could be removed or partially retained for reversing and storing PATH trains.



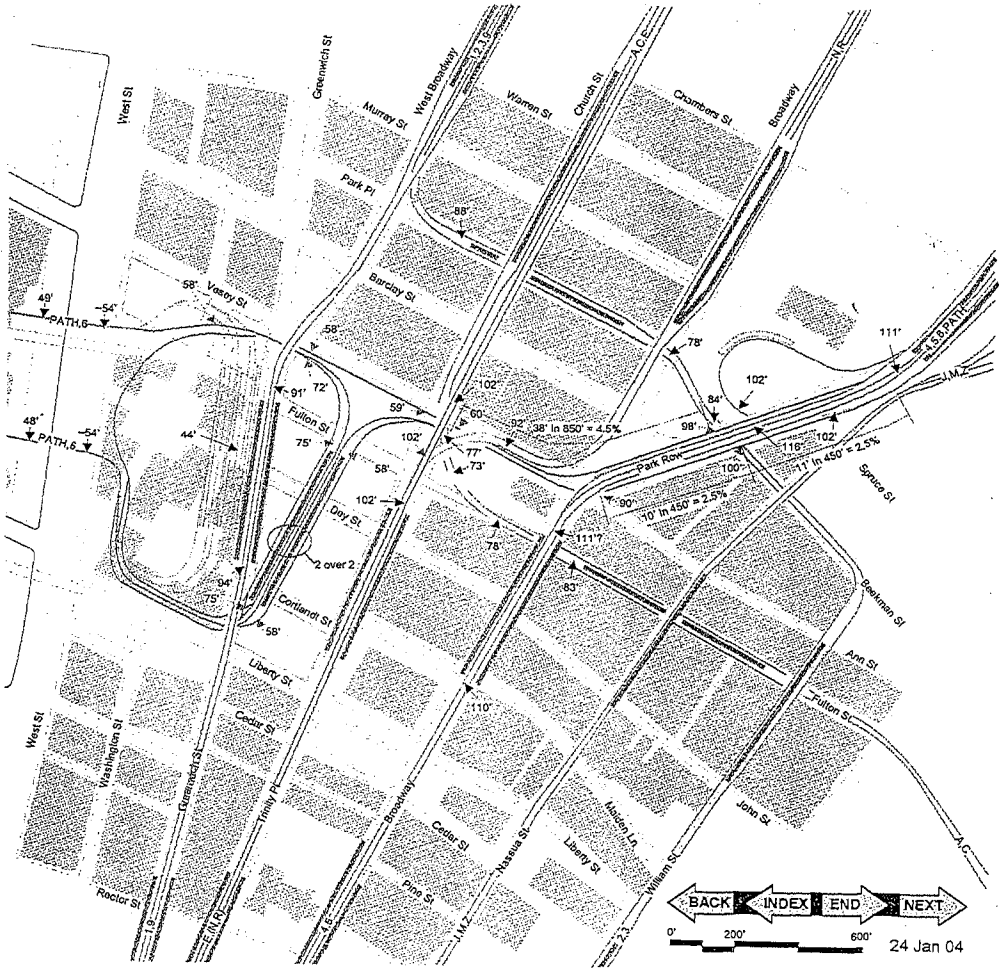
PATH - Lex

Alignment 4.1

The new PATH-Lex station allows service from New Jersey to be split. Trains using the west side of the station return to New Jersey; trains using the east side continue north on the Lexington Avenue line. Trains from Manhattan loop around the north tower footprint and use the west side of the station before continuing to New Jersey or the east side before returning north. (For clarity the platforms are shown next to each other; however they are stacked.)

East of Church Street the track alignment is shown along Park Row, which severs the City Hall loop. Alternatives include an alignment through City Hall Park and one split between the park and Park Row.

This sketch also shows an extension of the IND (E) connecting to the BMT south of Fulton Street.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL

# of pages ▸ 4	
Paul Lebrun	From D. CARLSO
Dept./Agency MRO	Phone # 212 637 350
Fax # 212 637 2505	Fax #
NSN 7540-01-317-7368 5099-101	GENERAL SERVICES ADMINISTR

RECEIVED JUL 2 2004

JUL 21 2004

Rating: EC-2

Bernard Cohen, Director
Lower Manhattan Recovery Office
Federal Transit Administration
One Bowling Green, Room 436
New York, New York 10004

Dear Mr. Cohen:

The Environmental Protection Agency (EPA) has reviewed the draft environmental impact statement (EIS) for the Permanent World Trade Center (WTC) Port Authority Trans-Hudson (PATH) Terminal project (CEQ #040257). This review was conducted in accordance with Section 309 of the Clean Air Act, as amended (42 U.S.C. 7609, PL 91-604 12(a), 84 Stat. 1709), and the National Environmental Policy Act (NEPA).

The draft EIS states that the metropolitan transportation system lost a significant portion of its capacity to serve commuters throughout New York and New Jersey as a result of the terrorist attacks on September 11. The purpose for the project is to replace the current temporary station, prepare for ridership growth, and assist in the economic recovery of lower Manhattan. Based on our review of the draft EIS, we have the following comments and concerns:

The draft EIS discusses the impacts that could be anticipated from the proposed action in very good detail. We are particularly pleased with the level of discussion on the impacts to air quality and cumulative impacts from construction activities, and particularly appreciate the mesoscale analysis of the direct impacts from the project on regional pollutant levels of nitrogen oxides (NOx), volatile organic compounds (VOCs) and particulate matter (PM_{10} and $PM_{2.5}$). We also appreciate the map and the description of the modeled receptor locations. The draft EIS presents a good discussion of mesoscale analysis in terms of the build and no build emissions and though the draft EIS states that emissions from both on-road sources and off-road sources, such as construction equipment, are included, a breakdown of each categories emissions contribution would have been helpful. We suggest that the final EIS provide that breakdown of the on-road emission and the off-road emissions.

We are concerned with the direct and cumulative impacts to air quality from the construction of this project and all of the projects occurring in lower Manhattan. In particular, we are very concerned with the projects PM_{10}, $PM_{2.5}$, and the NO_2 emission impacts that are predicted to occur at certain receptors. The draft EIS indicates that individually the impacts to $PM_{2.5}$, and cumulatively the concentration of PM_{10}, $PM_{2.5}$, and NO_2 will come close to or exceed the national ambient air quality standards (NAAQS) in the peak construction years. Though the draft EIS states that the NO_2 concentrations are conservatively high, we don't have the technical background data that would enable us to understand that statement, such as the NO to NO_2 conversion rate. Also, the draft EIS states that even with the mitigation measures the emissions of $PM_{2.5}$ will still exceed the of 65 micrograms/cubic meter NAAQS. The final EIS should

contain a more detailed discussion of the NO_2 emissions and the technical data used to support the conclusions as well as describe which other measures can be implemented to further minimize the emissions of $PM_{2.5}$.

Given the possibility for significant impacts, we strongly support the proposed Environmental Performance Commitments, which were developed as mitigation by the Metropolitan Transit Authority, the Port Authority of New and New Jersey, and the New York State Department of Transportation. To address the air quality impacts, the draft EIS suggests the implementation and use of equipment with Tier II diesel engines, particulate filters, and possible electrification of certain equipment. We support and agree with all of those measures and we noted that the draft EIS is rather definitive in its discussion of the ability of the particulate filters to greatly reduce the emissions of particulate matter, as indicated by tables 9-10 and 9-11. However, the emissions of NO_2 are not affected by this technology and there is still the potential for the $PM_{2.5}$ threshold to be exceeded even with mitigation. We believe that a scenario that implements all of the identified mitigation measures, in addition to others, will significantly reduce particulate matter pollution and will also minimize emissions of not only NO_2 but also of NOx.

To address our concerns with NO_2 emissions, the final EIS should be as definitive on opportunities to reduce the emissions of NO_2 as it was for PM reductions, inasmuch as discussing how much and which equipment can be electrified and to what degree such measures would reduce NO_2 emissions. However, there is a concern with the feasibility and availability of the needed electrical equipment and power sources such that we believe other mitigation techniques, such as fuel emulsions should be explored. We appreciate the willingness of the project sponsor agencies to meet with us to discuss these other mitigation techniques and to begin to investigate their availability. Our discussions thus far have been very fruitful and we look forward to future conversations and hope for a mutually agreeable solution. We are also pleased with FTA's and the Port Authority's discussion of the implementation plan for the EPCs and believe that this is an excellent step towards solidifying those commitments in the Record of Decision.

While the draft EIS addresses the cumulative impacts from PM_{10}, $PM_{2.5}$, and NO_2, it did not provide a discussion of NOx or VOCs. Given that the New York Metropolitan Region is a nonattainment area for ozone, a cumulative inventory of the emissions of NOx and VOC, as precursors to ozone formation, would have been appropriate. The final EIS should contain such analyses and also discuss other projects outside of lower Manhattan that will have an impact on regional air emissions. Additionally, in order to facilitate our understanding of the air quality issues, we would like to review the emission factors, technical background data, and the assumptions used for the air pollutant modeling, in both the No Action condition and in the with project condition for the years analyzed.

In summary, EPA has rated the draft EIS as EC-2 (see attached rating sheet), indicating that we have environmental concerns with the impacts to air quality and that additional analysis of the cumulative impacts to air quality (NOx and VOC), will be necessary as well as more information regarding the mitigation proposals and commitments. Nonetheless, we commend the project sponsors on this draft EIS, which was well written and disclosed the quite a bit of information in concise and appropriate detail.

Thank you for the opportunity to comment on this draft EIS. If you have any questions, please contact David Carlson of my staff at (212)-637-3502.

Sincerely yours,

Robert W. Hargrove, Chief
Strategic Planning and Multi-Media Programs Branch

SUMMARY OF RATING DEFINITIONS AND FOLLOW-UP ACTION

Environmental Impact of the Action

LO-Lack of Objections

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC-Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO-Environmental Objections

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU-Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of environmental quality, public health or welfare. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommend for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1-Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2-Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3-Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From: EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

79 Sullivan St., 6A
New York, NY 10012
(212) 925-6133

July 20, 2004

Via mail and facsimile (212) 435-5514

Public Comments
Draft Environmental Impact Statement
Permanent WTC PATH Terminal
The Port Authority of N.Y. & N.J.
115 Broadway, 5th Floor
New York, NY 10006

Attn: Mr. Anthony Cracchiolo

Dear Mr. Cracchiolo:

I would like to submit the following comments and questions regarding the Port Authority's Draft Environmental Impact Statement ("DEIS") for the permanent WTC PATH Terminal in the hope that the Port Authority will address some important issues that seem to have been either unaddressed or glossed over in the current DEIS. These issues concern the impact of the proposed permanent WTC PATH Terminal on the aesthetic, social and economic environment of Lower Manhattan and how the proposed permanent WTC PATH terminal, especially as currently planned, could very well have unintended negative – rather than positive – impacts on New York City in general, and on the World Trade Center district of Lower Manhattan in particular.

I. Regarding the so-called "need" for the proposed project

1) **The DEIS does not seem to explain why a more permanent version of the current temporary terminal – one that would in essence be an attempt to modestly upgrade the original pre-9/11 terminal concept and rework it so that it would fit into the present day plans for the site – was not also analyzed for its environmental impacts and used as a point of comparison with the proposed actions.**

By instead comparing the proposed alternatives only to a clearly unacceptable "no build" temporary alternative (i.e., a bare bones temporary terminal that was built hastily and will apparently "fall apart" after "x" number of years), this DEIS seems to be creating a no build alternative that is just a "straw man." Thus, the resulting comparisons between the suggested proposals and this "straw man" no build alternative would seem to be a methodological sham. These comparisons would seem to be structured so as to fail

to illuminate – or perhaps even mask or disguise – the negative environmental affects of the proposed alternatives.

2) **While the DEIS more or less seems to assert that an enlarged and "enhanced" terminal facility is necessary for the recovery and continued growth of Lower Manhattan, such assertions do not appear to be backed up with data or reasoning – or to be borne out in fact by Lower Manhattan's extensive actual history of unplanned, spontaneous, market-based neighborhood re-invention and re-vitalization. Shouldn't the DEIS have included an examination of spontaneous re-inventions and re-vitalizations in Lower Manhattan (e.g., SoHo, Tribeca and even already, to a lesser degree so far, Wall St.) and used that analysis to evaluate any so-called "need" for an enlarged or enhanced PATH terminal?**

Both pre-9/11 and post-9/11, areas of Lower Manhattan around the WTC site have re-invented and re-vitalized themselves spontaneously, and this has become increasingly become true of even the financial district itself – which has been witnessing the construction of residential units in what had previously been a virtually all-commercial district. This has occurred *without* an enlarged PATH Terminal facility and without the construction of a large, anti-urban terminal entry pavilion. In other words, the market-place has been working with what already exists in the area and is inventing new, marketable uses for it. Therefore, shouldn't the DEIS have examined the so-called "need" for an enlarged and "enhanced" PATH terminal facility in light of such spontaneous, market-based re-inventions and re-vitalizations? Might not such an examination have shown that, indeed, there is very little true "need" for the specific approaches suggested by the Port Authority?

3) **Furthermore, shouldn't the DEIS examined how a transformation to a more well-rounded, 24-hr district might actually lessen the need for peak hour transit capacity?**

The DEIS seems to claim that the area will need to accommodate more PATH riders than in the past, due to post-9/11 changes in the area. But even if this is so (and one wonders how overly optimistic such beliefs might be), if the area becomes more diverse as planned (e.g., becomes more residential and recreational, and less commercial) this would seem to indicate that the peaks and valleys of rush hour mass transit usage would become more spread out over a 24-hour day and 7-day week (and even more diverse in terms of transit modes chosen) – after all, this is one of the main benefits of creating a "24/7" district in the first place. Thus the logic of the anticipated changes to Lower Manhattan would seem to indicate less of need for an enlarged or enhanced facility, rather than more.

II. Regarding the impacts of the proposed transportation concourse

4) **Shouldn't the DEIS have noted how the proposed plans for a permanent PATH terminal would have a negative impact on passenger mobility and comfort when compared to the previous, pre-9/11, PATH terminal and transportation concourse that was on the site?**

The main concourse of the World Financial Center, to the west of the site, was built to correspond to the original WTC plaza and to Church St., which is approximately 18 feet higher than West St. The PATH terminal and transportation concourse that was beneath the plaza was street-level with West St., much of Liberty St. and was also virtually level with both the "E" train and the "N" / "R" trains beneath Church St. The pre-9/11 PATH terminal and transportation concourse cleverly utilized the site's unusual topography to provide convenient, comfortable, weather-protected access for transit passengers among the various transit facilities serviced by the transportation concourse and for pedestrians crossing through the site – especially those going in an east-west direction (which is a major Lower Manhattan route).

The proposed permanent PATH terminal, because it places the transit concourse truly below ground, beneath the No. 1 subway (rather than above-ground and into the side of a small "hill"), would appear to *reduce* passenger comfort and mobility for both transit passengers within the transit concourse itself and for pedestrians hoping to cross the site using the transportation concourse during inclement whether. While the pre-9/11 concourse could be conveniently entered without using any stairs from West St., Liberty St. and even from the poorly placed entrance on Vesey St. (if one used the handicapped ramps), this does not seem to appear to be possible at all in the proposed new facility. Everyone, including the handicapped and mobility impaired (and those carrying, bags, children, etc.), would appear to have to use either escalators or elevators to enter the new proposed transportation concourse. And during times of peak travel, these escalators and elevators would appear likely to create annoying bottlenecks – in addition to the shear inconvenience and annoyance of having to change grade in order to enter a truly underground transportation concourse. Shouldn't all of this have been discussed as negative impacts of the proposed new design as compared to the transit facility that existed on the site pre-9/11?

Another example of the negative impacts of the proposed alternatives: previously it was possible to enter the transportation concourse at street level on West and Liberty Sts. and to proceed virtually onto the "E" train platform using only a slight ramp situated to the south of the "E" train token booth. Shouldn't the fact that such ease of mobility would no longer be possible in the proposed new facility be cited as a negative impact with regard to mobility?

Yet another example: pedestrians using the transportation concourse as a weather-protected route between Church St. and the World Financial Center concourse (a major pedestrian route in Lower Manhattan) would have to make three changes of grade just to

get under West St, and then they would have to make a *very steep* three or four changes of grade in order to get to the elevator lobbies of the WFC – for a total of six or seven changes of grade altogether. (And it should be noted that the changes of grade on the WFC side of West St. would be a very steep zigzagging vertical egress.) In contrast, the pre-9/11 weather protected transportation concourse required only two changes of grade for the same trip! (That is, there was one change of grade from Church St. to the transportation concourse, and one change of grade to the North Bridge/WFC Concourse.) Shouldn't such negative impacts of the proposed new transportation concourse have been noted in the DEIS? (For instance, the steep egress from a possible permanent PATH terminal on Church St. was indeed noted and criticized as a negative impact in this DEIS.)

III. Regarding the proposed entry pavilion designed by Mr. Calatrava

5) **Shouldn't the DEIS have noted and examined how constructing a structure that is, in essence, a large, single story entry kiosk – or world's fair-like pavilion – on a full block of scarce buildable land would contribute to pressures to build oppressively large structures on the site's other buildable parcels?**

Looking at it from a slightly different perspective, the DEIS does not seem to consider whether a permanent PATH terminal that would be housed in a handsome commercial structure (similar to what existed on the site twice previously) would not, in fact, help create a better fit with the other structures and activities that are planned for the WTC site – and thus help create a redevelopment that would ultimately be more humanistically, and successfully, urban.

Neither does it note the that, unusually for Lower Manhattan, this site is already surrounded by plenty of open space (i.e., St. Paul's graveyard, the WTC memorial site, Liberty Park) and already surrounded by an unusually large number of relatively low (for Lower Manhattan) structures (e.g., Century 21, the Post Office, etc.), thus lessening the true usefulness of a low building on this site – especially a modern "free-form" one.

Furthermore, the DEIS does not seem to consider whether a more conventionally urban structure (one having a significant amount of commercial space above the passenger facility, and one of contemporary, but traditional, architectural design) would be less likely than a single-use, free form structure to distract from landmark structures situated near the site – including both the historic ones like St. Paul's Chapel and the art deco Century 21 building, and those scheduled to be built, namely the proposed memorial and the Freedom Tower.

6) **The DEIS didn't seem to examine how the proposed entry pavilion's lack of exterior street-level retail space would negatively affect street life in the area.**

When one looks at Grand Central Terminal (which has won world renown as a quintessentially urbane railroad terminal), one sees that its street-fronts are not empty,

economically sterile, architectural showpiece facades, but handsome, functional parts of the city – lined with retail stores, news dealers, weather protected cab stands (now sidewalk cafes), etc. In contrast, the proposed "arty" design of the entry pavilion is devoid of exterior street-level retail and is simply a flashy architectural showpiece better suited to a world's fair or to an airport, rather than to a vibrant city street. Shouldn't the absence of external street level retail, and its deadening effect on the area's street life, have been noted as a negative effect of the proposed terminal design?

7) **Shouldn't the DEIS have examined the negative effect that the construction of a low, free-form modern structure (the proposed terminal pavilion) would have on the flavorfully characteristic – and world famous – street walls of Lower Manhattan?**

As the DEIS notes, most traditional structures of Lower Manhattan are built out to the building line. But the DEIS does not seem to consider that this circumstance, along with the fact that such structures – whether designed in a modern or traditional style – usually have a "rectilinear" design, is what produces Lower Manhattan's flavorfully characteristic – and world famous – heritage of street walls (the concrete "canyons" of Lower Manhattan). The creation and maintenance of handsome street walls is a well-accepted criterion for successful urban design, yet the DEIS does not seem to discuss the negative effect that the proposed design (a modern, "free form" pavilion) would have on this very import aspect of the visual heritage of Lower Manhattan.

Because the free form design of the pavilion does not positively continue, reinforce or extend the area's street walls, it contributes towards their dissipation – and the destruction of the wonderful sense of enclosure that these street walls provide (i.e., outdoor hallways without ceilings). Thus, such a low, free form building as that which is being proposed would weaken, and thus hurt, the view corridors up and down Church St., Fulton St. and Dey St.

Furthermore, aside from the sheer clash of styles, such a free-form building does nothing to enhance the street wall surrounding the graveyard of St. Paul's Chapel – which ideally should have the feeling of a handsome large outdoor "room" but would instead have a large permanent gash knocked out of it by the strangely shaped voids created by the proposed terminal.

8) **The DEIS seems to provide only an extremely cursory, one-sided assessment – one that is based on highly dubious assumptions, at that – of the impact of the proposed terminal's "free form" modernism (more suitable to an airport or world's fair than a vibrant city) on the visual character and heritage of Lower Manhattan.**

The DEIS's very cursory evaluation of the impact of the terminal's "free-form" modern design on the essentially traditionally-designed cityscape of Lower Manhattan (where, for instance, even the modern buildings fit-in by being "right-angled," Bauhaus

modern) appears to be based on the highly questionable assumption that all the various styles of modern architecture (the various "-isms") have identical impacts upon the urban environment – and that they are all equally compatible with each other and with the city around them.

For instance, it justifies the construction of the proposed "free-form" terminal in "traditional" Lower Manhattan with the presence of other (but, in fact, more traditionally-based) modern structures like those found at the World Financial Center and Battery Park City. It assumes that "free-form" modernism, like that embodied by the proposed PATH terminal (which uncannily resembles a previously designed railroad terminal by the same architect that was indeed located at an airport!) is, in essence, interchangeable with more traditionally based "post-modern" modernism – which, in contrast, is an architecture that is consciously modeled upon traditional forms that have already been found to "work" in cities, in general, and in New York City, in particular.

So the question that the DEIS leaves unasked remains, "How and in what way does this proposed terminal fit in with the traditional cityscape of Lower Manhattan? If the proposed entry facility supposedly does no violence – has no negative impact – to the existing traditional cityscape, what does?"

9) **The DEIS doesn't seem to examine the negative effects of adding yet another visual "icon" (the proposed terminal's world's fair-like entry pavilion) to an area that is already brimming over with them – and one with yet even more on the way! The question may be stated as follows: does creating yet another visual icon have a positive -- or negative – impact on an area that already has probably more visual icons per acre than any other business district on earth?**

Lower Manhattan already is brimming with visual icons. Along Broadway alone, there is City Hall, the Woolworth Building, St. Paul's Chapel, the old ATT Building, the Noguchi cube and the original Marine Midland Building, Trinity Church and its graveyard, the Custom House and Bowling Green – just to name the "majors"! (And there are yet still many, many more throughout the rest of Lower Manhattan – Federal Hall National Memorial, the N.Y. Stock Exchange, and so on.) Does the addition of yet another visual "icon" (and one having an essentially alien, suburban character at that) add to – or diminish – the iconic power of Lower Manhattan's existing iconic (and historic) structures?

The DEIS doesn't seem to examine how the creation of yet another visual "icon" (the proposed entry pavilion) would contribute to what appears to be developing into a chaotic jumble of visual "icons" in Lower Manhattan (especially considering the addition of all the visual "icons" now planned for the World Trade Center area). Thus, the proposed entry pavilion should have been evaluated as a potential contributor to the negative transformation of Lower Manhattan, little by little, into something less than a genuine, functioning, urban district and into something more like a vacuous, anti-urban theme park or architectural world's fair.

The question is how many "iconic" foreground buildings can Lower Manhattan take without damaging its urbane, and well-beloved, arrangement of a large number of handsome "background" buildings providing a suitable context for a select few "iconic" foreground" buildings? Shouldn't the DEIS have also considered whether the negative contextual effects of the proposed entry pavilion (currently designed as a suburban "wow" structure) would not have been ameliorated somewhat had the facility been designed as a handsome, dignified and respectful urban "background" building instead?

Also apparently missing from the DEIS is an evaluation of the negative effects of the proposed entry pavilion on the historic and architecturally significant structures across the street from it – particularly St. Paul's Chapel. In many historic districts, such a flashy, world's fair-like pavilion would be seen as having flagrantly negative impacts upon a structure as historic and architecturally distinguished as St. Paul's Chapel. So the question remains, "If the proposed free-form entry pavilion is not deleterious to this 18th Century historic and architectural landmark, what is?"

10) **The DEIS seems to gloss over the limited benefits and significant problems posed by an entry pavilion whose major "benefit" is that it is an anti-urban, world's fair-like pavilion made up almost entirely of glass.**

I realize that the architect of the terminal plans to use openings in the roof, etc. to counteract the greenhouse effects of so much glass. But one wonders how much relief such a system would really provide. Plus, I don't believe the DEIS addresses the fact that much of the discomfort in New York summers is because of high humidity in the air. If left ignored and unaddressed, this humidity would have a significant negative impact on users of the terminal. Certainly in this regard the proposed terminal seems to have a negative impact when compared to the pre-9/11 terminal (which was delightfully temperature controlled).

One also wonders how much time, money and energy would have to be spent on keeping all this glass clean – especially considering the free-form shape of the pavilion which would appear to complicate efficient glass cleaning procedures.

Furthermore, shouldn't the DEIS also consider whether the benefits of a sunlit terminal, which would not get much sunlight when tall buildings block the sun, when whether is bad, during the night and during the short days of New York winters is really worth giving up all the benefits of having an equally aesthetically pleasing, but truly functional, "urban" building on the site. In contrast, a terminal such as Grand Central Terminal, uses glass much more judiciously – and perhaps to much greater effect -- and has many unheralded commercial spaces (tucked all throughout the building, including in the buildings' corners and above the waiting room) to boot!

11) The DEIS mentions as a benefit the energy savings generated by a glass pavilion having natural illumination. So shouldn't the DEIS also have mentioned as a negative impact the energy loses created by having an extensive transportation concourse that is truly underground (unlike the pre-9/11 terminal) and having an underground pedestrian tunnel beneath West St. (rather than a naturally illuminated pedestrian bridge, like the North Bridge).

Furthermore, shouldn't the DEIS also be mentioning the additional expenditures of energy needed to run all the additional escalators and elevators needed for the proposed transit concourse which – unlike the pre-9/11 concourse – is truly three or four stories beneath the ground-level of West St.? (See Point #4, above.)

The DEIS mentions how the steep egress from a possible Church St. terminal was a significant consideration. So shouldn't the DEIS also have considered and mentioned a similarly steep vertical egress on the World Financial Center side of the proposed transportation concourse as also having significant negative impacts?

Very truly yours,

Benjamin Hemric

Benjamin Hemric

Testimony of Jennifer Hensley
Director of Intergovernmental & Community Affairs
Alliance for Downtown New York
Before the Port Authority of New York and New Jersey

Public Comment on the Permanent PATH Station
at the World Trade Center Site
Draft Environmental Impact Statement
June 23, 2004

Thank you for the opportunity to speak here today on the draft Environmental Impact Statement for the permanent PATH Station at the World Trade Center Site. I am Jennifer Hensley, director of intergovernmental and community affairs for the Downtown Alliance, Lower Manhattan's business improvement district. We represent the thousands of property owners and businesses, and several hundred thousand workers south of Chambers Street.

The PATH Station at the WTC Site is an important part of Lower Manhattan's transportation network, providing convenient and affordable access to and from New Jersey for more than 30,000 commuters daily. The opening of the temporary PATH Station at the WTC Site last November marked a significant milestone in Lower Manhattan's recovery after the September 11th attacks, and the subsequent unveiling of Santiago Calatrava's magnificent design for the permanent PATH Station is further proof that Lower Manhattan's revitalization is well underway.

The Downtown Alliance is thrilled with the plans for the permanent PATH Station, which will undoubtedly serve as a grand point of arrival in Lower Manhattan and a spectacular 21st century transit center. Of course, a grand station deserves a grand train, and we encourage the Port Authority to continue your work with the LMDC, the city, and the state to bring direct, one-seat access from Long Island and Kennedy Airport to Lower Manhattan. These transportation improvements are critical to maintaining and enhancing Downtown's role as a central business district and a thriving part of the region's economy. In fact, there is no single issue that is more important to Downtown's major employers. We believe that Lower Manhattan's transportation infrastructure must be enhanced quickly and efficiently, with a focus on expanding service and connections to labor markets in the suburbs.

The Downtown Alliance does, however, have several concerns as the permanent PATH project moves forward. First, we believe that the construction of the permanent station should be coordinated through the forthcoming Lower Manhattan Construction Command Center. It is critical that issues such as worker transportation to and from the construction site, permitting, movement of materials, and other logistical concerns be coordinated with the many other development projects happening in Lower Manhattan at the same time.

Secondly, we believe that construction of the permanent station should occur with minimum disruption to existing PATH service, particularly during the weekday rush hours. The Downtown Alliance would also like to see the retail plan for the station complement the other retail components on the World Trade Center Site and in the surrounding areas. We envision a complete retail complex with shops and restaurants that serve the worker and residential populations Downtown, as well as commuters and the many visitors that will come to use the cultural and memorial spaces on the site, and other attractions throughout neighboring community.

Finally, I'd like to thank the Port Authority, for your hard work and vision, on both this permanent PATH Station, and on Lower Manhattan's broader revitalization. I look forward to working with you as this process continues.

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received:	06/23/04	**Type:** Written Comment
Contact Details:	Don Jackson Local Union #3 IBEW 65-81 Parsons Blvd. Flushing, NY 16365 **P ; F ; E**	**Location:**

Comment:
Please make this city what it was and can be.

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received: 07/06/04 **Type:** Email/Written Comment

Contact Details: Robert Kornfeld, Jr., RA **Location:**
The Historic Districts Council
P ; **F** ; **E** rkornfeld@LZATechnology.com

Comment:
E-mail & Written Comment sent on 7/6 by Historic Districts Council - Scanned

Entered
7/30/04

Morera, Margarita

From: Kornfeld, Robert [RKornfeld@LZATechnology.com]
Sent: Tuesday, July 06, 2004 6:12 PM
To: Morera, Margarita
Cc: 'ewa@allisongroup.com'; 'klustbader@aol.com'; 'fsanchis@mas.org'; 'alexherrera@nylandmarks.org'; 'Ethan_Yankowitz@nthp.org'; 'betsy_merritt@nthp.org'; 'philip.craft@mail.house.gov'; 'Charlene Vaughn'; 'Joel Klein'; 'aferster@transact.org'; 'amg@wtcufg.org'; 'Simeon Bankoff'; 'John S. Jurayj'; 'David Goldfarb'; 'Jay Platt'; Kornfeld, Robert
Subject: RE: Section 106 Consulting Parties - Meeting Invitation

Ivy.gif

COMMENTS OF
BERT KORNFELD 0

Ms. Morena:

This is an electronic copy of my preliminary comments regarding the Section 106 review for the Permanent WTC PATH Station. A hard copy was forwarded last week. Thannk you.

Robert Kornfeld Jr. on behalf of the Historic Districts Council

<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>
The information in this email and any attachments may contain confidential information that is intended solely for the attention and use of the named addressee(s). This message or any part thereof must not be disclosed, copied, distributed or retained by any person without authorization from the addressee. If you are not the intended addressee, please notify the sender immediately, and delete this message.
<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>

not appropriate to reject an alternative out-of-hand because it would necessitate design modifications to the station.

In several respects the PA cited their architects' designs as reasons that adverse effects are unavoidable. This is an invalid type of circular reasoning. These consultants or employees are carrying out your instructions. You have to furnish them with historic guidelines. If you instruct them which historic resources must be preserved they will design around them just as they design around any other constraint.

The PA should qualify its "need" to install additional track. It appears to be a long-term contingency for an area with a permanent reduction in office space, and which is increasingly residential. One suspects that the driving force is opportunity rather than need, because with the towers gone the construction cost would be much lower. This does not factor in the adverse effects to the historic site. The effects would be profound.

3. Another adverse effect is the encroachment of the upper level of the PATH station over the footprints, and the potential of a support column landing on the footprint. This is not acceptable because it would limit the development of the footprints as dignified spaces by limiting the ceiling height. It would also impact the memorial voids and circulation space for the memorial planned by LMDC. It is unacceptable for these elements to encroach on the footprints and therefore design of a column landing on the 1 WTC footprint should be a moot point.

SEYMOUR P. LACHMAN
SENATOR, 23rd DISTRICT
DEPUTY MINORITY WHIP

COMMITTEE ASSIGNMENTS
RANKING MINORITY MEMBER
TRANSPORTATION

MEMBER:
AGING
CHILDREN & FAMILIES
CONSUMER PROTECTION
CRIME VICTIMS, CRIME & CORRECTION
EDUCATION
FINANCE
HIGHER EDUCATION

THE SENATE
STATE OF NEW YORK

ALBANY OFFICE
ROOM 406
LEGISLATIVE OFFICE BUILDING
ALBANY, NEW YORK 12247
(518) 455-2427
FAX: (518) 426-6943

STATEN ISLAND OFFICE
36 RICHMOND TERRACE
STATEN ISLAND, NEW YORK 10301
(718) 448-8586
FAX: (718) 448-8413

BROOKLYN OFFICE
2424 CROPSEY AVENUE
BROOKLYN, NEW YORK 11214
(718) 449-1443
FAX (718) 373-5749

EMAIL:
LACHMAN@SENATE.STATE.NY.US

Comments of New York State Senator Seymour P. Lachman on the Permanent World Trade Center PATH Terminal Draft Environmental Impact Statement and Section 4(f) Evaluation July 21, 2004

My name is Seymour Lachman. I represent the 23rd district in the New York State Senate. My district includes portions of Brooklyn and Staten Island. I am the ranking Democrat on the Senate Committee on Transportation and the chair of the Democratic Conference Task Force on Public Transit. While I am supportive of the proposed Permanent World Trade Center PATH Terminal (the Terminal), I would like to express a concern that I have about how the Terminal will connect to the existing MTA New York City Transit subway lines at the World Trade Center site, two of which are to be connected under the proposed Fulton Street Transit Center (FSTC) project.

I want to urge the Port Authority of New York and New Jersey and the Metropolitan Transportation Authority to ensure that these two projects are completely integrated. The proposed connections between the Cortlandt Street Station of the R and W trains and the World Trade Center-Church Street Station of the E train should be integrated into the design of the Terminal project, as should the western end of the Dey Street passageway and the eventual

construction at the Cortlandt Street-WTC Station of the 1 and 9 trains.

New York City has been plagued by over a century of uncoordinated mass transportation services with poor and confusing connections between formerly competing transit lines. Hundreds of millions of dollars of scarce transit capital funds have been spent rebuilding poor interconnections at 42nd Street-Times Square, 14th Street-Union Square, and Atlantic Avenue-Pacific Street. One of the worst examples of this situation can be found at the four Fulton Street/Broadway-Nassau Street stations that will be rebuilt under the FSTC project to improve passenger flow and access. I would urge that the final design of the both the R/W-E connector and the Dey Street passageway be physically integrated into the WTC PATH Terminal such that there is easy passenger access and flow to and between the PATH terminal and the subway stations on the WTC site. I would also urge that the connections between the Terminal and the New York City Subway System (including provisions for the eventual Cortlandt Street station of the 1 and 9 trains) be designed in such a way that they can be reconfigured to allow easy free transfers if and when the subway system and PATH are brought within the fare system. We must not replicate the mistakes that led to awkward and inconvenient transfers between former IRT, BMT, and IND stations throughout the subway system.

Finally, I want to reiterate the importance of considering the wishes of many family members of the victims of the World Trade Center attack and not building on the footprints of the destroyed towers. I cannot overstate the significance of this request to these family members. I hope that the Port Authority can design a plan for the PATH station and the concourse that will serve the needs of Lower Manhattan commuters and the desires of the family members of the victims.

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received:	07/20/04	**Type:**	E-mail
Contact Details:	John D. Lictro **P** ; **F** ; **E** jdllog14@yahoo.com	**Location:**	

Comment:
Good morning, In regards to the permanent PATH terminal plan, I strongly recommend that this project be developed WITHOUT taking into consideration the Libeskind WTS site plan. The reason I believe this should be so, is that due to the lack of funding to build and overwhelming lack of public (The Libeskind plan finished LAST in the official poll at the Wintergarden) and corporate support (i.e. Citibank), this current WTC plan is close to being discarded. Instead, please consider building a cost-effective and practical PATH terminal with the probability that the Twin Towers will be rebuilt. With this bold new direction guiding your project, there is not doubt you will receive more public and corporate support thank you could ever imagine. Thank you very much for your time.

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received: 07/05/04 **Type:** Email/Letter
Contact Details: Bill Love **Location:**
Vice Chair
Coalition to Save West Street
333 Rector Place #11-B
New York, NY 10280
P 212-306-1789; **F** ; **E** blove93@earthlink.net

Comment:
E-mail & Letter sent 7/5 by Coalition to Save West Street – Scanned

333 Rector Place, Apt. 11-B
New York, NY 10280
July 5, 2004

Ms. Margarita Morera
Port Authority of New York and New Jersey
225 Park Avenue South, 15th Floor
New York, NY 10003

Re: Comments of Consulting Party on WTC Transportation Hub Project -- Draft Finding of Effects/Section 106 Review Process

Ladies and Gentlemen:

On behalf of the Coalition to Save West Street (the "Coalition"), a Consulting Party in the Section 106 review process relating to the WTC Transportation Hub project, I offer the following comments regarding the draft Finding of Effects document that was discussed at the meeting of the Consulting Parties on June 14, 2004.

The Coalition, a group comprised of several hundred residents of Lower Manhattan and formed in 2002 in order to oppose plans to tunnel a portion of West Street, believes that its views on the redevelopment of the WTC site are broadly representative of a strong majority of Lower Manhattan residents.

First, as I stated at the June 14 meeting, although our group opposes a West Street car tunnel, we have not opposed the proposed east/west pedestrian tunnel because we recognize the importance of providing a means for large numbers of pedestrians to be able to safely cross West Street, particularly during peak hours. This is critical not only for residents of Battery Park City (most of whom work east of West Street) but for office workers in the World Financial Center (WFC) and for the retail businesses located there.

We were intrigued to note, however, the reference on page 2 of the draft Finding of Effects to a bridge over West Street as a possible alternative to the proposed corridor beneath the street. Our main comment here is to urge you to seriously study a pedestrian bridge over West Street as a means to provide all-weather access between the WFC and the WTC Transportation Hub. In our view, it might also be possible to have both a corridor underneath and a bridge over West Street that would supplement each other, rather than one necessarily being an alternative to the other.

The model for any such permanent pedestrian bridge, in our view, should be the former North Bridge that was the primary means of crossing West Street prior to 9/11. That bridge worked extremely well and carried 8,000 pedestrians per hour during the rush hours. The current South Bridge at Liberty Street (which we hope will be retained) is a smaller version of the North Bridge. In our view, such a new pedestrian bridge over West Street must have the following characteristics for it to be an acceptable alternative/supplement to an underground passageway:

- completely enclosed and climate controlled at all times (unlike the current temporary bridges at Vesey and Rector Streets)

- seamless indoor connection between the WFC and the WTC Transportation Hub (i.e., pedestrians should not simply be deposited on the sidewalk, as the east end of the South Bridge did prior to 9/11 and as the temporary bridges at Vesey and Rector Streets do now)

- well-illuminated around the clock (for safety reasons)

- large windows to provide views of the neighborhood

- security at both ends (like the North Bridge, which had security guards in the WFC at one end and in One World Trade Center at the other, providing a high degree of safety 24 hours per day)

- indoor escalators (both up and down) and elevators that work in all weather conditions, with building personnel at each end responsible for quickly repairing breakdowns (anchoring the bridge with a Class A office building or the equivalent at each end would work best, which suggests linking such a bridge to the Freedom Tower in some fashion should be considered)

- west end of the bridge connecting to second floor of the WFC (where the elevator lobbies are) for the convenience of WFC office workers, preferably at the Winter Garden (where the North Bridge terminated)

If a high quality pedestrian bridge meeting the foregoing standards cannot be provided, then we agree than the proposed east/west pedestrian tunnel should be the preferred alternative even though the Hudson River Bulkhead will need to be pierced, resulting in an adverse effect on this historic resource. The need for a pedestrian passageway that will transport large numbers of pedestrians across West Street during the rush hours is critical if the residential and commercial properties in Battery Park City are to survive and prosper in the years to come. We call to your attention, however, the fact that this is one more reason for not putting a car tunnel under West Street. Such a car tunnel would result in even more extensive damage to the Hudson River Bulkhead.

At the June 14 meeting, I also spoke up in support of another Consulting Party who was concerned about the proposed plans to remove the last intact piece of the underground portion of the World Trade Center at the passageway to the NYCT "E" train. That passageway is the one WTC remnant that preserves the feeling of what it was like to enter the WTC indoor concourse from the train platform. As an "E" train rider for eight years prior to 9/11, I was very moved when they reopened that passageway in connection with the opening of the temporary PATH station. When I walk up those stairs or that ramp, I can visualize the old concourse, and that experience is magnified when I step a few feet into the temporary PATH station and see the escalators from the PATH train emerging at their same pre-9/11 location. I am sure that thousands of other people

familiar with this passageway share these feelings. Simply preserving the materials and moving them elsewhere is not going to preserve the feeling of the WTC that is provided by those materials and that passageway in their current location. We urge that the designers and architects be asked to take a careful look at their plans to see if there is a creative way to maintain this passageway in the current location within the framework of the overall design. If it is deemed appropriate to go to great lengths to preserve truncated box-beam columns and a slurry wall which were invisible to the masses of people who visited the WTC site daily prior to 9/11, then it should be that much more important to preserve a remnant that emerged relative unscathed and that is recognizable and very familiar to the thousands of people who used the "E" train passageway daily.

We are resigned to, and accept, the decision to remove the structural remnants of the former plaza and subway access from Vesey Street, due to the heavy damage to these remnants and their lack of permanent stability or functionality. We also agree with the decision to remove the steel beams in cross form from the site. This "steel cross" would be particularly inappropriate as a permanent part of the site because of its association with one particular religion at a site where people of many religions (and of no religion) perished.

In closing, I would simply like to observe that, while most local residents are sensitive to preservationist concerns as well as the need for remembrance and honoring those who perished, we do not want those concerns to significantly delay the redevelopment of the site and its ultimate return to the level of commercial and retail vitality that existed prior to 9/11. One preservationist at the June 14 meeting of the Consulting Parties argued, in essence, for trying to preserve everything that might be deemed a "ruin" by future generations. I and most other local residents could not disagree more strongly. We do not want to live next door to a "ruin" that is preserved for tourists (any more than we want to live next to a "graveyard," as some of the family members opposing redevelopment of the site have deemed it). The primary focus has to be on the redevelopment of the site and the economic revitalization of Lower Manhattan. Otherwise, we could find ourselves on the path of economic decline, and that could end up ratifying one of the goals of the attackers – to cause us severe economic harm.

Thank you for the opportunity that I and other members of the Coalition have been afforded to participate in the Section 106 review process.

Yours truly,

Bill Love
Vice Chair, Coalition to Save West Street
W: (212) 306-1789
H: (212) 786-4897
blove93@earthlink.net

LOWER MANHATTAN EMERGENCY PRESERVATION FUND

Municipal Art Society | National Trust for Historic Preservation | New York Landmarks Conservancy | Preservation League of New York State | World Monuments Fund

FACSIMILE COVER SHEET

To: Anthony Cracchiolo
The Port Authority of NY & NJ
212 435-5514

Bernard Cohen
Federal Transit Administration
212 668-2505

Kevin Rampe
Lower Manhattan Development Corporation
212 962-2431

Don L. Klima
Advisory Council on Historic Preservation
202 606-5072

From: Lower Manhattan Emergency Preservation Fund

Date: July 8, 2004

Pages: Cover plus 3

Re: Comments on Finding of Effect for the Permanent WTC PATH Terminal

PLEASE DELIVER THIS FAX IMMEDIATELY – THANK YOU

Municipal Art Society
457 Madison Avenue
New York, NY 10022
212 935-3960

National Trust for Historic Preservation
1785 Massachusetts Avenue, NW
Washington, DC 20036
800 944-NTHP

New York Landmarks Conservancy
141 Fifth Avenue
New York, NY 10010
212 995-5260

Preservation League of New York State
44 Central Avenue
Albany, NY 12206
518 462-5658

World Monuments Fund
95 Madison Avenue
New York, NY 10016
646 424-9594

LOWER MANHATTAN EMERGENCY PRESERVATION FUND

Municipal Art Society | National Trust for Historic Preservation | New York Landmarks Conservancy | Preservation League of New York State | World Monuments Fund

June 23, 2004

Response of the Lower Manhattan Emergency Preservation Fund to the Permanent WTC PATH Terminal Draft Environmental Impact Statement (DEIS).

Good afternoon. My name is Ken Lustbader and I represent the Lower Manhattan Emergency Preservation Fund. The Fund is a coalition of five leading preservation organizations that was formed in response to the events of September 11th. The group consists of the Municipal Art Society, the National Trust for Historic Preservation, the New York Landmarks Conservancy, the Preservation League of New York State, and the World Monuments Fund.

The LMEPF commends the DEIS for addressing historic preservation concerns and for identifying the numerous historic resources that contribute to the character and architectural significance of Lower Manhattan.

Most broadly, we are concerned about the possible impact that vibrations will have on adjacent historic properties and recommend state-of-the-art vibration monitoring. We are especially concerned about the cumulative impact of numerous construction projects on the surrounding historic properties and recommend that a single entity be charged with overseeing construction monitoring.

Specifically, we are concerned that the proposed project will negatively impact a number of surviving elements that are currently part of the WTC Site itself. These elements are called out in the National Register Determination of Eligibility and we are requesting that the PA provide more detailed information regarding why certain elements are proposed for removal and/or demolition. While we are not promoting the preservation of the site as it currently exists and look forward to rebuilding, we believe that the FTA and PA needs to view the site as historic, make attempts to incorporate existing elements into the design goals, and provide an analysis and detailed explanation if the preservation of these elements cannot be achieved.

We offer the following specific comments regarding certain elements that may be affected:

Tower Perimeter Column Bases

- We appreciate the attempt to minimize the encroachment over the perimeter column bases which outline the footprints of Towers One and Two; however, we are concerned about the cumulative impact that additional construction activities will have on minimizing access to these bases. Although the PA is not a party to the Programmatic Agreement for the WTC Site Memorial and Redevelopment Plan, we are requesting that they adhere to the design and construction goals outlined in the document. The Memorial Center Advisory Committee recently recommended providing access to these bases and this should be a recognized goal of all coordinated construction activities. Additionally, as stated in the Draft Section 4(f) Evaluation, creative and meaningful architectural treatments should be developed to demark and/or expose the locations of the column bases.

Northwest Remnant Subgrade Structures

- As part of a separate review, we previously recommended that the PA consult with museum curators and investigate the possibility of salvaging more than three elements from the northwest remnant subgrade structures. Additional elements, along with Tito Dupret's photographs, could provide for a more effective interpretation of the WTC Site.

Passageway to the E-Train

- As one of the last surviving elements of the WTC Site, the passageway to the E-train was recently restored and the PA should revisit the proposed plan to have it demolished. We are requesting that additional analysis be done with the goal of incorporating it into the new design.

Steel Beams in Cross Form

- Currently, the PA proposes to remove the steel beam in cross form to an off-site location. We are requesting that instead of moving the cross off site, it be moved temporarily within the WTC site. Should it have to be moved off-site, we should be provided with an explanation as to why, and confirmation that it will be moved to Hanger 17 at JFK where it will be properly stored.

Plaza and Subway Entrance at Vesey Street

- The plaza and subway entrance at Vesey Street are the only surviving above ground elements of the WTC Site. The current plan to have them demolished should be revisited with the goal of possibly incorporating them in situ into the new design. This proposed demolition, with no detailed justification or explanation, underscores our request for additional information as to how decisions to demolish elements were made.

The LMEPF recognizes the unprecedented nature of this undertaking and the importance of ensuring for meaningful public input as rebuilding proceeds. We appreciate the outreach that the PA doing with various interest groups and look forward to continued participation.

Thank you for the opportunity to express the LMEPF's views.

Contact Information:

Ken Lustbader
Preservation Consultant
Lower Manhattan Emergency Preservation Fund
c/o New York Landmarks Conservancy
141 Fifth Avenue
New York, NY 10010
212 995-5260

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received: 07/21/04
Type: Comment Sheet

Contact Details:
Yvonne Morrow
315 8th Avenue, #14E
New York, NY 10001
P 212-242-5909; **F** ; **E**

Location:

Comment:
(1) I support the option with the exit/entrance in Liberty Plaza. Prior to 9/11, I believe more than 40% of PATH users exited to the WTC complex at the SE corner. This option would be beneficial for both pedestrian and vehicular flow (2) Must coordinate construction of the permanent WTC Transportation hub through the "Lower Manhattan Construction Command Center" to mediate the severe impacts of so many construction projects happening at the same time. (3) Absolutely necessary to mediate/prevent severe impacts on existing buildings near the WTC site - especially historic and/or historically eligible properties. Two buildings in point, 125 Cedar Street and 114 Liberty Street, are directly across the street from the WTC site and were severely impacted by events of 9/11. In fact, the residents of 125 Cedar were not able to move back in for 16 months and, I believe, the residents of 125 Cedar were not able to move back in for 16 months and, I believe, the residents of 114 Liberty are still not back in. The impacts of rebuilding the WTC site and envirions can be horrendous on these folks. Special plans must be instituted to mediate these impacts. These folks have suffered enough - way beyond enough.

BE A PART OF THE PROCESS...

THE WORLD TRADE CENTER TRANSPORTATION HUB

Draft Environmental Impact Statement for the Permanent WTC PATH Terminal

DEIS Public Hearings
Tuesday, June 22, 2004 - Jersey City
Wednesday, June 23, 2004 - Lower Manhattan

Please use this comment form to let us know your thoughts about this important project. Please leave this form wit us today or **mail by July 21, 2004** to: WTC PATH Terminal - Comments, The Port Authority of NY & NJ, 115 Broadway, 5th Fl., NY, NY 10006 or fax to (212) 435-5514.

Contact Information:

Name YVONNE MORROW

Organization/Affiliation

Street Address 315 8TH AVENUE (14E)

City NYC State NY Zip 10001

Tel 212-242-5909

Fax

E-mail

Are you a part of any organization that would like to hear more about the project?

Who can we contact in your organization?

Comments (Please use additional sheets if necessary):

(1) I SUPPORT THE OPTION WITH AN EXIT/ENTRANCE IN LIBERTY PLAZA. PRIOR TO "9/11", I BELIEVE MORE THEN 40% OF PATH USERS EXITED THE WTC COMPLEX AT THE SE CORNER. THIS OPTION WOULD BE BENEFICIAL FOR BOTH PEDESTRIAN AND VEHICULAR FLOW

(2) MUST COORDINATE CONSTRUCTION OF THE PERMANENT WTC TRANSPORTATION HUB THROUGH THE "LOWER MANHATTAN CONSTRUCTION COMMAND CENTER" TO MEDIATE THE SEVERE IMPACTS OF SO MANY CONSTRUCTION PROJECTS HAPPENING AT THE SAME TIME

(3) ABSOLUTELY NECESSARY TO MEDIATE/PREVENT SEVERE IMPACTS ON EXISTING BUILDINGS NEAR THE WTC SITE — ESPECIALLY HISTORIC AND/OR HISTORICALLY ELIGIBLE PROPERTIES. TWO BUILDINGS IN POINT, 125 CEDAR STREET AND 114 LIBERTY STREET, ARE DIRECTLY ACROSS THE STREET FROM THE WTC SITE AND WERE SEVERELY IMPACTED BY EVENTS OF "9/11". IN FACT, THE RESIDENTS OF 125 CEDAR WERE NOT ABLE TO MOVE BACK IN FOR 16 MONTHS AND, I BELIEVE, THE RESIDENTS OF 114 LIBERTY ARE STILL NOT BACK. THE IMPACTS OF REBUILDING THE WTC SITE AND ENVIRONS CAN BE HARASSING ON THESE FOLKS. SPECIAL PLANS MUST BE INSTITUTED TO MEDIATE THESE IMPACTS. THESE FOLKS HAVE SUFFERED ENOUGH — WAY BEYOND ENOUGH!

United States Department of Transportation
Federal Transit Administration

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received:	06/28/04	**Type:** Written Comment
Contact Details:	James P. O'Shea Real Estate Consultant **P** 718-786-5431; **F** ; **E**	**Location:**

Comment:
1) Design - beautiful, but too costly at $2 Billion! New rolling stack cost $800 Million! Original location was site of 30/50 Church Street - Hudson Tubes - greater connectivity to financial district and transfer point to N&R BMT. 2) E train at Vesey/Church should be linked into N&R BMT - about 100' distance to carry IND service to south end of district at Whitehall/Water streets - or even further to Brooklyn. 3) Since masterplan seems to be still in flux it may be prudent to wait upon finalization before building this hub.

To: Mr. Shawn Lenahan
Port Authority of New York and New Jersey (PANYNJ)

August 4, 2004

Dear Mr. Lenahan:

I am submitting the attached joint reply letter from the New Jersey Association of Railroad Passengers (NJ-ARP) and the Regional Rail Working Group (RRWG), dated August 4, 2004, directed to Mr. Anthony G. Cracchiolo for submission into the NEPA Draft Environmental Impact Statement (DEIS) record dealing with the reconstruction of the permanent PATH Terminal at the World Trade Center site in downtown Manhattan. Also being submitted for that same record is an accompanying letter, dated April 23, 2004, from Mr. George Haikalis, Chair RRWG.

This morning, Mr. Haikalis contacted Mr. Lou Venech, PANYNJ Senior Manager, Transportation Policy Development, to discuss submission procedures. Mr. Venech replied that we direct this correspondence to your attention. It is hereby attached and copied in plain text below.

Subsequently, I will submit a printed copy of both documents to you for your records.

Sincerely,

Albert L. Papp, Jr.
New Jersey Association of Railroad Passenger, Director
121 Northfield Road,
Millington, N.J. 07946-1353
(973)762-1831
alpappjr@earthlink.net

Mr. Anthony G. Cracchiolo
Director, Priority Capital Programs The Port Authority of NY & NJ
233 Park Avenue South, 4rth Floor
New York, NY 10003

August 4, 2004

Dear Mr. Cracchiolo,

We are in receipt of your letter of June 10th, 2004 detailing your agency's evaluation of NJ-ARP's proposal dealing with the "Connection of PATH to New York City's Lexington Avenue Subway."

We would request that the following response be entered into the formal NEPA record of the Draft Environmental Impact Statement (DEIS) concerning the reconstruction of the permanent PATH Terminal at the World Trade Center (WTC) site in lower Manhattan.

We thank you and your associates for the time and effort involved in evaluating our series of proposals but feel that certain aspects of them were misunderstood and misinterpreted by both the PANYNJ, and your consultant, Parsons, Brinckerhoff, Quade & Douglas, Inc. (Parsons Brinckerhoff) whom you retained to examine the multiple facets of the design, constructability, operation and maintenance and federal regulations of the PATH/Lex Connection. In turn, adoption of, and strict adherence to, New York City Transit's (NYCT) best practices for grades, curvature and intersecting line separation distances as put forth in the "MW-1 Track Standards and Reference Manual" virtually precludes not only the PATH/Lex Connection but also most future subway or regional rail construction both in lower Manhattan and, in fact, much of the rest of Borough as well. It was none other than Norm Silverman, New York City Transit Director of Operations Planning, who stated at our March 26, 2004 meeting that exceptions from these standards were possible as long as the deviations were not extreme. That we adhered to current practices should be proof positive that the PATH/Lex Connection was conceived within operational constraints.

We feel compelled to state at the outset that NJ-ARP, and subsequently the "Regional Rail Working Group," (RRWG) was hopeful that a relatively frequent and truly interactive process between your agency, the consultants and our group could have materialized in order in to refine the PATH/Lex Connection over its almost 15 month gestation period. In fact, this did not occur. If it had, certain technical elements of the plan could have been discarded early on and led to more fruitful discussions between all parties thereby saving everyone involved considerable time and effort. To cite but one specific example, Parsons Brinckerhoff presented in their December 11, 2003 Figure 3 a gradient of 10.8% when referring to NJ-ARP "Alignment 2.1." That Parsons Brinckerhoff would even propose a further "Alternative Alignment to NJARP Proposal," dated

December 4, 2003, that employed a 15.9% grade and that it would be offered by the PANYNJ neither enhanced the credibility of our cause nor contributed to an effective on-going dialogue on the proposal. Clearly, grades of this kind are operationally impossible in service, were never proposed by NJ-ARP and should never have been attributed to our advocacy groups. So it should come as no surprise to you that NJ-ARP and the RRWG are profoundly dismayed and disappointed with your statement to "...not plan any further investigation of the proposed connection at this time."

NJ-ARP and the RRWG would like to address several of your comments regarding concept, alignment selection, station placement, vehicle compatibility and operational criteria and funding.

Concept

The original concept of the PATH/Lex Connection emerged from wide ranging discussions in the aftermath of the unprecedented terrorist attack on the World Trade Center on September 11, 2001. For over 10 years, the PANYNJ has been the lead agency on the "Access to the Region's Core" (ARC) study whose initial goal was to tie the tri-state metropolitan region together through the expansion of the existing regional rail network by adding capacity enhancements at several key choke points. Among them, this included the addition of two trans-Hudson rail tracks and, in one option, the connection between New York Penn Station (NYP) with Grand Central Terminal (GCT) with a physical track linkage. A key consideration in the later, as explained in the scoping document for the initiation of this study, was the critical determination that about 70% of all midtown job sites are within a short walk of GCT. The importance of east midtown has been accentuated as many employers relocated their facilities in the wake of the terrorist attack. But with the lack of any substantive relief from the ARC project expected in the near term -- implementation is years, if not decades, in the future -- NJ-ARP concluded that many of the anticipated benefits to be provided by ARC, principally access to midtown Manhattan, could be achieved relatively quickly (within three to four years) and inexpensively ($800 million to $1 billion) by the PATH/Lex Connection given the forthcoming reconstruction efforts at the WTC site.

Alignment and Constructability

With that in mind, and after our initial meeting with the PANYNJ on March 31, 2003 and subsequently with the PANYNJ and the MTA/NYCT on March 26, 2004, NJ-ARP, then joined by the RRWG, refined its alignment in several iterations to comply with best practice operating parameters of the existing PATH and NYCT properties. The PATH/Lex Connection is premised on grades of 4.5%, curve radii of 200 feet and a minimum rail to rail clearance of 17 feet (where the connecting track passes under the "A" and "C" subway line) and 14 feet (where the track link passes over the "#2" and "#3" line at Beekman Street).

We do agree that the paramount issue is the feasibility of building these close clearance intersections without infringing on the reliability of these heavily traveled lower Manhattan transportation arteries. However, we do not agree with your allegation that "...we were unable to identify a feasible vertical alignment that can be constructed to avoid all of the PATH and subway lines and meet in the Brooklyn Bridge Station..." and therefore reject "...the variation offered in your April 23rd letter as a workable solution."

We would be disingenuous if we didn't remind the PANYNJ, NYCT and Parsons Brinckerhoff that the NYCT's much praised #7 line operates on two minute headways and surmounts 4.5% grades in its Steinway Tunnels located to the west of Grand Central Terminal and in Long Island City. Even steeper gradients can be found on the approaches to the East River Bridges. The PATH has used 115 foot radius curves on its WTC approach and departure tracks for 30 years while NYCT has turned trains on its 147 foot radius City Hall loop for a century, both with no ill effect on operational reliability. Because of the age of the structures in this part of the City (some dating back to Colonial times) and the narrow street grid, engineering of the City's early subway infrastructure was carefully built to preclude damage to any number of priceless historic structures. And if success can be gauged by the yardstick of longevity and uninterrupted service, these lines have served the City faithfully for almost a century and likely will continue to do so for at least several more. And so the fundamental question remains "Why change the rules of the game when the current ones are perfectly adequate." Or in the vernacular, "If it ain't broke, don't fix it." And yet that is exactly what NYCT has done.

NJ-ARP and RRWG revised its plan and submitted "Alignment 2.8" to you on April 23rd to be in accordance with physical constraints of the existing PATH and NYCT infrastructure. Yet Parsons Brinckerhoff suggests that 230 foot curve radii result in track that impinges on the footprint of One WTC, interferes with the temporary PATH Station and has grades in excess of 6%. In fact, this alignment employs 200 foot radii curves, avoids the footprints of both WTC towers (something the present "temporary" station fails to achieve), passes over the tracks and platforms of the temporary station (albeit taking some of the northern part of the concourse) and has grades of no more than 4.5%, all this within existing NYCT practices. If the only reason that can be found to reject further discussion of this alternative is to invoke more restrictive clearance distances, grades and curving standards, then it is a grim portent, indeed, for future Manhattan mobility options.

While constructability would be challenging, it is not impossible. Ways were devised during the building of the WTC to keep PATH running and we have no doubt the creativity of the PANYNJ and MTA/NYCT engineers and designers will rise to the occasion, if only those agencies would be afforded the opportunity to do so. While this alternative would sever the southbound City Hall Lexington Avenue #6 loop track, this interruption in service would only occur after all other

work is finalized. Certainly, the 63rd Street tunnel local-express connection was built under the heavy load experienced by the Queens Boulevard four track subway line and underpinning of lines in service is not unknown during subway construction and station alterations.

As NJ-ARP and the RRWG listened to the comments of PATH and NYCT concerning operational constraints of an integrated system -- at least in the near future -- we devised "Alternative 4.2" that features a cross platform transfer between the #6 Lexington Avenue local (which is extended from its Brooklyn Bridge terminal to the WTC site) and the PATH. The separation between the two transit systems is maintained and the City Hall loop severed and taken out of service with the #6 subway trains reversal now taking place at the WTC site. If and when operational, jurisdictional and equipment issues can be harmonized, through running could still be adopted. This alignment stays within the bathtub on the west to avoid expensive, wet construction in West Street and to make continued operation of the temporary PATH station easier but does extend south of the bathtub to achieve less restrictive curve radii.

Station Placement

The Parsons Brinckerhoff analysis suggests that the proposed station location for the NJ-ARP "Alignment 2.1" "...would be located on the 4.0% grade. This exceeds the NYCT criteria of 0.5% maximum grade for new station construction. Also the switches within the interlockings would be placed on grades exceeding the 1.5% maximum allowable grade, and would be located within vertical curves." NJ-ARP spent considerable time with industry professionals and examined closely appropriate track diagrams to assure that the revised station location in "Alignment 2.8" which is oriented in a northeasterly direction is, in fact, on a gradient of 0.5% and meets NYCT criteria. Comprised of a basic two track, side platform facility, it is close to, and formally aligned with, the proposed station entrance just south of Fulton Street. A close examination by Parsons Brinckerhoff of the vertical cross section of "Alignment 2.8" should have revealed that the top of rail clearance between the tracks of the temporary station and those of the tracks leading to the WTC PATH/Lex station is 14 feet, perfectly adequate to allow the temporary facility to continue operations during construction of the new link. The grade never exceeds 4.5%, this in direct contrast to Parsons Brinckerhoff's assertion that it contains a "...track grade in excess of 6% to avoid the A/C, N/R, and 4/5 subway lines." NJ-ARP and the RRWG never suggested that a tunnel boring machine be used for station or right-of-way construction; rather, the openness of the "pit" pointed to a reduced cost of building in that nearby "soft ground." Underpinning is a typical facet of underground development, whether for subways, water, sewer or utility lines.

Vehicle Compatibility and Operational Criteria

We examined the dimensional differences between the IRT and PATH vehicles and have concluded that while width, length and truck center variations are evident, there is no technical barrier preventing the design of a hybrid vehicle to allow operation on both transit systems. In fact, the PANYNJ had considered an add on order to the NYCT's R-142 purchase according to an article in the Newark Star-Ledger. That the PATH has announced an order to replace much, if not all, of its aging fleet was a principal reason in crafting the PATH/Lex proposal after the terror attack on 9/11.

Through operation between the PATH and Lexington Avenue subway using 10-car trainsets need not necessitate lengthening "...all PATH platforms..." The Draft Environmental Impact Statement (DEIS) states that "...PATH plans to implement 10-car service on its Newark-WTC line..." but this action "...is not planned at this time." Still, Newark, Journal Square, Exchange Place and the WTC stations are already capable of accommodating 10-car PATH trainsets. Only Harrison and Grove Street have not been enlarged but could still accommodate 10-car sets although certain ones would not open their doors at that location. The Hoboken line does present a challenge, which, while not insuperable, would initially restrict through running to only the Newark line.

As to car widths, given that PATH vehicles are 8.75 inches wider than IRT cars, the width of the PATH fleet replacement purchase would be reduced accordingly, resulting in a 4.375 inch narrower profile on the platform side with PATH platforms reduced in a like amount. No interior passenger room need be lost since the exterior of the car can turn in more sharply at platform level than at present.

Recall that "Alignment 4.2" was presented to you to circumvent this difficulty and permit the continuation of separate non-integrated PATH/NYCT system operation with variable PATH train lengths until that time when all operational, jurisdictional and vehicle compatibility issues could be overcome.

Funding

One of the inevitable questions that was raised in the gestation of the PATH/Lex proposal is where the money would originate for its construction. Presently, the cost for the permanent WTC station ranges between $1.7 billion and $2.0 billion with the PANYNJ requesting $1.4 billion to $1.7 billion from FEMA/FTA. Our estimate for the 3000 feet of track to link the downtown PATH tunnels to the #6 Lexington Avenue local line at Brooklyn Bridge Station is about $800 million to $1 billion, using the 8 mile, $16 billion Second Avenue subway expense as a guide. No official thought that any remaining federal monies were left over to be directed to PATH/Lex. Yet, late in July, the Bush Administration, subject to Congressional approval, agreed to pay New York some $2 billion in additional transportation money in a swap for unused tax credits that were part of a $20 billion 9/11 aid

package. The White House agreed that the City could redirect the Liberty Zone tax benefits into transportation related projects.

The project that will be the recipient of these funds is a direct track link to New York City's JFK Airport with a new tunnel under the East River. Yet, with a short 1.5 mile extension of the PATH to Newark Liberty International Airport (EWR) from Newark Penn Station (ignoring for the moment the NEC airport monorail interface which provides two stop service to New York Penn Station) at a fraction of the JFK $6 billion cost, travelers would be able to access lower Manhattan on an existing PATH rail line that has experienced a 50% decline in ridership from that which existed on 9/10/01. And if the PATH/Lex Connection was built, this direct airport access would extend to the entire east side of Manhattan as well. To us, this sounds like a far better transit investment than a $6 billion tunnel under the East River to bring, at most, several thousand airline riders a day into downtown Manhattan.

NJ-ARP and the RRWG remain committed to a continuing constructive dialogue with the PANYNJ and NYCT regarding the PATH/Lex Connection even though your letter claims that the two agencies "...do not plan any further investigation of the proposed connection at this time." This opportunity is finite and eventually will no longer be available to merit consideration. Our concern remains that if this PATH/Lex proposal is not addressed in an expeditious manner, the opportunity will be lost for generations. Yet if all stake holders can put aside their own individual jurisdictional and institutional imperatives, this transportation link can be implemented and held out as a positive accomplishment in the wake of one of the most tragic episodes in American history.

Sincerely,

Albert L. Papp, Jr.
New Jersey Association of Railroad Passengers,
Director

George Haikalis
Regional Rail Working Group,
Chair

Regional Rail Working Group
A Consortium of Transit Advocacy Organizations:
New Jersey Association of Rail Passengers
Empire State Passengers Association
Committee for Better Transit
Institute for Rational Urban Mobility, Inc.

George Haikalis, Chair
One Washington Square Village, Suite 5D
New York, NY 10012
212-475-3394
geohaikalis@juno.com

April 23, 2004

Mr. Lou Venech
Sr. Manager Transportation Policy Development
Port Authority of NY and NJ
Authority
233 Park Avenue South, 11th Floor
New York, NY 10003

Mr. William Wheeler
Director, Planning
Metropolitan Transportation

347 Madison Avenue
New York, NY 10019

Re: Recommended Alignment for the PATH-Lex Connection

Dear Lou and Bill:

Thank you for arranging the March 26, 2004 meeting with representatives of our respective organizations to discuss the geometric characteristics of the proposed PATH-Lex connection. Based on suggestions made at the meeting, the Regional Rail Working Group (RRWG) has carefully reworked its plan and produced a revised alignment, which is feasible using design practices that are well within the parameters of the existing subway and PATH systems. This "Basic Alignment (2.8)" is shown in the attached drawing. Clearly, Lower Manhattan's colonial era street pattern and its densely developed structures prevent an alignment that completely meets the "best practices" for building new rapid transit routes. None of the existing rapid transit lines serving this area, including the newly rebuilt PATH line, meets these ideal standards.

The substantial benefits of this connection were enumerated at the RRWG's October 22, 2003 meeting with Congressman Jerrold Nadler, and are described in statements made by several of the group's member organizations at the environmental hearings for both the new PATH station and the World Trade Center redevelopment. Given the unanticipated opportunity to achieve these benefits, because of the extraordinary and tragic losses resulting from the 9/11 terrorist attack, taking some liberties from the "best practices" standards is certainly justified.

Alignment issues

The Regional Rail Working Group's proposed connection uses a minimum 200 foot radius curve and a minimum *bottom of rail to bottom of rail* clearance of 17 feet where

the new line passes under the existing A and C line at Church Street, and 14 feet where it passes over the existing 2 and 3 line at Beekman Street.

The RRWG's plan is a considerable improvement over the "no build" plan, which leaves both PATH and NYC Transit operating on existing 115 foot and 147 foot radius curves, respectively at the WTC terminal and the City Hall loop. Note also that the PANYNJ's recently completed AirTrain at Kennedy International Airport includes a 225 foot radius curve. This line was built to handle specially-designed "one-seat-ride" trains that could also operate on NYC Transit or the LIRR.

The RRWG plan requires a 4.5% grade, identical to grades experienced on the #7 Flushing subway line just west of Grand Central, and in Queens after crossing the East River approaching the Vernon-Jackson Station. NYC Transit operates very reliable service at two-minute headways through much of the peak hour on this busy line. Even steeper grades are found at several other locations in the NYC Transit subway system. The maximum grade on the Kennedy AirTrain is 5.35%.

Constructability

The attached drawing shows the proposed connection shifted slightly to the north at Church Street, avoiding the tube section of the A and C subway line. Clearly, this will require a careful underpinning and reconstruction of the cut-and-cover segment of the existing subway for 50 to 100 feet. This would be an ambitious, but not unprecedented effort, not unlike NYC Transit's recently completed local-express connection of the 63rd Street subway with the Queens Boulevard line. At Beekman Street the connection crosses over the 2 and 3 subway line. Since this construction would involve excavation downward from Park Row, a tight vertical clearance over an operating railroad is feasible. It is between these two crossing points, under the A and C line and over the 2 and 3, that the steepest grade is experienced. By minimizing the vertical clearances at these two points and by beginning vertical curves after these two critical crossing points are cleared, a 4.5% grade is achieved on this segment. The crossing under the 4 and 5 subway at Park Row is less constrained, with about 30 feet bottom of rail to bottom of rail clearance. A similar clearance is available for the crossing under the R and W lines at Vesey Street.

The City Hall loop of the #6 subway would be severed by the proposed southbound connecting
track. This interruption would occur as a final step after all other work is completed. The connection would pass over the new temporary PATH terminal, cutting off the northern portion of the concourse. When the PATH-Lex connection is completed and placed in service, the existing
PATH terminal could be removed and the space released to accommodate other subsurface activities at the WTC site. In this "basic alignment" all service would flow through Lower Manhattan, just as it now does on the 2 and 3 lines or the 4 and 5 lines. Instead of crossing the East River, the PATH-Lex connection crosses the Hudson River, greatly easing travel between the two states. Going beyond the "basic alignment", the

RRWG has identified a wide range of more complex options, permitting turn-back of trains or including more platform tracks. The RRWG would be happy to share these concepts with you.

The December 11, 2003 Parsons Brinckerhoff plan distributed at the meeting calls for more generous clearances than suggested by the RRWG, resulting in a 10.8% grade. This grade is clearly unacceptable, and should not be attributed to the RRWG or NJ-ARP. The central issue is the feasibility of constructing these limited clearance crossings without disturbing service on these busy subway lines. RRWG would welcome an opportunity to discuss this matter with PANYNJ and NYCT engineers and planners.

Request for Additional Information

Finally, we would like to repeat our request for two studies conducted by PANYNJ. One is the study of possible extension of platforms at the Hoboken PATH Station to accommodate longer trains, done in the mid-1980s. The other is the analysis of procurement of new PATH cars similar to NYC Transit 'A" Division subway cars, done prior to 9/11. At the meeting we also asked if we could obtain detailed vertical elevations that were described in the Parsons Brinckerhoff analysis distributed at the meeting.

Conclusion

This revised plan for the PATH-Lex connection offers substantial benefits for the riding public. While it does not adhere to current "best practices" design standards, the proposed alignment is well within the parameters of existing transit facilities operated by PANYNJ and NYC Transit. The connection is feasible and the question to be decided is whether the benefits are significant enough to outweigh the costs.

Thank you for your assistance.

George Haikalis
Chair, Regional Rail Working Group

cc Norman Silverman, NYCT
John Dean, MTA
Shawn Lenahan, PANYNJ
Kevin Lejda, PATH
Kieran Spillane, Parsons Brinckerhoff
Members of RRWG
Congressman Jerrold Nadler

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received:	06/21/04	**Type:**	Email
Contact Details:	Scott Pasternack	**Location:**	
	P ; **F** ; **E** scott_pasternack@yahoo.com		

Comment:
Dear Port Authority, My comment pertains to achieving better environmental results from this Downtown PATH/MTA Restoration Program by creating combined PATH/MTA ticketing options that will make underground rail use more cost-effective for NJ-NY travel than using cars. To encourage greater ridership (particularly on nights and weekends) and to lessen use of automobiles in tunnels, over bridges, and on streets between NJ and NY, Port Authority and MTA should agree to a ticket arrangement that would allow the user to pay one price for a combined PATH/MTA ride (and should also consider combined unlimited PATH/MTA tickets similar to MTA's current unlimited monthly subway pass). If the combination of riding PATH and MTA were made more cost effective, then more people would opt to use the underground rail and forgo use of cars -- especially on nights and weekend when the assumption is that there is less rush hour traffic. For example a family of 4 currently spends $7 per person (or $28) for roundtrip ride on PATH ($3 r/t)and MTA ($4 r/t) to come to NYC to visit a museum or go to a restaurant, etc. Yet, to drive a car through the Holland Tunnel, pay a parking meter, gas, and car wear & tear, the family of four would pay less than $28, probably only about $18-20. The combination of lower cost and greater convenience makes the car more appealing than underground rail -- and with use of the car comes the increase in air pollution, congestion and noise that this environmental review for this Downtown Restoration Plan is designed to prevent. Instead, if there were a combined PATH/MTA ticket (a daily one for $2.00 or $2.50 per person; a monthly for $70.00 or $75.00 per person) then that family of four might now reconsider the rail. Spending only about $8-10 ($2-$2.50 per person), the family of four might now forgo the car (and the traffic that comes with it) and use underground PATH and MTA, as is envisioned -- especially on nights and weekends. In the end, if public transportation is meant to truly achieve better environmental results, it needs to be priced competitively with cars, ESPECIALLY on nights and weekends when there is less traffic than rush hour. Thank you.

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received: 07/08/04 **Type:** Letter
Contact Details: **Location:**
Lower Manhattan Emergency Preservation Fund
P ; F ; E

Comment:
Letter sent on 7/8 by Lower Manhattan Emergency Preservation Fund - Scanned

LOWER MANHATTAN EMERGENCY PRESERVATION FUND

Municipal Art Society | National Trust for Historic Preservation | New York Landmarks Conservancy | Preservation League of New York State | World Monuments Fund

July 8, 2004

Anthony Cracchiolo
Director
Priority Capital Programs
The Port Authority of NY & NJ
233 Park Avenue South, 4th Floor
New York, NY 10003

Bernard Cohen
Director
Lower Manhattan Recovery Office
Federal Transportation Administration
One Bowling Green, Suite 436
New York, NY 10004

Re: Permanent WTC PATH Terminal Finding of Effects Pursuant to Section 106 of the National Historic Preservation Act

Dear Messrs. Cracchiolo and Cohen:

The five organizations that make up the Lower Manhattan Emergency Preservation Fund (LMEPF) support the building of the Permanent PATH Terminal as part of the revitalization of Lower Manhattan, and thank the PA and FTA for our involvement as Consulting Party. However, we have a number of serious concerns about the Section 106 process and how it is being implemented for this project. As requested, we are submitting the following comments concerning the proposed Finding of Effects (FOE) and will be submitting written testimony on the Draft Environmental Impact Statement (DEIS) before July 21st.

Most broadly, the LMEPF is concerned about the following:

- **The FOE Fails to Consider Cumulative Effects.** The FOE addresses the PATH Terminal as an isolated project and does not consider the cumulative impact that it will have on the National Register-eligible World Trade Center Site (WTCS) in conjunction with the numerous other projects soon to be underway (Route 9A, Freedom Tower, Memorial, Memorial Center, etc.). Each of these projects is being reviewed separately under Section 106 with little or no ability for the consulting parties to address effects and alternatives holistically. There is a significant risk that decisions made in the context of one project will foreclose alternatives or opportunities to minimize adverse effects for the other projects. For this reason, it is difficult, if not impossible, to evaluate this specific project's impact without taking into account how the other projects may also affect the site and existing remnants. For example, the LMEPF is concerned about the location of various site infrastructure elements that would impact the visibility of and accessibility to the column bases themselves. The information provided in the FOE is vague and the impact that these elements could have on the site should be coordinated with the cumulative infrastructure needs of all WTCS projects.

- **The Proposed Project Fails to Comply with the Requirement of Section 4(f) to Include "All Possible Planning to Minimize Harm."** The FOE does not include, nor were we ever provided with, any record of how decisions to demolish or remove National Register-eligible remnants were made. Section 4(f) of the Department of Transportation Act adopted by Congress in 1966 states that transportation projects must avoid harming historic sites unless there is "no feasible and prudent alternative," and the project includes "all possible planning to minimize harm" to historic places. While we are not suggesting that the site be preserved as it is, we strongly believe that the PA and FTA need to approach the project from the point of view that the work will be taking place within and around a historic site and make attempts to incorporate existing elements into the design goals, provide an analysis and detailed explanation if the preservation of these elements cannot be achieved, and provide mitigation solutions.

- **Precluding Visibility and Access to Remaining Features of the WTC Must be Acknowledged as an Adverse Effect.** The LMEPF requests that the following sentence be removed from page 6 of the FOE (Section B - Effects of the Undertaking on the WTC Site) since we believe it is an incorrect interpretation of the feeling of the WTC Site: "Because most of the features were not visible to the public prior to September 11, 2001 and would remain intact, obscuring the features from public view would not necessarily diminish the site's integrity of feeling." We strongly disagree. This statement does not take into account that these features took on a different meaning and feeling as surviving elements of the September 11th attacks. Whether or not they were in public view prior to the attacks is irrelevant because as they now exist, and with their current visibility, they "convey the tragedy and destruction" described in the National Register Determination of Eligibility (DOE). As a result, we believe that obscuring these features from public view would diminish the site's integrity of feeling, and it is important for the FOE to acknowledge this effect.

- **Need for Recommendations for Architectural Treatments.** The LMEPF recommends that the FTA and PA establish recommendations for specific architectural treatments that interpret remnants that are adversely impacted by the PATH Terminal. For example, the interior of the concourse that will cut through the slurry wall could indicate the location or provide a view of the wall itself giving pedestrians a sense of the bathtub's location. This concourse, which will be located along the northern elevation of the North Tower, could include design treatments indicating or providing visual access to the location of the former tower's façade and locations of the column bases.

As stated in our public testimony on June 23rd, we are specifically concerned that the proposed project will negatively impact a number of surviving elements that are currently part of the WTC Site itself. These elements are called out in the DOE and, as previously stated, we are requesting that the FTA and PA provide more detailed information regarding why certain elements are proposed for removal and/or demolition:

- **Tower Perimeter Column Bases.** We appreciate the attempt to minimize the encroachment over the perimeter column bases which outline the footprints of Towers One and Two; however, we are concerned about the cumulative impact that additional construction activities will have on reducing access to and visibility of these bases. In our view, a concerted effort must be made to maximize the access to and visibility of this significant part of the site. The Memorial Center Advisory Committee recently recommended providing access to these bases and this should be a recognized goal of all coordinated construction activities.

- **Northwest Remnant Subgrade Structures.** As part of a separate review, we previously recommended that the PA consult with museum curators and investigate the possibility of salvaging more than three elements from the northwest remnant subgrade structures. We have received no meaningful response to our earlier comments, and information about additional historic features that could possibly be salvaged has not been disclosed. The FOE fails to take into account our request and it appears that no additional elements will be salvaged.

- **Passageway to the E-Train.** As one of the last surviving elements of the WTC Site, the passageway to the E-train was recently restored and the PA and FTA should revisit the proposed plan to have it demolished. No reason has been offered as to why the passageway cannot be retained. We are requesting that additional analysis be done with the goal of incorporating it into the new design.

- **Steel Beams in Cross Form.** Currently, the PA and FTA propose to remove the steel beam in cross form to an off-site location. We are requesting that instead of moving the cross off-site, it be moved temporarily within the WTC site. This has become a highly evocative element of the site and an effort should be made to retain and incorporate it. Should it have to be moved off-site, we should be provided with an explanation as to why, and confirmation that it will be moved to Hanger 17 at JFK where it will be properly stored.

- **Plaza and Subway Entrance at Vesey Street.** The plaza and subway entrance at Vesey Street are the only surviving above ground elements of the WTC Site. The current plan to have them demolished should be revisited with the goal of possibly incorporating them in situ into the new design. This proposed demolition, with no justification or explanation, underscores our objections and our request for additional information as to how decisions to demolish elements were made.

The five organizations of the LMEPF recognize the unprecedented nature of this undertaking and the importance of ensuring for meaningful public input as rebuilding proceeds. The LMEPF reiterates our position that the PA and FTA should work toward the goal of minimizing harm and adverse effects on the World Trade Center Site.

We appreciate the outreach that the PA and FTA are doing with various interest groups and look forward to continued participation.

Sincerely,

Frank E. Sanchis, III
Executive Director
Municipal Art Society
457 Madison Avenue
New York, NY 10022
212 935-3960

Elizabeth S. Merritt
Deputy General Counsel
National Trust for Historic Preservation
1785 Massachusetts Avenue, N.W.
Washington, D.C. 20036
202 588-6035

Peg Breen
President
New York Landmarks Conservancy
141 Fifth Avenue
New York, NY 10010
212 995-5260

Scott Heyl
President
Preservation League of New York State
44 Central Avenue
Albany, NY 12206
914 462-5658

Bonnie Burnham
President
World Monuments Fund
95 Madison Avenue
New York, NY 10016
646 424-9594

cc: Kevin Rampe, Lower Manhattan Development Corporation
Don L. Klima, Advisory Council on Historic Preservation

LOWER MANHATTAN EMERGENCY PRESERVATION FUND

Municipal Art Society | National Trust for Historic Preservation | New York Landmarks Conservancy | Preservation League of New York State | World Monuments Fund

August 2. 2004

cc: B. McNeely
C. Calvert (LMRF)
C. Ryan (HSC)
T. Stickelman
B. Wong

Anthony Cracchiolo
Director
Priority Capital Programs
The Port Authority of NY & NJ
233 Park Avenue South, 4th Floor
New York, NY 10003

Bernard Cohen
Director
Lower Manhattan Recovery Office
Federal Transportation Administration
One Bowling Green, Suite 436
New York, NY 10004

Re: Permanent WTC PATH Terminal Draft Environmental Impact Statement (DEIS) and Finding of Effects (FOE)

Dear Messrs. Cracchiolo and Cohen:

On behalf of the Lower Manhattan Emergency Preservation Fund (LMEPF), the following are our written comments on the Draft Environmental Impact Statement (DEIS) and Finding of Effects (FOE) for the Permanent WTC PATH Terminal. Each of the five organizations that make up the LMEPF support the building of the Terminal as part of the revitalization of Lower Manhattan and appreciate the opportunity to contribute to the rebuilding process.

Most broadly, the LMEPF is concerned about the following:

- **Cumulative Impact of Ground-Borne Vibrations From All Construction Projects.** The LMEPF is concerned about the cumulative impact of ground-borne vibrations and dewatering on historic resources from all World Trade Center Site and Lower Manhattan redevelopment projects. We recommend increasing the standards and adopting state-of-the-art monitoring methods to ensure that historic resources within the project site and Area of Potential Effect are protected. We are especially concerned that this project be coordinated by the single entity charged with overseeing all Lower Manhattan construction activities.

- **The Construction Protection Plan (CPP), Based on Technical Policy and Procedure Notice #10/88, Fails to Address Cumulative Impacts.** Chapter 6: Cultural Resources and Chapter 10: Noise and Vibration state that the CPP will be based on the requirements laid out in the "New York City Department of Buildings Technical Policy and Procedure Notice #10/88." This Notice, dating from June 6, 1988, deals with procedures for avoiding damage to historic structures resulting from adjacent construction of a single project. It does not include procedures, vibration standards, and monitoring programs for cumulative construction projects.

- **The Finding of Effects (FOE) Included in the DEIS Fails to Consider Cumulative Effects.** The FOE addresses the PATH Terminal as an isolated project and does not consider the cumulative impact that it will have on the National Register-eligible World Trade Center Site (WTCS) in conjunction with the numerous other projects soon to be underway (Route 9A, Freedom Tower, Memorial, Memorial Center, etc.). Each of these projects is being reviewed separately under Section 106 with little or no ability for the consulting parties to address effects and alternatives holistically. There is a significant risk that decisions made in the context of one project will foreclose alternatives or opportunities to minimize adverse effects for the other

projects. For this reason, it is difficult, if not impossible, to evaluate this specific project's impact without taking into account how the other projects may also affect the site and existing remnants. For example, the LMEPF is concerned about the location of various site infrastructure elements that would impact the visibility of and accessibility to the column bases and footprints of the twin towers. The information provided in the FOE is vague and the impact that these elements could have on the site should be coordinated with the cumulative infrastructure needs of all WTCS projects.

- **Precluding Visibility and Access to Remaining Features of the WTC Must be Acknowledged as an Adverse Effect.** The LMEPF requests that the following sentence be removed from page 6 of the FOE (Section B - Effects of the Undertaking on the WTC Site) since we believe it is an incorrect interpretation of the feeling of the WTC Site: "Because most of the features were not visible to the public prior to September 11, 2001 and would remain intact, obscuring the features from public view would not necessarily diminish the site's integrity of feeling." We strongly disagree. This statement does not take into account that these features took on a different meaning and feeling as surviving elements of the September 11th attacks. Whether or not they were in public view prior to the attacks is irrelevant because as they now exist, and with their current visibility, they "convey the tragedy and destruction" described in the National Register Determination of Eligibility (DOE). As a result, we believe that obscuring these features from public view would diminish the site's integrity of feeling, and it is important for the FOE to acknowledge this effect.

- **The Proposed Project Fails to Comply with the Requirement of Section 4(f) to Include "All Possible Planning to Minimize Harm."** Section 4(f) of the Department of Transportation Act requires that transportation projects must avoid harming historic sites unless there is "no feasible and prudent alternative," and the project includes "all possible planning to minimize harm" to historic places. 49 U.S.C. § 303. As stated in our public testimony on June 23rd, and reiterated at the consultation meeting on July 20, we are specifically concerned that the proposed project will negatively impact a number of surviving elements that are currently part of the WTC Site itself. We recognize that complete avoidance of historic properties would be impossible, given the inextricable relationship between the PATH Terminal and the World Trade Center site. Nonetheless, the project needs to incorporate more modifications that would minimize harm to the various contributing elements of the site. The proposed list of mitigation measures on page 4(f)-13 of the Draft Section 4(f) Evaluation needs to be expanded. Additional measures to minimize harm, which should be incorporated into a Memorandum of Agreement (MOA) under Section 106, should include the following:

  - **Minimize Encroachment on the Tower Footprints.** As we discussed at the July 20, 2004 consultation meeting, the Port Authority should conduct a much more stringent analysis of ways to reduce the footprint of the main passenger platforms in order to reduce encroachment on the footprints of the twin towers.[1] Alternatives should include eliminating or narrowing the width of the new western-most platform. In addition, the MOA should incorporate a specific commitment to keep utilities and other infrastructure outside the tower footprints.

  - **Maximize Visual and Physical Access to Tower Perimeter Column Bases.** We appreciate the Port Authority's efforts to minimize the encroachment over the perimeter column bases which outline the footprints of Towers One and Two; however, we are concerned about the cumulative

[1] The Draft Section 4(f) Statement describing elements of the historic site that would be "used" by the PATH project needs to be revised to include a specific discussion of the Tower Footprints in addition to the Tower Perimeter Column Bases. *See* DEIS at 4(f)-4. The footprints as a whole should be explicitly acknowledged as a significant contributing element of the site.

impact that additional construction activities will have on reducing access to and visibility of the bases. In our view, a concerted effort must be made to maximize the access to and visibility of this significant part of the site. The Memorial Center Advisory Committee recently recommended providing access to these bases and this should be a recognized goal of all coordinated construction activities.

- **Include Architectural Treatments to Increase Public Interpretation of WTC Remains.** The LMEPF recommends that the MOA incorporate specific architectural treatments that will increase public awareness and interpretation of remnants from the World Trade Center that will be adversely affected by the PATH Terminal. For example, the interior of the concourse that will cut through the slurry wall could indicate the location or provide a view of the wall itself, giving pedestrians a sense of the bathtub's location. This concourse, which will be located along the northern elevation of the North Tower, could also include design treatments indicating or providing visual access to the location of the former tower's façade and locations of the column bases. In addition, we support the concept of incorporating into the passenger platforms a design demarcation that would identify the footprint of the twin towers to the extent that infringing upon the footprint is found to be unavoidable.

- **Salvage or Preserve Additional Elements From Northwest Remnant Subgrade Structures.** We previously recommended that the Port Authority investigate the possibility of salvaging more than three elements from the northwest remnant subgrade structures. We appreciate the Port Authority providing us with additional photographs of the northwest slab remnants, which we just received today, and we will be reviewing these in order to offer more specific suggestions for mitigation through the MOA.

- **Preserve and Incorporate Passageway to the E-Train.** As one of the last surviving elements of the WTC Site, the passageway to the E-train was recently restored. We appreciate the Port Authority's commitment to additional analysis of this element in order to incorporate it into the new transportation hub.

- **Retain Steel Beams in Cross Form On-Site If Possible.** Instead of moving the cross off-site, as proposed, it should be moved temporarily within the WTC site, in order to minimize harm. This has become a highly evocative element of the site and an effort should be made to retain and incorporate it. Should it have to be moved off-site, we should be provided with an explanation as to why, and confirmation that it will be moved to Hanger 17 at JFK where it will be properly stored and accessible to the public.

- **Explore Options to Preserve or Relocate Plaza and Subway Entrance at Vesey Street.** The plaza and subway entrance at Vesey Street are the only surviving above-ground elements of the WTC Site. The current plan to have them demolished should be revisited. We recognize that the proposed plan for redevelopment creates significant constraints (if not outright conflicts) that severely limit or foreclose options for preserving this element of the site. Nonetheless, we appreciate the Port Authority's efforts to begin exploring those options as discussed at the July 20 meeting, in order to minimize harm.

The five organizations of the LMEPF recognize the unprecedented nature of this undertaking and the importance of ensuring for meaningful public input as rebuilding proceeds. The LMEPF reiterates our position that the Port Authority and the FTA should work toward the goal of minimizing harm and adverse effects on the World Trade Center Site and adjacent historic properties in the Area of Potential Effect.

We appreciate the outreach that the PA and FTA are doing with various interest groups and look forward to continued participation.

Sincerely,

Frank E. Sanchis, III
Executive Director
Municipal Art Society
457 Madison Avenue
New York, NY 10022
212 935-3960

Elizabeth S. Merritt
Deputy General Counsel
National Trust for Historic Preservation
1785 Massachusetts Avenue, N.W.
Washington, D.C. 20036
202 588-6035

Marilyn Fenollosa
Senior Program Officer & Regional Attorney
National Trust for Historic Preservation
7 Faneuil Hall Market Place
Boston, MA 02109
617 523-0885

Peg Breen
President
New York Landmarks Conservancy
141 Fifth Avenue
New York, NY 10010
212 995-5260

Scott Heyl
President
Preservation League of New York State
44 Central Avenue
Albany, NY 12206
914 462-5658

Bonnie Burnham
President
World Monuments Fund
95 Madison Avenue
New York, NY 10016
646 424-9594

cc: Kevin Rampe, Lower Manhattan Development Corporation
Carol Braegelmann, Federal Transit Administration
Paul Lebrun, Federal Transit Administration
Don L. Klima, Advisory Council on Historic Preservation
Carol Shull, National Park Service
Ruth Pierpont, New York State Office of Parks, Recreation, and Historic Preservation

THE WORLD TRADE CENTER TRANSPORTATION HUB
Permanent WTC PATH Terminal and Pedestrian Connections
Environmental Review Process
DEIS Comments Summary

Date Received: 06/21/04 **Type:** Email
Contact Details: Paul Scian **Location:**
P 212-458-1119; **F** ; **E** paul.scian@aig.com

Comment:
After quite a search, I found the drawings showing various options for the PATH restoration. It seems however that no matter where I searched, I could not find any drawings/sketches/plans for integration of the existing subways into a regional subsurface transportation hub. Am I just missing it or is the future integration of the various subway stations and PATH station with subsurface people movers not being planned any more? If so, it would be a tremendous loss to the rebirth and economic vitality of both downtown and NYC as a whole.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

cc: Memo
Graham
Sahni
Wong

June 15, 2004

cc
6/16

Anthony Cracchiolo, Director
WTC PATH Terminal
The Port Authority of New York and New Jersey
115 Broadway, 5th Floor
New York, NY 10006

Attn: Comments on the Permanent WTC PATH Terminal DEIS

Dear Mr. Cracchiolo:

The U.S. Fish and Wildlife Service (Service) has reviewed, and has the following comments on, the Draft Environmental Impact Statement (DEIS) for the Permanent WTC PATH Terminal, Borough of Manhattan, New York.

Project Description

The Port Authority of New York and New Jersey (Port Authority) proposes to construct a permanent terminal at the World Trade Center site for the Port Authority Trans-Hudson (PATH) system to replace the terminal that was destroyed during the September 11, 2001, terrorist attacks. The stated project purpose is to restore and enhance public transportation infrastructure to Lower Manhattan that would meet present and future needs and be compatible with the redevelopment of the World Trade Center. The project is located in the Borough of Manhattan, New York.

Threatened and Endangered Species

The Service notes that our August 26, 2003, letter stating that, with the exception of occasional transient individuals, no Federally-listed species or proposed threatened or endangered species under our jurisdiction are known to exist in the project impact area, was included in the DEIS. The Federally-listed endangered shortnose sturgeon (*Acipenser brevirostrum*) is found in the Hudson River and coastal areas near the project area. This species is under the jurisdiction of the National Oceanographic and Atmospheric Administration/Fisheries (NOAA/F). The Port Authority should contact Mr. Stanley Gorski, Habitat and Protected Resources Division, Area Coordinator, NOAA-F, James J. Howard Marine Sciences Laboratory, 74 Magruder Road, Highlands, NJ 07732 (telephone: 732-872-3037) for additional information on sturgeon and Essential Fish Habitat (EFH).

RECEIVED
JUN 16 2004
BY

The shortnose sturgeon is also listed by the State of New York. The New York State Department of Environmental Conservation (NYSDEC) contacts for the shortnose sturgeon are Mr. Peter Nye, Endangered Species Unit, NYSDEC, 625 Broadway, Albany, NY 12233-4753 (telephone: 518-402-8859) and Ms. Kathy Hatalla, NYSDEC, Hudson River Fisheries Unit, New Paltz, NY 12561 (telephone: 845-256-3071).

The NYSDEC requests that you be advised that the peregrine falcon (*Falco peregrinus*), listed as endangered by the State of New York, is known to occur in the vicinity of the project area. The project should, therefore, be coordinated with the NYSDEC. The NYSDEC contact for the peregrine falcon is Mr Peter Nye (see above contact information).

Aquatic Impacts

The Service has designated the Lower Hudson River estuary as a Significant Habitat Complex (USFWS 1997). Shellfish such as northern quahog (*Mercenaria mercenaria*), soft clam (*Mya arenaria*), and eastern oyster (*Crassostrea virginica*) are abundant in some areas. This is also an important spawning area for blue crab (*Callinectes sapidus*).

The lower Hudson River estuary is among the most productive systems on the northern Atlantic coast for fisheries (USFWS 1997). Marine finfish that use this area include American eel (*Anguilla rostrata*), Atlantic menhaden (*Brevoortia tyrannus*), fourbeard rockling (*Enchelyopus cimbrius*), bluefish (*Pomatomus saltatrix*), weakfish (*Cynoscion regalis*), northern pipefish (*Syngnathus fuscus*), and longhorn sculpin (*Myoxocephalus octodecemspinosus*). Estuarine fish that spawn in this stretch of the Hudson include winter flounder (*Pleuronectes americanus*), bay anchovy (*Anchoa mitchilli*), hogchoker (*Trinectes maculatus*), striped bass (*Morone saxatilis*), and mummichog (*Fundulus heteroclitus*) (USFWS 1997).

The Service recognizes that the proposed project construction would not occur along the Hudson River shoreline or waterfront areas. However, the DEIS stated that the final design may include the withdrawal of an undetermined quantity of cooling water from the Hudson River using the existing intake structures. Thermal discharges may also be required using existing infrastructure. Both of these actions can have negative impacts on aquatic species. Water withdrawals can result in fish impingement and entrainment, with early life stages (i.e. eggs, larvae, juveniles) being the most susceptible. Thermal discharges can result in decreases in dissolved oxygen levels and thermal stresses depending on the temperature and quantity of the discharge.

Given the importance of this area for aquatic species resources, the Service recommends using the closed cooling system option that was mentioned in the DEIS, or one of the dry-cool technologies that are available. Otherwise, we recommend incorporating best management practices to avoid impacts associated with impingement/entrainment and thermal discharge. Marine life exclusion systems have been developed to reduce impingement/entrainment, and these systems are constantly being improved.

Migratory Birds

Migratory birds including waterfowl and passerines use the area during spring and fall migration periods. Waterfowl species such as canvasback (*Aythya valisineria*), brant (*Branta bernicla*),

scaup (*Aythya* spp.), and black duck (*Anas rubripes*) can be periodically abundant throughout the winter months. Manhattan's Central Park is world renowned for providing the public with opportunities to witness a wide diversity of songbirds during migrations.

The Migratory Bird Treaty Act (MBTA) provides that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture, or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not without appropriate permits.

Through the MBTA, the Service is working with agencies and individuals to reduce impacts to migratory birds. We recommend the implementation of measures to avoid or reduce the likelihood of "take". Examples of these measures that would be applicable to this project include: 1) minimizing window lighting and using strobes on aerial towers/antennae for aircraft beacons (especially during migration periods - mid-March to mid-May and mid-August to mid-November), and 2) minimizing reflective window surfaces by using etched glass or adhesive films.

Summary Comments

The DEIS provides an adequate assessment of the resources in the project area and potential impacts to those resources. The Service recommends that the Port Authority: 1) contact the NOAA/F for information on EFH and Federally-listed species, 2) contact the NYSDEC for information on State-listed species, 3) use best available technologies to avoid or reduce water withdrawals/thermal discharges and minimize entrainment/impingement, and 4) avoid "take" of migratory birds as described above.

We appreciate the opportunity to comment on this project. If you have any questions regarding this letter, please contact Alex Chmielewski at the Service's New York Field Office (telephone: 607-753-9334).

Sincerely,

Anne d. Secord

for David A. Stilwell
Field Supervisor

Literature Cited:

USFWS. 1997. Significant Habitats and Habitat Complexes of the New York Bight Watershed. Department of the Interior - Fish and Wildlife Service, Coastal Ecosystems Program, Charlestown, Rhode Island.

cc: BFA (ERT), Washington, DC

The New York City Landmarks Preservation Commission

1 Centre Street, 9th Floor North New York NY 10007 TEL: 212-669-7922 FAX: 212-669-7797
http://www.nyc.gov/landmarks

61

To: Anthony Cracchiolo, Director of Priority Capital Projects
From: Amanda Sutphin, Director of Archaeology AS
Date: June 17, 2004
Re: May 2004 DEIS Review

The Landmarks Preservation Commission is in receipt of the May 2004 "Permanent WTC PATH Terminal Draft Environmental Impact Statement and Section 4(f) Evaluation."

The Commission notes that the text describing the potential impacts to potentially significant archaeological resources reflects the findings of Historical Perspectives Archaeological Documentary Studies dated October 2003, March 2004, and April 2004 as well as Cultural Resources Summary Report for the Route 9A Project prepared by Vollmer Associates LLP and dated April 1996 which are provided in Appendix B. The Commission has previously reviewed the October 2003, the March 2004, and the Route 9A Study. This is the first opportunity we have had to review the Phase 1A Archaeological Assessment for the Permanent World Trade Center PATH Terminal for the South Pedestrian Passageway, dated April 2004. The LPC cannot concur that there are no further archaeological concerns for this project area. Instead, we recommend that the consultant do additional research to substantiate their finding that Liberty St, Liberty Place, and Temple Street do not contain potentially significant archaeological resources. HPI's determination appears to be based upon the assumption that the installation of utilities would have disturbed the entire area. However, we note that there are examples, such as Chambers Street, where significant archaeological resources have remained intact at shallow levels irregardless of the high number of utilities that are present. We further note that additional research should be completed to determine whether these streets were widened as some streets in the vicinity were in the Colonial and early 19th century. If this happened at these streets and the project will impact these locations, there may be potential that early building foundations and their builders' trenches may be within the project area as well as water features that may once have been located in the historic sidewalk and are now within the streetbed.

The text related to historic architectural resources is appropriate.

cc: Bernard Cohen, Federal Transit Authority
Robert Kuhn, NY SHPO
Mary Beth Betts, LPC
Kate Daly, LPC

RECEIVED
JUN 22 2004
By

TOTAL P.02

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, DC 20240

TAKE PRIDE IN AMERICA

JUL 30 2004

RECEIVED
JUL 30 2004

ER-04/0420

Ms. Letitia Thompson
Regional Administrator
Federal Transit Administration, Region 2
One Bowling Green, Room 429
New York, New York 10014-1415

Dear Ms. Thompson:

This responds to a request for the Department of the Interior's (Department) review and comment on the Draft Environmental Impact Statement (DEIS) for the **Permanent World Trade Center PATH Terminal and (Subway) Pedestrian Connections, Lower Manhattan Development, New York County, New York.** We note that a Draft Section 4(f) Evaluation is included as a separate documentary part of Volume I of this DEIS, and will comment on it first.

DRAFT SECTION 4(f) EVALUATION

We concur that there are no feasible and prudent alternatives to the proposed project, if project objectives are to be met. However, we cannot concur with the Section 4(f) proviso that all planning for measures to minimize harm has been undertaken for cultural resources, considered as "Section 4(f) resources." As noted in the document, parties are exploring measures to minimize harm and are coordinating such measures through a Section 106 review under the National Historic Preservation Act. It is anticipated that measures and final commitments will be established between the consulting parties prior to publication of the FEIS. At that time, we would be pleased to review those measures in the final documents for this project so that our concurrence in the measures to minimize harm can be recorded.

DRAFT ENVIRONMENTAL IMPACT STATEMENT

CULTURAL and RECREATIONAL RESOURCES

Regarding recreational resources, this project is primarily an underground infrastructure when complete and should not interfere with surface recreation such as park land, except at access or egress portals, and in those situations it would be appropriate if consideration is given for safety and resource loss mitigation during construction.

Regarding cultural resources, we simply reiterate our comments above under the Section 4(f) review, wherein we have in effect reserved our rights and responsibilities to concur and agree to final determinations. The National Park Service (NPS), Heritage Preservation Services, 1201

Eye Street, NW, Washington, DC 20005, has indicated that the NPS should be notified directly whenever National Historic Landmarks are involved, two of which appear in this case. Contact on that matter can be made with Caroline Hall, Preservation Compliance Coordinator, the Preservation address given above, or by telephone at 202-354-2056.

NATURAL and WETLAND/WATER HABITAT RESOURCES

The Department endorses the comments by the U.S. Fish and Wildlife Service (FWS) sent on June 15, 2004, to Mr. Anthony Cracchiolo, Director, World Trade Center PATH Terminal, The Port Authority of New York and New Jersey (address below).

Project Description

The Port Authority of New York and New Jersey (Port Authority) proposes to construct a permanent terminal at the World Trade Center site for the Port Authority Trans-Hudson (PATH) System to replace the terminal that was destroyed during the September 11, 2001, terrorist attacks. The stated project purpose is to restore and enhance public transportation infrastructure to Lower Manhattan that would meet present and future needs and be compatible with the redevelopment of the World Trade Center. The project is located in the Borough of Manhattan, New York.

Threatened and Endangered Species

The FWS notes that our August 26, 2003, letter stating that, with the exception of occasional transient individuals, no federally-listed species or proposed threatened or endangered species under our jurisdiction are known to exist in the project impact area, was included in the DEIS.

The federally-listed endangered shortnose sturgeon (*Acipenser brevirostrum*) is found in the Hudson River and coastal areas near the project area. This species is under the jurisdiction of the National Oceanographic and Atmospheric Administration/Fisheries (NOAA/F). The Port Authority should contact Mr. Stanley Gorski, Habitat and Protected Resources Division, Area Coordinator, NOAA-F, James J. Howard Marine Sciences Laboratory, 74 Magruder Road, Highlands, NJ 07732 (telephone: 732-872-3037) for additional information on sturgeon and Essential Fish Habitat (EFH).

The shortnose sturgeon is also listed by the State of New York. The New York State Department of Environmental Conservation (NYSDEC) contacts for the shortnose sturgeon are Mr. Peter Nye, Endangered Species Unit, NYSDEC, 625 Broadway, Albany, NY 12233-4753 (telephone: 518-402-8859) and Ms. Kathy Hatalla, NYSDEC, Hudson River Fisheries Unit, New Paltz, NY 12561 (telephone: 845-256-3071).

The NYSDEC requests that you be advised that the peregrine falcon (*Falco peregrinus*), listed as endangered by the State of New York, is known to occur in the vicinity of the project area. The project should, therefore, be coordinated with the NYSDEC. The NYSDEC contact for the peregrine falcon is Mr. Peter Nye (see above contact information).

Aquatic Impacts

The FWS has designated the Lower Hudson River estuary as a Significant Habitat Complex (FWS 1997). Shellfish such as northern quahog (*Mercenaria mercenaria*), soft clam (*Mya arenaria*), and eastern oyster (*Crassostrea virginica*) are abundant in some areas. This is also an important spawning area for blue crab (*Callinectes sapidus*).

The lower Hudson River estuary is among the most productive systems on the northern Atlantic coast for fisheries (FWS 1997). Marine finfish that use this area include American eel (*Anguilla rostrata*), Atlantic menhaden (*Brevoortia tyrannus*), fourbeard rockling (*Enchelyopus cimbrius*), bluefish (*Pomatomus saltatrix*), weakfish (*Cynoscion regalis*), northern pipefish (*Syngnathus fuscus*), and longhorn sculpin (*Myoxocephalus octodecemspinosus*). Estuarine fish that spawn in this stretch of the Hudson include winter flounder (*Pleuronectes americanus*), bay anchovy (*Anchoa mitchilli*), hogchoker (*Trinectes maculatus*), striped bass (*Morone saxatilis*), and mummichog (*Fundulus heteroclitus*) (FWS 1997).

The FWS recognizes that the proposed project construction would not occur along the Hudson River shoreline or waterfront areas. However, the DEIS stated that the final design may include the withdrawal of an undetermined quantity of cooling water from the Hudson River, using the existing intake structures. Thermal discharges may also be required using existing infrastructure. Both of these actions can have negative impacts on aquatic species. Water withdrawals can result in fish impingement and entrainment, with early life stages (i.e., eggs, larvae, juveniles) being the most susceptible. Thermal discharges can result in decreases in dissolved oxygen levels and thermal stresses depending on the temperature and quantity of the discharge.

Given the importance of this area for aquatic species resources, the FWS recommends using the closed cooling system option that was mentioned in the DEIS, or one of the dry-cool technologies that are available. Otherwise we recommend incorporating best management practices to avoid impacts associated with impingement/entrainment and thermal discharge. Marine life exclusion systems have been developed to reduce impingement/entrainment, and these systems are constantly being improved.

Migratory Birds

Migratory birds including waterfowl and passerines use the area during spring and fall migration periods. Waterfowl species such as canvasback (*Aythya valisineria*), brant (*Branta bernicla*), scaup (*Aythya* spp.), and black duck (*Anas rubripes*) can be periodically abundant throughout the winter months. Manhattan's Central Park is world renowned for providing the public with opportunities to witness a wide diversity of songbirds during migrations.

The Migratory Bird Treaty Act (MBTA) provides that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture, or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not without appropriate permits.

Through the MBTA, the FWS is working with agencies and individuals to reduce impacts to migratory birds. We recommend the implementation of measures to avoid or reduce the likelihood of "take." Examples of these measures that would be applicable to this project include: 1) minimizing window lighting and using strobes on aerial towers/antennae for aircraft beacons (especially during migration periods - mid-March to mid-May and mid-August to mid-

November), and 2) minimizing reflective window surfaces by using etched glass or adhesive films.

Summary Comments

The FWS recommends that the Port Authority: 1) contact the NOAA/F for information on EFH and federally-listed species, 2) contact the NYSDEC for information on State-listed species, 3) use best available technologies to avoid or reduce water withdrawals/thermal discharges and minimize entrainment/impingement, and 4) avoid "take" of migratory birds as described above.

If you have any questions regarding this letter, please contact Alex Chmielewski at the FWS's New York Field Office (telephone: 607-753-9334).

Literature Cited: USFWS. 1997. Significant Habitats and Habitat Complexes of the New York Bight Watershed. Department of the Interior - Fish and Wildlife Service, Coastal Ecosystems Program, Charlestown, Rhode Island.

We appreciate the opportunity to provide these comments.

Sincerely,

for Willie R. Taylor
Director, Office of Environmental
Policy and Compliance

cc:
Mr. Anthony Cracchiolo, Director
World Trade Center PATH Terminal
Port Authority of New York and New Jersey
115 Broadway, 5th Floor
New York, New York 10006

Regional Plan Association
NJ CT NY

Written Statement on the World Trade Center Transportation Hub
June 23, 2004

RPA strongly supports the construction of the World Trade Center Transportation Hub to restore long-term access to Lower Manhattan and connectivity to the NYC Subway system, contributing to the revitalization and economic recovery of Lower Manhattan.

We are particularly pleased by the selection of Santiago Calatrava as the lead architect for the station, and his graceful and symbolic design of the freestanding grand pavilion unveiled in January of this year. The commitment to rebuilding the public and civic spaces of Lower Manhattan with high quality architecture holds great promise for Lower Manhattan's future. The design of the pavilion that allows light to reach down to the platform level of PATH trains supports a long-held goal of RPA that transit facilities should be open to light and air to orient the rider to the street above and improve the user experience.

RPA also supports the functionality of the transportation hub as described in the DEIS, including the expansion of the station to accommodate five tracks and four ten-car platforms. Coherent connections to the 1/9, R/W and E subway lines will enhance connections to the subway system to the benefit of commuters moving to and through Lower Manhattan.

The preliminary design of the station suggests it will correct the deficiencies of the former station by providing sufficient capacity for the 175,000 people a day that will be making their way on foot from PATH to the subways or the buildings and streets above. It is imperative that the new station avoid hidden spaces, narrow corridors, steep stairwells, low ceilings, and poor ventilation -- all mistakes of the past station, which we now have an opportunity to correct. For example, the width of stairways between levels should be sufficient to meet the RPA-recommended standard of 3 pedestrians per minute per foot of width in peak periods. This translates into adequate stairway and escalator capacity between platform and mezzanine. We are looking forward to meeting with the Port Authority's architects and planners as the terminal is designed.

Within the context of our strong support for the project, we offer several additional recommendations for your consideration:

1. We support the Terminal without Liberty Plaza Connection Alternative for the project. While the EIS has demonstrated poor pedestrian levels of service at Church and Liberty Streets without the underground passageway, the proposed mitigation measures of widening sidewalks and crosswalks are in fact extremely desirable. In contrast, the Liberty Plaza Connection if built would draw

pedestrians underground below Church Street, undermining the viability of street-level retail, which is an important component of animating street life in Lower Manhattan. The Liberty Plaza connection would also require the appropriation of public open space in Liberty Plaza for access and egress to the passageway, and cost $81 million – a price we feel is not justified by its relatively slim benefits.

2. Second, as a consulting party to the Section 106 historic review process, RPA recommends that the Port Authority make an extraordinary effort to stabilize, preserve and incorporate historic elements of the WTC site, such as the box-beam column remnants that delineate the footprints of the World Trade Center towers, into the rebuilt station, so that they may serve as constant physical testaments to the immeasurable historic importance of this place as commuters, visitors, residents and family members move through the station.
3. Third, we commend the Port Authority for adopting Environmental Performance Criteria to mitigate the cumulative environmental impact of multiple Lower Manhattan Recovery Projects. However, we urge the Port Authority with the other agencies to strengthen the EPCs to protect Lower Manhattan air quality and reduce noise and vibrations. We support the recommendations of Environmental Defense, that the EPCs should be strengthened to the level of Local Law 77, including greater requirements for using Ultra Low Sulfur Diesel Fuel and best available retrofit technology not just to onsite generators and heavy duty equipment, but to moving vehicles delivering to and from the site.

Finally, we look forward to greater details from the Port Authority regarding the specific design of the outdoor public space around the PATH pavilion, as well as the retail mix of the below-grade shops, their planned square footage, and the retail strategy in light of potential slow rates of office space absorption.

While the Port Authority has designed a station that will provide seamless and pleasant underground connections between important Lower Manhattan destinations; we believe the success of Lower Manhattan's revitalization will depend greatly on the quality of the pedestrian experience at the street level. We therefore urge you to pay great attention to the design of the public plaza surrounding the PATH pavilion, as well as the public spaces throughout the World Trade Center site, which hold the greatest potential to provide a positive or negative user experience during the decade of construction that lies ahead of us.

Regional Plan Association
NJ CT NY

July 21, 2004

Anthony Cracchiolo
Director
Priority Capital Programs
The Port Authority of NY & NJ
233 Park Avenue South, 4th Floor
New York, NY 10003

Bernard Cohen
Federal Transit Administration, Lower Manhattan Recovery Office
One Bowling Green, Room 436
New York, NY 10004

Dear Mr. Cracchiolo (Tony) and Mr. Cohen (Bernard):

Thank you for the opportunity to submit comments on the Draft Environmental Impact Statement (DEIS) for Permanent World Trade Center PATH terminal, as well as the Preliminary Finding of Effects (FOE) for the Permanent World Trade Center PATH terminal, pursuant to the Section 106 Process. This letter is supplemental to RPA's testimony at the June 23rd public hearing and includes specific comments on the Section 106 historic review process. A written version of our June 23 comments is attached to this letter.

RPA strongly supports the construction of the World Trade Center Transportation Hub to restore long-term access to Lower Manhattan and connectivity to the NYC Subway system, contributing to the revitalization and economic recovery of Lower Manhattan. We are pleased by many aspects of the plans for the new station, including its distinctive architectural design that will allow for air and light to reach to the platform level, and the functionality of the station that will provide seamless connections to the 1/9, R/W and E subway lines. While we strongly support the project, we have specific concerns about the Section 106 process that we wish to bring to your attention.

- **Section 106 Process and Finding of Effects:** While we appreciate the Port Authority's efforts with the consulting parties regarding the Section 106 process, we are concerned that design and construction is moving forward so quickly that major elements of historic importance risk being compromised each day. For that reason we would like to see more specific and concrete plans detailing how major elements of historic significance will be stabilized, preserved, and made accessible in conjunction with the rebuilding of the new WTC PATH station.

  We agree with the comments made by the Lower Manhattan Emergency Preservation Fund (LMEPF) in their letter of July 14 and in particular with the point that precluding visibility and access to remaining features of the WTC must

be acknowledged as an adverse effect. It is not enough to "preserve" elements of historic significance, such as the box beam column remnants marking the tower footprints, under layers of concrete. If the preservation of these elements is to have any meaningful role in the rebuilt site, the elements must be visible or accessible to the public on a day-to-day basis. The experience of moving though a modern and rebuilt station that references the historic significance of the site by allowing glimpses of historic elements (glass panes permitting viewing of the slurry wall, indicators in the floor marking the Tower footprints, etc.) is extremely desirable and would imbue the quotidian commuter experience with the layers of meaning that its history demands.

Therefore we ask the Port Authority to immediately prepare specific plans to incorporate the viewing and access of historic elements into the everyday experience of the new station. In cases where adverse impacts to certain elements are absolutely unavoidable, the Port Authority should immediately share plans with the consulting parties for the mitigation of these adverse impacts.

The elements that we believe hold particular significance to the site and opportunity for preservation and incorporation into the new station are listed below. We look forward to reviewing plans from the Port Authority about how these elements may be incorporated into the design of the new station for viewing and access to these elements, preferably in locations where they currently sit.

- Box beam column remnants marking the tower perimeter
- Northwest remnant sub-grade structures
- Passageway to E-Train
- Steel beams in cross form
- Plaza and Subway entrance to Vesey Street

Thank you again for the opportunity to provide comments on the Section 106 process. We look forward to reviewing forthcoming plans for incorporating these important historic elements of the WTC site into a new functional and historic World Trade Center transportation hub.

Sincerely,

Robert D. Yaro
President

Appendix H-4: Section 106 Review Meeting Transcripts

CONTENTS

June 14, 2004	Section 106 Consulting Parties Meeting 225 Park Avenue South, New York, New York
July 20, 2004	Section 106 Consulting Parties Meeting 115 Broadway, New York, New York
August 19, 2004	Section 106 Consulting Parties Meeting 225 Park Avenue South
November 4, 2004	Section 106 Consulting Parties Meeting 225 Park Avenue South
November 15, 2004	Section 106 Consulting Parties Meeting 225 Park Avenue South

WTC TRANSPORTATION HUB
PERMANENT WTC PATH TERMINAL
SECTION 106 CONSULTING PARTIES MEETING

JUNE 14, 2004
THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
225 PARK AVENUE
NEW YORK, NEW YORK

WTC TRANSPORTATION HUB
PERMANENT WTC PATH TERMINAL
SECTION 106 CONSULTING PARTIES MEETING

JUNE 14, 2004
PORT AUTHORITY OF NEW YORK AND NEW JERSEY
225 PARK AVENUE
NEW YORK, NEW YORK

Transcription by Jane Rose Reporting

PORT AUTHORITY OF NEW YORK AND NEW JERSEY
Timothy Stickelman
Lou Menno
Carla Bonacci
Peter Rinaldi
Stephanie Talbert
Jackie Hanley
Steve Coleman
Bernie McNeely
Shawn Lenahan
Mark Pagliettini
Harold Levitt
Bill Wong
Paul DeMeo
Anthony Cracchiol

FTA - LOWER MANHATTAN RECOVERY OFFICE
Bernard Cohen
Peter Goelz
Paul Lebrun

AMERICAN PLANNING ASSOCIATION
Eric Allison

WORLD TRADE CENTER NATIONAL MEMORIAL
Louise Lo Presti

COALITION OF 9/11 FAMILIES
Joel Klein
Anthony Gardner

HISTORIC DISTRICTS COUNCIL
Robert Kornfeld

STATE HISTORIC PRESERVATION OFFICE
Ruth Pierpont

ADVISORY COUNCIL
Charlene Vaughn

NYC LANDWORKS PRESERVATION COMMISSION
Katy Daly

REGIONAL PLAN ASSOCIATION
Petra Todorovich

COALITION TO SAVE WEST STREET
Bill Love
Marilyn Gaull-Howard

LOWER MANHATTAN EMERGENCY PRESERVATION FUND
Ken Lustbader

NY STATE ASSEMBLY SPEAKER SHELDON SILVER
Deborah Lester

BATTERY PARK CITY AUTHORITY
Adam Alter

DOWNTOWN ALLIANCE
Anna Melman

NEW YORK STATE DEPARTMENT OF TRANSPORTATION
Shilpan Patel
Adam Levine

AKRF
Robert Conway
Anne Locke
Chris Calvert
Andrea Burke

LOWER MANHATTAN DEVELOPMENT CORPORATION
Irene Chang

PARTNERSHIP FOR NEW YORK CITY
Patty Noonan

FEDERAL TRANSIT ADMINISTRATION
Carol Braegelmann

LOUIS BERGER GROUP
John Hotopp

NATIONAL TRUST - WASHINGTON, D.C.
Elizabeth Merritt

NATIONAL TRUST - BOSTON, MA
Marilyn Fellonossa

June 14, 2004
Port Authority of New York and New Jersey
225 Park Avenue
New York, New York
3:00 p.m.

- - -

MR. COHEN: Good afternoon, everyone. My name is Bernard Cohen. I'm the Director of the Federal Transit Administration's Lower Manhattan Recovery Office. I'm pleased to welcome you here today.

Because the Port Authority project, the PATH project, is a federally funded project, my office, the FTA office in Lower Manhattan, is working very closely with the Port Authority on the planning efforts that are underway for the project, including the 106 process.

So it's my pleasure to welcome you here today and to just give you a minute of background.

You will recall that the initial Section 106 meetings that took place in January and February were conducted under the auspices of multiple agencies--HUD, LMDC, FTA, FHWA,

Port Authority--and that's because at that time we were all jointly involved in developing a document that was used to determine and identify the eligibility of historic resources at the World Trade Center site; and with your involvement and your comments, the outcome of that earlier set of meetings was a coordinated determination of National Register eligibility for the World Trade Center site that was released on March 31st, 2004.

Having made that determination together, as a group of agencies, we have now proceeded individually to look at, on a project-by-project basis, the respective projects' potential effects on these historic resources.

So to that end, the focus for this afternoon's meeting is to discuss the draft determination of effects of the permanent World Trade Center site PATH Terminal project, some of which will have adverse impacts on historic resources at the site.

We're going to talk about that in more detail, we're going to review some early mitigation ideas that we have, and most

importantly, we're going to receive your comments and ideas on both.

There's a great deal of material to go over today, so at this point I'm going to turn the meeting over to our facilitator, Peter Goelz, but I would like to thank you in advance for your time and your participation in the consulting parties meeting today.

Peter?

MR. GOELZ: Good afternoon. It's good seeing all of you again.

As Bernard said, our task today is to really dig into the presentation that's going to be made by the Port Authority staff as it pertains to the World Trade Center PATH Terminal.

As you know, there's been -- I've facilitated a couple of meetings prior to this. This is the first one that's going to focus specifically on the PATH Terminal.

The way in which the agenda is set up is we're going to hear about the 106 process from both Tim Stickelman and John Hotopp, and feel free to ask questions after each one of those folks.

But the real meat of the presentation comes from the Port Authority's staff, and what I would like to do is let them move through their presentation in its entirety.

What I would encourage each of you to do, as questions come up, write them down and write down the number of the slide that will show up in the corner so we Can go back to visit them.

At the end of the presentation by Lou Menno, I'll come back up and we'll just start taking questions. I think that way we'll be able to get as much input from you folks as is humanly possible over the next two hours.

MS. MERRITT: This is Betsy Merritt speaking. Could you e-mail the slides to Marilyn and I?

MR. STICKELMAN: Marilyn, We're going to have to do that separately because we can't do it right now. But we will provide it.

MS. FELLONOSSA: Well, last time we didn't realize there was going to be new materials brought up at the meeting. Last time you sent us the slides in advance. It's just

not clear why that wasn't thought of, if there was going to be new materials. I mean, how can we ask questions based on slides if we can't even see them? It really wasn't a problem last time because you e-mailed them to us.

MR. STICKELMAN: I would have done that but I did not have the slides yet. I mean, I did think about that when I sent you the call-in number, but I did not have the slides, and we will provide that, because we discussed that.

MS. FELLONOSSA: It's not possible for someone to e-mail them now?

MR. STICKELMAN: No.

MS. FELLONOSSA: I find that hard to believe. That surprises me that that's not possible.

MS. LO PRESTI: Are the slides on premise?

MR. STICKELMAN: No.

MS. FELLONOSSA: I mean, even the National Trust would have the technical capability to do that.

MR. STICKELMAN: We just can't do it right now, Marilyn, but I did think about

that, and we will provide them hopefully later this afternoon.

MS. FELLONOSSA: Well, I would appreciate it, then, if the facilitator could describe what's being shown.

MR. GOELZ: Well, to the best of my ability, I will try and do that, or I will ask the speakers to also describe it.

I would point out, I mean, it's unfortunate you didn't get the slides today, but you will have them, and the comment period is open for some period of time, so you will be able to comment on them. And this is not the only meeting we're going to have on this subject.

MS. FELLONOSSA: Well, we are aware of that. But could you just refresh our recollection as to the written comment date for the slides being shown today?

MR. STICKELMAN: The comment period ends on July 21, 2004.

MS. FELLONOSSA: For the slides you are showing today?

MR. STICKELMAN: Well, we are going to discuss when we're going to ask for

comments back from the consulting parties at the end of this session.

MR. GOELZ: Right.

MR. STICKELMAN: But the comment period for the DEIS, which includes the Section 106 process, is July 21, 2004.

MS. FELLONOSSA: Okay. The whole DEIS, including today? Including today?

MR. STICKELMAN: Excuse me?

MS. FELLONOSSA: You are saying the comments for the whole DEIS as well as the today, right, is July 21?

MR. STICKELMAN: Correct.

MS. FELLONOSSA: Okay.

MR. GOELZ: All right. Any other questions?

Well, Tim, since you've already started, why don't you step to the plate.

MR. STICKELMAN: Good afternoon, everyone. My name is Tim Stickelman, with the Port Authority. Many of you know me already.

I'm going to do a quick overview of the Section 106 process to date and what has happened.

As Bernard earlier said, the FHWA, the FTA, LMDC, HUD, and the Port Authority and NYS DOT had coordinated hearings in regards to the determination of eligibility for the World Trade Center site, which took place on January 6th and February 2nd, with comments that came back in.

We then issued a coordinated determination of eligibility for the World Trade Center site on March 31st, 2004.

In addition, the Port Authority, with the help of the LMDC, had some tours of Hangar 17, which many of you participated in, so you could see the artifacts that the Port Authority had in its possession.

The Port Authority also provided a preliminary draft of an artifacts inventory, which we are updating as we speak right now, and an updated inventory will be provided, hopefully soon.

I know that they are actually working very diligently out at Hangar 17 on the secondary lot of steel to include in the artifact inventory for you.

As you are aware, the

coordinated DOE was actually issued on March 31st. I know some of you may be aware, and I just wanted to point out that there was a letter that was sent by the Advisory Council to the keeper for National Historic Landmarks to look at the DOE and give their opinion, advisory opinion, on that DOE, and we are well aware of that with the FTA.

We do not believe that that is going to invalidate the DOE in any way, but they're looking for their expert opinion on that.

When we sent you an invitation for this party, we issued our draft effects document for you to look at. I believe you all received that about two weeks ago, which is also included in the draft EIS for comment.

The comment period for the draft EIS and for the determination of effects is July 21st.

We will speak to you at the end of this meeting about possibly asking for your input prior to that, not that you are going to be cut off before July 21st, but to get feedback from you before the public comment

period so we can possibly have other consulting party meetings after this one.

This is just an overview of the PATH project in regards to its environmental process.

As you know, the draft EIS for the PATH project was issued on June 4th, and we're here having a Section 106 meeting on June 14th.

The DEIS public hearings are going to be June 22nd in New Jersey and June 23rd in New York.

As you can see, we are hopefully going to get comments from you sometime in July on the draft effects comment, but we will talk about dates with you because we want to hear your input on that.

We hope to have another Section 106 consulting parties meeting sometime in July, and as I said here, the draft EIS written comments are due on June 21st, and we will be sharing with you a Section 106 draft MOA agreement on the effects document, and with written comments on the MOA sometime in August, with a possible third consulting parties

meeting again in August, and then a final MOA to be signed sometime in September.

The FEIS availability is hopefully going to be sometime in September, and then with a Record of Decision sometime in October, with a signed MOA prior to that.

That's where we are, and that's the status today, the steps that we are going to be going forward with the EIS and the Section 106 process for the Permanent PATH Terminal.

MR. GOELZ: Any questions on that, on the time frame or the dates that are being proposed and laid out?

MR. KLEIN: Just one. How is --

MR. STICKELMAN: Joel, can I ask you --

MR. KLEIN: Yes.

MR. STICKELMAN: We have a court reporter here, as you know. If you can identify yourself before you speak? She may get to know your names by the end of it, but -- I know your names, but she may not.

MR. GOELZ: How about, before we do this, why don't we go around the room and

introduce each other, in case there's some new people here. Would that be useful?

MR. ALLISON: Eric Allison representing American Planning Association.

MS. LO PRESTI: Louise Lo Presti, the World Trade Center National Memorial.

MR. KLEIN: Joel Klein for the Coalition of 9/11 Families.

MR. GARDNER: Anthony Gardner for the Coalition of 9/11 Families.

MR. KORNFELD: Robert Kornfeld, Historic Districts Council.

MS. PIERPONT: Ruth Pierpont, SHPO.

MS. VAUGHN: Charlene Vaughn, Advisory Council.

MS. DALY: Kate Daly, New York City Landworks Preservation Commission.

MS. TODOROVICH: Petra Todorovich, Regional Plan Association.

MR. LOVE: Bill Love, Coalition to Save West Street.

MR. LUSTBADER: Ken Lustbader, Lower Manhattan Emergency Preservation Fund.

MS. LESTER: Deborah Lester, New York State Assembly Speaker Sheldon Silver.

MR. ALTER: I'm Adam Alter, Battery Park City Authority.

MS. MELMAN: Anna Melman, Downtown Alliance.

MR. PATEL: Shilpan Patel, New York State DOT.

MR. LEVINE: Adam Levine, New York State DOT.

MR. CONWAY: Robert Conway, AKRF.

MS. LOCKE: Anne Locke, AKRF.

MS. CHANG: Irene Chang, LMDC.

MR. CALVERT: Chris Calvert, AKRF.

MS. BURKE: Andrea Burke, AKRF.

MS. TALBERT: Stephanie Talbert, Port Authority.

MS. NOONAN: Patty Noonan, Partnership for New York City.

MS. HANLEY: Jackie Hanley, Port Authority.

MR. COLEMAN: Steve Coleman,

Port Authority.

MR. LEBRUN: Paul Lebrun, FTA, Lower Manhattan Recovery Office.

MR. McNEELY: Bernie McNeely, Port Authority.

MR. CRUZZOLA: Tony Cruzzola, Port Authority.

MS. BRAEGELMANN: Carol Braegelmann, Federal Transit Administration.

MR. LENAHAN: Shawn Lenahan, Port Authority.

MR. PAGLIETTINI: Mark Pagliettini, Port Authority.

MR. LEVITT: Harold Levitt, PATH.

MR. HOTOPP: John Hotopp, Louis Berger Group.

MR. WONG: Bill Wong, Port Authority.

MR. MENNO: Lou Menno from the Port Authority.

MS. BONACCI: Carla Bonacci, Port Authority.

MR. RINALDI: Peter Rinaldi, Port Authority.

MR. DEMEO: Paul DeMeo, Port Authority.

MR. STICKELMAN: Joel, I think you had a question.

MR. GOELZ: On the phone.

MS. MERRITT: On the phone? Ready for us?

MR. GOELZ: Always.

MS. MERRITT: Okay. This is Elizabeth Merritt with the National Trust in Washington, D.C.

MS. FELLONOSSA: And I'm Marilyn Fellonossa with the National Trust in Boston.

MR. GOELZ: Great. Good to have you with us.

MS. MERRITT: Thank you for making the telephone equipment available. We appreciate it.

MR. GOELZ: Joel, you had a question?

MR. KLEIN: Yes.

I just want to know how this schedule ties in with your proposed construction schedule.

MR. STICKELMAN: I can't answer

that question, as a lawyer.
MR. GOELZ: Lou Menno is going to answer.
MR. MENNO: The proposed construction schedule is to begin sometime in 2005. We haven't started any of the final design yet, but in 2005 we will see construction beginning.
MR. KLEIN: Does that mean there really is no ground-breaking ceremony scheduled for the 4th of July?
MR. GOELZ: We're not here to discuss that.
MR. STICKELMAN: That's a different project. That's not the PATH project.
MR. COHEN: This is the Permanent World Trade Center PATH Terminal project.
MR. GOELZ: We are focusing on the PATH project.
MR. KLEIN: This may be a good time to bring this issue up, before we get into this.
MR. GOELZ: Which issue is that?

MR. KLEIN: There is a great deal of confusion as to which agency is taking responsibility for the demolition of the remnants in the northwest corner of the site, including the remains of the parking garage and Six World Trade Center.
LMDC has transmitted information on that under their letterhead, but all of the information under their cover letter indicates that it's a Port Authority undertaking.
We asked LMDC to clarify this in writing almost a month ago and have never heard a response, and we'd be interested in knowing, is this part of your undertaking? Is it a Port Authority undertaking or is it LMDC's responsibility?
MR. GOELZ: Joel, I think that that's the kind of question that should come up after the Port Authority makes their presentation on this project. It's going to be -- they are going to give a pretty extensive presentation. If that question isn't answered, you can ask it at that time.
MR. KLEIN: I'm certainly willing to hold off on that. I only brought it

up now because it relates to the rest of the schedule.
MR. GOELZ: We will get to it. I mean, it's on the agenda.
Yes?
MS. LO PRESTI: Louise Lo Presti. This is a simple yes-or-no question.
MR. GOELZ: When the Port Authority construction people come up, they'll answer it.
MS. LO PRESTI: Okay. Good. They'll answer it?
MR. GOELZ: If they can, they'll answer it.
MR. STICKELMAN: Louise, we hear both yours and Joel's question, and it will be answered.
MR. GOELZ: It will come. I mean, give them a chance to make their presentation in the order that they think is useful, and if it turns out not to be useful, we've got a lot of time here. Okay?
MS. LO PRESTI: Fine.
MR. GOELZ: All right. Any other questions?

John. I think many of you remember John Hotopp.
MR. HOTOPP: I get to go to all the meetings, but I don't talk much.
Thank you. I'm pleased to be here. We are talking a little about -- I'm just going to very quickly run over the Section 106 process.
We did a flow chart ages ago. As you know, the goal was to initiate the process, determine if there were any historic properties, which we did do, and now we are at the point of determining what, if any, impacts the proposed project has on these historic properties. And so that's kind of where we are today.
The first thing was to put it together, figure out who the players were, get the appropriate SHPOs and all that sort of thing, determine if it was going to affect the property, and we did determine that, and now we are on to, I believe, this slide, which is the historic properties affected.
And so today we are beginning the process as to assessing the adverse

effects, as we see them. And you guys may have some other thoughts about this as well.

If in fact they are affected adversely, and this is what will be worked out, we are going to move forward in the process next to try to resolve these adverse effects, and that will lead us to a Memorandum of Agreement, which will conclude the process for the Port Authority.

So that's kind of what we are doing.

The role that we defined for the consulting parties early on was to have you guys give us some input as we went on to each step of the process, to review the documents and to kind of see what we were doing and check out things.

And your input, by the way, on the Determination of Eligibility Report was extremely valuable, and it resulted, I think, in a very strong determination of eligibility. So I thank you for that.

We're looking for your specialized knowledge and your perspectives and your views.

So that's kind of where we are today, and I think the whole presentation, from this point forward, will be on very specific items; what it is the Port Authority proposes to do to build this permanent station and what impacts they will have or they think they will have on this site.

So with that, I'm going to turn it over to the next speaker, and he'll take it from there.

If there are any questions, I'll be happy to field them at this point, but I don't think that I have a major role today. I think you need the information that they are going to be handing out here.

MR. GOELZ: Okay.

MR. HOTOPP: Okay. Thanks.

MR. GOELZ: Thank you.

All right. Now, this next section will involve a number of speakers from the Port Authority, and as I've suggested earlier, watch the slides, keep the numbers if you've got questions about them, because the presentation will be pretty detailed.

When they get through, which

could be 20, 25 minutes, then we will start taking questions.

So I think we want to start with -- I think you all know Lou Menno, and Lou is going to start with the presentation. Then he will turn it over to Shawn Lenahan, and then on to Peter Rinaldi, who you also know.

Go ahead, Lou.

MR. MENNO: Thank you very much, Peter, and good afternoon, everyone.

This afternoon I'm going to provide you with an overview of what the World Trade Center Permanent PATH Terminal is all about.

I'd like to begin by pointing out that this project is not just a new PATH Station in downtown; it is much more than that. It is a transportation terminal, a transportation complex that includes a new PATH Station but also intermodal connections between PATH and virtually all of the subways in Lower Manhattan, intermodal connections that we never had before 9-11; in addition, pedestrian concourses that will reconnect areas of the World Trade Center with other parts of Lower

Manhattan, all through this downtown terminal.

All of these elements that make up this terminal will come together at a new Transit Hall, which is referred to sometimes as a hub. Think of it as the hub of a wheel, and the spokes of that wheel are these intermodal connections, the pedestrian linkages that will be taking place in this terminal.

The terminal will be a visible presence in downtown, and transportation is vital for the rebuilding and the long-term economic viability of downtown.

This terminal, this $2 billion project, is important to downtown but also to the rebuilding of the World Trade Center site. It directly supports the World Trade Center site.

In addition, it will support all of the growth that is coming in downtown in the years to come, not just at the World Trade Center site, but also with other retail spaces, commercial office spaces that will be built away from the World Trade Center site, and other residential areas. It's being built for the future and to provide for that future

growth.

Transportation is so critical to the rebuilding that the federal government has granted us, the Port Authority, $1.7 billion to undertake this World Trade Center PATH Terminal.

It is so important that they put up $1.7 billion, and the Port Authority will be putting up the other $300 million.

They are also funding, the FTA, other critical transportation projects, and it's very important, and they recognize the importance of transportation to the rebuilding of downtown.

I'm going to take you through an overview of this terminal. And this terminal will be built in five levels within the World Trade Center site, beginning at street level and going all the way down to the lowest level within the World Trade Center site, going down approximately 75 feet, just to give a good feel for how deep this terminal will go with all of these intermodal connections and these pedestrian linkages.

Let's begin at the street level.

At the street level, this is where the new downtown transportation terminal will be; a very visible presence in Lower Manhattan.

It has been designed to be in coordination with the master plan for the rebuilding of the World Trade Center site.

It's located at the intersection of the new Fulton Street, the new Greenwich Street, and Dey Street.

It is visible in Lower Manhattan and it is accessible from the street level, from the new streets that will surround the site.

It's located within the Wedge of Light, within the master plan of the World Trade Center, and there's many different access points from the street level along Church Street, along Greenwich Street, in and around the World Trade Center site. It is a visible presence, fully accessible at street level.

As we go down another level -- think of the street level as elevation 325; this is approximately at elevation 295, 294, approximately 30 feet below. This is where our

first intermodal connections begin, as well as a north-south corridor begins to take shape.

And as you can see, it begins to filter and funnel right into that Transit Hall at this upper concourse, or balcony, level.

At this particular level, what you see taking place here are the first intermodal connections that will be made between the 1 and 9 subway that go north and south through the site. It will hook up with that new station that the MTA will be building in the future.

It will connect at the north to the existing E train to create that intermodal connection to the E train.

In addition, we will have the intermodal connection with the N and the W line, but, more importantly, which is not shown here, is the underground Dey Street connection from the Fulton Street Transit Center that the MTA will be providing and building, and that will be another major east-west link from our transportation hall to the Fulton Street Transit Center. That is where we will create the other intermodal connections with the other

nine subways that service Lower Manhattan that come together.

As we go down another level, which is approximately elevation 274, what we have is a main concourse, and what you see here is the east-west link that I was talking about, this one link that will begin at the World Financial Center, come under Route 9A, come across in an east-west fashion to the Transit Hall, where we create this east-west link, and we reconnect the World Trade Center, the entire site, with Battery Park City, the World Financial area on the west.

And by creating this link, we have almost a half a mile of climate-controlled environment for people coming to and from transportation going either west to Battery Park City, the World Financial District, or going over to the heart of Lower Manhattan at the Fulton Street Transit Center. And you can see the lower south link that will take you through the area of the Financial District to the south of the site.

As we go down one more level, this is the new mezzanine level for the PATH

Station that will be located within the site. This is the mezzanine level at elevation 264.

This is where we will have direct access to the PATH platform and tracks below. We will have escalators, stairs, elevators to make the station fully accessible, a climate-controlled environment, as we had before 9-11.

The mezzanine is oriented in a north-south direction, but what's important about the mezzanine, it actually provides access to PATH from both the east side of the site and also from the west side. So we are making PATH more accessible than ever before. Before 9-11, people had to access from the east side, just as we do now in the temporary station.

At the lowest level, which is elevation 250, or the platform level, this is where we have some impacts on the resources in this area.

Before I go into some of the details, I'd just like to say a few words about the Port Authority staff working on this project.

Many of us worked in the World Trade Center for a good number of years, and we were very fortunate to survive. In addition, some of us helped build, operate, and maintain this complex up until that horrible day.

We come together as a team, and we provide great understanding and sensitivity to the resources here. They are very important to us, just as they are important to you, and we are doing everything we can to minimize and to avoid impacts on those resources.

I want you to know that. And we are doing our best, and we are living up to some of the commitments that we already have made in the past.

At the track level, we have the new platform and track configuration for the PATH Station.

Originally, the World Trade Center PATH Station had five tracks, and the new station will also have five tracks; no more than five tracks.

The tracks will be located in virtually the same location and in the same configuration as the original station.

If you remember, early on, we were not sure whether track 1, which was the closest one to the Greenwich Street slurry wall, was going to be able to stay there within that location because we thought that there were issues with the slurry wall and we would have had to bring that track and relocate it further into the bathtub.

We pointed that out; we made a commitment that we would do our best to look at what could be done to keep that track where it was, and we lived up to that commitment, and that's why we can say to you today those five tracks will stay in the same location as before.

Next, with regard to the platforms, in the original station, there were three ten-car platforms. In the new station, there will be four ten-car platforms.

Three of those platforms will remain in virtually the same location and in the same configuration as before, in the original station.

We need to put in a fourth platform, a fourth ten-car platform, to meet

the increased ridership over the next twenty years as spelled out in our DEIS.

The projected increase in ridership is 25 percent above the ridership of the pre-9-11 station, and we need to provide that future transportation for the future.

In addition, we do recognize, and we've pointed out, that that fourth platform has an impact on some of the resources at the northeast corner of One World Trade Center.

In addition, as we look at the design and as we look at the constructability issues associated with building this station, we recognized an important point. We made a commitment publicly that we would maintain PATH service throughout the construction of this terminal. We made a public commitment.

And what we found out, as we analyzed all of our work, we saw that we would be required to remove either one or two of the PATH tracks; they must be taken out of service in order for us to accomplish our work.

In order to provide a level of service that we represented to the public, we

Page 37

would have to include the building of a temporary track that would run along the west side of that new platform for the duration of the construction, and that track will be removed when we complete our work.

We do recognize that there will be some temporary impact to the resources in this area. But that track will come out; it's needed to maintain the level of service that we, the Port Authority, committed to early on in this project.

The other point that I wanted to mention here was that along the north column of the One World Trade Center line is where that east-west concourse will come across.

Right now, as we look at the design, we feel comfortable that we could minimize and avoid any impacts to those columns along the north wall of the One World Trade Center column line.

And another thing that we wanted to -- that I wanted to point out is, in the area along the east wall of One World Trade Center, as this design is evolving, and from an architectural point of view, as you see in some

Page 38

of the renderings of Santiago Calatrava's, are the use of arches.

Well, one column will have to carry a substantial amount of load to support all of the structures above, including some of the cultural facilities that will be built in the future, and that one column will come through the fourth platform, but it will not hit any of the resources.

But what we have been advised, and looking at, is that the footing upon which this column rests that is used to distribute the load could possibly impact some of the columns along that east wall of One World Trade Center.

We are working; we are just looking at this situation, and we are looking in terms of ways to mitigate and to avoid, as much as possible, the impact on those resources.

I wanted to point that out because it's important that we point this out. We are working at it. We are very early on in this design, and we are identifying these potential issues, and we are working in a very

Page 39

strong way to make a commitment to minimize the impacts on those resources.

And finally, before I turn it over to Shawn Lenahan, this is a graphic of the World Trade Center site which shows the existing remnants and structures at the World Trade Center site.

As you can see, we show the Temporary PATH Station, which was recently opened last November; the tracks that come in, the substation, the ramp, the slurry walls, and you will notice we broke this up on the west side and on the east side.

I'm going to turn this over to Shawn Lenahan in a moment. Others will be talking about the resources on the east and the west side.

Thank you very much.

MR. GOELZ: Shawn, do you want to come up and speak on the resources? Do you want to use the podium or do you want to use the mike?

SHAWN LENAHAN: Sure.

As part of the Section 106 process, we've looked not only at resources on

Page 40

the site, but also resources near the site that could be impacted or will be impacted. There are 21 such sites.

On the diagram here, the short dashed lines represent an area of potential effect for historic resources on the west and on the east side of the site.

The solid lines indicate an area of potential effects for historic resources.

The long dashed lines on the right of the screen indicate a known historic resource -- or a known historic district, and the hatched areas indicate the Permanent World Trade Center PATH Terminal, and the shaded area indicates the site being impacted as a historic resource.

Of the 21 resources, the potential impacts are as follows.

First, tunneling for a pedestrian concourse under Route 9A would require piercing the Hudson River bulkhead, which is buried below ground on the western edge of Route 9A, indicated right here, and this would result in an alteration of the characteristics of this resource.

Subgrade work associated with the construction of the terminal could affect historic resources within 90 feet of the site.

Construction could cause damage due to ground-borne vibrations and dewatering, and there are five such potential properties that could be affected. They are the Barclay-Vesey Building on the corner of Vesey and West Street, which is also known as the Verizon building; the former East River Savings Bank, which is currently Century 21 Department Store; the U.S. Realty Building, which is 115 Broadway; the Beard Building on Liberty Street; and 114 through 118 Liberty Street.

In terms of potential mitigation, the impacts that there may be, again, for these buildings would be damage -- potential damages due to ground-borne vibrations and dewatering, and the potential mitigations that we are considering or looking at for these potential impacts are vibration monitoring during construction.

The World Trade Center site, of course, will have direct impacts, and that will be the subject of the remainder of our

discussion today.

In addition, the environmental team has done a Section 4F analysis as part of the Draft Environmental Impact Statement.

For our discussion today, as Lou mentioned, our sites -- or our resources on-site will be broken down by those on the west of the site and those on the east of the site.

And right now I'm going to ask Peter Rinaldi to come up and talk about those on the west side of the site.

Thank you.

PETER RINALDI: Thank you. My name is Peter Rinaldi.

What we thought we would do is talk about some of the remaining, remnant structures and the resources on the west portion of the site.

This is essentially the area within the slurry wall area bounded by Vesey, West, Greenwich, and Liberty Streets.

I'm going to talk about some of the tower perimeter column bases, the bathtub or slurry wall and the tiebacks, the potential

impact, and later on, we will talk about some mitigation.

Mark Pagliettini, who has been working with me on this, will talk about some of the tunnel projections for the PATH, the recovery and construction ramp, the cooling water pipes, and some of the other infrastructure that was left behind as we finished the recovery operations back in June of 2002.

I'd like to talk first about the tower perimeter column bases and what they are and where they are.

If you look at an aerial of the site, this shows the area where the Permanent PATH Station inside the west side of the site will be located, the PATH tracks and the mezzanine and the station area.

Tower One is located here at the foot of the ramp, and Tower Two is located over in the southern portion of the site.

The perimeter column bases were the bases of the columns that literally supported the outer skin or perimeter of the building. They were located along here. This

is an example of one. Typically, they were about 28 inches by 32 inches, very heavy structural steel.

This is the basement slab, or the B6 level of the basement of the World Trade Center.

This column here, you can see, is along -- actually located in this location along here. You can almost look down a line, looking west, on where the face of the North Tower was as an example.

During the recovery operation, we had to cut these columns off at their lowest point, and you can see where they are striated there where we kind of burned through them and cut through them in order to be able to facilitate the recovery and the search as we went forward, and that's the reason they were cut at that level. They had to be cut in order for us to move forward with that operation.

So in the North Tower, there are 84 of those column bases, the original bases for the building.

In Tower Two, there are 73 at the lowest level, and as you went up and got up

Page 45

to the Street level, there were 84 columns that went around and carried the load.

The difference, the reason why there's less at the lowest level in the South Tower is because the South Tower structure had to be configured, unlike the North Tower structure, to bridge over the PATH tubes during construction and eventually the PATH Station that was built. So there is a difference in the structure down at that grade, at that level.

If we take a look at pre-9-11 in terms of the bathtub and the tower footprints, the PATH Station, as it came out of the -- you are looking north. This is Vesey Street; this is West Street on the left; Liberty Street over here on the south portion of the diagram; and Greenwich Street on the right part of the diagram. The tunnel comes in, Tunnel F from New Jersey, splits into the tracks. This is the original configuration that existed for the PATH Station pre-9-11.

In the North Tower, the entire perimeter of the columns and the building were outside of the footprint of the station.

Page 46

The northeast corner of the tower just came up against the crash wall for the existing pre-9-11 PATH Station.

In the South Tower, you can see that the tracks and the station itself came through and intersected through the footprint of Tower Two. I think 34 of these columns were within the existing PATH Station, and 39 were outside, which totals up to the 73.

During the construction, as Lou mentioned, we will be constructing a platform on the western portion adjacent to the existing track 5. That platform will be a permanent platform, a fourth platform.

When it is constructed, it will have an impact, in terms of where it's located, on the footprint of Tower One, in the northeast corner, and it will have an impact also on Tower Two, on several of the column bases that are there, that exist today.

In addition, we will be placing a temporary track that Lou had mentioned, and that will be put there to facilitate the construction so that we can maintain service. That's this track. It's a relocated temporary

Page 47

track. That track will be removed at the end of construction.

The proposed final configuration -- and all of this is somewhat subject to change because, as we mentioned, we are going through the preliminary design and engineering for this. The final configuration: The temporary track will be removed; the permanent platform, the fourth platform, will be in place. Also, the pedestrian concourse that Lou Menno had mentioned, which will be just north of the face of Tower One and will be constructed, we believe, just on some preliminary analysis, very sketchy, that it looks like it's feasible to be able to try and avoid the column bases that exist. They may be able to work around them so that the supports in this infrastructure, at least for the pedestrian concourse, will not impact on that footprint.

Lou did mention that one of the things we are looking at now in order to be able to support the new design for the station, at least the conceptual design, that there will probably have to be a large support column that

Page 48

will come down somewhere through the middle or edge of the platform D, or the new platform. And while that column itself will come down through the platform and probably not impact the existing column outlines, it's possible and probable that the support required for that, or the footing base, would have to come out into an area westward to be able to support those lobes. We are looking at that right now.

Again, all of this is based on our current plans in the conceptual design stage.

So with that in mind, in pre-9-11, as I said before, we had a total, in the North Tower, of 84 in the column bases; in the South Tower, we had 73; and as of today, and pre-9-11, all 84 are outside the footprint of the PATH Station. Pre-9-11, the 39 in the South Tower are outside the footprint of the station; 34 were within the existing station.

During construction, with the construction of the fourth platform and the temporary track, we will probably have to at least temporarily cover about 20 of those column bases, and in the South Tower we will

affect covering another seven to eight of those column bases between the temporary track that we have to relocate and the platform.

After construction, in its final configuration with the fourth platform, there will be 72 column bases out of the 84 originally that should be accessible or viewable, and there will be 34 in the South Tower, about five less than there are today.

This does not account for the possibility that I described of having to support the new station load down through the center of that fourth platform and what impact that might have.

Let me just go back. That is subject to change and confirmation as we go forward on that.

One of the other resources in the site is the slurry wall. This is Vesey Street. This is looking north. This is West Street along here. Liberty Street, again, here. And this is the Greenwich Street wall. This is the bathtub area.

The Memorial is in the southern central portion of the site. The new station

will be over here; again, above, essentially, where the existing station is today.

The Freedom Tower will be over in this location, along with the Performing Arts in this area.

And we will have an impact; that pedestrian connection on the pass that Lou mentioned. The east-west corridor will be coming along the 264 mezzanine level and will be going through the western slurry wall.

So in an area at the 264 level against the West Street slurry wall, we will need to cut an opening probably about 30 feet tall by about 50 feet across to accommodate the pedestrian connections and the infrastructure associated with that.

And you can see Battery Park and the World Financial Center and the Winter Garden in the background, going along there.

These are the remnants of the old parking structure openings from the ramps that came into the Trade Center above that.

The proposed area to be exposed in the Memorial and the slurry wall is south of this, so this area is to the north of that

area. So the area being talked about, planned for having the slurry wall exposed in view, is in this area over here, so it's away from the zone that we are impacting.

Other small minor impacts, I guess, on the slurry wall: In the Greenwich Street wall, it will have to be widened underground there to be able to accept some of the increased pedestrian underpasses and the modification in this station, so we will be removing portions of the Greenwich Street slurry wall adjacent to where the wall was removed for the original construction of the PATH underpass, and probably in this southern portion of the site over here.

This is an area where, during the recovery operation early on, the wall moved quite a bit, and probably eventually there will have to be a structural liner that will come. Depending on how the construction goes forward with the rest of the site, that wall will have to be aligned at some point in the future to maintain the structural integrity.

At this point what I would like to do is have Mark come up and talk to you a

little bit about some of the other resources that we will possibly be impacting as we go forward and try and implement $2 billion worth of construction at this site.

Mark?

MR. PAGLIETTINI: Thank you very much, Peter. Good afternoon.

In regards to the recovery and the construction ramp, the ramp was installed as a temporary ramp to facilitate the recovery efforts.

Also in regards to when we built the Temporary World Trade Center PATH Station, we utilized the ramp. During that construction, we planned to utilize the ramp when we built the Permanent PATH Station.

What we will need to do is we will need to relocate and modify a set of ramp towers right now to facilitate the temporary track. The ramp will be removed when the -- as the construction proceeds and is completed.

In terms of the tunnel projections, the tunnel projections, the north and the south PATH tunnels, they enter the site under West Street, through the tunnel

Page 53

projections that are located in the slurry walls. There's a north and there's a south, as indicated.

The slurry walls and their configuration will not be impacted by our project.

What we will need to do is we will need to look here at some of the lateral and vertical bracing. Some of it that was installed as part of the -- temporarily as part of the recovery efforts, we will need to modify that in order to allow the temporary track to come through from the tunnels.

In terms of the cooling water pipes, the cooling water pipes, they extend from the Hudson River Pump House in Battery Park City, they go underneath West Street, and they come into the World Trade Center site right here, along the west slurry wall.

It is our intent to reuse the cooling water pipes, and not as part of this particular program, but as part of the Memorial and the redevelopment.

Some of the components of the system may be realigned or reconfigured,

Page 54

depending on how they are supposed to be used, but they will not be impacted by our construction of the Permanent PATH Station.

In regards to other bathtub infrastructure, there are elevator pits, sump pump pits, ejector pits, as well as drainage lines that the construction of the Permanent PATH Terminal will not impact.

As a matter of fact, as you can see in this photograph here, we actually utilize some of the sump pump pits today to pump out the water that infiltrates the site.

MR. RINALDI: Mark and I, just concluding our section here and summarizing on the resources, the tower perimeter column bases, actually the full impact, as I mentioned, really needs to be determined.

Right now there's a possibility that we will cover or affect 12 of the column bases from the North Tower and three column bases from the South Tower.

Again, as I mentioned, we still need to look at the design for that, other support for the station in terms of that area.

The bathtub wall and tiebacks;

Page 55

we'll be removing a section of the 30-by-50 foot section of wall, approximately.

The tunnel projections; we really have minimal impact there, just making sure that they're braced adequately during the construction and that we don't collapse them.

And the recovery and construction ramp needs to be modified. Eventually it needs to be removed. It's not going to be removed as part of the PATH construction, but in order to facilitate the construction of the Memorial and the other infrastructure that's in there, it's right in the location where eventually it will have to be backed out and moved out, and we'll have to provide access another way.

Cooling water pipes will not be impacted by the station work or the other bathtub infrastructure that Mark mentioned to you.

So now I would like to bring up Carla Bonacci, who will talk to you about some of the issues and efforts involved with the east portion of the site; the site from the slurry wall going east.

Page 56

Carla?

MS. BONACCI: Okay. Thank you. Good afternoon.

I'm going to talk to you about the east side of the site.

Just to refresh your memories, it is essentially bounded on the north by Vesey Street, on the east by Church Street, on the south by Liberty, and on the west by the eastern wall of the 1 and 9.

Of the potential resources on the east side, there are four that are currently in existence today.

I'm going to take you through what is there and what could be impacted by the proposed design.

The first one is the passageway to the E subway train, the second is the steel beams and cross-form, the third will be the plaza and subway access from Vesey Street, and the last one is the H&M Terminal remnants.

This first passageway to the E train, what you are looking at here was refurbished as part of the Temporary PATH Station project.

The existing concourse to PATH connects to the E train. There's about a four-foot drop between the platform and the station.

The star at the top of the plan indicates where that location is and that the access to the E train will essentially be maintained in the proposed design by Calatrava.

However, his design for the Transit Hall is essentially a three-level space that changes by over 60 feet from the west to the east of the site and is a more gradual ascent and therefore cannot use this current concourse.

The next item that I mentioned, the steel beams in cross form, after 9 -- this area right here is what was preserved during the recovery. At one point during the recovery it was relocated to the eastern side of the site right here on the diagram, and this temporary base was constructed to elevate it and support the structure.

It is essentially in alignment with Cortlandt Street, which is east of Church Street. It is also in the way of the proposed

north-south concourse, which you see here, and Cortlandt Way, and so at the time when we would begin the construction of this area, we would look to relocate that element, probably to Hangar 17, at which time it would go into storage with the other potential artifacts.

This element, this remnant element right here, is on Vesey Street. It is adjacent to the proposed Greenwich Street, which you can see in this diagram.

It did provide access up to the plaza prior to 9-11. It also was an access way to the 1 and 9.

In the proposed design, as you can see, we are looking at providing an entry to the 1 and 9 and to the Transit Hall. It would be generally in this area but would be coordinated with the new work. So this element would have to be removed.

It is structurally stable at this point. However, the longevity of that is still to be determined.

And you can see it in this diagram right here. Here's the 1 and 9, which would be the future Greenwich Street.

And the last element is the H&M Terminal which existed prior to the former World Trade Center.

This area here was not structurally impacted by the events on September 11th. It's probably about 40 to 50 thousand square feet of space, indicated in the diagram here in white outline.

So as you can see, in order to build the Transit Hall and the north-south concourse, it would be needed to be removed.

These are also -- this is the cast-iron rings. There are two of them, one to the northern end around here and one at the southern end that were part of the original H&M.

When the Trade Center was built, they were used, really, for service access; they connected the truck docks on each end of the site.

At least one of these would probably have to be impacted in order to connect the mezzanine to the east side and to do the appropriate underpinning to make that connection under the 1 and 9.

And in summary, here are the four elements again. Essentially, the impact is we're saying that they all would probably need to be removed. Some things could be relocated, like the steel beams.

One thing I believe I failed to mention, in the passageway, there are material elements there that could be preserved or used as potential artifacts. If I could just go back and show you, there were some elements that existed prior; the doors, some of the flooring, the signage. One could look at those elements.

Lou?

MR. MENNO: Thank you, Carla.

MR. GOELZ: Lou, you are going to summarize?

MR. MENNO: Yes.

MR. GOELZ: And then we will take some questions. Then we will start the questioning.

MR. MENNO: All right. On this slide, I'm going to summarize the commitments that we've made concerning the impact on the resources and what we will commit to and the

direction that we are taking.

First of all, concerning the temporary track that we spoke about: That temporary track is temporary, and it will be in place during the construction of the terminal. And as I mentioned before, it is required so that we can maintain the level of service that is required for PATH throughout construction. That was the commitment that we made publicly. That track is a temporary one, and it will come out.

Next, the egress stairs from the temporary station, as well as the egress stair from the new substation, will also be removed. As we always indicated, they were temporary and they will be removed.

We acknowledge that one of the stairs from the terminal, from the temporary station, impacted the North Tower. That's being removed with all of the others, as well as that one emergency egress stair that impacts the footprint of Two from the substation will also be removed.

The commitment that we made that the corridors that will go east-west will avoid

the tower column bases: We are analyzing that to ensure that we commit to that and live up to that commitment.

We also have done the documentation, the photographic documentation, of the entire World Trade Center site.

We've also committed to incorporating certain materials from the World Trade Center that would be reused in the Permanent World Trade Center PATH Terminal.

We would allow for access to as many of the tower column bases as possible. That's our commitment.

We will allow for the portion of the exposed slurry wall to be used in the Memorial. That has always been part of the Memorial experience.

We are maintaining the artifacts from the World Trade Center over at JFK for potential use in exhibits.

Early on, when we began this whole project, including the temporary station, we recognized, as I mentioned before, the sensitivity of the footprints and the resources; and that, early on, we kept that

substation out of the footprint of Two World Trade Center and we were very conscious about that, the commitment that we made in terms of track 1, where it was possibly to be relocated into the area west, within the bathtub, and we lived up to our commitment that we were able to keep it in its original location.

This is what we've done, and we will continue to do, to minimize the impact on those resources.

Thank you.

MR. GOELZ: All right.

That was a fairly substantial presentation, and I think all of the Port Authority presenters are available to take questions, so why don't we start with the questions.

MS. LO PRESTI: Louise Lo Presti. I'm just going to restate my original question.

Which is the agency or agencies, plural, that is undertaking the construction?

MR. STICKELMAN: I will answer that. I said I would answer it.

Silverstein Properties, as you

know, is building the Freedom Tower. The Freedom Tower falls under the LMDC Joint Memorial & Redevelopment FGEIS. The Port Authority was acting as the engineer of record for the demolition of the northwest slabs.

MS. FELLONOSSA: Could you speak a little bit more into the phone?

MR. STICKELMAN: I will use the mike. Hopefully you can hear me again.

What I said was the Freedom Tower is being built by Silverstein Properties, which falls under the Joint Memorial & Redevelopment Plan for the World Trade Center site FGEIS.

The Port Authority was acting as the engineer of record for the demolition of the northwest slabs. That's why the Port Authority was involved in the presentation back on April 29th.

MS. LO PRESTI: You didn't respond to who is undertaking construction for the PATH Station.

Is that the Port Authority?

MR. STICKELMAN: It's the Port Authority and FTA. Well, the FTA is the

sponsoring agency.

MR. KORNFELD: This is Robert Kornfeld, Historic Districts Council.

Just to add to what you were saying about being the engineer of record for the demolition, it appears the Port Authority also came up with the mitigation plan, which goes beyond engineering for the demolition for Six World Trade Center.

MR. STICKELMAN: I can say that the northwest slabs is because they are artifacts that have -- potentially may be taken out of the site and were brought to Hangar 17. That is why the Port Authority was involved in that also.

MR. KLEIN: Another follow-up on that.

If that's the case, then why is the discussion of the removal of the northwest slabs included in your 4F statement?

MR. STICKELMAN: Because there's a potential that -- that because of the funding, and I think right now it's unclear in regards to potential funding for some other elements of substructure and infrastructure

that may be made by other agencies, and that's probably -- that is why it is part of the 4F.

MS. FELLONOSSA: Who is funding the deconstruction of the parking garage?

MR. GOELZ: The question is, who's funding deconstruction of the parking garage.

MR. RINALDI: Silverstein Properties.

MR. STICKELMAN: Yes. It's private funding. It's Silverstein Properties.

MS. FELLONOSSA: It's exclusively private, so there is no HUD funding and no STA funding going into that?

MR. STICKELMAN: Correct.

MS. FELLONOSSA: Okay.

BILL LOVE: Bill Love from the Coalition to Save West Street.

I just had a couple of comments and a question that has to do with the proposed east-west pedestrian corridor.

Although our group has opposed the car tunnel, we haven't opposed the pedestrian tunnel because we recognize it's important for large numbers of people to be

able to cross West Street, particularly during peak hours.

And the numbers that -- it's important not only for residents of Battery Park City, but also for office workers in the World Financial Center and also for the retail businesses at the World Financial Center, and the projections that I've seen are that, in twenty years, we're looking at some sort of a passageway of some type that would get about 9,300 pedestrians an hour across West Street at the peak.

So I was kind of intrigued to see on page 2 of the finding of effects a reference to a corridor beneath or a bridge over that would allow for all-weather access.

Then I assume -- this is sort of a question. I assume this is the same reference -- I'm also looking at the State DOT's projected EIS; they say it should be noted that the Port Authority would consider a pedestrian bridge over Route 9A, but this alternative would only be considered if a concourse wasn't feasible.

I'm wondering if it might be

possible for you to take a more serious look at that instead of --

MR. GOELZ: At a bridge?

BILL LOVE: At a bridge, and not just if the other turns out to be infeasible. I don't know if it's practical or not.

I thought that the north pedestrian bridge worked extremely well. That carried 8,000 pedestrians an hour at the peak.

As I see it, in order for it to work, you would really have to anchor it with a Class A office building or the equivalent at both ends so you could have functioning elevators and escalators and have everything done -- you've used the phrase climate control, and I'm glad to hear that; completely enclosed, well-illuminated for security purposes.

If it were done that way, it might be possible. The logic of that would be it puts people into the World Financial Center on the second floor, which is where the elevator lobbies are located.

There are retail businesses on the second floor, as well as the first floor of the World Financial Center. So it might work.

Page 69

I don't know if it's practical or not.
But I just wish you would maybe take a little more serious look at it in evaluating it as an alternative. But we recognize, in either case, we have to have one or the other, and it has to be able to handle the capacity that's projected for twenty years.
MR. GOELZ: Good. Thank you.
The next two?
MS. TODOROVICH: Petra Todorovich from Regional Plan Association.
I want to thank the Port Authority for some of the commitments made in the presentation, such as preserving access to the slurry wall and as many box-beam column remnants as possible.
I was wondering if some of the Port Authority staff could talk a little bit, practically, how these elements will be incorporated in the functioning PATH Terminal.
I don't have a good understanding of how one might encounter them when we use the PATH Terminal, such as would there be an area as you're going down to the PATH platform that you might see the slurry

Page 70

wall through glass or one of the column remnants in the floor through glass?
I know that that will be a goal in the Memorial, but just in terms of the PATH Terminal, will these elements be part of the everyday experience to encounter when it's rebuilt?
MR. STICKELMAN: I think that's what we want to hear from you, suggestions like that.
MS. TODOROVICH: Well, I would suggest, yes, that something like that be done.
Has there been any thought about how that might be --
[Inaudible.]
MS. BONACCI: We are looking at, in the area where platform D is, if there could be visual access to those column box beams that are in that area. However, all the other column box beams are probably within the Memorial.
MS. TODOROVICH: What about the slurry wall, when you say "preserve access to the slurry wall" or "preserve the slurry wall"? What does that mean in terms of the rebuilt

Page 71

PATH Station?
MR. STICKELMAN: I think you were talking about the west slurry wall. Lou will answer that.
MR. MENNO: The west slurry wall that we were referring to was part of the Memorial experience. Early on, the vision of the Memorial was to have a portion of the slurry wall exposed, and we would work to make that happen.
MR. RINALDI: One other point.
The reason it ties into the station and the infrastructure there is because the structure for the station, the structure for the Memorial will have to be integrated in terms of a permanent support for the slurry wall.
The tiebacks that you see that were installed during the recovery are temporary. They were never meant to replace the permanent structure.
So when we say preserve visibility to the wall, you have to build a structure, and it's not easy to do, to be able to leave a section of wall exposed, and that

Page 72

needs to be integrated with the design across the site. So that's part of what we were referring to.
MR. GOELZ: Other questions?
Yes?
MR. GARDNER: I just want to add to Petra's comment.
A lot of -- and this is actually just to kind of fill Petra in. A lot of the members of the Family Advisory Council have sort of charged the Port Authority with incorporating the PATH Station and experience into a Memorial, since so much of it traverses the footprints of the towers themselves, so we felt that that would be a natural -- should be something relatively easy to do.
I did what you said, and I wrote down slides, but I have so many slides written down that I think I'm just going to try to look at the effects determination first.
I just want to read a portion of this.
There would be various site infrastructure elements supporting the Permanent WTC PATH Terminal, including utility

Page 73

lines traversing the outline of the tower perimeter, column bases, and utility rooms and structures located within the area outlined by the tower by the perimeter column bases.

The families, for the last two and a half years, have been advocating for the preservation of the footprints of the Twin Towers, and we have been very diligent in this process. We've been very diligent with LMDC directly on these issues. We've held rallies and done all of those sorts of things.

In September '03 we learned that the columns were delineated by the box beam column remnants, and we started to sort of focus on that.

I just -- I find it -- I'm baffled by how you are now focusing on the tower perimeter columns and overlooking the fact that they are outlining the footprints of the Twin Towers.

They derive their significance because they are examples of design and construction, obviously, and because they form the footprints.

I would like to know--I think

Page 74

some of us here would like to know--why, in your inventory of these resources -- I think slide 14 might be a good starting point -- if there's any reason why the core column remnants, the concrete slabs, and the elevator pits that are within the footprints of the towers are not listed as a resource.

Let's see if I was right about 14. I think so.

Well, I think that actually -- is that the right one? Yes, because you have an inventory of the resources.

MS. BONACCI: That's the Memorial zone.

MR. GARDNER: I'm sorry?

MS. BONACCI: That's the Memorial zone.

MR. GARDNER: That's the Memorial zone? Yes, but your project impacts the footprints directly, so it falls under your project.

MR. WONG: Those areas that we are covering over are those areas that we've described as infringing or --

MR. GARDNER: Yes, but you are

Page 75

saying you are going to be building within the tower perimeter area. So, I mean, this is another point of contention, because when you ask LMDC -- LMDC's programmatic agreement gives them the ability to determine appropriate access to the columns that form the footprints, but yet your project directly impacts the footprints of the towers, which are delineated by the column remnants.

Slide 12, please.

And you are using terminology within your effects finding -- you are focusing now on the perimeters and saying, "Oh, we're just going to build utility rooms and structures located within the area outlined by the perimeter column bases."

Why not just say, "We're going to build on the footprints these structures," because those are the footprints.

MR. WONG: A while ago, I think, Lou and others talked about utility lines needing to cross over inside the, quote/unquote, footprint area. 40,000 square feet will require utility lines for all of the projects. So that was that reference.

Page 76

MR. GARDNER: This specifically says utility rooms and structures located within the area outlined by the perimeter column bases.

MR. WONG: I think that's something, at this point, we haven't determined right now that there is such an impact. So probably that will be clarified.

MR. GARDNER: Can you just --

MR. WONG: We don't have any utility rooms for the PATH Terminal in the footprint area.

MR. GARDNER: Then why does it say that in here?

MR. WONG: This is something that at the time -- again, the time of writing these things has been probably two or three months ago, when plans were not as solidified as they may be right now.

So some things, as to why the subgrade slab remnants are in or out, these are things that are open until such time as we have determined -- our design work will lead us -- will give us the ability to make such statements as we are today about temporary

tracks and other things.
At the time these were being developed, these were still open questions.
MR. GARDNER: Would you say that this document is, then, premature to release it at this time, when you don't --
MR. WONG: It's a draft.
MR. STICKELMAN: It's a draft.
MR. GARDNER: It's just a draft?
MR. STICKELMAN: That's what it says.
Anthony, can you just comment for the record, so we know and look at it, what page that's on and what paragraph?
MR. GARDNER: Sure. This is on page 3 of the Permanent WTC PATH Terminal draft finding of effects.
MR. STICKELMAN: And what paragraph?
MR. GARDNER: This is paragraph 3 under "Tower Perimeter Column Bases (constructed pre-September 11, 2001)."
MR. WONG: I forgot about this.
The other thing that -- I mean, you've got to understand. I mean, we've talked

how, out of the South Tower footprint, a lot of this is in the PATH right of way, so right there and then you have utility infrastructure and so forth.
But I think at this point, beyond the confines or the boundaries of what we've outlined in this presentation, we are not planning on any major PATH utility areas in these footprints.
MR. GOELZ: Within the footprints.
MR. WONG: We can probably say that now.
MR. GARDNER: What I think would be important to do, because when we talk about the footprints in, say, Family Advisory Council meetings, we talk about percentages.
If you go to slide 26 -- and then I'll shut up, I promise, so we can pass the mike on.
But the footprints, to us, are just a priceless historic resource that it would be the worst cultural injustice of our time if you don't preserve the maximum amount of these footprints or column delineations for

the general public.
So slide 26, there's no reference to percentage of -- you have, like, numbers about tower perimeter column bases; you have here "to be determined."
But this might be a good place to say how much of each footprint is being compromised by your PATH structures, because we've talked statistics with --
MR. GOELZ: It was discussed at one of the earlier ones.
MR. GARDNER: -- Kevin Rampe and people from the Port Authority before.
MR. GOELZ: Right.
MR. GARDNER: And when Michael Arad's design was selected, we were told -- this is really for you, I think, Lou. We were told that 97 percent of the North Tower with delineations was available at that point and 50 percent of the South and that you were going to look into an alternative to the fourth platform.
MR. MENNO: At that time, when we spoke about the fourth platform, way back when, we identified that before September 11th,

that PATH right of way occupied 48 percent of the footprint of One -- I'm sorry, of Two World Trade Center and just missed the North Tower.
With the fourth platform included, the area of Two World Trade Center went up to 50 percent, while the area of One World Trade Center went to 3 percent.
That was the impact in terms of square footage.
MR. GARDNER: So that's where the 97 -- so my figure is correct with the 97 percent.
MR. MENNO: Correct.
MR. GARDNER: So, I think, moving forward, it would be very beneficial to us to see percentages, as to how much of those footprints are still free of any infrastructure. So in addition to addressing the inventory of the column bases, also that acreage.
MR. MENNO: Yes.
MR. LUSTBADER: When you are talking about footprints, to get back on an earlier subject, are you talking about the actual box beam columns?

Page 81

MR. GARDNER: No. We are talking about the columns, but the space the columns defined along with the columns.

MR. GOELZ: Okay. The interior space?

MR. GARDNER: They have been referred to as columns and they have also been referred to as footprints.

So basically what we've always said is the maximum preservation of the footprints which are delineated by the box beam column reference.

MS. GAULL-HOWARD: My name is Marilyn Gaull-Howard, and I'm with the Coalition to Save West Street, which is really trying to save our neighborhood, the Battery Park City neighborhood.

This is absolutely gorgeous, and we all love your plans very much when we've talked about them in private.

We have one reservation, and that is, there are about -- or will be, by the time the building is done, 8,000 people living in Battery Park City, south. I would like a little more information about our access to the

Page 82

terminal. We used to go through World Trade Center Two.

MR. GOELZ: Can anyone respond? Lou?

MS. BONACCI: Through the southern portion of the site there is the Memorial, which is now essentially a plaza at grade. That would then -- could then take you through, we're showing, if you go back to one of the plans, at street level.

Keep going.

As you can see, those yellow circles are the proposed street entries, and then the north-south line is the potential north-south corridor.

But coming from Battery Park City, from the south, you could traverse across the plaza and then enter at any of those points along Greenwich Street, at Cortlandt, the Transit Hall itself, and then up north. But it is an external connection until you get to that side at this point.

MS. GAULL-HOWARD: The Memorial doesn't leave room for people to use it as a -- I mean, the Memorial is not going to be built

Page 83

so that people can ...

MR. GOELZ: Traverse it? Is that what you're saying?

MS. BONACCI: Well, that will be part of that process, how you get across.

MR. WONG: I think it will, not that it's impossible. We are not going to put up a wall.

MS. BONACCI: No. No, they are looking at how one could traverse across the site.

MR. WONG: You can see it in the rendering of the Memorial.

MR. ALLISON: I have a comment and then I have a question.

The comment is that the last I heard, the -- and it's absolutely that the -- because of the street levels, the Memorial is not going to be at grade. It's either got to be below grade at one end or above grade at the other end; otherwise, it's not going to be flat, and it's intended to be flat. And Arad is currently looking at depressing it.

So it's not going to be traversible in an easy way, and we should stop

Page 84

talking about it that way.

My question, actually, though -- because you kind of rushed past it, I think, and I'm a little unclear as to why the multiple levels in the transit hub will mean that the remnants of the E train access will have to be destroyed.

MS. BONACCI: Based upon the current proposed design, where there are three floor elevations, the lowest one is at approximately 276, and then it traverses up to around 296, from which point you could access, via vertical circulation, the E train, which I believe is around 306, approximately.

And then in the new proposed design, you would then go up to elevation 325, which is the Church Street grade.

So the issue is that the current concourse is at elevation 310. It's sandwiched right in between.

So what Calatrava has done is to look for a more graceful way to traverse the site at 20-foot increments versus what we had prior, which was a huge, like, 36-foot rise from PATH and then another 16-foot rise.

Page 85

You went 36 feet from the PATH mezzanine to the concourse at 310, and you dipped down to the E train or then you continued up to street.

MR. ALLISON: I understand where you are going with that, but right at the moment, there's a 4-foot rise between the one end of the ramp at the E train access, the remnant piece, the one that was written up in The Times about two weeks ago that that's basically the last intact piece of the underground portion of the World Trade Center. So that's a 4-foot ramp right there to get to the E train.

So I don't understand -- and this may be because we haven't seen Calatrava's work at this point. But I don't understand why that 4 feet cannot be incorporated into it, no matter what you are doing.

MR. WONG: We are looking for a graceful way to not have people make five or six moves to get to the level they need to be at.

MR. ALLISON: So what you are saying is, in order to get routed, at a 4-foot

Page 86

differential, you are going to destroy the last remaining remnant of the World Trade Center?

I'm asking, is that what you are saying?

Because I don't understand. I understand the graceful getting up and all the rest of it, but in the end --

MS. BONACCI: At the 310 level, it would be removed, yes.

MR. WONG: The whole 310 level, that whole deck.

MS. BONACCI: Because between 196 and 325 --

MR. ALLISON: I understand what you are talking about, the deck and all the rest of it.

The point is that it's only 4 feet at that point on the deck, wherever you are talking, between that and the E train platform, so I don't understand why being -- having a more graceful access, or whatever, means you have to get rid of that particular piece of the platform, even if it meant people had to go up and then down again slightly.

You are not going to change the

Page 87

level of the E train platform?

MS. BONACCI: Right. Okay.

MR. ALLISON: And it's only 4 feet there.

MS. BONACCI: But from 296, which is the floor --

MR. ALLISON: Forget 296. Start with the E train platform. Okay?

MR. WONG: I guess we are not understanding. The issue right now is -- I mean, I'm not going to start drawing.

MR. ALLISON: Draw. Come on. This makes no sense, the way you've explained it. And I'm not saying it doesn't make sense; I'm saying it makes no sense the way you've explained it.

Let's do it this way, if you can translate the numbers. Let's take the E train platform as zero, and tell me how that affects getting to it from anyplace in Calatrava's drawing, recognizing the fact that we are talking about the end of a corridor.

MR. GOELZ: Your point is that that's the last remnant intact?

MR. ALLISON: Exactly.

Page 88

And you just did a wonderful refurbishment job. You just put up a wonderful plaque saying it's the last remnant, and now you are saying that because it doesn't fit into some graceful approach that you are going to destroy it.

MS. VAUGHN: I think, Peter, you captured it as something that people feel is --

MR. GOELZ: Right. I think this is called input. I don't think we need to debate, but I think it's fairly accurate input.

MS. MERRITT: This is Betsy Merritt on the phone. Can I clarify which item you are talking about? Is it element number 10 on the diagram that's in the draft EIS document, way up in the northeast corner of the site?

MR. STICKELMAN: Yes.

MR. GARDNER: Yes.

MS. MERRITT: Passageway for the E train?

MR. GARDNER: Slide 29, when you get the slides.

MS. MERRITT: Okay. Thank you.

BILL LOVE: I would just like to

echo the gentleman's comment about what a shame it would be if we did lose that. I was an E train ride for many years, and I know for the thousands of people who pass through there, that's the one remnant that you really get a feel for the old World Trade Center when you come in from the E train.

I mean, I remember when they re-opened that, and I was shocked to see that the same doors were there and that the stairs were there, and it really gives you a feeling. And particularly, when you walk up now, you can look off to the right and see where the PATH train comes up.

So if there's some way to preserve that, I think it would be well worth doing.

MR. LUSTBADER: Ken Lustbader from the Lower Manhattan Emergency Preservation Fund.

I echo the sentiments about the staircase to the -- I mean, the entrance to the E train.

But I also want to better understand the issue of the staircase that's

above grade that was also talked about going up to the concourse, and why -- there was a mention that it may not be stable in future months or something, and I just want to have that clarified.

The other issue is regarding documentation. I mentioned this at the last meeting about the slab remnants, and I'm happy to say that the Port Authority did do different types of documentation.

But having been on the Memorial Center Advisory Committee, the issue of having a curatorial kind of understanding about the existing conditions now, and not just still photography or drawings, it would be helpful to have moving images for the existing conditions.

And also, let me just say, this access to the slurry wall and the box beam columns are something that are Memorial Center commitments that went out by the LMDC in their draft comments.

So that's something that -- is that area being dealt with at the same time that the Port Authority is designing the PATH Station? What's the coordination between the

two?

And, lastly, I'm just curious to hear how vibrations are going to be dealt with rather than just "We're monitoring them."

There's going to be so many cumulative projects going on, this has come up at every EIS public hearing. It came up last week at the Fulton Street Transit Center EIS, so this is a major issue that the preservation world is most concerned about.

MR. STICKELMAN: Ken, just for the recordation, there are several things that we're doing. One is to have photography, which they spoke about earlier, which is the black-and-white photography.

In addition, the Port Authority is also going to be doing color photography of the entire site. And, I think, Ken, you are aware of this.

Tito Dupret from the World Monuments Fund actually was there last week taking the 360 photography of the World Trade Center site and the bathtub. Actually, if anyone's curious, they can stop afterwards. There's an article about him in Conde Nast that

I brought so you can see what kind of photographs he takes.

In addition, the LMDC is actually right now talking to videographers, possibly three, to actually videotape the actual experience of going down to the World Trade Center site before any work is done. We are working with them on getting access and having that done.

So you'll have the HAER photography, the color photography, Tito Dupret's 360, and the videography.

MR. LUSTBADER: I just want to stress the need to have curators who are on the Memorial Advisory Committee giving an input, because, you know, I'm a lay person in preservation, and there were so many good resources on that committee that could be tapped, just to say, "No, here's a way to do it better."

MR. RINALDI: We didn't answer his questions.

MR. STICKELMAN: The engineering stuff, I can't answer.

MR. RINALDI: I'll tell you what

it was originally used for.

The reason that remnant structure is standing is because during the recovery process, that was the only way we could really get down into the 1-9 subway, from that end of the areas that weren't collapsed, and that's why it was left there. It was really used as access during the recovery process, and then later on, during reconstruction of the 1-9, it was also used for construction access as part of going forward.

That's why it was not demolished at the time we were going forward with the recovery.

The structure itself was somewhat damaged both during the demolition and recovery/removal process. So while it's a stable structure, it's not going to collapse, it's not meant for public access. It's cracked. Over time it's deteriorated. It's not meant to last.

So that's what Carla was referring to about the stability of the structure, is that its long-term usefulness in its current condition will not be there. It's

a block wall. The cement, where the stairs were on, has been cracked. The escalator was ripped off of there. It used to have an escalator up on top.

So what you see there truly looks like a remnant structure, but it's not -- the structural integrity of that wall, it's not going to collapse today; it's not meant to stay like it is for a long time in the future, as it exists. That's just the existing structure.

MR. LUSTBADER: But it is a remnant structure, and it could be stabilized?

MR. RINALDI: You could refurbish the structure to make it a stable refurbished structure. It might not look quite what it looks like today.

MR. LUSTBADER: You can also stabilize it as it exists too; you don't have to refurbish it.

MR. RINALDI: I'm not a restoration expert. Just in terms of the structure and how it's boxed and what's there would have to be strengthened, and whether that could be done so it's invisible or not --

MALE SPEAKER: From a practical

point of view, what -- is it in the way of the design? I just want to understand.

MALE SPEAKER: Well, your recommendation in the end is it's a remnant and it ought to be preserved. Is that the recommendation?

MALE SPEAKER: I'm not making a recommendation, no. I wanted to get a better understanding as to what's the condition and just what's the potential use in terms of the area that you had mentioned, the egress and ingress for 1 and 9, if it had to be reconfigured.

MS. BONNACI: [Inaudible] reconfigure because that accessway was built many years ago [inaudible] we're looking at, and then [inaudible] is what makes that exact [inaudible] concept of the proposed [inaudible] is something that [inaudible]. But, you know, where exactly is the best place [inaudible] around access to [inaudible] fairly complicated issue. But we're also looking at [inaudible] structural hardening to protect [inaudible] criteria as well impacts how long and where one can access [inaudible]. So we just can't

[inaudible].

MR. KORNFELD: Bob Kornfeld, Historic Districts Council.

I think that the way you're approaching it is kind of symptomatic to me of the general problem. It's kind of a corporate culture thing, maybe.

You're not looking at this primarily as a historic site. You're looking at these structures functionally.

I think that, you know, on September 10th, this was a transportation and office facility. Today, this is a world monument, and these things have meanings and significance that they didn't have in the past.

I don't think the issue of this structure -- I'm not saying that this structure has to remain in exactly its current form for eternity, but just the way that you are looking at it is that "It was damaged and it's not really useful, and we want to build something else there, so it has to be torn down." That's essentially what you are saying.

I think that you need to look at it. First, is it significant; what would need

to be done to stabilize it; how can it be incorporated into a historic site.

It's just a very different approach. I think that if you walked across Vesey Street, you would see a number of things all along there, like there are columns that stub up all the way along from Five World Trade Center; there are remnants of floor finishes. There's just a lot of stuff.

I think that if you looked at the site with a different point of view, then you would walk along and every five feet you would say, "Oh, look at this; oh, look at that," and come up with an inventory of things that would be up for discussion, rather than just seeing it as kind of a clean slate.

And I think that that's true, certainly to the greatest extent, with the footprints of One and Two World Trade Center, where I feel that all of the -- the entire footprint has a lot of features. There are concrete slabs and equipment pads, sump pits, elevator pits; all of those are -- if you looked as an archaeologist, if this site were buried for 2000 years and then you were part of

a team that excavated it and you went in as an archaeologist, you would find all these things, try to figure out what they were, sort of clean them off so they were protected, make an inventory, analyze the whole thing.

And no one has approached this project that way at all. It seems to me that even the HAER photography is going to take place with a foot of fill over everything and construction equipment everywhere, so you can't even see the footprints. I may be wrong; maybe it will be cleaned off.

But I just think those are all things that need to be documented. You can't -- especially a lay person who's involved in this and didn't see anything during the recovery cannot conceptualize what the footprints are without seeing them cleaned off of debris and seeing all the -- the core columns, all the different slab levels, the damage to the slab.

I think you did a plan of Six World Trade Center that showed sort of the remnants of the slab and the columns, and then it suddenly became easy to conceptualize what

was there. I think you really need to do that for One and Two World Trade Center, to show every single feature.

Start with an original detailed floor plan and then go through and show what's there; these were all cut off at this level, and then what areas of slab are damaged, and so on.

Anyway, that's my comment. Thanks.

MR. KLEIN: I just want to make an observation, and I say this as someone who works with engineers, has worked with engineers on a daily basis for thirty years. The point -- I worked for many years, a lot of people know, for what was the largest AE in the state of New York. We had 17 floors of office space in the South Tower for many years. So I think I know something about how engineers think.

What I'm noticing, and I say this not as a criticism but as an observation, is that the engineers at the Port Authority seem to be viewing the historic remains at the World Trade Center site as an impediment to their project. And that's understandable, as

engineers who want to build and want to create something new.

But if we were to do that, we would say, "Well, gee, it's your project that's an impediment to the preservation of a really, really important historic site."

And why you wouldn't be giving precedence over the other is subject to debate, and that's what the 106 process is all about, to make that decision.

Bob Kornfeld mentioned -- he talked about archaeologists in the future. Well, I'm an archaeologist. I think 2000 years from now, which was the time period Bob mentioned, if an archaeologist is excavating the remains of the World Trade Center site, it's going to be the remains of the original Twin Towers and not the new Port Authority transportation hub that are probably going to be considered the most important aspect of that site.

I would just ask that you think about some of these things a little bit as you proceed. You've got some good consultants who can talk to you about this.

Page 101

I think your engineers need to educate themselves a little bit more about the emotional and historic importance that's associated with this site and think about some better ways as to how they can incorporate some of the concerns rather than trying -- consistently treating them as an impediment to the development of the site.

MS. LO PRESTI: Louise Lo Presti.

I know you guys at the Port Authority always get a bad rap for everything and you get blamed for it all. In this case, unlike -- I have a slightly divergent point of view.

I think that the Calatrava design is brilliant. He is an architectural artist.

However, the nature of his designs is such that it doesn't corporate klugey things like artifacts and remnants. They simply don't fit in a Calatrava design, and that's something that we haven't discussed here at all.

If you go into any of his sites,

Page 102

you are not going to find something like a remnant of a staircase or a box beam.

Maybe you will find a glass wall looking out to something like a slurry wall, but nothing else. But that's his vision.

We, as Americans, have a profound disrespect for our history, and if you go to any number of cities in this world, you will find architectural remnants in metro stations.

In Mexico City, when they were in the process of unexpectedly discovering an archaeological ruin, what did they do? Did they take it out? Did they mitigate it? Did they cover it up? No, they built around it.

So if any of you have ever been there, when you walk through those stations, you see the ancient ruins in situ. The same thing for London, Rome, Paris, St. Petersburg, Moscow.

Are they less sophisticated than we are? No. Hopefully we could learn from that.

Second -- and before I leave this subject of artifacts, I think everyone has

Page 103

covered everything except the H&M tubes. It would be sad to see the H&M tubes go. They really are distinctive. I think that was brought up by some of the national people in the first meeting.

The second, on the issue of the Port Authority being the engineer of record for Silverstein, who is using private monies, there have been a series of articles in The Wall Street Journal speculating -- for over the year, speculating why federal money has been released to Silverstein in advance of his building plans.

Well, now it's fairly clear; because the money is being funged, so that private monies will in fact pay for this. And it doesn't take a financial rocket scientist to figure that out.

And that is why these issues are in the 4F statement, because the money is funged.

MS. VAUGHN: Charlene Vaughn from the Advisory Council.

I think that a lot of the comments that have been made are on point.

Page 104

I would, however, commend the Port Authority and FTA for their approach to identifying distinct historic elements on the site and trying to gauge what the effects are, which is somewhat different from how we function with the LMDC review.

What I would say is let's build on that, let's look at alternatives, have the discussion, and I think we can get there.

I don't think that we're that far apart in our thinking. I think it's just really looking at the full range of alternatives and documenting the pros and cons of them.

And I think that one thing we never really did was look at the site holistically, and that's what Bob was saying; it's not disparate parts and elements and resources; it's a total site. We keep missing that, and I don't know why.

MR. GOELZ: Anybody else?

MR. GARDNER: Do we have any slide capability anymore? Because I notice it went off. I don't know if it was a screensaver.

Can you go back to the E train platform remnant?

I just have a real quick anecdote that I think kind of speaks to what Charlene was saying.

A couple family members went on a tour of this. The Port Authority took us on a tour right before they opened the temporary station in November, and we were standing on the E platform. Between those two doors there you will see a panel; it looks like a wall. That's actually a panel that was put up in front of a door, and on that door was written, "9-13," in orange paint, and some various symbols, and we had Lee Ielpi with us, who his son as a firefighter who was killed, and Lee also worked through the whole recovery period. And he sort of deciphered what those symbols meant, and on 9-13 there was rescue team that got to that point.

And the Port Authority was -- and I don't think this is malicious, but they were getting somebody in the next day to kind of clean up the doors, and when we sort of pointed that out to them and talked to them

about it, they made a couple calls and they made the commitment to board it up and save it.

And this collaboration between us, I think we can maybe point out things that you might not see that we see.

And I believe that door has been saved. At least it was boarded up.

But I think that also adds to the significance of this E platform area, which should be considered, as Eric said and, I believe, Ken said.

What I would like to know is you mentioned that Tito Dupret came and did the 360-degree photography.

Were the footprints cleaned off for that? Because we all know there's, like, a couple inches of that dirt and construction.

Does anybody know?

MS. BONACCI: It was done as the site is now.

MR. GARDNER: Okay.

MS. BONACCI: [Inaudible.]

MR. GARDNER: Now, I think it's pretty sad that, two and a half years later, the Coalition of 9-11 Families has better

pictures than you guys have.

I mean, we have a photo that shows the perfect delineation of the North Tower footprint, with the ramp feeding right into it, and I would hope that you would take advantage of Tito and have him come back and photograph the footprints, especially given there's so much -- it's not clear, when you talk about --

When you focus on columns versus the footprints, it would be nice for people to have photos of what's actually there so we can make those determinations, hopefully together.

I think the families have compromised a lot through this process.

We originally had rejected the PATH coming back in that area, and I think the position that we put forth was provided that what was put back was originally there and that it was incorporated somehow into the Memorial experience, we would be willing to compromise that.

I mean, that's coming from, you know, a position like -- a rather optimistic position that we do have a position of some

sense of authority in here, but -- I don't know if that's really the case.

But I really want to, once again, urge you to take a look at One World Trade Center and Two World Trade Center's footprints, and I beg you to preserve the maximum amount of those footprints, because only -- their significance will only increase over time.

And I'm not talking about just a row of columns; I'm talking about the space that they define and the columns together.

MR. KLEIN: Joel Klein.

I want to just elaborate a little bit on what Anthony said about the significance of the areas within the perimeters as defined by the box beam columns.

There is a GPS map prepared by the fire department showing the precise locations of approximately 20,000 human remains, the site of recovery at bedrock, and the vast majority of those remains came from within the footprints, within the area delineated by the box beam columns. And that's one of the reasons that that area within the

box beam -- within the perimeter is so significant.

It's unfortunate that what we see in some of the slides here and in the effects analysis that's been presented is the treatment of the individual box beam columns as what is contributing to the significance rather than what they comprise, which is the footprint, the entire area as defined within those perimeter spaces.

45 percent of the victims have still not been identified, so that's the last place these people were known to be, and it's the only place that many of the families will have, ultimately, to come.

I ask you to consider that in terms of what you are doing to this site, and to take that into consideration.

If I could -- if you could go back to slide 34? I just want to point out some of the inconsistency in the logic that you've been using.

In the previous slides in the earlier part of the discussion you talked about numbers of box beam column remnants that would

be preserved.

Yet on this slide, the very last bullet point, you are taking credit for the fact that the substation is avoiding the footprint; you didn't say avoiding the box beam column members. It appears that you are using two different standards to assess impact.

When you want to talk about the main parts of the facility, you talk about the box beam columns that are going to be affected. What you really should be talking about, again, is the entire area within the footprint and the percentages. So you are kind of using apples and oranges.

In terms of the effects determination, a number of comments, one of which what it's sadly lacking, and I think could be incorporated without too much effort, is a consideration of the various alternatives.

That information is included to some degree in the 4F statement, and it probably should be incorporated in the effect finding, in particular, a discussion of, probably even in a tabular format, of how the various alternatives described in the 4F

statement would affect the various remnants on-site.

I would also ask that an additional alternative be considered, which is a variation on the no-build, and that is to just not build the fourth platform, and what the effects on the resources would be by doing that and what the consequences would be.

You are basing a lot of your assessment on the assumption that that fourth platform will be built, and in fact, on slide 21 -- if we could have that?

I'm not sure if you misspoke, but it was my understanding that you said that this analysis did not include the effects of the fourth platform, but in fact the slide says it does, so I just would like to clarify.

MR. RINALDI: Let me correct that, if I spoke that way.

I said it did not include the potential effect of bringing down a column that supported the station that might have an impact on the footprint of the tower.

And let me go further. When we're talking about impact on the footprint, we

translated that to the box beam columns because Lou and I had spoken, and Lou, previously in presentations, talked about the percentage impact on the footprints, and there was a lot of concern beyond that about actually the visibility of the box beam columns and the significance of that. That's why we focused in terms of that.

The percentage of the impact on the footprint is still the same as we talked about before, which is the 3 percent -- from zero to 3 percent, from 48 to 50 percent. We are looking at the number of box beam columns within that percentage that would be affected, and that's what we were trying to say.

I'm not in any way saying that the footprint wasn't significant. It's the details within the footprint.

MR. KLEIN: Thank you for clarifying that.

I'm wondering if -- I suspect this information is in the DEIS, but I think it would be helpful to all of us if we had sort of a road map as to where to find it, and that is the documentation supporting the increased

ridership. I think you estimated it is 25 percent at the end of twenty years.

MR. MENNO: Yes, 25 percent above the pre-9-11 ridership at the PATH Stations.

MR. KLEIN: And that's at the end of 20 years?

MR. MENNO: Within -- up to 20, 25.

MR. KLEIN: Okay. 20, 25. So it's from when construction is completed?

MR. MENNO: Basically 2009 to --

MR. KLEIN: Is the supporting documentation to that analysis in the DEIS?

MR. MENNO: Yes, it is.

MR. KLEIN: Could you --

MR. LENAHAN: The number is in Chapter 8, Section A.

MR. KLEIN: Okay. It's 8A.

Are there any backup studies to that or is all the data presented there?

MR. LENAHAN: There's the chapter and related appendices.

MR. KLEIN: So it's in the transportation appendix?

MR. LENAHAN: Yes.

MR. KLEIN: Just a few more.

Tim Stickelman mentioned that -- and, I think, again, somebody may have misspoke here that the photo documentation at the World Trade Center site was completed.

MR. STICKELMAN: No, it's not completed.

MR. KLEIN: Okay. I suspected somebody had misspoke.

Tim also referred to the HAER recording, and I know we are getting into the LMDC material here as well, but has any decision been made as to the type of HAER recording and, in particular, has the National Park Service been consulted yet? That was a commitment of LMDC within the programmatic agreement.

MR. STICKELMAN: I can't speak for LMDC. I don't know what they have done, National Parks. That's a question for LMDC. But your comment is noted here.

MR. KLEIN: And the last thing, if we can sort of go off agenda a little bit, but we weren't given the opportunity to -- we

weren't asked as to whether we had agenda items -- to come back to the artifact issue.

You mentioned that the artifact inventory is ongoing.

Frankly, we've been puzzled as to why this has taken so long; in particular, why there isn't even a count of the numbers of artifacts.

When we visited Hangar 17, we raised the issue at that point; there was a concern that items might disappear, and the response was, "Well, there's very heavy security," and our response at that time was, "Well, fine, then you will know who to suspect." But you don't even still know what's there. You would have no way of knowing if something was missing.

Tim, do you want to respond to that? I've got a few more on the artifacts.

MR. STICKELMAN: I will wait until you are finished.

MR. KLEIN: Okay. The Port Authority has indicated that it's the custodian of the remains rather than the owner, and yet the Port Authority -- we've heard rumors of the

Port Authority making commitments to turn over artifacts to other institutions.

We'd like to know if that's true.

We also keep finding out about pieces of World Trade Center popping up all over the place, and we're wondering -- including in The New York Times today, there was a story that the towns of New Castle and Chappaqua in Westchester County have pieces of steel from the World Trade Center that they were about to incorporate into a memorial there, that were, quote, "given to them by the police."

Is the Port Authority taking any action to recover any of these materials or find out if any more materials exist, other than what you are already aware of?

MR. STICKELMAN: We can only give an inventory of what we have in our control and custody.

What I can tell you about those pieces that you may hear about being incorporated into museums and memorials throughout the country, those items did not

Page 117

come from the Port Authority.
I will say that the Port Authority does have a number -- a significant amount of requests from memorials and museums throughout the country, but all that is on hold until after this process is done.
We're not giving out any pieces of steel or anything else that we have under our control and custody.
MR. KLEIN: You didn't quite answer my question. The question was, is the Port Authority taking any actions to try to identify any of these materials that have gone off-site?
MR. STICKELMAN: No.
MR. GOELZ: Joel, if they said they got it from the police, wouldn't the inquiry be to the police?
MR. KLEIN: Was it somebody local, you know, a local responder who, quote, "stole it"?
The point's been made many times that this material does not belong to the Port Authority, that it most likely belongs to the insurance company, and if in fact all these

Page 118

institutions have pieces, they are in fact holding stolen property.
It's kind of shocking to me, as someone who works with museums a lot. I know when I turn something over to a museum, which I do quite frequently in my own work, I have to go through an awful lot of paperwork to prove that I had custody and provide for an adequate chain of title.
Yet there seems to have been this free-for-all of grabbing stuff off the World Trade Center, including some of our very prominent institutions, with no concern as to who has legal ownership of this material.
MR. GOELZ: But I think the Port Authority, have they given you a substantive answer in terms of the material that they have?
MR. KLEIN: Well, yes, but what they've said is that they're not doing anything.
MR. GOELZ: They are holding it.
MR. KLEIN: I think the last -- in terms of finding additional material.
MR. STICKELMAN: Joel, what I can say is that the Port Authority, as you

Page 119

know, was not in control of the site until after June 2nd.
MR. KLEIN: I understand that.
MR. STICKELMAN: So we have no way of finding out where all that steel went to. I mean, the answer is no, we're not going to be doing that.
MR. ALLISON: Tim, could you just respond to his question about why the inventory is taking so long?
MR. STICKELMAN: What it is, it's the secondary lot; that I don't know if you recall, in the inventory that you were given, there was a whole secondary lot. There was one picture taken of all this huge lot of steel. They are right now actually cataloging each piece of steel, taking a photograph of it as -- I don't know if you remember from the inventory, there were pieces of steel with numbers on it. That secondary lot is being done right now.
The reason why there is a concern that it's taking so much time is some of this may be contaminated, so they have to treat it all as if it's contaminated, so they

Page 120

have to take it out of the hangar, photograph it, give it its number, bring it back into the hangar, and that's all going on as we speak.
We hope -- I can't really answer, because I know when they're -- I know they're working diligently out there, but I think we'll, hopefully, sometime in July have a completed inventory. And each piece, just like the other ones, will be numbered.
MR. GARDNER: And the flag?
MR. STICKELMAN: And the flag.
MR. KORNFELD: I would just like to bring one particular piece to your attention that I saw recently, and I just felt it was a very significant Trade Center remnant.
It's at the Intrepid Museum. In the front, when you first enter that site on the right, there's a big ship's propeller from the USS United States, and then right next to that, outdoors, is a piece of -- a tower, one of the triad pieces, a partial piece.
But it has the column covers intact on it. It's the only piece that I've seen anywhere that has the column covers intact, with the sealant and everything, and

Page 121

you can see from the back. And there's a plaque that says it was given to them by the Port Authority police.

I mean, I think it's an appropriate place for something to be exhibited, but this, I happen to think, is a very significant piece that should be considered possibly part of the Memorial; maybe there, but definitely not sitting outdoors, unprotected, in a salt air environment.

So, anyway, I just wanted to bring that to your attention.

MR. GARDNER: Nobody mentioned the -- I don't think anybody mentioned the steel cross and the ramp.

In terms of what we've seen here, we just see proposed mitigation being removing these items.

Can you -- can the Port Authority give some sort of commitment that they are going to be protected and preserved and give us some sort of assurance that they are not going to just be destroyed?

I'm not saying they should be preserved in place, but the cross is important

Page 122

for a number of reasons, as a document of the recovery period, and also the ramp. I mean, during ceremonies, we've traveled, we've journeyed down the ramp to stand on bedrock, and it's a document of the whole recovery period, the ceremonies that have taken place on the anniversaries, and it would be really -- it's something that we would hope would -- you know, we don't want to pick up a newspaper one day and find out that that was just recycled.

So those two things.

And once again, since the photo documentation is not complete, as Tim said, just urging you to clean off those couple inches of dirt on those footprints and take some real -- you know, take an accurate account of what's there so that these determinations can be made properly.

Because a lot of these documents still remain flawed by implying that the columns form portions of the lower footprints. I mean, these are the footprints. Go to that site right now. Street level to 30 feet is midair. They are symbolic representations of where the towers stood. These are the tangible

Page 123

ruins of the footprints.

They are not functional, you can't support them maybe, but they are ruins; they are modern-day ruins, and you have to preserve the maximum amount for the public to be able to benefit from them in the future.

Lou mentioned before about this transportation hub as being something for the future. That's something you could really give to the future, by preserving the maximum amount of these footprints with column delineations, something tangible that they could always experience and connect to September 11th, because we will all be long gone by then and we won't be able to tell the story.

MR. GOELZ: Thanks.

It's after 5:00, so why don't we see if we can do some final wrap-up work.

As you know, the comments are due on the 21st, and one of the things that we were discussing was whether we could ask you to give us your comments right after the 4th of July weekend, which would then allow us to hold a second meeting such as this prior to the 21st.

Page 124

But we didn't want to impose that on you. If people want to wait until the 21st, that's also doable.

But I think in terms of keeping the communications going and trying to be responsive as well as timely, whether that's an agreeable strategy, which we would ask for comments right after the 4th of July weekend and then try and hold a second public meeting on this sometime around the 13th of July.

Is that right? Somewhere in that region.

Does that seem unreasonable? Any major objections?

Go ahead, Joel.

MR. KLEIN: I don't have an objection. I just want to say I think it's a wonderful idea, but I would ask that if we were to do that, that the agenda for that second, next meeting be to specifically discuss the comments that we have rather than -- and have you respond to those, rather than hearing an updated presentation, although you would probably like that as well.

MR. GOELZ: You would want an

updated presentation, yeah, and I think we can. We will try to do some response. I'm not sure we can respond to all of them, but we certainly could do some.

MS. GAULL-HOWARD: What I'm saying is why don't you just meet with the families and leave everybody else out of it then.

MR. GOELZ: So are we in agreement, then, that we will have written comments which would be due July 6th? Is that what we're saying? Is that the Tuesday after?

As close as you can after the 4th of July, and then we will schedule a meeting, giving two or three weeks' notice as soon as we can around July 13th.

Is that okay?

FEMALE SPEAKER: I have another question.

How will we address the comments we're turning in on the draft DEIS? Because with LMDC, I don't know that we ever got a summary of the preservation comments that were received during its environmental review process. And I think those are important, and

everybody who is interested in preservation issues may not in fact be here or have the opportunity to attend these meetings.

So I'm fine with that schedule but would like to know how we have the benefit of any other preservation comments that come in during the environmental review process. The comments from the 21st -- after the 21st.

MR. WONG: That would be part of this discussion as well.

FEMALE SPEAKER: That would be great.

MR. GOELZ: Okay. Any other questions?

MR. GARDNER: I think our attorney, if she's able to receive these, on the line.

MR. STICKELMAN: Is anyone on the line still?

MS. MERRITT: Yes. Betsy Merritt here. I'm still here.

MR. STICKELMAN: Anyone else?

MR. GOELZ: So we will get a notice out as soon as possible to set a time and date after July.

MR. KLEIN: When will the transcript be made available?

MR. GOELZ: The transcript? There's one thing I want to say about the transcript. Remember, we cannot vouch for 100 percent accuracy of the transcript. She has done an extraordinary job. We have tested her skills, but we are not going to go back and circulate the transcript to everyone for editing, because then you wouldn't see the transcript for about two years, knowing this group.

So when will we be able to see a transcript?

THE REPORTER: A week maybe.

MR. GOELZ: About a week or ten days.

MR. STICKELMAN: We will be making that available. It all depends on her schedule in getting it to us.

MR. KLEIN: Thank you. I want to close on a very positive note and thank the Port Authority for arranging to have that transcript. We appreciate it.

MR. ALLISON: I would just like

to say that with all the things that we may have said to you today that may have sounded like criticisms, and they probably were, that the Port Authority has to be complimented, and as many of us complimented the DOT on the 9A hearing, on being much more cooperative and much more forthright than certain other agencies.

MR. GOELZ: I should say, one of the things is at any kind of these public processes, you get punished sometimes, and of course, for doing the right thing you end up getting beat up for a couple hours, but we understand that.

MR. ALLISON: Thank you for the opportunity to beat you up.

MR. KORNFELD: I would like to point out also that while we may sound kind of strident in tone at some points, that we've been very focused on issues that we think are important and really not attacking the overall plan for the site. And I think we have to see -- I think probably most people here feel that Calatrava is a genius, and I don't think that that's -- that terminal itself is not a

point of attack. Really, the impacts on historic resources I don't think affect major elements.

MR. KLEIN: I would like to second that.

I also want to say to the engineers, you know, I talked about your viewing the historic resources as an impediment. I think you should treat this as a challenge, as something that you need to deal with.

As somebody once told me -- I worked in nuclear waste disposal for a long time, and they said there was no such thing as nuclear waste problems; there were only issues that needed to be addressed.

And I think if you take that same approach to the issues and the challenges of building your facility within the constraints that historic preservation creates at this site, I think everybody is going to be pleased with the end result.

MR. GOELZ: Good. Thank you.

- - -

(Meeting concluded at 5:30 p.m.)

A
ability 11:7 75:5 76:24
able 9:14 11:13 35:4 44:16 47:15,17,23 48:8 51:8 63:6 67:1 69:6 71:24 123:6,15 126:16 127:13
absolutely 81:18 83:17
accept 51:8
access 30:17 33:4,12,15 55:16 56:20 57:7 58:11,12 59:18 62:11 67:16 69:14 70:18,23 75:6 81:25 84:6,12 85:8 86:21 90:18 92:8 93:8,11,19 95:21 95:25
accessible 30:12,21 33:6,14 49:7
accessway 95:15
accommodate 50:14
accomplish 36:23
account 49:10 122:16
accuracy 127:6
accurate 88:11 122:16
acknowledge 61:17
acreage 80:20
acting 64:4,15
action 116:16
actions 117:12
actual 80:25 92:6
Adam 4:12,17 18:3,9
add 65:4 72:6
addition 13:11 27:23 28:18 31:16 34:3 36:7,12 42:2 46:21 80:18 91:16 92:3
additional 111:4 118:23
address 125:20
addressed 129:16
addressing 80:18
adds 106:8
adequate 118:8
adequately 55:5
adjacent 46:12 51:12 58:9
Administration 5:6 19:9
Administration's 6:10
advance 8:6 9:25 103:12
advantage 107:6
adverse 7:21 24:25 25:6
adversely 25:4
advised 38:10
advisory 3:17 14:5,7 17:17 72:10 78:16 90:12 92:15 103:23
advocating 73:6
AE 99:16
aerial 43:14
affect 24:20 41:2 49:1 54:19 111:1 129:2
afternoon 6:7 8:10 11:2 12:20 27:10,11 52:7 56:3
afternoon's 7:18
agencies 6:25 7:12 63:21 66:1 128:8
agency 22:2 63:21 65:1
agenda 8:21 23:4 114:24 115:1 124:19
ages 24:9
ago 14:16 22:12 24:9 75:20 76:18 85:10 95:16
agreeable 124:7
agreement 15:23 25:8 75:4 114:18 125:10
ahead 27:8 124:15
air 121:10
AKRF 4:19 18:12,13 18:17,18
aligned 51:22
alignment 57:23
Alliance 4:14 18:6
Allison 3:5 17:3,3 83:14 85:5,24 86:14 87:3,7,12,25 119:8 127:25 128:15
allow 53:12 62:11,14 67:16 123:23
all-weather 67:16
Alter 4:12 18:3,3
alteration 40:24
alternative 67:23 69:4 79:21 111:4
alternatives 104:8,13 110:19,25
American 3:4 17:4
Americans 102:6
amount 38:4 78:24 108:7 117:4 123:5,10
analysis 42:3 47:14 109:5 111:15 113:14
analyze 98:5
analyzed 36:20
analyzing 62:1
anchor 68:11
ancient 102:18
Andrea 4:21 18:18
anecdote 105:4
Anna 4:14 18:5
Anne 4:20 18:13
anniversaries 122:7
answer 20:25 21:3 23:10,12,14 63:23,24 71:4 92:21,24 117:11 118:17 119:6 120:5
answered 22:22 23:17
Anthony 2:15 3:10 17:10 77:12 108:15
anybody 104:21 106:18 121:14
anymore 104:23
anyone's 91:24
anyplace 87:20
anyway 99:9 121:11
apart 104:11
appears 65:6 110:6
appendices 113:23
appendix 113:25
apples 110:13
appreciate 11:4 20:18 127:24
approach 88:5 97:4 104:2 129:18
approached 98:6
approaching 96:5
appropriate 24:19 59:24 75:6 121:5
approximately 29:21 30:24,25 32:4 55:2 84:11,14 108:20
April 64:19
Arad 83:22
Arad's 79:16
archaeological 102:13
archaeologist 97:24 98:2 100:13,15
archaeologists 100:12
arches 38:2
architectural 37:25 101:17 102:9
area 32:13,22 33:21 37:8,23 40:5,8,14 42:20,21 43:15,18 48:8 49:23 50:5,11,23 50:25 51:1,1,3,16 54:24 57:17 58:3,17 59:4 63:5 69:24 70:17,19 73:3 75:2,15 75:23 76:3,12 80:5,6 90:23 95:11 106:9 107:17 108:23,25 109:9 110:12
areas 27:24 28:24 40:13 74:22,23 78:8 93:6 99:7 108:16
arranging 127:23
article 91:25
articles 103:9
artifact 13:24 115:2,3
artifacts 13:14,17 58:6 60:9 62:18 65:12 101:21 102:25 115:8 115:19 116:2
artist 101:18
Arts 50:5
ascent 57:13
asked 22:11 115:1
asking 14:22 86:3
aspect 100:20
Assembly 4:9 18:2
assess 110:7
assessing 24:25
assessment 111:10
associated 36:14 41:1 50:16 101:4
Association 3:4 4:1 17:4,21 69:11
assume 67:17,18
assumption 111:10
assurance 121:22
attack 129:1
attacking 128:21
attend 126:3
attention 120:13 121:12
attorney 126:16
August 15:24 16:1
auspices 6:24
authority 1:14 2:1 4:11 6:2,12,16 7:1 8:14 12:21 13:3,11,15,16 18:4,20,24 19:1,5,7 19:11,13,19,21,23,25 20:2 22:10,15,19 23:9 25:9 26:4,21 29:4,8 33:24 37:10 63:15 64:4,15,18,23,25 65:6 65:14 67:21 69:13,18 72:11 79:13 90:9,24 91:16 99:22 100:18 101:12 103:7 104:2 105:7,21 108:1 115:23,25 116:1,15 117:1,3,12,24 118:16 118:25 121:3,20 127:23 128:4
Authority's 9:2
availability 16:3
available 20:17 63:15 79:19 127:2,19
Avenue 1:15 6:3
avoid 34:11 37:18 38:18 47:16 61:25
avoiding 110:4,5
aware 11:17 13:25 14:3 14:8 91:19 116:18
awful 118:7

B
back 9:10,12 12:1 13:7 43:9 49:15 60:10 64:18 79:24 80:23 82:9 105:1 107:6,17 107:19 109:20 115:2 120:2 121:1 127:8
backed 55:15
background 6:21 50:19
backup 113:20
bad 101:12
baffled 73:17
balcony 31:5
Bank 41:11
Barclay-Vesey 41:8
base 48:7 57:21
based 10:3 48:10 84:8
basement 44:4,5
bases 42:24 43:12,22 43:23 44:22,22 46:19 47:16 48:15,25 49:2,6 54:16,20,21 62:1,12 73:2,4 75:16 76:4 77:21 79:4 80:19
basically 81:9 85:11 113:12
basing 111:9
basis 7:14 99:14
bathtub 35:8 42:24 45:13 49:23 54:4,25 55:19 63:5 91:23
Battery 4:11 18:4 32:12,17 50:17 53:16 67:4 81:16,24 82:16
beam 73:13 80:25 81:11 90:18 102:2 108:17,24 109:1,6,25 110:5,10 112:1,6,13
beams 56:19 57:16 60:5 70:18,20
Beard 41:13
beat 128:13,16
bedrock 108:21 122:4
beg 108:6
began 62:21
beginning 21:8 24:24

29:18
begins 31:2,3
believe 10:16 14:9,15 24:22 47:13 60:6 84:14 106:6,11
belong 117:23
belongs 117:24
beneath 67:15
beneficial 80:15
benefit 123:6 126:5
Berger 5:8 19:17
Bernard 3:1 6:8 8:12 13:1
Bernie 2:9 19:4
best 11:6 34:13 35:10 95:20
Betsy 9:16 88:12 126:20
better 89:24 92:20 95:8 101:5 106:25
beyond 65:8 78:6 112:5
big 120:18
Bill 2:13 4:4 17:22 19:18 66:17,17 68:4 88:25
billion 28:13 29:4,8 52:3
bit 51:18 52:1 64:7 69:18 100:23 101:2 108:15 114:24
black-and-white 91:15
blamed 101:13
block 94:1
board 106:2
boarded 106:7
Bob 96:2 100:11,14 104:17
Bonacci 2:4 19:22,22 55:22 56:2 70:16 74:13,16 82:5 83:4,9 84:8 86:8,12 87:2,5 106:19,22
BONNACI 95:14
Boston 5:13 20:13
boundaries 78:6
bounded 42:21 56:7
box 70:18,20 73:13 80:25 81:11 90:18 102:2 108:17,24 109:1,6,25 110:5,10 112:1,6,13
boxed 94:22
box-beam 69:15
braced 55:5
bracing 53:9
Braegelmann 5:6 19:8 19:9
bridge 45:7 67:15,22 68:3,4,8
brilliant 101:17
bring 21:23 35:7 55:21 120:2,13 121:12
bringing 111:21
Broadway 41:13
broke 39:12
broken 42:7
brought 9:24 22:25 65:13 92:1 103:4
build 26:5 34:4 59:10 71:23 75:14,18 96:21 100:1 104:7 111:6
building 31:11,21 36:14 37:1 41:8,10,12 41:13 43:25 44:23 45:24 64:1 68:12 75:1 81:23 103:13 129:19
buildings 41:17
built 28:22,24 29:17 38:6 45:9 52:12,16 59:17 64:11 82:25 95:15 102:15 111:11
bulkhead 40:21
bullet 110:3
buried 40:22 97:25
Burke 4:21 18:18,18
burned 44:15
businesses 67:7 68:23
B6 44:5

C

Calatrava 57:8 84:21 101:16,22 128:24
Calatrava's 38:1 85:16 87:20
called 88:10
calls 106:1
call-in 10:9
Calvert 4:21 18:16,16
capability 10:23 104:23
capacity 69:7
captured 88:8
car 66:23
Carla 2:4 19:22 55:22 56:1 60:15 93:22
Carol 5:6 19:8
carried 45:2 68:9
carry 38:4
case 17:1 65:18 69:5 101:13 108:2
Castle 116:9
cast-iron 59:13
cataloging 119:16
cause 41:4
cement 94:1
center 3:7 7:5,9,20 8:15 13:5,10 17:6 21:18 22:6 27:13,25 28:15 28:16,21,23 29:5,18 29:20 30:7,17,20 31:20,24 32:8,11,20 34:2,20 36:11 37:14 37:20,24 38:15 39:5,7 40:14 41:23 44:6 49:13 50:18,22 52:13 53:18 59:3,17 62:6,9 62:10,19 63:2 64:13 65:9 67:6,7 68:20,25 80:3,5,7 82:2 85:12 86:2 89:6 90:12,19 91:8,23 92:7 97:8,19 98:23 99:2,24 100:16 108:5 114:6 116:6,11 118:12 120:15
Center's 108:5
central 49:25
Century 41:11
ceremonies 122:3,6
ceremony 21:10
certain 62:8 128:7
certainly 22:24 97:18 125:3
chain 118:9
challenge 129:10
challenges 129:18
chance 23:19
Chang 5:1 18:14,14
change 47:5 49:16 86:25
changes 57:11
Chappaqua 116:10
chapter 113:18,23
characteristics 40:25
charged 72:11
Charlene 3:18 17:16 103:22 105:5
chart 24:9
check 25:16
Chris 4:21 18:16
Church 30:18 56:8 57:24 84:17
circles 82:13
circulate 127:9
circulation 84:13
cities 102:8
City 4:11 5:3 17:19 18:4,22 32:12,18 53:17 67:5 81:17,24 82:17 102:11
clarified 76:8 90:5
clarify 22:11 88:13 111:17
clarifying 112:20
Class 68:12
clean 97:16 98:3 105:24 122:14
cleaned 98:12,18 106:15
clear 10:1 103:14 107:8
climate 68:15
climate-controlled 32:15 33:7
close 125:13 127:22
closely 6:15
closest 35:3
Coalition 3:9 4:3 17:9 17:11,22 66:18 81:15 106:25
Cohen 3:1 6:7,8 21:17
Coleman 2:8 18:25,25
collaboration 106:3
collapse 55:6 93:18 94:8
collapsed 93:6
color 91:17 92:11
column 37:13,20 38:3,7 38:12 42:24 43:12,22 44:7,22 46:19 47:16 47:25 48:3,5,15,25 49:2,6 54:15,19,20 62:1,12 69:15 70:1,18 70:20 73:2,4,14 74:4 75:9,16 76:4 77:21 78:25 79:4 80:19 81:12 109:25 110:6 111:21 120:22,24 123:11
columns 37:18 38:14 43:23 44:13 45:1,24 46:7 73:13,18 75:6 80:25 81:2,3,3,7 90:19 97:6 98:20,24 107:10 108:11,12,17 108:24 109:6 110:10 112:1,6,13 122:21
come 9:7,12 22:18 23:9 23:18 28:3,20 32:2,8 32:8 34:6 37:8,15 38:7 39:10,20 42:11 48:1,3,7 51:19,25 53:13,18 61:11 87:12 89:7 91:6 97:14 107:6 109:15 115:2 117:1 126:6
comes 9:2 45:19 89:14
comfortable 37:17
coming 28:19 32:16 50:9 82:16 107:17,23
commend 104:1
comment 11:11,13,18 11:20 12:4 14:17,18 14:25 15:15 72:7 77:12 83:14,16 89:1 99:9 114:22
comments 7:6 8:2 12:1 12:11 13:7 15:14,21 15:24 66:19 90:21 103:25 110:16 123:19 123:22 124:8,21 125:11,20,23 126:6,8
commercial 28:22
Commission 3:20 17:19
commit 60:25 62:2
commitment 35:10,12 36:16,18 39:1 61:9,24 62:3,13 63:3,6 106:2 114:17 121:20
commitments 34:14 60:23 69:13 90:20 116:1
committed 37:10 62:7
committee 90:12 92:15 92:18
communications 124:5
company 117:25
complete 37:5 122:13
completed 52:21 113:11 114:6,8 120:8
completely 68:16
complex 27:19 34:5
complicated 95:21
complimented 128:4,5
components 53:24
comprise 109:8
compromise 107:21
compromised 79:8 107:15
concept 95:18
conceptual 47:24 48:11
conceptualize 98:17,25
concern 112:5 115:11 118:13 119:23
concerned 91:10
concerning 60:24 61:2
concerns 101:6
conclude 25:8
concluded 129:25
concluding 54:14
concourse 31:5 32:5

37:15 40:20 47:10,19 57:1,14 58:1 59:11 67:24 84:19 85:2 90:2
concourses 27:24
concrete 74:5 97:22
Conde 91:25
condition 93:25 95:9
conditions 90:14,16
conducted 6:24
configuration 34:17,25 35:22 45:21 47:3,7 49:5 53:5
configured 45:6
confines 78:6
confirmation 49:16
confusion 22:2
connect 31:13 59:23 123:13
connected 59:19
connection 31:15,17,19 50:7 59:25 82:21
connections 27:20,22 28:7 29:23 31:1,8,25 50:15
connects 57:2
cons 104:13
conscious 63:2
consequences 111:8
consider 67:21 109:16
consideration 109:18 110:19
considered 67:23 100:20 106:10 111:4 121:8
considering 41:20
consistently 101:7
constraints 129:20
constructability 36:13
constructed 46:15 47:13 57:21 77:22
constructing 46:11
construction 20:24 21:5,8 23:9 36:17 37:4 41:2,4,22 43:6 45:8 46:10,24 47:2 48:21,22 49:4 51:13 51:20 52:4,9,15,21 54:3,7 55:6,8,11,12 58:3 61:5,8 63:22 64:21 73:23 93:11 98:10 106:17 113:11
consultants 100:24
consulted 114:16
consulting 1:9 8:8 12:1 15:1,19,25 25:13
contaminated 119:24 119:25
contention 75:3
continue 63:9
continued 85:4
contributing 109:7
control 68:15 116:21 117:9 119:1
Conway 4:20 18:11,11
cooling 43:6 53:14,15 53:21 55:17
cooperative 128:6
coordinated 7:7 13:3,8 14:1 58:18
coordination 30:6 90:25
core 74:4 98:19
corner 9:9 22:4 36:10 41:8 46:1,18 88:16
corporate 96:6 101:20
CORPORATION 5:1
correct 12:13 66:15 80:11,13 111:18
corridor 31:2 50:8 66:21 67:15 82:15 87:22
corridors 61:25
Cortlandt 57:24 58:2 82:19
Council 3:12,17 14:5 17:13,17 65:3 72:10 78:16 96:3 103:23
count 115:7
country 116:25 117:5
County 116:10
couple 8:18 66:19 105:6 106:1,17 122:14 128:13
course 41:24 128:12
court 16:19
cover 22:9 48:24 54:19 102:15
covered 103:1
covering 49:1 74:23
covers 120:22,24
Cracchiol 2:15
cracked 93:20 94:2
crash 46:2
create 31:14,24 32:10 100:1
creates 129:20
creating 32:14
credit 110:3
criteria 95:24
critical 29:2,11
criticism 99:21
criticisms 128:3
cross 57:16 67:1 75:22 121:15,25
cross-form 56:19
Cruzzola 19:6,6
cultural 38:6 78:23
culture 96:7
cumulative 91:6
curatorial 90:13
curators 92:14
curious 91:2,24
current 48:11 57:13 84:9,18 93:25 96:18
currently 41:11 56:13 83:23
custodian 115:23
custody 116:21 117:9 118:8
cut 14:24 44:13,16,19 44:19 50:13 99:6

D

D 48:2 70:17
daily 99:14
Daly 3:20 17:18,18
damage 41:4,17 98:21
damaged 93:16 96:20 99:7
damages 41:18
dashed 40:5,10
data 113:21
date 11:18 12:24 126:25
dates 15:16 16:13
day 34:5 105:23 122:10
days 127:17
deal 8:3 22:2 129:10
dealt 90:23 91:3
debate 88:11 100:8
Deborah 4:9 18:1
debris 98:19
deciphered 105:18
decision 16:5 100:10 114:14
deck 86:11,15,18
deconstruction 66:4,6
deep 29:22
define 108:12
defined 25:12 81:3 108:17 109:9
definitely 121:9
degree 110:21
DEIS 12:5,8,11 15:10 36:2 112:22 113:14 125:21
delineated 73:13 75:9 81:11 108:24
delineation 107:3
delineations 78:25 79:19 123:11
DeMeo 2:14 20:1,1
demolished 93:12
demolition 22:3 64:5 64:16 65:6,8 93:16
department 4:16 41:11 108:19
depending 51:20 54:1
depends 127:19
depressing 83:23
derive 73:21
describe 11:5,8
described 49:11 74:24 110:25
design 21:7 36:13 37:17,24 38:24 47:6 47:23,24 48:11 54:23 56:16 57:8,9 58:14 72:1 73:22 76:23 79:16 84:9,16 95:2 101:17,22
designed 30:5
designing 90:24
designs 101:20
destroy 86:1 88:6
destroyed 84:7 121:23
detail 7:24
detailed 26:24 99:4
details 33:23 112:18
deteriorated 93:20
determination 7:8,11 7:19 13:4,9 14:19 25:19,21 72:20 110:16
determinations 107:13 122:17
determine 7:3 24:11,20 24:21 75:5
determined 54:17 58:22 76:6,23 79:5
determining 24:13
developed 77:3
developing 7:2
development 5:1 101:8
dewatering 41:5,19
Dey 30:10 31:19
diagram 40:4 45:17,19 57:20 58:10,24 59:8 88:15
difference 45:3,9
different 21:15 30:17 90:9 97:3,11 98:20 104:5 110:7
differential 86:1
dig 8:13
diligent 73:8,9
diligently 13:22 120:6
dipped 85:3
direct 33:4 41:24
direction 33:10 61:1
directly 28:16 73:10 74:20 75:7
Director 6:9
dirt 106:17 122:15
disappear 115:11
discovering 102:12
discuss 7:18 11:25 21:13 124:20
discussed 10:11 79:10 101:23
discussing 123:21
discussion 42:1,5 65:19 97:15 104:9 109:24 110:23 126:10
disparate 104:18
disposal 129:13
disrespect 102:7
distinct 104:3
distinctive 103:3
distribute 38:12
district 32:18,22 40:12
Districts 3:12 17:13 65:3 96:3
divergent 101:14
doable 124:3
docks 59:19
document 7:3 14:15 15:23 77:5 88:16 122:1,5
documentation 62:5,5 90:7,10 112:25 113:14 114:5 122:13
documented 98:14
documenting 104:13
documents 25:15 122:19
DOE 14:1,6,7,10
doing 25:11,16 34:10 34:13 85:19 89:17 91:13,17 109:17 111:7 118:19 119:7 128:12
door 105:13,13 106:6
doors 60:11 89:10 105:10,24
DOT 13:3 18:8,10 128:5
DOT's 67:20
downtown 4:14 18:6

27:17 28:1,10,12,14 28:19 29:14 30:2
draft 7:19 13:17 14:14 14:17,18 15:6,15,20 15:22 42:4 77:7,8,9 77:16 88:15 90:21 125:21
drainage 54:6
Draw 87:12
drawing 87:11,21
drawings 90:15
drop 57:3
due 15:21 41:5,18 123:20 125:11
Dupret 91:20 106:13
Dupret's 92:12
duration 37:3
D.C 5:11 20:11

E

E 31:14,15 56:18,23 57:2,7 84:6,13 85:3,8 85:14 86:19 87:1,8,18 88:21 89:2,7,23 105:1 105:10 106:9
earlier 7:7 13:1 26:22 79:11 80:24 91:14 109:24
early 7:25 25:13 35:1 37:10 38:23 51:17 62:21,25 71:7
east 33:12,16 37:23 38:14 39:13,16 40:7 41:10 42:8 55:24,25 56:5,8,12 57:12,24 59:23
eastern 56:10 57:19
east-west 31:22 32:6,9 32:10 37:15 50:8 61:25 66:21
easy 71:24 72:16 83:25 98:25
echo 89:1,21
economic 28:12
edge 40:23 48:2
editing 127:10
educate 101:2
effect 40:6 110:22 111:21
effects 7:15,19 14:14,19 15:15,23 25:1,6 40:9 67:14 72:20 75:12 77:17 104:4 109:5 110:15 111:7,15
effort 110:18
efforts 6:16 52:11 53:11 55:23
egress 61:12,13,21 95:11
eight 49:1
EIS 14:17,19 15:6,20 16:9 67:20 88:15 91:7,8
either 32:17 36:21 69:5 83:19
ejector 54:6
elaborate 108:14
element 58:4,7,8,18 59:1 88:14
elements 28:2 60:2,8,10 60:13 65:25 69:19 70:5 72:24 104:3,18 129:3
elevate 57:21
elevation 30:23,24 32:4 33:2,19 84:16,19
elevations 84:10
elevator 54:5 68:22 74:5 97:23
elevators 33:6 68:14
eligibility 7:4,8 13:4,9 25:19,21
Elizabeth 5:11 20:10
emergency 4:6 17:25 61:21 89:19
emotional 101:3
enclosed 68:16
encounter 69:22 70:6
encourage 9:6
ends 11:21 68:13
engineer 64:4,16 65:5 103:7
engineering 47:6 65:8 92:23
engineers 99:13,13,19 99:22 100:1 101:1 129:7
ensure 62:2
enter 52:24 82:18 120:17
entire 32:11 45:23 62:6 91:18 97:20 109:9 110:12
entirety 9:5
entrance 89:22
entries 82:13
entry 58:15
environment 32:16 33:7 121:10
environmental 15:4 42:2,4 125:24 126:7
equipment 20:17 97:22 98:10
equivalent 68:12
Eric 3:5 17:3 106:10
escalator 94:2,4
escalators 33:5 68:14
especially 98:15 107:7
essentially 42:20 50:1 56:7 57:7,10,23 60:2 82:7 96:23
estimated 113:1
eternity 96:19
evaluating 69:4
events 59:5
eventually 45:8 51:18 55:9,14
everybody 125:7 126:1 129:21
everyday 70:6
evolving 37:24
exact 95:17
exactly 87:25 95:20 96:18
example 44:1,11
examples 73:22
excavated 98:1
excavating 100:15
exclusively 66:13
Excuse 12:9
exhibited 121:6
exhibits 62:20
exist 46:20 47:16 116:17
existed 45:21 59:2 60:11
existence 56:13
existing 31:14 39:6 46:3,8,12 48:5,20 50:2 57:1 90:14,16 94:10
exists 94:10,18
experience 62:17 70:6 71:7 72:12 92:6 107:21 123:13
expert 14:11 94:21
explained 87:13,16
exposed 50:23 51:2 62:15 71:9,25
extend 53:15
extensive 22:21
extent 97:18
external 82:21
extraordinary 127:7
extremely 25:20 68:8
e-mail 9:17 10:13
e-mailed 10:5

F

F 45:19
face 44:10 47:12
facilitate 44:17 46:23 52:10,19 55:11
facilitated 8:18
facilitator 8:5 11:4
facilities 38:6
facility 96:13 110:9 129:19
fact 25:3 54:9 73:19 87:21 103:16 110:4 111:11,16 117:25 118:1 126:2
failed 60:6
fairly 63:13 88:11 95:21 103:14
falls 64:2,12 74:20
families 3:9 17:9,11 73:5 106:25 107:14 109:14 125:7
family 72:10 78:16 105:6
far 104:11
fashion 32:9
feasible 47:15 67:24
feature 99:3
features 97:21
February 6:24 13:6
federal 5:6 6:9 19:9 29:3 103:11
federally 6:13
feedback 14:25
feeding 107:4
feel 8:24 29:21 37:17 88:8 89:6 97:20 128:23
feeling 89:11
feet 29:21 30:25 41:3 50:13,14 57:11 59:7 75:24 85:1,18 86:18 87:4 97:12 122:23
FEIS 16:3
Fellonossa 5:14 9:22 10:12,15,21 11:3,16 11:22 12:7,10,14 20:12,13 64:6 66:3,12 66:16
felt 72:15 120:14
FEMALE 125:18 126:11
FGEIS 64:3,14
FHWA 6:25 13:2
field 26:12
figure 24:18 80:11 98:3 103:18
fill 72:9 98:9
filter 31:4
final 16:1 21:6 47:3,7 49:4 123:18
finally 39:3
financial 32:8,13,18,22 50:18 67:6,7 68:20,25 103:17
find 10:15 73:16 98:2 102:1,3,9 112:24 116:17 122:10
finding 67:14 75:12 77:17 110:23 116:5 118:23 119:5
fine 23:23 115:14 126:4
finished 43:9 115:21
finishes 97:8
fire 108:19
firefighter 105:16
first 8:19 24:17 31:1,7 40:19 43:11 56:17,22 61:2 68:24 72:20 96:25 103:5 120:17
fit 88:4 101:22
five 29:17 34:20,21,22 35:13 41:6 49:9 85:21 97:7,12
flag 120:10,11
flat 83:22,22
flawed 122:20
floor 68:21,24,24 70:2 84:10 87:6 97:8 99:5
flooring 60:12
floors 99:17
flow 24:9
focus 7:17 8:20 73:15 107:10
focused 112:7 128:20
focusing 21:20 73:17 75:12
folks 8:25 9:14
follows 40:18
follow-up 65:16
foot 43:20 55:2 98:9
footage 80:9
footing 38:11 48:7
footprint 45:25 46:6,17 47:20 48:17,19 61:22 63:1 75:23 76:12 78:1 79:7 80:2 97:21 107:4 109:9 110:5,12 111:23,25 112:10,17 112:18
footprints 45:13 62:24 72:14 73:7,19,24 74:6 74:20 75:7,8,18,19

78:9,11,16,21,25 80:17,23 81:8,11 97:19 98:11,18 106:15 107:7,11 108:6,7,23 112:4 122:15,21,22 123:1 123:11
Forget 87:7
forgot 77:23
form 57:16 73:23 75:6 96:18 122:21
format 110:24
former 41:10 59:2
forth 78:4 107:18
forthright 128:7
fortunate 34:3
forward 16:9 25:5 26:3 44:18,20 49:17 51:20 52:3 80:15 93:11,13
found 36:19
four 35:19 56:12 60:2
fourth 35:24,25 36:8 38:8 46:14 47:9 48:22 49:5,13 79:21 79:24 80:4 111:6,10 111:16
four-foot 57:3
frame 16:13
Frankly 115:5
free 8:24 80:17
Freedom 50:3 64:1,2 64:10
free-for-all 118:11
frequently 118:6
front 105:13 120:17
FTA 3:1 6:14,25 13:2 14:8 19:2 29:10 64:25,25 104:2
full 54:16 104:12
fully 30:21 33:6
Fulton 30:9 31:20,23 32:20 91:8
function 104:6
functional 123:2
functionally 96:10
functioning 68:13 69:20
Fund 4:6 17:25 89:20 91:21
funded 6:14
funding 29:10 65:23,24 66:3,6,11,13,14
funged 103:15,21
funnel 31:4
further 35:8 111:24
future 28:25,25 31:12 36:6,6 38:7 51:22 58:25 90:3 94:9 100:12 123:6,9,10

G

garage 22:5 66:4,7
Garden 50:19
Gardner 3:10 17:10,10 72:6 74:15,18,25 76:1 76:9,13 77:4,9,15,20 78:14 79:12,15 80:10 80:14 81:1,6 88:19,22 104:22 106:21,23 120:10 121:13 126:15
gauge 104:4
Gaull-Howard 4:4 81:13,14 82:23 125:5
gee 100:4
general 79:1 96:6
generally 58:17
genius 128:24
gentleman's 89:1
getting 86:6 87:20 92:8 105:23 114:12 127:20 128:13
give 6:20 14:6 22:21 23:19 25:14 29:21 76:24 116:20 120:2 121:20,22 123:9,22
given 107:7 114:25 116:13 118:16 119:14 121:2
gives 75:4 89:11
giving 92:15 100:7 117:7 125:15
glad 68:16
glass 70:1,2 102:3
go 8:4 9:9 16:25 24:3 27:8 29:22 30:22 31:9 32:3,24 33:22 49:15,16 52:2 53:17 58:5 60:9 61:25 78:18 82:1,9 84:16 86:24 99:5 101:25 102:8 103:2 105:1 109:19 111:24 114:24 118:7 122:22 124:15 127:8
goal 24:10 70:3
Goelz 3:2 8:6,10 11:6 12:3,15 16:12,24 20:5 20:8,14,19 21:2,12,20 21:25 22:17 23:3,8,13 23:18,24 26:16,18 39:19 60:16,19 63:12 66:5 68:3 69:8 72:4 78:10 79:10,14 81:4 82:3 83:2 87:23 88:9 104:21 117:16 118:15 118:21 123:16 124:25 125:9 126:13,23 127:3,16 128:9 129:23
goes 51:20 65:8
going 7:23,24 8:1,4,14 8:19,22 9:20,23 10:2 11:14,25,25 12:23 14:10,23 15:11,14 16:4,8,9 21:2 22:20 22:21 24:7,20 25:5 26:8,15 27:5,11 29:15 29:19,20 32:17,19 35:4 39:14 42:10,23 47:5 50:10,19 55:10 55:25 56:4,14 60:16 60:23 63:19 66:14 69:24 72:19 75:1,14 75:17 79:20 82:11,25 83:7,19,21,24 85:6 86:1,25 87:11 88:5 90:1 91:3,5,6,17 92:6 93:11,13,18 94:8 98:8 100:17,19 102:1 110:10 119:6 120:3 121:21,23 124:5 127:8 129:21
good 6:7 8:10,11 12:19 20:14 21:22 23:11 27:10 29:21 34:2 52:7 56:3 69:8,21 74:3 79:6 92:17 100:24 129:23
gorgeous 81:18
government 29:3
GPS 108:18
grabbing 118:11
graceful 84:22 85:21 86:6,21 88:5
grade 45:10 82:8 83:19 83:20,20 84:17 90:1
gradual 57:12
granted 29:4
graphic 39:4
great 8:3 20:14 22:1 34:7 126:12
greatest 97:18
Greenwich 30:9,19 35:3 42:22 45:18 49:22 51:6,11 58:9,25 82:19
ground 40:22
ground-borne 41:5,18
ground-breaking 21:10
group 5:8 7:12 19:17 66:22 127:12
growth 28:19 29:1
guess 51:6 87:9
guys 25:1,14 101:11 107:1

H

HAER 92:10 98:8 114:11,14
half 32:15 73:6 106:24
hall 28:4 31:4,23 32:10 57:10 58:16 59:10 82:20
handing 26:15
handle 69:6
hangar 13:13,22 58:5 65:13 115:9 120:1,3
Hanley 2:7 18:23,23
happen 71:10 121:6
happened 12:25
happy 26:12 90:8
hard 10:16
hardening 95:23
Harold 2:12 19:14
hatched 40:13
hear 8:22 15:16 23:15 64:9 68:16 70:9 91:3 116:23
heard 22:12 83:17 115:25
hearing 91:7 124:22 128:6
hearings 13:3 15:10
heart 32:19
heavy 44:2 115:12
held 73:10
help 13:12
helped 34:4
helpful 90:15 112:23
he'll 26:9
historic 3:12,15 7:4,15 7:22 14:6 17:13 24:11,14,23 40:6,9,11 40:12,15 41:3 65:3 78:22 96:3,9 97:2 99:23 100:6 101:3 104:3 129:2,8,20
history 102:7
hit 38:9
hold 22:25 117:5 123:23 124:9
holding 118:2,21
holistically 104:17
hook 31:10
hope 15:18 107:5 120:4 122:8
hopefully 11:1 13:20 15:13 16:4 64:9 102:22 107:13 120:7
horrible 34:5
Hotopp 5:9 8:24 19:16 19:16 24:2,3 26:17
hour 67:11 68:9
hours 9:15 67:2 128:13
House 53:16
hub 1:7 28:5,5 84:5 100:19 123:8
HUD 6:25 13:2 66:13
Hudson 40:21 53:16
huge 84:24 119:15
human 108:20
humanly 9:15
H&M 56:21 59:1,16 103:1,2

I

idea 124:18
ideas 7:25 8:2
identified 79:25 109:12
identify 7:4 16:21 117:13
identifying 38:24 104:3
Ielpi 105:15
images 90:16
impact 36:9 37:7 38:13 38:19 42:4 43:1 46:16,18 47:19 48:4 49:13 50:6 54:8,16 55:4 60:2,24 63:9 76:7 80:8 110:7 111:22,25 112:4,9
impacted 40:2,2,15 53:5 54:2 55:18 56:15 59:5,22 61:19
impacting 51:4 52:2
impacts 7:21 24:13 26:6 33:20 34:11 37:18 39:2 40:18 41:16,21,24 51:5 61:21 74:19 75:8 95:24 129:1
impediment 99:24 100:5 101:7 129:9
implement 52:3
implying 122:20
importance 29:13 101:3
important 28:14 29:7 29:12 33:10 34:8,9

36:15 38:22 66:25 67:4 78:15 100:6,20 121:25 125:25 128:21
importantly 8:1 31:18
impose 124:1
impossible 83:7
inaudible 70:15 95:14 95:16,17,18,18,19,20 95:21,22,23,25 96:1 106:22
inches 44:2,2 106:17 122:15
include 13:23 37:1 111:15,20
included 14:17 65:20 80:5 110:20
includes 12:5 27:19
including 6:17 12:8,8 22:5 38:5 62:22 72:25 116:8 118:12
inconsistency 109:21
incorporate 101:5 116:12
incorporated 69:20 85:18 97:2 107:20 110:18,22 116:24
incorporating 62:8 72:12
increase 36:3 108:8
increased 36:1 51:9 112:25
increments 84:23
indicate 40:8,11,13
indicated 40:23 53:3 59:7 61:15 115:23
indicates 22:9 40:15 57:6
individual 109:6
individually 7:13
infeasible 68:5
infiltrates 54:12
information 22:7,9 26:14 81:25 110:20 112:22
infrastructure 43:8 47:18 50:15 54:5 55:13,19 65:25 71:13 72:24 78:3 80:18
infringing 74:24
ingress 95:12
initial 6:22
initiate 24:10
injustice 78:23
input 9:14 14:23 15:17 25:14,18 88:10,11 92:15
inquiry 117:18
inside 43:16 75:22
installed 52:9 53:10 71:19
institutions 116:2 118:1,13
insurance 117:25
intact 85:11 87:24 120:23,25
integrated 71:15 72:1
integrity 51:23 94:7
intended 83:22
intent 53:20
interested 22:13 126:1
interior 81:4
intermodal 27:20,22 28:6 29:23 31:1,8,14 31:17,25
intersected 46:6
intersection 30:8
Intrepid 120:16
intrigued 67:13
introduce 17:1
invalidate 14:10
inventory 13:17,19,24 74:2,12 80:19 97:14 98:5 115:4 116:20 119:10,13,19 120:8
invisible 94:24
invitation 14:13
involve 26:20
involved 7:2 55:23 64:18 65:14 98:15
involvement 7:6
Irene 5:1 18:14
issue 21:23,25 84:18 87:10 89:25 90:6,12 91:9 95:22 96:16 103:6 115:2,10
issued 13:8 14:1,14 15:7
issues 35:6 36:14 38:25 55:23 73:10 103:19 126:2 128:20 129:15 129:18
item 57:15 88:13
items 26:4 115:1,11 116:25 121:18

J

Jackie 2:7 18:23
Jane 1:25
January 6:23 13:6
Jersey 1:14 2:1 6:2 15:11 45:20
JFK 62:19
job 88:2 127:7
Joel 3:10 16:16 17:8 20:3,19 22:17 108:13 117:16 118:24 124:15
Joel's 23:16
John 5:9 8:23 19:16 24:1,2
Joint 64:2,12
jointly 7:2
Journal 103:10
journeyed 122:4
July 11:21 12:6,12 14:20,24 15:14,20 21:11 120:7 123:23 124:8,10 125:11,14 125:16 126:25
June 1:13 6:1 15:7,9,11 15:12,21 43:9 119:2

K

Kate 17:18
Katy 3:20
keep 26:22 35:11 63:7 82:11 104:19 116:5
keeper 14:5
keeping 124:4
Ken 4:7 17:24 89:18 91:11,18 106:11
kept 62:25
Kevin 79:12
killed 105:16
kind 22:18 24:15 25:10 25:16 26:1 44:15 67:13 72:9 84:3 90:13 92:1 96:5,6 97:16 105:4,23 110:13 118:3 128:10 128:18
Klein 3:10 16:15,18 17:8,8 20:21 21:9,22 22:1,24 65:16 99:11 108:13,13 112:19 113:6,10,13,16,19,24 114:2,9,23 115:22 117:10,19 118:18,22 119:3 124:16 127:1 127:21 129:4
klugey 101:21
know 8:17 12:22 13:21 14:2 15:6 16:20,22,23 20:22 24:10 27:4,7 34:12 64:1 68:6 69:1 70:3 73:25 74:1 77:13 89:3 92:16 95:19 96:11 99:16,19 101:11 104:20,24 106:12,16,18 107:24 108:1 114:12,20 115:14,15 116:3 117:20 118:4 119:1 119:12,18 120:5,5 122:9,16 123:19 125:22 126:5 129:7
knowing 22:13 115:16 127:11
knowledge 25:24
known 40:11,12 41:9 109:13
Kornfeld 3:13 17:12,12 65:2,3 96:2,2 100:11 120:12 128:17

L

lacking 110:17
laid 16:14
Landmarks 14:6
Landworks 3:20 17:19
large 47:25 66:25
largest 99:16
lastly 91:2
lateral 53:8
lawyer 21:1
lay 92:16 98:15
lead 25:7 76:23
learn 102:22
learned 73:12
leave 71:25 82:24 102:24 125:7
Lebrun 3:2 19:2,2
Lee 105:15,16
left 43:8 45:16 93:7
legal 118:14
Lenahan 2:10 19:10,10 27:6 39:4,15,23 113:17,22 114:1
Lester 4:9 18:1,1
letter 14:4 22:9
letterhead 22:8
let's 29:25 74:8 87:17 87:18 104:7,8
level 29:18,19,25 30:1 30:12,18,21,22,23 31:5,6 32:3,24,25 33:2,18,19 34:16 36:24 37:9 44:5,19,25 45:1,4,11 50:9,11 61:7 82:10 85:22 86:8,10 87:1 99:6 122:23
levels 29:17 83:18 84:5 98:20
Levine 4:17 18:9,9
Levitt 2:12 19:14,14
Liberty 41:13,14 42:22 45:16 49:21 56:9
Light 30:16
line 31:18 37:14,20 44:9 82:14 126:17,19
liner 51:19
lines 40:5,8,10 54:7 73:1 75:21,24
link 31:22 32:6,7,10,14 32:21
linkages 28:7 29:24
listed 74:7
literally 43:23
little 24:6 52:1 64:7 69:3,18 81:25 84:4 100:23 101:2 108:15 114:24
live 62:2
lived 35:12 63:6
living 34:13 81:23
LMDC 6:25 13:2,12 18:15 22:7,11 64:2 73:9 75:4 90:20 92:3 104:6 114:13,17,20 114:21 125:22
LMDC's 22:15 75:4
Lo 3:7 10:18 17:5,5 23:6,6,11,23 63:18,18 64:20 101:9,9
load 38:4,13 45:2 49:12
lobbies 68:22
lobes 48:9
local 117:20,20
located 30:8,15 33:1 34:23 43:17,19,20,25 44:8 46:16 53:1 68:22 73:3 75:15 76:2
location 34:24 35:5,14 35:21 44:8 50:4 55:14 57:6 63:7
locations 108:20
Locke 4:20 18:13,13
logic 68:19 109:21
London 102:19
long 40:10 94:9 95:24 115:6 119:10 123:14 129:13
longevity 58:21
long-term 28:11 93:24
look 7:13 14:6,15 35:10 36:12,13 37:16 43:14 44:9 45:12 53:8 54:23 58:4 60:12 68:1 69:3 72:19

77:13 79:21 84:22 89:13 94:15 96:24 97:13,13 104:8,16 108:4
looked 39:25 97:10,24
looking 14:11 25:23 38:11,17,17 41:20 44:10 45:15 47:22 48:9 49:20 56:23 58:15 67:9,19 70:16 83:10,23 85:20 95:16 95:22 96:8,9,19 102:4 104:12 112:13
looks 47:15 94:6,16 105:11
lose 89:2
lot 13:23 23:22 72:8,9 78:1 97:9,21 99:15 103:24 107:15 111:9 112:4 118:4,7 119:12 119:14,15,20 122:19
Lou 2:3 9:12 19:20 21:2 27:4,4,8 42:5 46:10,22 47:10,21 50:7 60:14,16 71:3 75:21 79:17 82:4 112:2,2 123:7
Louis 5:8 19:16
Louise 3:7 17:5 23:6,15 63:18 101:9
love 4:4 17:22,22 66:17 66:17 68:4 81:19 88:25
lower 3:1 4:6 5:1 6:10 6:15 17:25 19:3 27:21,25 30:3,11 32:1 32:19,21 89:19 122:21
lowest 29:19 33:18 44:13,25 45:4 84:10
Lustbader 4:7 17:24,24 80:22 89:18,18 92:13 94:11,17

M

MA 5:13
main 32:5 110:9
maintain 34:4 36:16 37:9 46:24 51:23 61:7
maintained 57:8
maintaining 62:18
major 26:13 31:22 78:8 91:9 124:14 129:2
majority 108:22
making 20:17 33:14 55:4 95:7 116:1 127:19
MALE 94:25 95:3,7
malicious 105:22
Manhattan 3:1 4:6 5:1 6:10,15 17:25 19:3 27:22 28:1 30:4,11 32:1,19 89:19
map 108:18 112:24
March 7:10 13:10 14:2
Marilyn 4:4 5:14 9:18 9:19 10:25 20:12 81:14
Mark 2:11 19:12 43:3 51:25 52:5 54:13 55:19
master 30:6,16
material 8:3 60:7 114:13 117:23 118:14 118:17,23
materials 9:24 10:2 62:8 116:16,17 117:13
matter 54:9 85:19
maximum 78:24 81:10 108:7 123:5,10
McNeely 2:9 19:4,4
mean 10:2,8,21 11:9 21:9 23:4,19 70:25 75:2 77:24,25 82:25 84:5 87:11 89:8,22 107:2,23 119:6 121:4 122:2,22
meanings 96:14
means 86:22
meant 71:20 86:23 93:19,21 94:8 105:19
meat 9:1
meet 35:25 125:6
meeting 1:9 7:18 8:5,8 9:24 11:14 14:22 15:8,19 16:1 90:8 103:5 123:24 124:9 124:20 125:15 129:25
meetings 6:23 7:7 8:18 15:2 24:4 78:17 126:3
Melman 4:14 18:5,5
members 72:10 105:6 110:6
Memorandum 25:7
memorial 3:7 17:7 49:24 50:24 53:22 55:12 62:16,17 64:3 64:12 70:4,21 71:7,8 71:15 72:13 74:14,17 74:19 82:7,23,25 83:13,18 90:11,19 92:15 107:20 116:12 121:8
memorials 116:24 117:4
memories 56:6
Menno 2:3 9:12 19:20 19:20 21:2,4 27:4,9 47:11 60:15,18,22 71:5 79:23 80:13,21 113:3,8,12,15
mention 37:13 47:21 60:7 90:3
mentioned 42:6 46:11 46:22 47:5,11 50:8 54:17,22 55:19 57:15 61:6 62:23 90:7 95:11 100:11,15 106:13 114:3 115:3 121:13,14 123:7
Merritt 5:11 9:16,17 20:6,9,10,16 88:12,13 88:20,24 126:20,21
metro 102:9
Mexico 102:11
mezzanine 32:25 33:2 33:9,11 43:18 50:9 59:23 85:2
Michael 79:15
midair 122:24
middle 48:1
mike 39:22 64:9 78:20
mile 32:15
million 29:9
mind 48:13
minimal 55:4
minimize 34:10 37:18 39:1 63:9
minor 51:5
minute 6:20
minutes 27:1
missed 80:3
missing 104:19 115:17
misspoke 111:13 114:4 114:10
mitigate 38:18 102:14
mitigation 7:25 41:16 43:2 65:7 121:17
mitigations 41:20
MOA 15:23,24 16:1,6
modern-day 123:4
modification 51:10
modified 55:8
modify 52:18 53:11
moment 39:15 85:7
money 103:11,15,20
monies 103:8,16
monitoring 41:22 91:4
month 22:12
months 76:18 90:4
monument 96:14
Monuments 91:21
Moscow 102:20
move 9:4 25:5 44:20
moved 51:17 55:15
moves 85:22
moving 80:15 90:16
MTA 31:11,21
multiple 6:25 84:4
museum 118:5 120:16
museums 116:24 117:4 118:4

N

N 31:17
name 6:8 12:20 42:15 81:13
names 16:22,23
Nast 91:25
national 3:7 5:11,13 7:8 10:22 14:5 17:6 20:10,13 103:4 114:15,21
natural 72:15
nature 101:19
near 40:1
need 26:14 35:24 36:5 50:13 52:17,18 53:7,8 53:11 54:23 60:4 85:22 88:10 92:14 96:24,25 98:14 99:1 101:1 129:10
needed 37:9 59:11 129:16
needing 75:22
needs 54:17 55:8,9 72:1
neighborhood 81:16,17
never 22:12 27:22 71:20 104:16
new 1:14,14,16,16 2:1 2:1 4:16 5:3 6:2,2,4,4 9:23 10:2 15:11,12 17:1,18 18:1,7,10,22 27:16,19 28:3 30:2,9 30:9,13 31:11 32:25 34:17,21 35:18 37:3 45:20 47:23 48:2 49:12,25 58:18 61:14 84:15 99:17 100:2,18 116:8,9
newspaper 122:9
nice 107:11
nine 32:1
Noonan 5:4 18:21,21
north 31:9,13 37:13,19 44:10,21 45:6,15,23 47:11 48:15 49:20 50:25 52:23 53:2 54:20 56:7 61:19 68:7 79:18 80:3 82:20 107:3
northeast 36:10 46:1 46:17 88:16
northern 59:14
northwest 22:4 64:5,17 65:11,19
north-south 31:2 33:10 58:1 59:10 82:14,15
note 127:22
noted 67:21 114:22
notice 39:12 104:23 125:15 126:24
noticing 99:20
November 39:10 105:9
no-build 111:5
nuclear 129:13,15
number 9:8 10:9 26:20 34:2 88:14 97:5 102:8 110:16 112:13 113:17 117:3 120:2 122:1
numbered 120:9
numbers 26:22 66:25 67:3 79:4 87:18 109:25 115:7 119:20
NY 4:9
NYC 3:20
NYS 13:3

O

objection 124:17
objections 124:14
observation 99:12,21
obviously 73:23
occupied 80:1
October 16:6
office 3:1,15 6:11,14,14 19:3 28:22 67:5 68:12 96:13 99:17
off-site 117:14
oh 75:13 97:13,13
okay 12:7,14 20:9 23:11,22 26:16,17 56:2 66:16 81:4 87:2 87:8 88:24 106:21 113:10,19 114:9 115:22 125:17 126:13

old 50:21 89:6
once 108:3 122:12 129:12
ones 79:11 120:9
ongoing 115:4
on-site 42:7 111:2
open 11:12 76:22 77:3
opened 39:10 105:8
opening 50:13
openings 50:21
operate 34:4
operation 44:12,20 51:17
operations 43:9
opinion 14:7,7,11
opportunity 114:25 126:3 128:16
opposed 66:22,23
optimistic 107:24
orange 105:14
oranges 110:14
order 23:20 36:23,24 44:16,19 47:22 53:12 55:11 59:9,22 68:10 85:25
oriented 33:9
original 34:25 35:17,23 44:22 45:21 51:13 59:15 63:7,19 99:4 100:17
originally 34:19 49:7 93:1 107:16,19
ought 95:5
outcome 7:6
outdoors 120:20 121:9
outer 43:24
outline 59:8 73:1
outlined 73:3 75:15 76:3 78:7
outlines 48:5
outlining 73:19
outside 45:25 46:9 48:17,19
overall 128:21
overlooking 73:18
overview 12:23 15:3 27:12 29:16
owner 115:24
ownership 118:14

P

pads 97:22
page 67:14 77:14,16
Pagliettini 2:11 19:12 19:13 43:3 52:6
paint 105:14
panel 105:11,12
paperwork 118:7
paragraph 77:14,19,21
Paris 102:19
Park 1:15 4:11 6:3 18:4 32:12,18 50:17 53:17 67:5 81:17,24 82:16 114:16
parking 22:5 50:21 66:4,6
Parks 114:21
part 22:14 39:24 42:3 45:18 53:10,10,21,22 55:10 56:24 59:15 62:16 66:2 70:5 71:6 72:2 83:5 93:11 97:25 109:24 121:8 126:9
partial 120:21
participated 13:13
participation 8:7
particular 31:6 53:22 86:22 110:23 114:15 115:6 120:13
particularly 67:1 89:12
parties 1:9 8:8 12:1 15:19,25 25:13
Partnership 5:3 18:22
parts 27:25 104:18 110:9
party 14:14 15:2
pass 50:7 78:19 89:4
passageway 56:17,22 60:7 67:10 88:20
Patel 4:17 18:7,7
PATH 1:8 6:13 7:20 8:15,20 15:4,7 16:10 19:15 21:15,18,21 27:13,16,19,21 29:5 32:25 33:4,12,14 34:18,20 36:16,22 39:9 40:14 43:5,16,17 45:7,8,14,22 46:3,8 48:18 51:14 52:13,16 52:24 54:3,8 55:10 56:24 57:1 61:8 62:10 64:22 69:20,23 69:25 70:4 71:1 72:12,25 76:11 77:16 78:2,8 79:8 80:1 84:25 85:1 89:13 90:24 107:17 113:4
Patty 5:4 18:21
Paul 2:14 3:2 19:2 20:1
pay 103:16
peak 67:2,12 68:9
pedestrian 27:23 28:7 29:24 40:20 47:10,19 50:7,15 51:9 66:21,24 67:22 68:8
pedestrians 67:11 68:9
people 17:2 23:9 32:16 33:15 66:25 68:20 79:13 81:23 82:24 83:1 85:21 86:23 88:8 89:4 99:15 103:4 107:11 109:13 124:2 128:23
percent 36:4 79:18,20 80:1,6,7,12 109:11 112:11,12,12 113:2,3 127:6
percentage 79:3 112:3 112:9,14
percentages 78:17 80:16 110:13
perfect 107:3
Performing 50:4
perimeter 42:24 43:12 43:22,24 45:24 54:15 73:2,4,18 75:2,16 76:3 77:21 79:4 109:1,10
perimeters 75:13 108:16
period 11:11,12,21 12:5 14:18 15:1 100:14 105:17 122:2 122:6
permanent 1:8 7:19 16:10 21:18 26:5 27:13 40:13 43:15 46:13 47:8 52:16 54:3,7 62:10 71:16,21 72:25 77:16
person 92:16 98:15
perspectives 25:24
pertains 8:15
Peter 2:5 3:2 8:5,9 19:24 27:7,10 42:11 42:14,15 52:7 88:7
Petersburg 102:19
Petra 4:1 17:20 69:10 72:9
Petra's 72:7
phone 20:5,6 64:7 88:13
photo 107:2 114:5 122:12
photograph 54:10 107:7 119:17 120:1
photographic 62:5
photographs 92:2
photography 90:15 91:13,15,17,22 92:11 92:11 98:8 106:14
photos 107:12
phrase 68:15
pick 122:9
picture 119:15
pictures 107:1
piece 85:9,11 86:23 119:17 120:8,13,20 120:21,23 121:7
pieces 116:6,10,23 117:7 118:1 119:19 120:21
piercing 40:21
Pierpont 3:15 17:14,14
pipes 43:7 53:15,15,21 55:17
pits 54:5,6,6,11 74:6 97:22,23
place 6:23 13:6 28:8 31:7 47:10 61:5 79:6 95:20 98:9 109:13,14 116:7 121:5,25 122:6
placing 46:21
plan 4:1 17:21 30:6,16 57:5 64:13 65:7 69:11 98:22 99:5 128:22
planned 51:1 52:15
planning 3:4 6:16 17:4 78:8
plans 48:11 76:18 81:19 82:10 103:13
plaque 88:3 121:2
plate 12:18
platform 33:4,19 34:17 35:25,25 36:9 37:3 38:8 46:11,13,14,14 47:9,9 48:2,2,4,22 49:3,5,13 57:3 69:25 70:17 79:22,24 80:4 86:20,23 87:1,8,19 105:2,10 106:9 111:6 111:11,16
platforms 35:17,18,19 35:20
players 24:18
plaza 56:20 58:12 82:7 82:18
please 75:10
pleased 6:11 24:5 129:22
pleasure 6:19
plural 63:22
podium 39:21
point 8:4 11:9 14:3 24:13 26:3,12 36:15 37:12,22,25 38:21,22 44:14 51:22,24 57:18 58:21 71:11 74:3 75:3 76:6 78:5 79:19 82:22 84:12 85:17 86:17,18 87:23 95:1 97:11 99:14 101:14 103:25 105:20 106:4 109:20 110:3 115:10 128:18 129:1
pointed 35:9 36:8 105:25
pointing 27:15
points 30:18 82:18 128:19
point's 117:22
police 116:14 117:17 117:18 121:3
popping 116:6
Port 1:14 2:1 6:2,12,16 7:1 8:14 9:2 12:21 13:2,11,14,16 18:20 18:24 19:1,5,7,11,13 19:18,21,23,25 20:2 22:10,15,19 23:8 25:9 26:4,21 29:4,8 33:24 37:10 63:14 64:3,15 64:17,23,24 65:6,14 67:21 69:12,18 72:11 79:13 90:9,24 91:16 99:22 100:18 101:11 103:7 104:2 105:7,21 115:22,25 116:1,15 117:1,2,12,23 118:15 118:25 121:3,19 127:23 128:4
portion 42:19 43:21 45:17 46:12 49:25 51:15 55:24 62:14 71:8 72:21 82:6 85:12
portions 51:11 122:21
position 107:18,24,25 107:25
positive 127:22
possession 13:15
possibility 49:11 54:18
possible 9:15 10:13,17 15:25 38:19 48:5 62:12 68:1,19 69:16 126:24
possibly 14:22 15:1 38:13 52:2 63:4 92:5

121:8
potential 7:15 38:25 40:5,9,18 41:6,15,18 41:19,21 42:25 56:11 58:6 60:9 62:20 65:22,24 82:14 95:10 111:21
potentially 65:12
practical 68:6 69:1 94:25
practically 69:19
precedence 100:8
precise 108:19
preliminary 13:17 47:6 47:14
premature 77:5
premise 10:19
prepared 108:18
presence 28:10 30:3,21
presentation 8:13 9:2,4 9:11 22:20,22 23:20 26:2,24 27:5 63:14 64:18 69:14 78:7 124:23 125:1
presentations 112:3
presented 109:5 113:21
presenters 63:15
preservation 3:15,20 4:6 17:19,25 73:7 81:10 89:19 91:9 92:17 100:5 125:23 126:1,6 129:20
preserve 70:23,24 71:22 78:24 89:16 108:6 123:5
preserved 57:17 60:8 95:5 110:1 121:21,25
preserving 69:14 123:10
Presti 3:7 10:18 17:5,6 23:6,7,11,23 63:18,19 64:20 101:9,10
pretty 22:21 26:24 106:24
previous 109:23
previously 112:2
pre-September 77:22
pre-9-11 36:5 45:12,22 46:3 48:14,17,18 113:4
priceless 78:22
primarily 96:9
prior 8:18 14:23 16:6 58:12 59:2 60:11 84:24 123:24
private 66:11,13 81:20 103:8,16
probable 48:6
probably 47:25 48:4,23 50:13 51:14,18 58:4 59:6,22 60:3 66:2 70:20 76:8,17 78:12 100:19 110:22,24 124:24 128:3,23
problem 10:4 96:6
problems 129:15
proceed 100:24
proceeded 7:13
proceeds 52:21
process 6:18 8:23 12:6 12:24 15:5 16:10 24:8,11,25 25:5,8,15 39:25 73:9 83:5 93:4 93:9,17 100:9 102:12 107:15 117:6 125:25 126:7
processes 128:11
profound 102:7
program 53:22
programmatic 75:4 114:17
project 6:13,13,14,17 7:20 15:4,7 21:15,16 21:19,21 22:20 24:14 27:16 28:14 33:25 37:11 53:6 56:25 62:22 74:19,21 75:7 98:7 99:25 100:4
projected 36:3 67:20 69:7
projections 43:5 52:23 52:23 53:1 55:3 67:8
projects 7:15 29:11 75:25 91:6
project-by-project 7:14
prominent 118:13
promise 78:19
propeller 120:18
properly 122:18
properties 24:12,15,23 41:6 63:25 64:11 66:9,11
property 24:21 118:2
proposed 16:14 20:23 21:4 24:14 47:3 50:23 56:16 57:8,25 58:9,14 66:20 82:13 84:9,15 95:18 121:17
proposes 26:4
pros 104:13
protect 95:23
protected 98:4 121:21
prove 118:7
provide 9:21 10:10 11:1 27:12 28:25 34:7 36:5,24 55:16 58:11 118:8
provided 13:16,19 107:18
provides 33:11
providing 31:21 58:15
public 14:25 15:10 36:18,25 79:1 91:7 93:19 123:5 124:9 128:10
publicly 36:16 61:9
pump 53:16 54:6,11,12
punished 128:11
purposes 68:17
put 24:17 29:7 35:24 46:23 83:7 88:2 105:12 107:18,19
puts 68:20
putting 29:9
puzzled 115:5
p.m 6:5 129:25

Q

question 20:4,20 21:1 22:18,22 23:7,16 63:20 66:5,20 67:18 83:15 84:2 114:21 117:11,11 119:9 125:19
questioning 60:21
questions 8:24 9:7,13 10:3 12:16 16:12 23:25 26:11,23 27:2 60:20 63:16,17 72:4 77:3 92:22 126:14
quick 12:23 105:3
quickly 24:7
quite 51:18 94:15 117:10 118:6
quote 116:13 117:20
quote/unquote 75:23

R

raised 115:10
rallies 73:10
ramp 39:11 43:6,20 52:9,9,10,14,15,18,20 55:8 85:8,13 107:4 121:15 122:2,4
Rampe 79:12
ramps 50:21
range 104:12
rap 101:12
read 72:21
Ready 20:7
real 9:1 105:3 122:16
realigned 53:25
realize 9:23
really 8:13 10:4 21:10 54:17 55:4 59:18 68:11 79:17 81:15 89:5,11 93:5,8 96:21 99:1 100:5,6 103:3 104:12,16 108:2,3 110:11 120:4 122:7 123:9 128:21 129:1
Realty 41:12
reason 44:18 45:3 71:12 74:4 93:2 119:22
reasons 108:25 122:1
rebuilding 28:11,15 29:3,13 30:7
rebuilt 70:7,25
recall 6:22 119:13
receive 8:1 126:16
received 14:16 125:24
recognize 29:12 36:7 37:6 66:24 69:5
recognized 36:15 62:23
recognizing 87:21
recollection 11:18
recommendation 95:4 95:6,8
reconfigure 95:15
reconfigured 53:25 95:13
reconnect 27:24 32:11
reconstruction 93:10
record 16:5 64:4,16 65:5 77:13 103:7
recordation 91:12
recording 114:12,15
recover 116:16
recovery 3:1 6:10 19:3 43:6,9 44:12,17 51:17 52:8,10 53:11 55:7 57:18,18 71:19 93:4,8 93:14 98:17 105:17 108:21 122:2,5
recovery/removal 93:17
recycled 122:10
redevelopment 53:23 64:3,13
reference 67:15,19 75:25 79:3 81:12
referred 28:4 81:7,8 114:11
referring 71:6 72:3 93:23
refresh 11:17 56:6
refurbish 94:14,19
refurbished 56:24 94:15
refurbishment 88:2
regard 35:16
regarding 90:6
regards 13:4 15:4 52:8 52:12 54:4 65:24
region 124:12
Regional 4:1 17:21 69:11
Register 7:8
rejected 107:16
related 113:23
relates 23:1
relatively 72:16
release 77:5
released 7:10 103:12
relocate 35:7 49:3 52:18 58:4
relocated 46:25 57:19 60:5 63:4
remain 35:21 96:18 122:20
remainder 41:25
remaining 42:17 86:2
remains 22:5 99:23 100:16,17 108:21,22 115:24
remember 24:2 35:1 89:8 119:18 127:5
remnant 42:17 58:7 85:9 86:2 87:24 88:3 89:5 93:2 94:6,12 95:4 102:2 105:2 120:15
remnants 22:4 39:6 50:20 56:21 69:16 70:2 73:14 74:5 75:9 76:21 84:6 90:8 97:8 98:24 101:21 102:9 109:25 111:1
removal 65:19
remove 36:21
removed 37:5 47:1,8 51:13 52:20 55:9,10 58:19 59:11 60:4 61:14,16,20,23 86:9
removing 51:11 55:1 121:18
rendering 83:13
renderings 38:1

replace 71:20
Report 25:19
reporter 16:20 127:15
Reporting 1:25
represent 40:5
representations 122:24
represented 36:25
representing 17:4
requests 117:4
require 40:21 75:24
required 36:21 48:6 61:6,8
rescue 105:19
reservation 81:21
residential 28:24
residents 67:4
resolve 25:6
resource 40:12,16,25 74:7 78:22
resources 7:4,16,22 33:20 34:8,11 36:9 37:7 38:9,20 39:2,16 39:20,25 40:1,6,9,17 41:3 42:6,18 49:18 52:1 54:15 56:11 60:25 62:25 63:10 74:2,12 92:18 104:19 111:7 129:2,8
respective 7:14
respond 64:21 82:3 115:18 119:9 124:22 125:3
responder 117:20
response 22:13 115:12 115:13 125:2
responsibility 22:3,16
responsive 124:6
rest 23:1 51:21 86:7,16
restate 63:19
restoration 94:21
rests 38:12
result 40:24 129:22
resulted 25:20
retail 28:21 67:6 68:23
reuse 53:20
reused 62:9
review 7:24 25:15 104:6 125:24 126:7
re-opened 89:9
rid 86:22
ride 89:3
ridership 36:1,4,4 113:1,4
right 9:21 10:25 12:3 12:12,15 13:18 23:24 26:19 31:4 37:16 40:11,23 42:10 45:18 48:9 52:19 53:19 54:18 55:13 57:17,20 58:8,24 60:22 63:12 65:23 74:8,11 76:7,19 78:2,2 79:14 80:1 84:20 85:6,13 87:2,10 88:9 89:13 92:4 105:8 107:4 119:16 119:21 120:18,19 122:23 123:22 124:8 124:11 128:12
Rinaldi 2:5 19:24,24 27:7 42:11,14,15 54:13 66:8 71:11 92:21,25 94:13,20 111:18
rings 59:13
ripped 94:3
rise 84:24,25 85:7
River 40:21 41:10 53:16
road 112:24
Robert 3:13 4:20 17:12 18:11 65:2
rocket 103:17
role 25:12 26:13
Rome 102:19
room 16:25 82:24
rooms 73:2 75:14 76:2 76:11
Rose 1:25
Route 32:8 40:20,23 67:22
routed 85:25
row 108:11
ruin 102:13
ruins 102:18 123:1,3,4
rumors 115:25
run 24:7 37:2
rushed 84:3
Ruth 3:15 17:14

S

sad 103:2 106:24
sadly 110:17
salt 121:10
sandwiched 84:19
Santiago 38:1
save 4:3 17:23 66:18 81:15,16 106:2
saved 106:7
Savings 41:10
saw 36:20 120:14
saying 12:10 60:3 65:5 75:1,13 83:3 85:25 86:4 87:14,15 88:3,4 96:17,23 104:17 105:5 112:16 121:24 125:6,12
says 76:2 77:11 111:16 121:2
schedule 20:23,24 21:5 23:2 125:14 126:4 127:20
scheduled 21:10
scientist 103:17
screen 40:11
screensaver 104:25
sealant 120:25
search 44:17
second 56:18 68:21,24 102:24 103:6 123:24 124:9,19 129:5
secondary 13:23 119:12,14,20
section 1:9 6:23 12:5,24 15:8,19,22 16:10 24:7 26:20 39:24 42:3 54:14 55:1,2 71:25 113:18
security 68:17 115:13
see 10:4 13:14 15:13 21:7 25:1,16 31:3,7 32:5,21 37:25 39:8 44:7,14 46:4 50:17 54:10 58:1,10,15,23 59:9 67:14 68:10 69:25 71:18 74:8 80:16 82:12 83:12 89:9,13 92:1 94:5 97:5 98:11,16 102:18 103:2 105:11 106:5,5 109:4 121:1,17 123:18 127:10,13 128:23
seeing 8:11 97:16 98:18 98:19
seen 67:8 85:16 120:24 121:16
selected 79:16
sense 87:13,14,15 108:1
sensitivity 34:7 62:24
sent 9:25 10:8 14:4,13
sentiments 89:21
separately 9:20
September 16:2,4 59:6 73:12 79:25 96:12 123:13
series 103:9
serious 68:1 69:3
service 32:1 36:17,22 36:25 37:9 46:24 59:18 61:7 114:16
session 12:2
set 7:7 8:22 52:18 126:24
seven 49:1
shaded 40:14
shame 89:1
shape 31:2
sharing 15:22
Shawn 2:10 19:10 27:6 39:4,15,19,23
Sheldon 4:9 18:2
Shilpan 4:17 18:7
ship's 120:18
shocked 89:9
shocking 118:3
short 40:4
show 9:9 39:8 60:10 99:2,5
showed 98:23
showing 11:23 82:9 108:19
shown 11:5,19 31:18
shows 39:5 43:15 107:3
SHPO 17:15
SHPOs 24:19
shut 78:19
side 33:12,13,16 37:3 39:13,13,17 40:7 42:12 43:16 56:5,12 57:19 59:23 82:22
signage 60:12
signed 16:2,6
significance 73:21 96:15 106:9 108:8,16 109:7 112:7
significant 96:25 109:2 112:17 117:3 120:15 121:7
Silver 4:9 18:2
Silverstein 63:25 64:11 66:8,11 103:8,12
simple 23:7
simply 101:22
single 99:3
site 7:5,9,20,22 13:5,10 22:4 26:7 28:15,17,21 28:23 29:18,20 30:7 30:14,20 31:10 32:12 32:23 33:1,13 39:5,7 40:1,1,7,15 41:3,23 42:8,9,12,19 43:15,16 43:21 49:19,25 51:15 51:21 52:4,24 53:18 54:12 55:24,24 56:5 57:12,20 59:20 62:6 64:14 65:13 72:2,23 82:6 83:11 84:23 88:17 91:18,23 92:7 96:9 97:2,11,24 99:24 100:6,16,21 101:4,8 104:4,16,19 106:20 108:21 109:17 114:6 119:1 120:17 122:23 128:22 129:21
sites 40:3 42:6 101:25
sitting 121:9
situ 102:18
situation 38:17
six 22:6 65:9 85:22 98:22
sketchy 47:14
skills 127:8
skin 43:24
slab 44:4 76:21 90:8 98:20,21,24 99:7
slabs 64:5,17 65:11,20 74:5 97:22
slate 97:16
slide 9:8 24:22 60:23 74:3 75:10 78:18 79:2 88:22 104:23 109:20 110:2 111:12 111:16
slides 9:17,25 10:3,7,10 10:18 11:10,19,22 26:22 72:18,18 88:23 109:4,23
slightly 86:24 101:14
slurry 35:3,6 39:11 42:21,25 49:19 50:10 50:12,24 51:2,6,12 53:1,4,19 55:25 62:15 69:15,25 70:23,24,24 71:3,5,9,16 90:18 102:4
small 51:5
solid 40:8
solidified 76:18
somebody 105:23 114:4,10 117:19 129:12
somewhat 47:4 93:16 104:5
son 105:16
soon 13:20 125:16 126:24
sophisticated 102:21
sorry 74:15 80:2
sort 24:19 67:9,17

72:11 73:14 98:3,23 105:18,24 112:23 114:24 121:20,22
sorts 73:11
sound 128:18
sounded 128:2
south 31:10 32:21,23 45:4,5,17 46:4 48:16 48:19,25 49:8 50:24 52:24 53:2 54:21 56:9 78:1 79:20 81:24 82:17 99:18
southern 43:21 49:24 51:14 59:15 82:6
space 57:10 59:7 81:2,5 99:17 108:11
spaces 28:21,22 109:10
speak 13:18 14:21 16:21 39:20 64:6 114:19 120:3
speaker 4:9 18:2 26:9 94:25 95:3,7 125:18 126:11
speakers 11:8 26:20
speaking 9:17
speaks 105:4
specialized 25:24
specific 26:3
specifically 8:20 76:1 124:20
speculating 103:10,11
spelled 36:2
splits 45:20
spoke 61:3 79:24 91:14 111:19
spoken 112:2
spokes 28:6
sponsoring 65:1
square 59:7 75:23 80:9
St 102:19
STA 66:14
stability 93:23
stabilize 94:18 97:1
stabilized 94:12
stable 58:20 90:3 93:18 94:14
staff 8:14 9:3 33:24 69:18
stage 48:12
stair 61:13,21
staircase 89:22,25 102:2
stairs 33:5 61:12,18 89:10 94:1
stand 122:4
standards 110:7
standing 93:3 105:9
star 57:5
start 9:13 27:1,3,5 60:20 63:16 87:7,11 99:4
started 12:18 21:6 73:14
starting 74:3
state 3:15 4:9,16 18:2,8 18:10 67:19 99:16
statement 42:4 65:20 103:20 110:21 111:1
statements 76:25
States 120:19
station 26:5 27:17,20 31:11 33:1,6,17 34:18 34:20,21,25 35:17,18 35:23 36:5,14 39:9 43:16,18 45:8,14,22 45:25 46:3,5,8 47:23 48:18,20,20 49:12,25 50:2 51:10 52:13,16 54:3,24 55:18 56:25 57:4 61:13,19 62:22 64:22 71:1,13,14 72:12 90:25 105:9 111:22
stations 102:10,17 113:5
statistics 79:9
status 16:8
stay 35:4,14 94:8
steel 13:23 44:3 56:18 57:16 60:5 116:11 117:8 119:5,16,17,19 121:15
step 12:18 25:15
Stephanie 2:6 18:19
steps 16:8
Steve 2:8 18:25
Stickelman 2:2 8:23 9:19 10:6,14,20,24 11:20,24 12:4,9,13,19 12:21 16:16,19 20:3 20:25 21:14 23:15 63:23 64:8,24 65:10 65:21 66:10,15 70:8 71:2 77:8,10,18 88:18 91:11 92:23 114:3,7 114:19 115:20 116:19 117:15 118:24 119:4 119:11 120:11 126:18 126:22 127:18
stole 117:21
stolen 118:2
stood 122:25
stop 83:25 91:24
storage 58:6
Store 41:12
story 116:9 123:15
strategy 124:7
street 4:3 17:23 29:18 29:25 30:1,9,10,10,12 30:18,19,19,21,23 31:19,20,23 32:20 35:3 41:9,13,14 45:1 45:15,16,16,18 49:20 49:21,21,22 50:12 51:7,11 52:25 53:17 56:8,8,20 57:24,25 58:8,9,25 66:18 67:1 67:11 81:15 82:10,13 82:19 83:18 84:17 85:4 91:8 97:5 103:10 122:23
streets 30:13 42:22
strengthened 94:23
stress 92:14
striated 44:14
strident 128:19
strong 25:21 39:1
structural 44:3 51:19 51:23 94:7 95:23
structurally 58:20 59:5
structure 45:5,7,10 50:21 57:22 71:14,14 71:21,24 93:3,15,18 93:24 94:6,10,12,14 94:15,22 96:17,17
structures 38:5 39:6 42:18 73:3 75:15,18 76:2 79:8 96:10
stub 97:7
studies 113:20
stuff 92:24 97:9 118:11
subgrade 41:1 76:21
subject 11:15 41:25 47:4 49:16 80:24 100:8 102:25
substantial 38:4 63:13
substantive 118:16
substation 39:11 61:14 61:22 63:1 110:4
substructure 65:25
subway 31:9 56:18,20 93:5
subways 27:21 32:1
suddenly 98:25
suggest 70:12
suggested 26:21
suggestions 70:9
summarize 60:17,23
summarizing 54:14
summary 60:1 125:23
sump 54:5,11 97:22
support 28:18 38:4 47:23,25 48:6,8 49:12 54:24 57:22 71:16 123:3
supported 43:24 111:22
supporting 72:24 112:25 113:13
supports 28:16 47:17
supposed 54:1
sure 35:2 39:23 55:5 77:15 111:13 125:2
surprises 10:16
surround 30:13
survive 34:3
suspect 112:21 115:15
suspected 114:9
symbolic 122:24
symbols 105:15,18
symptomatic 96:5
system 53:25

T

tabular 110:24
take 26:9 29:15 31:2 32:21 45:12 56:14 60:20 63:15 68:1 69:3 82:8 87:18 98:8 102:14 103:17 107:5 108:4 109:18 120:1 122:15,16 129:17
taken 36:22 65:12 115:6 119:15 122:6
takes 92:2
Talbert 2:6 18:19,19
talk 7:23 15:15 24:4 42:11,17,23 43:1,4,11 51:25 55:22 56:4 69:18 78:15,17 100:25 107:9 110:8,9
talked 51:1 75:21 77:25 79:9 81:20 90:1 100:12 105:25 109:24 112:3,10 129:7
talking 24:6 32:6 39:16 71:3 80:23,24 81:2 84:1 86:15,19 87:22 88:14 92:4 108:10,11 110:11 111:25
tall 50:14
tangible 122:25 123:12
tapped 92:19
task 8:12
team 34:6 42:3 98:1 105:19
technical 10:22
telephone 20:17
tell 87:19 92:25 116:22 123:15
temporarily 48:24 53:10
temporary 33:16 37:2 37:7 39:9 46:22,25 47:8 48:23 49:2 52:10,13,19 53:12 56:24 57:21 61:3,4,4 61:10,13,15,18 62:22 71:20 76:25 105:8
ten 127:16
ten-car 35:18,19,25
terminal 1:8 7:20 8:16 8:20 16:11 21:18 27:13,18 28:1,3,8,9 28:13 29:6,16,16,22 30:2 36:18 40:14 41:2 54:8 56:21 59:2 61:5,18 62:10 69:20 69:23 70:5 72:25 76:11 77:16 82:1 128:25
terminology 75:11
terms 38:18 41:15 45:13 46:16 52:22 53:14 54:24 63:3 70:4,25 71:16 80:8 94:21 95:10 109:17 110:15 112:8 118:17 118:23 121:16 124:4
tested 127:7
thank 8:6 20:16 24:5 25:22 26:18 27:9 39:18 42:13,14 52:6 56:2 60:15 63:11 69:8,12 88:24 112:19 127:21,22 128:15 129:23
Thanks 26:17 99:10 123:16
thing 24:17,20 37:21 60:6 77:24 96:7 98:5 102:19 104:15 114:23 127:4 128:12 129:14
things 25:17 47:22 60:4 73:11 76:17,20,22 77:1 91:12 96:14 97:5,14 98:2,14 100:23 101:21 106:4 122:11 123:20 128:1 128:10

think 9:13 10:8,25 20:3 22:17 23:20 24:1 25:20 26:2,6,13,14 27:3,4 28:5 30:23 46:7 63:14 65:23 70:8 71:2 72:19 73:25 74:2,9,10 75:20 76:5 78:5,14 79:17 80:14 83:6 84:3 88:7 88:9,10,11 89:16 91:18 96:4,11,16,24 97:4,10,17 98:13,22 99:1,18,19 100:13,22 101:1,4,16 102:25 103:3,24 104:9,10,11 104:15 105:4,22 106:4,8,23 107:14,17 110:17 112:22 113:1 114:4 118:15,22 120:7 121:4,6,14 124:4,17 125:1,25 126:15 128:20,22,23 128:24 129:2,9,17,21
thinking 104:11
third 15:25 56:19
thirty 99:14
thought 10:1 35:5 42:16 68:7 70:13
thoughts 25:2
thousand 59:7
thousands 89:4
three 35:18,20 54:20 76:17 84:9 92:5 125:15
three-level 57:10
tiebacks 42:25 54:25 71:18
ties 20:23 71:12
Tim 8:23 12:17,20 114:3,11 115:18 119:8 122:13
time 7:1 8:7 9:22,24 10:5 11:12 16:13 21:23 22:23 23:22 58:2,5 76:16,16,22 77:2,6 78:24 79:23 81:23 90:23 93:13,20 94:9 100:14 108:9 115:13 119:23 126:24 129:14
timely 124:6
times 85:10 116:8 117:22
Timothy 2:2
title 118:9
Tito 91:20 92:11 106:13 107:6
today 6:11,20 8:4,8,12 11:10,19,23 12:8,8,12 16:8 24:16,24 26:2,13 35:13 42:1,5 46:20 48:16 49:9 50:2 54:11 56:13 76:25 94:8,16 96:13 116:8 128:2
Todorovich 4:1 17:20 17:21 69:10,11 70:11 70:22
told 79:16,18 129:12
tone 128:19
Tony 19:6
top 57:5 94:4
torn 96:22
total 48:14 104:19
totals 46:9
tour 105:7,8
tours 13:12
tower 42:24 43:12,19 43:20 44:11,21,24 45:5,5,6,13,23 46:2,4 46:7,17,19 47:12 48:15,16,19,25 49:9 50:3 54:15,20,21 61:19 62:1,12 64:1,2 64:11 73:1,4,18 75:2 77:21 78:1 79:4,18 80:3 99:18 107:4 111:23 120:20
towers 52:19 72:14 73:8,20 74:7 75:8 100:18 122:25
towns 116:9
track 34:16,17 35:2,7 35:11 37:2,4,8 46:13 46:22,25 47:1,1,8 48:23 49:2 52:20 53:12 61:3,4,10 63:4
tracks 33:4 34:20,21,22 34:23 35:14 36:22 39:10 43:17 45:20 46:5 77:1
Trade 3:7 7:5,9,20 8:15 13:5,10 17:6 21:18 22:6 27:13,25 28:15 28:16,20,23 29:5,18 29:20 30:7,17,20 32:11 34:2,19 36:10 37:14,19,23 38:14 39:5,7 40:14 41:23 44:5 50:22 52:13 53:18 59:3,17 62:6,9 62:10,19 63:2 64:13 65:9 80:3,5,7 82:1 85:12 86:2 89:6 91:22 92:7 97:7,19 98:23 99:2,24 100:16 108:5,5 114:6 116:6 116:11 118:12 120:15
train 31:14,15 56:18,23 57:2,7 84:6,13 85:3,8 85:14 86:19 87:1,8,18 88:21 89:3,7,14,23 105:1
transcript 127:2,3,5,6 127:9,11,14,24
Transcription 1:25
transit 5:6 6:9 19:9 28:4 31:4,20,24 32:9 32:20 57:10 58:16 59:10 82:20 84:5 91:8
translate 87:18
translated 112:1
transmitted 22:7
transportation 1:7 4:16 27:18,19 28:10 29:2 29:11,13 30:2 31:23 32:17 36:6 96:12 100:19 113:25 123:8
traveled 122:3
traverse 82:17 83:2,10 84:22
traverses 72:13 84:11
traversible 83:25
traversing 73:1
treat 119:25 129:9
treating 101:7
treatment 109:6
triad 120:21
truck 59:19
true 97:17 116:4
truly 94:5
Trust 5:11,13 10:22 20:10,13
try 11:7 25:6 47:15 52:3 72:19 98:3 117:12 124:9 125:2
trying 81:16 101:6 104:4 112:15 124:5
tubes 45:7 103:1,2
Tuesday 125:12
tunnel 43:5 45:19,19 52:22,23,25 55:3 66:23,24
tunneling 40:19
tunnels 52:24 53:13
turn 8:5 26:8 27:6 39:3 39:14 116:1 118:5
turning 125:21
turns 23:21 68:5
twenty 36:1 67:9 69:7 113:2
Twin 73:7,20 100:18
two 9:15 14:16 36:21 43:20 44:24 46:7,19 59:13 61:22 63:1 69:9 73:5 76:17 80:2 80:5 82:2 85:10 91:1 97:19 99:2 105:10 106:24 108:5 110:7 122:11 125:15 127:11
type 67:10 114:14
types 90:10
Typically 44:1

U

ultimately 109:15
unclear 65:23 84:4
underground 31:19 51:8 85:12
underneath 53:17
underpass 51:14
underpasses 51:9
underpinning 59:24
understand 77:25 85:5 85:15,17 86:5,6,14,20 89:25 95:2 119:3 128:14
understandable 99:25
understanding 34:7 69:22 87:10 90:13 95:9 111:14
undertake 29:5
undertaking 22:10,14 22:15 63:22 64:21
underway 6:17
unexpectedly 102:12
unfortunate 11:10 109:3
United 120:19
unprotected 121:10
unreasonable 124:13
updated 13:19 124:23 125:1
updating 13:18
upper 31:5
urge 108:4
urging 122:14
use 38:2 39:21,21 57:13 62:20 64:8 69:23 82:24 95:10
useful 17:2 23:21,21 96:21
usefulness 93:24
USS 120:19
utility 72:25 73:2 75:14 75:21,24 76:2,11 78:3 78:8
utilize 52:15 54:11
utilized 52:14
U.S 41:12

V

valuable 25:20
variation 111:5
various 72:23 105:14 110:19,25 111:1
vast 108:22
Vaughn 3:18 17:16,16 88:7 103:22,22
Verizon 41:10
versus 84:23 107:10
vertical 53:9 84:13
Vesey 41:8 42:21 45:15 49:19 56:7,20 58:8 97:5
viability 28:12
vibration 41:21
vibrations 41:5,19 91:3
victims 109:11
videographers 92:4
videography 92:12
videotape 92:5
view 37:25 51:2 95:1 97:11 101:15
viewable 49:8
viewing 99:23 129:8
views 25:25
virtually 27:21 34:24 35:21
visibility 71:23 112:6
visible 28:9 30:3,11,20
vision 71:7 102:5
visit 9:10
visited 115:9
visual 70:18
vital 28:11
vouch 127:5

W

W 31:17
wait 115:20 124:2
walk 89:12 97:12 102:17
walked 97:4
wall 35:4,6 37:19,23 38:14 42:21,25 46:2 49:19,22 50:10,12,24 51:2,6,7,12,12,17,21 53:19 54:25 55:2,25

56:10 62:15 69:15 70:1,23,24,24 71:3,5 71:9,17,23,25 83:8 90:18 94:1,7 102:3,4 103:9 105:11
walls 39:11 53:2,4
want 15:16 20:22 27:3 34:12 39:19,21,21 69:12 70:9 72:6,21 89:24 90:4 92:13 95:2 96:21 99:11 100:1,1 108:3,14 109:20 110:8 115:18 122:9 124:1,2,17,25 127:4,21 129:6
wanted 14:3 37:12,21 37:22 38:21 95:8 121:11
Washington 5:11 20:11
wasn't 10:1,4 67:24 112:17
waste 129:13,15
watch 26:22
water 43:7 53:14,15,21 54:12 55:17
way 8:21 9:13 14:10 25:18 29:19 39:1 55:16 57:25 58:2,12 68:18 78:2 79:24 80:1 83:25 84:1,22 85:21 87:13,15,17 88:16 89:15 92:19 93:4 95:1 96:4,19 97:7 98:7 111:19 112:16 115:16 119:5
ways 38:18 101:5
Wedge 30:15
week 91:8,21 127:15,16
weekend 123:23 124:8
weeks 14:16 85:10 125:15
welcome 6:11,19
well-illuminated 68:17
went 25:14 44:18,25 45:2 80:6,7 85:1 90:20 98:1 104:24 105:6 119:5
weren't 93:6 114:25 115:1
west 4:3 17:23 32:13,17 33:13 37:2 39:12,17 40:6 41:9 42:8,12,18 42:22 43:16 44:10 45:16 49:20 50:12 52:25 53:17,19 56:9 57:11 63:5 66:18 67:1,11 71:3,5 81:15
Westchester 116:10
western 40:22 46:12 50:10
westward 48:8
we'll 9:12,13 55:1,15 120:7
we're 7:23,24 8:1,22 9:19 11:14,25 15:8 21:12 25:23 60:3 67:9 75:13,17 82:9 91:4,13 95:16,22 104:10 111:25 116:7 117:7 119:6 125:12 125:21
we've 23:22 36:8 39:25 60:24 62:7 63:8 73:9 73:10 74:23 77:25 78:7 79:9 81:9,19 115:5,25 121:16 122:3,3 128:19
wheel 28:5,6
white 59:8
widened 51:7
willing 22:25 107:21
Winter 50:18
wish 69:2
wonderful 88:1,2 124:18
wondering 67:25 69:17 112:21 116:7
Wong 2:13 19:18,18 74:22 75:20 76:5,10 76:15 77:7,23 78:12 83:6,12 85:20 86:10 87:9 126:9
words 33:23
work 36:20,23 37:5 41:1 47:17 55:18 58:18 68:11,25 71:9 76:23 85:17 92:7 118:6 123:18
worked 25:4 34:1 68:8 99:13,15 105:17 129:13
workers 67:5
working 6:15 13:22 33:24 38:16,23,25 43:4 92:8 120:6
works 99:13 118:4
world 3:7 7:5,9,20 8:15 13:5,9 17:6 21:18 22:6 27:12,25 28:15 28:16,20,23 29:5,17 29:20 30:7,16,20 32:7 32:11,12,18 34:1,19 36:10 37:14,19,23 38:14 39:5,6 40:13 41:23 44:5 50:18 52:13 53:18 59:3 62:6,8,10,19 63:1 64:13 65:9 67:6,7 68:20,25 80:2,5,7 82:1 85:12 86:2 89:6 91:10,20,22 92:6 96:13 97:7,19 98:23 99:2,24 100:16 102:8 108:4,5 114:5 116:6 116:11 118:12
worst 78:23
worth 52:3 89:16
wouldn't 100:7 117:17 127:10
wrap-up 123:18
write 9:7,8
writing 22:12 76:16
written 11:18 15:21,24 72:18 85:9 105:13 125:10
wrong 98:11
wrote 72:17
WTC 1:7,8 72:25 77:16

Y

yeah 125:1
year 103:11
years 28:20 34:2 36:2 67:9 69:7 73:6 89:3 95:16 97:25 99:14,15 99:18 100:13 106:24 113:2,7 127:11
yellow 82:12
yes-or-no 23:7
York 1:14,16,16 2:1 4:16 5:3 6:2,4,4 15:12 17:18 18:2,8,10 18:22 99:17 116:8

Z

zero 87:19 112:12
zone 51:4 74:14,17,19

$

$1.7 29:4,8
$2 28:13 52:3
$300 29:9

0

03 73:12

1

1 31:9 35:2 56:10 58:13 58:16,24 59:25 63:4 95:12
1-9 93:5,10
10 88:14
10th 96:12
100 127:5
106 1:9 6:17,23 8:22 12:6,24 15:8,19,22 16:10 24:8 39:24 100:9
11 77:22
11th 59:6 79:25 123:13
114 41:14
115 41:12
118 41:14
12 54:19 75:10
13th 124:10 125:16
14 1:13 6:1 74:3,9
14th 15:9
16-foot 84:25
17 13:13,22 58:5 65:13 99:17 115:9
196 86:13

2

2 67:14
2nd 13:6 119:2
20 27:1 48:24 113:7,8 113:10
20,000 108:20
20-foot 84:23
2000 97:25 100:13
2001 77:22
2002 43:10
2004 1:13 6:1 7:10 11:21 12:6 13:10
2005 21:6,7
2009 113:12
21 11:21 12:6,12 40:3 40:17 41:11 111:12
21st 14:20,24 15:21 123:20,25 124:3 126:8,8
22nd 15:11
225 1:15 6:3
23rd 15:12
25 27:1 36:4 113:2,3,9 113:10
250 33:19
26 78:18 79:2
264 33:2 50:9,11
274 32:4
276 84:11
28 44:2
29 88:22
29th 64:19
294 30:24
295 30:24
296 84:12 87:5,7

3

3 77:16,21 80:7 112:11 112:12
3:00 6:5
30 30:25 50:13 122:23
30-by-50 55:1
306 84:14
31st 7:10 13:10 14:2
310 84:19 85:2 86:8,10
32 44:2
325 30:23 84:16 86:13
34 46:7 48:20 49:8 109:20
36 85:1
36-foot 84:24
360 91:22 92:12
360-degree 106:14
39 46:8 48:18

4

4 85:18 86:17 87:3
4F 42:3 65:20 66:2 103:20 110:21,25
4th 15:7 21:11 123:22 124:8 125:14
4-foot 85:7,13,25
40 59:6
40,000 75:23
45 109:11
48 80:1 112:12

5

5 46:13
5:00 123:17
5:30 129:25
50 50:14 59:6 79:20 80:6 112:12

6

6th 13:6 125:11
60 57:11

7

72 49:6
73 44:24 46:9 48:16
75 29:21

8

8 113:18
8A 113:19
8,000 68:9 81:23
84 44:22 45:1 48:15,17

49:6

9

9 31:9 56:10 57:16 58:13,16,24 59:25 95:12
9A 32:8 40:20,23 67:22 128:5
9,300 67:11
9-11 27:23 33:8,15 58:12 106:25
9-13 105:14,19
9/11 3:9 17:9,11
90 41:3
97 79:18 80:11,11

WTC TRANSPORTATION HUB
PERMANENT WTC PATH TERMINAL
SECTION 106 CONSULTING PARTIES MEETING

JULY 20, 2004
PORT AUTHORITY OF NEW YORK AND NEW JERSEY
115 BROADWAY
NEW YORK, NEW YORK

WTC TRANSPORTATION HUB
PERMANENT WTC PATH TERMINAL
SECTION 106 CONSULTING PARTIES MEETING

JULY 20, 2004
THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
115 BROADWAY
NEW YORK, NEW YORK
3:30 p.m.

Transcription by Jane Rose Reporting

PORT AUTHORITY OF NEW YORK AND NEW JERSEY:
Timothy Stickelman
Louis Menno
Carla Bonacci
Peter Rinaldi
Stephanie Talbert
Jackie Hanley
Steve Coleman
Bernie McNeilly
Shawn Lenahan
Mark Pagliettini
Harold Levitt
Bill Wong
Kevin Lejda
Glenn Guzi
Louis Rodriguez
Steven Plate

NATIONAL TRUST
Elizabeth Merritt

VOORS ANGER & ASSOCIATES
Mark Wagner

AMERICAN PLANNING ASSOCIATION
Steve Weintraub
COALITION OF 9/11 FAMILIES
Joel Klein
Patricia Reilly
Anthony Gardner
Jack Lynch
FTA - LOWER MANHATTAN RECOVERY OFFICE
Bernard Cohen
Paul Lebrun
Carol Braegelmann
Peter Goelz
WORLD TRADE CENTER NATIONAL MEMORIAL
Louise Lo Presti

LMDC
Anthoula Katsimatides
William Kelley

MASS TRANSIT AUTHORITY
Virginia Borkoski
HISTORIC DISTRICT COUNCIL
Robert Kornfeld

BATTERY PARK CITY AUTHORITY
Adam Alter
LBG
John Hotopp

COALITION TO SAVE WEST STREET
Bill Love
LOWER MANHATTAN EMERGENCY PRESERVATION FUND
Ken Lustbader

NEW YORK STATE DEPARTMENT OF TRANSPORTATION
Adam Levine

AKRF
Robert Conway
Andrea Ferster
Chris Calvert
WALL STREET RISING
Katherine Christodoulatos

REBUILDING DOWNTOWN
Jesi Pozzyoli
DOWNTOWN DESIGN PARTNERSHIP
Jonathan Cohn

LOUIS BERGER
Tracy Newmann
CONGRESSMAN MOLONEY'S OFFICE
Phil Kraft

Bob Rivari (phonetic)

Mark Shaming

Bruce Desell

Page 5

MR. BERNARD COHEN: Sorry for the delay in getting started. My name is Bernard Cohen Director of the FTA, Lower Manhattan Recovery Office. FTA is the federal funding agency for the Port Authority Permanent PATH Terminal Project.

I'd like to begin by welcoming you all to today's Consulting Meeting, which is being held under Section 106 of the National Preservation Act.

At the last Consulting Parties Meeting, which was held on June 14, many of the most significant features from the draft determination of effects document were discussed at some length. Valid questions were raised about how those features will be affected by redevelopment of the World Trade Center site. And feedback that you provided at that meeting and in subsequent written correspondence, the most recent of which was a letter that we received last Friday from the Coalition of 9/11 Families, was carefully considered and factored into the preparations for today's meeting.

It is my hope that the ideas that you

Page 6

will be hearing today from the Port Authority addressing issues that were talked about at the last meeting will create positive momentum for moving the 106 process forward.

In short, I hope that today will be seen as a day of progress, recognizing that inevitably there is more work to be done.

Before turning the meeting over to Peter Goelz, I would like to point out that a representative from the Lower Manhattan Development Corporation, Bill Kelley, is here today to participate in this Consulting Parties Meeting.

One of the concerns that was expressed to us is the need for better coordination between project sponsors at these consulting party meetings regarding historic resources. So hence, the representation for the need for that.

At this point, I would like to ask Peter Goelz to take over.

MR. PETER GOELZ: Thanks, Bernard. Good afternoon.

As Bernard mentioned, we really envision this two-hour session today to be a working

Page 7

period. Many of the comments, many of the suggestions, many of the written submissions that have come in over the past weeks, are reflected in some of the work that's going to be presented to you this afternoon.

We would like this session to be as interactive as possible. So as the various items are being discussed, we really encourage you to ask questions, perhaps to raise new issues, and to really get a dialogue going.

These are working drawings. These are not final drawings. These are not draft drawings. At some point in the near future, draft drawings will be prepared.

(Phone ringing.)

MR. BERNARD COHEN: Tim? Someone is calling.

MR. PETER GOELZ: At some point in the next few weeks -- can anyone name that tune?

At some point in the near future, draft drawings will be available and will become part of the record.

As you can see, our discussion here today is being transcribed. And if you need

Page 8

clarification, just jump in and ask us. Thank you for your work.

As I say, our proposed format is to be interactive. We would like you to comment as often as you see fit. And if there are issues that you think -- new issues that need to be raised, we will discuss those. There will be time for those as well.

I think we'll start it off with Lou, is that correct? We have a lot of work and presentation to do today.

MR. LOUIS MENNO: Yes, sir.

MR. PETER GOELZ: You all know Lou Menno. And before Lou starts, let's go around the room again and introduce each other. Why don't we start right here.

MS. LOUISE LOPRESTI: Louise LoPresti, Advocate Legislation for World Trade Center National Memorial.

MR. ROBERT KORNFELD: Bob Kornfeld, Historic District Council.

MR. JOEL KLEIN: Joel Klein for the Coalition of 9/11 Families.

MR. ANTHONY GARDNER: Anthony Gardner for the Coalition of 9/11 Families.

MR. JACK LYNCH: Jack Lynch, Coalition of 9/11 Families.
MS. PATRICIA REILLY: Patricia Reilly, Coalition of 9/11 Families.
MR. BILL LOVE: Bill Love, Coalition to Save West Street.
MR. BERNIE MCNEILLY: Bernie McNeilly, Port Authority.
MR. MARK PAGLIETTINI: Mark Pagliettini, Port Authority.
MR. ANTHONY CRACCHIOL: Tony Cracchiol, Port Authority.
MR. JOHN HOTOPP: John Hotopp, LBG.
MR. KEVIN LEJDA: Kevin Lejda, I'm with the Transportation of PATH.
MR. LOUIS MENNO: Lou Menno, Port Authority.
MR. PETER RINALDI: Peter Rinaldi with the Port Authority.
MR. GLENN GUZI: Glenn Guzi, Port Authority.
MR. STEVE PLATE: Steve Plate, Port Authority.
MR. LOUIS RODRIGUEZ: Louis Rodriquez, Port Authority.

MS. JACKIE HANLEY: Jackie Hanley, Port Authority.
MS. TRACY NEWMAN: Tracy Newman, from Louis Berger.
MR. JONATHAN COHN: Jonathan Cohn, Downtown Design Partnership.
MR. ADAM ALTER: Adam Alter, Battery Park City Authority.
MR. PHIL KRAFT: Phil Kraft, Congressman Moloney's Office.
MR. BOB RIVARY: Good morning. WTC Families, Bob Rivary (phonetic).
MR. ROBERT CONWAY: Robert Conway from AKRF.
UNIDENTIFIED WOMAN: (inaudible).
MR. KEN LUSTBADER: Ken Lustbader, Lower Manhattan Emergency Preservation Fund.
MS. ELIZABETH MERRITT: Betsy Merritt with the National Trust Preservation.
MS. ANDREA FERSTER: Andrea Ferster, Counsel for Coalition of 9/11 Families.
MR. BILL WONG: Bill Wong, Port Authority.
MS. CARLA BONACCI: Carla Bonacci, Port Authority.

MS. ANTHOULA KATSIMATIDES: Anthoula Katsimatides, LMDC.
MR. WILLIAM KELLEY: William Kelley, LMDC.
MS. VIRGINA BORKOWSKI: Virginia Borkoski, MTA.
MS. KATHERINE CHRISTODOULATOS: Katherine Christodoulatos, Wall Street Rising.
MS. JESI POZZYOLI: Jesi Pozzyoli, Rebuilding Downtown.
MS. STEPHANIE TALBERT: Stephanie Talbert Stephanie, Port Authority.
MR. CHRIS CALVERT: Chris Calvert, AKRF.
MR. ADAM LEVINE: Adam Levine, New York City Department Of Transportation.
MR. BERNARD COHEN: Bernard Cohen, FTA.
MS. CAROL BRAEGELMANN: Carol Braegelmann, FTA.
MR. PAUL LEBRUN: Paul LeBrun, FTA.
MR. MARK WAGNER: Mark Wagner, Voors Anger & Associates, architects.
MR. MARK SHAMING: Mark Shaming, New York State (inaudible).
MR. STEVEN WEINTRAUB: Steven Weintraub,

APS.
MR. STEVE COLEMAN: Steven Coleman, Port Authority.
MR. PETER GOELZ: I think that's it.
MR. LOUIS MENNO: Thank you. Good afternoon everyone and thank you for joining us here today.
What I wanted to point out today, this is another meeting as part of the Section 106 process for the permanent World Trade Center PATH Terminal or the Transportation Hub Project. And this is what this meeting is all about. It's focused primarily on the Transportation Hub Project. And we'd just like to point that out, but we do recognize and acknowledge that we are coordinating this with the other projects that are going on at the World Trade Center site that are being undertaken by LMDC or New York State Department of Transportation. And we get involved and we coordinate all of our activities with them because we are the owners of the World Trade Center site.
But today, we're focusing on the PATH terminal project, the transportation hub.

And also pointing out that the transportation hub has some impacts on the footprints and the columns of both 1 and 2 World Trade Center as we previously pointed out at previous meetings.

And so, working with LMDC and NYSDOT with other issues associated with the slurry walls and with the other remnant structures at the World Trade Center site.

This project does not focus on the removal of the portions of 6 World Trade Center slab at the northwest corner of the site. It is not part of our project, but we are working and coordinating all of our efforts, as I said, with LMDC and with our other business partners since we are the owners of the World Trade Center site.

And the transportation project that we're here talking about is the transportation hall that we are all are aware of, that will be designed by Santiago Calatrava, that's located on the east side of the World Trade Center site, as well as the various components that make up this transportation complex, which is the

east/west corridor, that comes from the World Financial Center under Route 9A into the site, into the main mixing bowl of the transportation hub, as well as the north and south concourses also. As we also join up and hook up with the N and the R Subway Line and hooking up with the Dey Street connections coming from the Fulton Street Transit Center. Then building the new PATH Facility which is the new mezzanine and the new station and platforms below in the original locations of where the original World Trade Center station once stood before 9/11.

And that is the whole goal here, is to talk about this particular project. But we do recognize, it interfaces with all of the other projects going on, and that's why we have representatives from LMDC and NYSDOT to talk about how we are working together and to share any of the concerns and comments that you have as they relate to all of these projects.

We do know that there is some overlap, but we're primarily focused on the

Transportation Hub Project. I'm going to turn it over to Tim Stickelman.

MR. BERNARD COHEN: I think he stepped out.

MR. LOUIS MENNO: I'll turn it over to Jackie. We'll skip over that. On the agenda, we'll go to item number three; the E Train.

MR. PETER GOELZ: We'll come back to number two when Tim comes back.

MR. LOUIS MENNO: As you pointed out to us at the last meeting in July about how we could incorporate, preserve and integrate the entries to the E train into the design, and we carefully looked at many different options that Carla Bonacci is going to present to you today of what we are considering.

We'd like to hear your feedback on these different options that are we are going to present.

And on this drawing here, hopefully you can see it, this is a cross section, looking north of the transportation complex, starting at Church Street, going west to just shy of Route 9A. And this area, this box that you

see here, that is the approximate location of where the E Train entrance, the existing E Train entrance exists, relative to the new plan for downtown transportation.

And as you can see here, we tried to, on this drawing, show relative to all of the other existing infrastructure and how we had to incorporate this into the existing infrastructure that was there in terms of developing the master plan for the World Trade Center site, as well as the plan for the transportation terminal.

What you can see here, this is the Main Transit Hall. And the elevation of this station, of the entrance from the E Train, is at elevation approximately 306. And questions were, "Why can't you keep elevation at 306 or 310," which was the original World Trade Center concourse consistent throughout, "stick with that and make that work?"

Unfortunately, by staying with elevation 310 or 306, it doesn't work with the plan, because that basically would bring you at the new street level, or the new street level within the master plan for the World Trade

Center site. And it doesn't quite work by keeping it at such a high elevation, because the goal in the master plan was to integrate the World Trade Center site with the rest of downtown.

Originally the World Trade Center didn't do that. It was isolated. And 310 was determined as the level of the lobbies for 1 and 2 World Trade Center, which basically controlled everything that went on into the site. That's why you had those high walls along Vesey Street and why the bridge going across 9A was very, very high. It was isolated. It was like a castle. We boxed ourselves in away from everybody. Now we're doing it in a more enhanced way of reintegrating the site to be a part of downtown.

And what you can see here, in terms of creating the east/west connection between the Fulton Street Transit Center and the Dey Street underpass and going all the way over to the World Financial Center, we're trying to keep it in such a way that pedestrian movement as a minimal amount of vertical

circulations going up and down.

And then keeping in mind, having to avoid hitting the 1 and 9 subway box that runs under Greenwich Street, as well as keeping clear of the PATH right-of-way, within the bathtub itself, and then coming in under the N and R Subway here, hooking up with the Dey Street corridor, as we coordinated all of our efforts, and to create a movement that will take people east and west, by working around, by coming through all of these existing pieces of transportation infrastructure without determining it.

And this is the configuration as we see it now. So that if someone were to come from the Dey Street corridor, they would come in here, take a stair or an escalator and they can go down to this level here, which is approximately at elevation 277, go down another level to 264 and go across. Or take right past the PATH area, just before the PATH area, or take another vertical circulation movement up to get to a higher elevation to get to the north tower, which is

the Freedom Tower.

And there are many different movements so that we can effectively create those intermodal connections between the various subway lines, PATH, as well as creating direct access to the buildings in and around the World Trade Center site.

MR. ROBERT KORNFELD: Sorry to interrupt. Bob Kornfeld, Historic District Council.

I'm just trying to understand what's on the drawing. Because the section of corridor that's being discussed is just a small section, like 30 or 40 feet, right?

MR. LOUIS MENNO: Yes.

MR. ROBERT KORNFELD: Are you showing that to be preserved?

MR. LOUIS MENNO: That's what we're going to show in a moment. I wanted to give you a quick overall view because the questions were asked --

MR. ROBERT KORNFELD: I don't think anyone was thinking that that should determine what the level of circulation is all around the site.

MR. LOUIS MENNO: Because what we heard last time was that why wasn't everything fixed at 310 or 306.

MR. ROBERT KORNFELD: No, no.

MR. LOUIS MENNO: Okay, I'm sorry. That's why we were addressing that.

Anyway, this is basically where it is relative to the rest of the transportation structure.

MR. ANTHONY GARDNER: Just a question in terms of the east/west connections. Where are the footprints on this?

MR. LOUIS MENNO: The footprints are in this area here. This is beyond it. So if the footprints are here, this is beyond the footprints. What you see here is not within the footprints.

MR. ANTHONY GARDNER: Is it north of the footprints?

MR. LOUIS MENNO: Yes, it is. That's correct. As you see here, this is a cross-section that's basically taken through this area here, but it does not go through.

MR. ANTHONY GARDNER: And that's at an upper level?

MR. LOUIS MENNO: That's at an upper level. This just gives you a slice through it. But it's not through the footprint. This is not through the footprint.

MR. JACK LYNCH: Is it possible when you refer to these, that you could refer to the levels other than the elevation? I'll tell you why; elevation to most people is sea level. That's what we are looking at. This elevation obviously is completely different to some elevation that's -- I think it was some town in New Jersey.

MR. ANTHONY GARDNER: Talking about 30 feet is street level.

MR. JACK LYNCH: B-2, B-1, you know?

MR. LOUIS MENNO: Basically what we have here, street level, at Church Street is at approximately elevation 324. And the lowest level, which is the PATH right-of-way, is at elevation 250. So we're approximately -- there's like a 75 foot difference from the street level all the way down to the lowest level. The mezzanine area, which would have the fare control, as well as the level that will take people east and west, is at

approximately elevation 264. And then within the transit hall itself, the bottom of the transit hall is approximately at elevation 277. And then depending on the circulation, there's circulation around here, around the outside edges or the perimeter of it and that's at basically elevation 295; coming around 295 or 296. So there's many different levels.

MR. JACK LYNCH: But lowest level is 250?

MR. LOUIS MENNO: Yes, lowest level which is in the bathtub at 250.

MR. BERNIE MCNEILLY: Lou, just to clarify that. Those elevations are Port Authority data. 300 means sea level. You were asking, so 324 is 24 feet above sea level. 250 is 50 feet below sea level.

MR. PETER RINALDI: There is one level at the station at B-6 level, which was inside the bathtub level, is actually the 243 and steps down from the PATH. That's why the PATH sits a little higher. But there is another level as you get outside the station area. It's a little lower.

MR. JACK LYNCH: Thank you.

MS. CARLA BONACCI: There are four options specific to this area. I thought first I'd take you through what the existing condition is of this particular area, which on the plan is right here. It's about 1650 square feet. And prior to 9/11 and today, it connects E train users into the concourse that takes people to the PATH. And this is what the facility looked like prior to 9/11. And this is that E train entry, which is right here.

So what we're talking about, the area that remained after 9/11, is about at this point you can see the trafficking. There's a ramp and steps that take you to the doors that are then the entry into the MTA subway area. And there is this overhead.

Now, what we did is we refurnished this, so not everything is existing from prior to 9/11. The handrails existed prior. The flooring existed prior. The signage existed prior. However, we put in a new ceiling. Kept the same form. Kept the same envelope. Put in a new wall finish and reframed the

columns so that you have a sense of what was. And this is what could be.

So we have four options of various stages of reuse of the facility. Right here, what we're showing is something where people leaving the E train could actually come into this area. And it's more of a museum piece, because it's not connecting through into the World Trade Center site.

So I don't know how you want to think about what that really means. But it's the idea of going into this area and seeing something of what was.

MR. PETER GOELZ: This is Option 2.

MS. CARLA BONACCI: Now we're moving to Option 2.

MR. PETER GOELZ: So option one is essentially everything; the 1650 square feet as you see it in the photographs, but not leading anyplace, essentially being an exhibition or museum area?

MS. CARLA BONACCI: Right. Exactly. No physical link. Not being used as it is being used today.

Then as we move here to Option 2, and

the other options, we're looking at reusing it in a way so that people walk through it as they did prior to 9/11, as they do today. It's part of a transit connection into the World Trade Center site. And what we looked at here was, keeping the elevations as they exist. So you're at 306 at the platform level, you come up some stairs to the 310 elevation, but you have to get back down to the 295.

MR. PETER GOELZ: Do you have that elevation shown here?

MS. CARLA BONACCI: And this is the section through. So you come up, you're at 310, the old elevation, you go back down. So it's about, if my math is right -- so I think one of the issues here is thinking about how people actually use this. This is the main connector for people that come from Penn Station every morning to work. It was a pretty heavily used corridor and passageway. And about 10,000 people a day I think were the numbers.

So you should think about how people traverse and is this a convenient mode to go

up and down, or does it became frustrating to people.

Then we move on to Option 2-A. And what we said here is, if we can modify this existing passageway and eliminate the stairs and the ramps, and hold the 306 elevation, then the difference is about 11 feet. And now, when people come in at 306, they only make one transition down into this transit area. And it requires -- we're still reusing it. We're still using it as a transit entry way, but perhaps it's more convenient for people.

MR. PETER GOELZ: And you would eliminate just one flight of stairs on it?

MS. CARLA BONACCI: As you can see, there's a four-foot change in elevation right here with the ramp. That would get cut out. Right here. And we would hold this lot in elevation. And then from there, people can transit to where they need to go.

And then this fourth option is also maintaining the area for transportation. It's essentially connecting people from the E Train into the R and W. It's not making a

connection into this area. We've also looked at eliminating the stairs, so that you're at the same elevation, because otherwise you get 360, 310. Pretty practical.

And there could be some issues with security concerns and because of the curve and seeing in there, people hanging out in there. And there is no connection back. And here you can see it is a straight line.

And that's essentially the four options. And we thought, perhaps you'd have some reactions to these. Give us some feedback.

MR. BILL LOVE: It seems to me the last two, if you're eliminating the stairs and the ramp, you're kind of eliminating the essence of the whole thing. And that's sort of what gives you the feeling that you have when you're walking into the concourse. And so, I would tend to say that those probably around worth the trouble. I don't think it's worth the troubles just to preserve the level. It's more the ramp and the stairs and the essence of it and the railing.

I don't know. That one preserves it.

Obviously it looks a little strange, and I don't know other people's reaction to that, but that would preserve it as something useful. Sort of, preserving it as a museum piece, the first one, doesn't quite seem maybe to be worth the effort. I don't know. So I suppose I'm more inclined with the second, but if people see it as problematic, and the up and down.

MS. CARLA BONACCI: Maybe other people have reactions. One is walking through this, and the volume, and the envelope part of the feeling, more than changing elevation. Because you're going to change elevation anyway when you're here.

MR. BILL LOVE: And it's not --

MS. CARLA BONACCI: I don't think it's preserving architectural interest, as much as there is an emotional attachment here. So what is it that makes it --

MR. PETER GOELZ: What is the attachment?

MR. BILL LOVE: I think it's the experience of walking up the stairs or the ramp that's the emotional attachment part of

it. You would lose that, I think, with the last two options.

MS. LOUISE LOPRESTI: As another frequent user, I would tend to agree that it's the processional experience of going through it that really, at least for those of us that use it, is the most significant. And in terms of traipsing up stairs and down stairs and up ramps and down, anybody who's gone through 53rd Street at Fifth Avenue, 59th Street and Lexington Avenue, we deal with this all the time. Grand Central. New York commuters are used to going up and down.

Last but not least, you raised a concern about 10,000 people going through here per day. There were 10,000 people going through before and it worked just fine.

MS. CARLA BONACCI: Yes. These are just -- I'm not saying is there a preference or not, but they went through it and then they were on one level.

MS. LOUISE LOPRESTI: I understand that.

MS. CARLA BONACCI: And we are familiar with it, and we may have a different

attachment to it than others who haven't been there before. I'm just asking you to think about that up/down movement.

MS. PATRICIA REILLY: But they go through it on a certain level and then they have to go somewhere else to travel. They're going up and then entering into a big transportation hub that can take them anywhere in the city. So they're better off, even in number one, than they were pre-9/11. Am I correct to say that when they go up and down -- well, from the E, commuters would come in from the big transportation hub right to the PATH train?

MS. CARLA BONACCI: They're coming -- from here, if we just take this --

MS. PATRICIA REILLY: That big yellow thing is the transportation hub, right?

MS. CARLA BONACCI: They'll either go to the World Financial Center, or over to the Freedom Tower. So it may continue along to Dey Street.

MS. PATRICIA REILLY: That circular thing is the hub?

MS. CARLA BONACCI: Yes. From this

level, they can go down to the lower level and then make their way down another level and then across.

Does anyone else have questions?

MR. KEN LUSTBADER: Ken Lustbader, Lower Manhattan Emergency Preservation Fund.

If you could just review, specifically the physical changes to what's declared the historic resource in there so I can get -- rather than being subjective about the emotional component and the feeling, I just want to understand the physical change to the resource.

MS. CARLA BONACCI: For each alternative? For the two that we're talking about.

MR. KEN LUSTBADER: Right.

MS. CARLA BONACCI: From what's there now, what would be the change with one of these alternatives?

MR. KEN LUSTBADER: Right. I've been through it, but just on --

MS. CARLA BONACCI: In this one, I suppose no change.

MR. BILL WONG: We would update the

materials that are temporary. There's fiberglass and other column covers.

MS. CARLA BONACCI: The level of what this gets refurbished to, does it go back to really what it was pre-9/11 if there were (inaudible) on the wall or does it get upgraded? That's another issue. But the envelope and the physical elements, the fixed elements, wouldn't change.

MR. KEN LUSTBADER: Okay, that's what I --

MS. CARLA BONACCI: The walls and the ceiling.

MR. KEN LUSTBADER: The interpretative elements and the design treatments could be discussed. Then, going forward, to create that 306 level?

MS. CARLA BONACCI: This, what's happening is this area right here, the swap where the steps are and then this ramp, this triangular ramp, would come out and it would get locked down to this 306 floor level. However, none of that's changing because it's the area right here at the floor.

MR. BERNIE MCNEILLY: Even though we're

taking out the steps, we have the ability to still utilize the tile, if so desired.

MS. CARLA BONACCI: Again, how this gets redressed or refurbished, to me, is the same as the dressing here, except you wouldn't have the steps, you wouldn't have the ramp.

Can you not hear me?

MR. PETER GOELZ: Go ahead.

UNIDENTIFIED SPEAKER: Where do the people like (inaudible) the E train and the ones where you don't have an exit from the E train?

MS. CARLA BONACCI: They would exit right here. This would be a new entrance that would be provided and they would come around at that 306 level, take vertical circulation. Again, same issue. And drop down --

UNIDENTIFIED SPEAKER: That sounds a lot more confusing than the way it is now where you would get off the train and walk out the doors. That way you'll have to walk down to the end of the platform, back up to the left and take more stairs. Doesn't sound like anything less time consuming.

MS. CARLA BONACCI: It sounds like this one is dropping off. That's okay we want to drop some off.

You give it refunction. So just ...

MR. TIMOTHY STICKELMAN: Just so you know, the transcriber can't get everyone talking at the same time. I'm trying to help her, but --

MR. PETER GOELZ: The transcript shows "mumble mumble."

MS. LOUISE LOPRESTI: One of the great drawbacks of the former site in terms of those who had to try to get from point A to point B was a lack of navigability. And I would hope that either in the usurious of this and planning overall, that that could be improved upon. In which case, this, as far as someone that needs to get around that area and the end one, they're not really viable.

MR. PETER GOELZ: So let's focus for a couple more minutes on the two center ones. And the difference is in 2-A, as you called it, the stairwell is eliminated. The stairs and the ramp are taken out.

MS. CARLA BONACCI: Taken out.

MR. PETER GOELZ: Right. And the reason for that is the convenience for the 10,000 people that are going to go through.

MS. CARLA BONACCI: What we call a level of service because the less vertical moves someone has to make, the faster their travel is, the more convenient.

MR. PETER GOELZ: Now, for somebody like me, steps are good.

MS. CARLA BONACCI: Everyone needs exercise, okay.

MR. ANTHONY GARDNER: Anthony Gardner with the Coalition.

You're not asking us to choose one of these today?

MS. CARLA BONACCI: No, we're just trying to get a sense.

MR. PETER GOELZ: We'd like to have feedback.

MR. ANTHONY GARDNER: I think this kind of relates to those of the Consulting Parties that are concerned with historic preservation. I think the issues is sort of twofold; you want the resource to be preserved, but you want people to be able to

experience it.

I think with the first one, and just a preliminary comment, you know, it's not -- people aren't going to be able to experience it in a way that would be sort of reminiscent of the way it was before because it would just be sort of there, and how would people even know where to go? Would you have signage with arrows saying platform?

MR. PETER GOELZ: I think that one is droppings off the board.

MS. CARLA BONACCI: I'd turn it around, but it's too big.

MR. ANTHONY GARDNER: Not saying you should do that, but I think with historic preservation, it's twofold because you want the resource preserved, but you want access to it.

MR. BILL LOVE: I would say between the two alternatives that we have left here, the second one over here really destroys too much of it. It's really the stairs and the ramp that are the experience. And it's probably not worth the trouble, otherwise, those are taken away.

So I would tend to vote for this one over here. The steps that you go up, it's a 4 foot difference in elevation that I think there are six steps. It's a gentle sort of slope. I don't think it's a real problem at all.

MS. LOUISE LOPRESTI: I agree as well.

MS. CARLA BONACCI: May I ask them a question?

MR. PETER GOELZ: Sure.

MS. CARLA BONACCI: In this area here, prior to 9/11, there was a small corner that was a storefront, a view window. What do you think, depending on the retail here, this became a store window? Not an access point, but a window where one sees merchandise, versus a wall because it is an adaptive change?

MR. PETER GOELZ: Does it show in the photographs?

MR. TIMOTHY STICKELMAN: It's covered. I don't know if anyone remembers, but pre-9/11 it was a HAER salon.

MS. CARLA BONACCI: But you know, I'm just curious.

MR. JOEL KLEIN: You're restoring the original function. And I think that would be appropriate and keep it closer to what was there, which relates to why the first option is dropping out.

This was a transportation corridor destined originally, and you lose that totally with the first operation. In regard to the other alternatives, there's clearly an inverse relationship between the level of service and the amount of historic fabric and integrity that's being maintained.

But because you're dealing with changes in elevation here, there's also a psychological element. When people have to make that change going up and down, to recognize that there's a reason for that to be there, very little in the way of interpretation would be needed at that point to make people recognize either this is why I have to walk up these four steps and down these ten steps on the other side. It's a real break on both sides.

MR. ROBERT KORNFELD: The elevation change relates to what was there. Not that I would object to it being the other way, but I think that's enough of a reason for people to understand why they're going up a few steps.

MR. JACK LYNCH: The doors were originally there -- oh, okay.

MR. KEN LUSTBADER: My hand was raised to raise the point that Joel was making. It's important, if we're going to accept the importance, it's important that people that are using it ultimately understand why there's a change in elevation and back down again.

MR. JACK LYNCH: The doors in that area had markings on it from the Fire Department; are they the doors that are there now?

MS. CARLA BONACCI: Yes.

MR. LOUIS MENNO: And they're covered over. And they are covered over with a protective covering, as you can see. Can you see it? They have not been removed.

MR. TIMOTHY STICKELMAN: I believe, Mr. Lynch, what we're committed to do is, I believe some of the consulting parties have asked us to add that -- to bring it out to Hanger 17. So it would be removed and brought out as one of the artifacts from part of the artifact collection. That's why it's covered up, to protect it.

MR. PETER GOELZ: Tim, do you want to step up and move in?

MR. TIMOTHY STICKELMAN: Jack, you have to help me. I apologize for being a little late. My name is Tim Stickelman. Some of you know me. I work at the Port Authority.

I just want to give you a quick update on some of the status of the artifacts out at Hanger 17, and some of other issues.

As you know, some of you have been actually out to Hanger 17 where we have a number of artifacts that we're cataloging. You've been given an interim catalogue. We'll be finalizing it and I'll let Jackie speak about where we are on that.

We hope to have it out to you in a CD format by late August. I'll let Jackie speak about it.

One of the other issues too, I believe that came up last meeting, was the Intrepid, the piece of steel and facing that was out at the Intrepid.

Someone provided pictures to us. There

is a plaque there that says it was donated by the Port Authority Police. I have contacted the Port Authority Police; they have no record of this being donated.

I then reached out to the Intrepid to find out how they got it and who they got it from to track that down. And we will report that back to you.

But at this point, I can't give you any more answers than that. But there is a plaque that says it was donated by the Port Authority Police, but it was not an official donation as far as we can tell.

Jackie, you want to speak about the inventory as to what's going on out there? Jackie.

MS. JACKIE HANLEY: When you came out for the tours a few months ago, there was a lot of steel that we referred to as a secondary line of steel. So the issue was the inventory of that.

I know you asked the question at our meeting a month ago. So let me ask Mark Wagner from Voors Anger & Associates, who is working on the inventory everyday at the

hanger, and he can fill you in on the status of that.

MR. MARK WAGNER: Just a quick update on it. When I last addressed some of you previously thought that that secondary lot of steel contained somewhere between 200 and maybe 400 pieces of steel. Over the last few months, we've moved all of that steel out of the hanger, spread it out so we could get at each piece. As it turns out, there are over roughly 533 pieces -- 33 or 34, I have to go back and finalize my numbers.

Everything now has been moved back into the hanger. Everything has been photographed, measured, if there were any markings on the steel like shop tags from the original construction; all of that was taken down, photographed, handwritten.

And what we're doing now is we're in the process of putting everything into the database which, as Tim said, will be provided at some point.

As I said, everything is tagged. Everything is back in the hanger now, and 533 pieces.

MR. TIMOTHY STICKELMAN: Thank you.

MR. ROBERT KORNFELD: Informally, are there any more of the complete triad pieces, the columns with three plates?

MR. MARK WAGNER: There were not pieces like that in this secondary lot of steel. The secondary lot came to us towards the end of the cleanup of the site. It was steel that the DDC had just rounded up. It wasn't hand-selected by anybody -- an effort to grab what they could grab at the time. And, so most of it is just generic I-beam sections. You will find a couple of stair treads; things like that. Some things with a little bit more significance than others, but for the most part, it's typically I-sections.

MS. LOUISE LOPRESTI: We all understand, especially from the last meeting, that the artifacts are not only of tremendous significance to us here, but there's a great deal of curatorial interest in that as well.

There has been a slight disconnect in that the distribution of the artifacts or the allocation of the artifacts from the memorial center, as I understand it, will be dealt

with by a team of curators under the purview of LMDC. And to avoid a disconnect between the artifacts that are currently under control of the Port Authority and their distribution by the LMDC, it would be nice if the process of the potential distribution, or the request for distribution, be integrated between the two agencies so that you don't have a process where, on the one hand, you're controlling it, but we find out that another agency has, in fact, distributed them. There are certain stellar pieces out there, not just the triads, as you showed me, but the big steel angel. Some of them are really unique and they should remain here rather than being distributed elsewhere, no matter how wanted they are by other institutions.

MR. TIMOTHY STICKELMAN: You gave me a great segue into what I wanted to speak about, was the whole coordination with the LMDC and the Port Authority.

As you know, the Port Authority owns the site, so we are intimately involved with all the different projects that are going forward. There's the PATH project, which is

why you're here today, about the PATH project.

The Port Authority, as the owner of the site, is also intimately coordinating with the LMDC on their project, which is the master plan, which includes the memorial and the commercial development.

We are going to be coordinating with the LMDC on every step of the way. The Port Authority is a consulting party to their process, the same way our Consulting Parties to NYSDOT's process, same way we are consulting party to the MTA process.

You couldn't have given me introduction to this. There is a great coordination between these projects. They are separate, but they're dealing with the same resource which really is the World Trade Center. That is why, in the beginning, we have a joint coordination of eligibility and then the projects went their separate ways dealing with that resource. But that does not mean that we're not going to coordinate.

I want to emphasize that that's the key thing among all these different agencies,

both the federal and the local agencies sponsoring them is that we need to coordinate.

We have heard you. I know I have heard you. We really want to emphasize the fact that this coordination is going to continue. I don't know if LMDC wants to speaks about their next process in regards to the program because the Port Authority will be cooperating with them on a lot of things they'll be doing.

MS. LOUISE LOPRESTI: I would ask that -- I understand that there is coordination, and I'm sure everyone here would echo this. Much of what has transpired in this process previously has occurred. We've been informed of it ex post facto. And I think in the interest of ongoing good relations, that if it could be addressed in advance?

MR. TIMOTHY STICKELMAN: One big issue that you raised up was the curatorial. That's one of the things we'll be speaking to LMDC and the other agencies about the next steps in regards to that. You've raised it and we've heard you. We'll be meeting with

the LMDC to discuss that next step, but having some type of panel or something curatorial, except what we have already done.

MS. LOUISE LOPRESTI: No, what I'm saying is that I think it would be a proactive and positive approach if rather than the 106 participants being told ex post facto that ABC and XYZ have all been given away, that it be reviewed in advance of signing any paper off on distribution.

MR. TIMOTHY STICKELMAN: I hear what you're saying.

MS. LOUISE LOPRESTI: Okay.

MR. TIMOTHY STICKELMAN: And the other projects, I just wanted to mention, as you know, the MTA is working on the South Ferry project. And what has come up there is the Koenig piece, some of you may be aware of, which is basically the sculpture that was in the fountain. That right now is a temporary memorial in Battery Park City.

South Ferry is going to be going forward with their EA for the South Ferry project. And they may have to move that Koenig piece. They're not sure what they'll be doing

because of their project, but the Port Authority, if temporarily it had to be moved, as far as we're concerned, it should go out to Hanger 17, remain with the rest of the artifacts, until it's finally determined what's going to happen with it.

I don't know what South Ferry is doing right now, but I know they're not sure if they have to move it or not.

UNIDENTIFIED SPEAKER: If I can interrupt. They're prepared to do that project without moving the piece.

MR. TIMOTHY STICKELMAN: Okay, it's not moving then. That's the answer.

MS. LOUISE LOPRESTI: Under the heading, because I have to leave, and I want to put this in under other issues and resources.

In terms of other ongoing projects within this, since we have LMDC in the room, one of the standards of architectural practice in New York City is that you only have one signature building in the site.

Now we have the Freedom Tower, and the Calatrava Building. And the Calatrava Building, quite frankly, will be one

Page 49

of the great landmarks of the 21st Century to which the Port Authority should get all due congratulations for good taste. Adjacent to it is the Cultural Center. Originally it was foreseen, or I hoped, that the City Opera would move in there. And for various reasons it's not. And we now have several much smaller works that is going to be there.

Has there been any thought given to rescaling that building in view of the significance of the Calatrava Building, and are there, in terms of the actual tenants, who are much lesser arts organizations, or possibly even moving it elsewhere?

MR. TIMOTHY STICKELMAN: Unfortunately that's not part of this project. But I believe there are four programs. I really feel uncomfortable speaking about that.

MR. WILLIAM KELLEY: Bill Kelley. That's for a different discussion, but they'll be sized appropriately to their use. You know, it's a thousand-seat theater -- I mean, the program there and the building architects will design it to the programs.

MS. LOUISE LOPRESTI: One quick

Page 50

question: Is the concept then, is it possible that the building will be scaled up or down?

MR. WILLIAM KELLEY: It's really up to the architects when they're selected.

MS. LOUISE LOPRESTI: Thank you, Bill.

MR. ANTHONY GARDNER: I have a comment on the artifacts. And it might take like a minute or two, so bear with me.

I think Louise touched on this, but it's getting a little frustrating reading about things in the New York Times as Consulting Parties. I just want to make that point.

But it might not be such a bad thing in this case because maybe it's not too late for this particular thing. But Dunlap talks about an exposed steel beam in the garage that is clearly stenciled PONYA, for Port of New York Authority, as your agency was called at the time the Trade Center was built.

Do you know if this resource is included in any of your inventories?

MR. TIMOTHY STICKELMAN: You kind of gave me another reason to talk about something else I want to talk about; the HAER

Page 51

Photography. The HABS HAER photography has been completed for the northwest slabs. That HABS HAER Photography has some pictures showing the PONYA, so it's been recorded.

Prior to 1972, the Port of New York and New Jersey was Port of New York, and changed in 1972. All the steel from the Trade Center had that stamp on it. That's all part of the recordation of the HABS HAER Photography of the northwest slabs.

MR. ANTHONY GARDNER: Are we going to be able to review the HABS HAER photos so we could advise you if we think there's any resources that you should consider before 6 World Trade Center is demolished?

MR. TIMOTHY STICKELMAN: Northwest slabs, as you know, we met back in April. We had three items that we basically dealt with SHPO about bringing out to Hanger 17.

In addition, we are committing, if there are other items that we can take from the northwest slabs, in addition to those three items, an example would be, I know there are some glow-in-the-dark handrails that we want to get, which shouldn't be a problem.

Page 52

Then there are the other items that are in the northwest corner, that as they're doing the demolition that we'll be able to take out to Hanger 17, we don't know right now.

MR. ANTHONY GARDNER: I think if you remember back in April, many Consulting Parties asked to be able to see an inventory before you just decide what's going to be removed. I don't think anyone is arguing with the slabs you selected, but basically just the process in which they were selected, we were shown those three slabs and basically told to comment on those three slabs.

And what many Consulting Parties asked for is this HABS HAER documentation or inventory so we can look at it before it's destroyed and maybe mention to you, maybe there's something in there, you know -- for me, I think that's a significant resource because it speaks to the construction of the World Trade Center, which I would think that the Port Authority would be very interesting in preserving remnants that speak to that time period.

That's the point I wanted to make on that. I think you should share an inventory with the Consulting Parties.

MR. TIMOTHY STICKELMAN: What we'll be doing, you'll all be getting, if you want it, a copy on CDs, of all the HABS HAER Photography. We finished the northwest slabs. We'll be taking the photography of the entire World Trade Center and all of its resources. You will be given a CD of all the photographs.

MR. BILL WONG: We still have to work out technically how we do that, but if it's a scan, it may not be the high reds, and all that. But we should be able to do that.

MS. ELIZABETH MERRITT: Betsy Merritt, National Trust. Is this going to be the same CD you referred to as being distributed in late August because we'd like to get these ASAP so we can give you feedback. We all, all the preservation-related groups, all very emphatically said we want more information about what features are in the parking garage so we can give you some feedback on elements that we'd like to see.

MR. TIMOTHY STICKELMAN: The CD in August is the artifact inventory. The CD that we're talking about, you'll be getting. So what you're asking is you would refer to get the CD for the HABS HAER copy of the northwest slabs upfront. We'll be happy to supply that to you.

MR. BILL WONG: This is part of LMDC's --

MR. TIMOTHY STICKELMAN: This is the continuing cooperation. The northwest slabs, just so you know, is not part of the PATH project. That was part of the LMDC master of redevelopment and memorial. It's not part of this project. I want you to understand that.

MS. ANDREA FERSTER: Andrea Ferster for the Coalition of 9/11 Families. Just a follow-up on the question about the CD.

The Consulting Parties were interested in reviewing the HABS HAER documentation for the northwest remnants because they want to provide comments on whether or not there are other remnants featured that they would prefer -- I have a follow-up question, but that

they would prefer to be preserved as opposed even perhaps in addition to the features that you have designated already in your review of the construction.

I understand your position is that the deconstruction of that structure is not part of your undertaking. But in the spirit of sort of cooperation that's going on here, I think it's really important that the Consulting Parties understand the schedule for demolition, or deconstruction of the garage structure in relationship to the comments that they're going to be providing you on the salvage element. How do the two mesh there? Maybe they want to make sure that their comments, if they feel that there are additional features that should be considered for preservation or salvaged, are provided before they are destroyed.

MR. TIMOTHY STICKELMAN: I understand what you're saying. We will provide you with a CD of the photographs. However, that process in regards to what mitigation members of the northwest slabs has already been completed. I can't say any more than that.

That's not part of this project. But we will provide a CD of the HABS HAER of the northwest slabs.

And the Port Authority and the LMDC will make every effort to get any other items when they do the deconstruction.

MR. KEN LUSTBADER: I know we're diverting off the PATH project, but this speaks to the bigger issue that you began at the segue that the issue of cumulative impact. This is something that the LMDC and the five preservation groups are very concerned about.

How do we assess the PATH project? How do we assess the parking garage when there are these cumulative impacts on historic resources, that were individually taken into account, but holistically we're not addressing. And is there anyway for two things; one is the cumulative impact on historic resource. And two, to do an overall documentation now, rather than waiting.

MR. TIMOTHY STICKELMAN: The goal is to get the HABS HAER finished hopefully within a couple of weeks. The whole idea is to get

the HABS HAER done, the whole entire site done.

MR. KEN LUSTBADER: Is that going to include part of the uncovering, showing the perimeter and the outlines?

MR. TIMOTHY STICKELMAN: Yes. We'll get to that later on when we talk about the footprints, but yes, not only would be the HAER hotography, but the videotaping of that.

MR. KEN LUSTBADER: And again, that links to what was brought up earlier about coordination of the LMDC and the memorial center and the people who are curators on that who could be advising as to what is a good method of documentation. So it can be used in the future for the memorial center. So there's an ebb and flow but not a coordination perception-wise.

MR. TIMOTHY STICKELMAN: Maybe we're not expressing ourselves correctly, but there is a significant amount of coordination. As I said, we want to make every effort to get the entire HAER hotography of the entire site done within the next month or so; which

would include all the resources, the footprints. We'll talk later on.

MR. BILL WONG: That may not be done doable in a month. We have to see how the construction schedules work out to be able to get all the documentation. But we can submit to the documentation before any of the significant features are kind of altered.

MR. PETER GOELZ: I want to get to the footprints. Make sure we have time.

MR. KEN LUSTBADER: Follow-up to the cumulative impact issue. I want to know if that could be answered. Perhaps not now, but something you can discuss?

MR. TIMOTHY STICKELMAN: We've received your letter and also a letter from the Coalition in regards to that statement. I believe it was mentioned in both. And we're looking at that now.

MR. PETER GOELZ: Jack, go ahead.

MR. JACK LYNCH: When I was out in Fresh Kills, there was a lot of steel out there and artifacts out there in Fresh Kills.

Question: Has it all been removed in Fresh Kills? I want to know if it has been

removed, has it been inventoried, or is it at Hanger 17?

MR. TIMOTHY STICKELMAN: The steel that was at Fresh Kills, that was the City of New York. I am the DDC. I've never been out there. I don't believe they have any steel. But I can't really answer that question.

MR. JACK LYNCH: I would like to have the organization that did do it, the group, somebody look into it so we can identify --

MR. TIMOTHY STICKELMAN: We can reach out the City of New York. That won't be a problem.

MR. JOEL KLEIN: Joel Klein for the Coalition. I don't know whether or not you're aware that the Coalition has filed a dispute with SHPO regarding LMDC's implementation of the provision of the programmatic agreement that relates to the site. And one of the issues we're concerned about is LMDC, when we spoke to them about a week ago, never consulted with the HABS HAER people at the National Park Service which they were obligated to do.

As a result, the recording has been

completed. We're not sure that we can accept that statement at face value. We don't know what the nature of that HABS HAER recording was done. I know the Coalition raised questions when the original proposal for mitigation was put forth as to what level of HAER recording was to be employed. The National Trust and some of the other preservation groups raised similar issues. And none of those comments were ever addressed or even responded to. So we don't know what HAER recording, if any true HAER recording has ever really been done. We continue to have serious concerns about it.

MR. TIMOTHY STICKELMAN: What I can say, the HABS HAER photo documentation of the northwest slabs will be transmitted to New York SHPO. They have requested two copies of the photography. We also, in addition, we did color photography which will be on the CDs of same photographs in color. And that will be submitted to SHPO. In addition, we'll be submitting it to HABS and other documentation that Port Authority may have in regard to the two towers. That should

probably, I think it's going out, assuming that it's been delivered to our offices, either tonight or tomorrow. They requested two copies. I believe New York SHPO, they're not here right now so I can't speak to them, but I believe they contacted National Park and HABS back in June.

MR. JOEL KLEIN: They did and they asked them one question which was how many copies do we send them. And that was the extent.

MR. TIMOTHY STICKELMAN: I can't speak for New York SHPO, but the Port will be transmitting the HABS HAER Photography to New York SHPO.

MR. JOEL KLEIN: Will you be waiting to initiate demolition until you've had time for HAER to indicate whether or not the recording is adequate to their standards?

MR. TIMOTHY STICKELMAN: It's being submitted to New York SHPO. The process for the northwest slabs mitigation has been decided. We'll go forward with that project. It's being done by Silverstein Properties.

MR. JOEL KLEIN: You're not really

answering the question which is: How do we know that what you are submitting to HAER will, in fact, satisfy HAER standards. And if HAER comes back and says no, this is not an adequate recordation, and you've proceeded with the demolition of 6 World Trade, we have a problem.

MR. BILL WONG: I think, if John wants to discuss how the recordation is done and to what extend that previous recordation was done, that this should be pretty much consistent. There shouldn't be any issue.

MR. JOHN HOTOPP: The process was done at our standards. (inaudible) large format cameras, processed archival standards. Prints were made from the negatives. Standard process that we used. Approximately 30 photographs were taken across the site; everywhere from establishing shots to close detail shots of things that we needed to illustrate. It's a standard recordation. As they index the photos and as little bit of testing that goes with it, everything is done.

We're waiting now to get a number

from HAER. As soon as we have that, we'll put it in the sleeves and send it to them. The set that will be given to SHPO will be given to the State archives, as well. I would assume that we'll get a comment or two from Kathy about what we're submitting to her.

MR. JOEL KLEIN: What I've heard is a description of what may barely qualify as the minimal level of HAER recording, which is the kind of thing you do when you demolish an outhouse that's historically significant.

Level one HAER recording would certainly involve measured drawings, at the very least. And I think if anyone had even bothered --

MR. JOHN HOTOPP: Joel, we are using (inaudible) to illustrate the photo locations.

MR. JOEL KLEIN: I think the concern here was that there was a commitment, or at least we understood a commitment, on the part of LMDC, not Port Authority, to consult with HABS HAER. And that commitment does not appear to have been honored. This relates to

the coordination issue that we're talking about. The situation with the Port Authority now is possibly being hampered by the reluctance of LMDC to comply with commitment.

MR. TIMOTHY STICKELMAN: I don't think there's any reluctance to comply. And I can't speak for LMDC, but the HABS HAER photo was taken by our consultant, as John just explained. It is being submitted to New York SHPO as they requested. I believe that they contacted in June. I can't speak for New York SHPO.

MR. JOEL KLEIN: HABS HAER recordation is not just photography. And it's not a difficult thing to either talk to the people at HAER about what would be appropriate or even -- in fact, I noticed the original proposals never referenced any of the HABS HAER standards or manuals which lay out in detail exactly what would be appropriate for a HAER recording of a site of this level of importance. And we have no way of knowing how you're matching up with those standards and guidelines.

MR. JOHN HOTOPP: Their recordation was

done at HAER standards. We've been doing this for years. We're very familiar with the standards and we've complied with it.

MR. TIMOTHY STICKELMAN: Next question?

MR. JACK LYNCH: I would like a question on the issue, if you haven't complied, which you indicated you haven't complied totally with the requirements, how can you say that it will go ahead?

MR. TIMOTHY STICKELMAN: I didn't say we didn't comply.

MR. JACK LYNCH: If you haven't received the necessary approval you need from this group?

MR. TIMOTHY STICKELMAN: What I said is, we've taken the HAER photography according to their regs and rules. It's being submitted to New York SHPO as they requested, and also copies will be given to HABS. And eventually, John, you can correct me if I'm wrong, a set goes to the National Archives.

MR. JOHN HOTOPP: Yes.

MR. JACK LYNCH: My question is: Have you received an answer from them?

MR. TIMOTHY STICKELMAN: They have not

received a HABS HAER --

MR. JACK LYNCH: Then how can you say you'll go ahead if you haven't received --

MR. TIMOTHY STICKELMAN: We are not going forward with the deconstruction today, I can tell you that much.

MR. JACK LYNCH: Are you going to go ahead before you get an answer, that's my question?

MR. TIMOTHY STICKELMAN: The documents have been submitted. They will comply.

MR. JACK LYNCH: My question, are you going to go ahead, regardless of whether you get the documentation back from them, or not?

MR. TIMOTHY STICKELMAN: We will follow the rules and regs and submit it to New York SHPO and they will respond.

MR. JACK LYNCH: And then will you wait until you receive a responsible answer from them before you proceed?

MR. TIMOTHY STICKELMAN: Most likely the response will go to LMDC and we'll probably be copied on it. And at that point, they will go forward with their project.

MR. JACK LYNCH: At that point? Fine. Thank you.

MR. PETER GOELZ: Any other questions?

MR. BILL WONG: We have to clarify that the project is on its way. We may be able to get these comments back if there are comments. We don't anticipate comments. I haven't heard any discussion that there will be comments. I don't know this additional level, but in terms of the construction or the deconstruction of those slabs, there is a set schedule that we have discussed with everyone. And that project is still going to be proceeding.

MR. JACK LYNCH: That's a different response than what he gave.

MR. JOEL KLEIN: Could you discuss it with us?

MR. JACK LYNCH: I would like a definite answer from both the LMDC and the Port Authority, from both of them, that you will not go ahead until you get approval on this issue. That's my question. And if you do that, I think you violated the law.

MR. TIMOTHY STICKELMAN: What's going to

happen, the HABS HAER photography that was taken is being submitted to New York SHPO. They will comment on it. Whatever they comment, we will make sure that you get a copy of if, if that's what you're asking.

MR. JACK LYNCH: I'm asking, how can you go ahead without getting approval?

MR. TIMOTHY STICKELMAN: It's going to be submitted to New York SHPO --

MR. JACK LYNCH: I'm not asking that question. I don't care what you submit. If you don't have approval from them, how can you go ahead?

MR. TIMOTHY STICKELMAN: What I'm saying --

MR. BILL WONG: It's a comment.

MR. TIMOTHY STICKELMAN: What will happen is, New York SHPO will comment if they approve of the photographer or they do not approve of the photography.

MR. JACK LYNCH: What if they do not approve?

MR. TIMOTHY STICKELMAN: We will have to answer their questions before we do anything else.

Page 69

MR. JOEL KLEIN: The review is not so much the SHPO review as it is the review from HAER.

MR. BILL WONG: Right.

MR. PETER GOELZ: Do we have an answer?

MR. JOEL KLEIN: I'm curious, I just heard they said that everyone is aware of the plans. Is there a schedule for the demolition? Is there a date?

MR. PETER GOELZ: Peter can update.

MR. BILL WONG: Peter, if you want to -- we'll get to --

MR. PETER RINALDI: The truck work, they're installing bar-backs to stabilize the stone wall in preparation of removing slabs. They've also done some preparation on steel that supports Vesey Street. The schedule is to get those in probably and finish that work sometime around mid to late August, and then begin removal of slabs starting in probably the northwest corner and working their way east way across the site. That's approximately where the plan is.

MR. PETER GOELZ: You want to talk about the disposition?

Page 70

MR. PETER RINALDI: No, there was a question raised last time about the cross of the steel beam that's on the site and what was going to happen to it.

It happens to be located over here on Church Street. That was a piece of naturally occurring steel that was found in September of 2001, over in the site near the World Trade Center 6 area. It was erected -- just so you know, it was erected on the remnants of what was the north bridge in the beginning of October. It was blessed by Father Brian. It remained there, remain at that location until it was necessary to relocate it at the plan of reopening West Street after the demolition of remnant structure. It was then moved in February of 2002 to its present location.

Our current plans are to leave it in that location until such time as construction of the site necessitates it being moved. That's probably a year or two out; depending on how things go in terms of the construction.

We think, in looking at the entire site, there's really not an area on the site that you can relocate it to that it wouldn't have to keep needing to be relocated. We think the best course of action, and we'll discuss it, is to take that and ship it once out to JFK and hold it there, rather than move it around the site to various locations, so the construction and the risk of damaging it every time you take it and move it. So that's what we're thinking about.

Page 71

Right now the current plan is leave it in place until such time that construction has to move it. We think the best course of preserving that would be to take it, log it, keep it up with the artifacts out at Kennedy and find out how it is going to be used. That's kind of our thinking.

MR. JACK LYNCH: Are you talking about the cross?

MR. PETER RINALDI: Yes, the cross that's from the piece of the skin from the building.

MR. ANTHONY GARDNER: Do you have any further ideas for the Vesey Street staircase? Because I know a lot of us are concerned about what's going to happen with that.

Page 72

MR. PETER GOELZ: We'll get to that.

MR. PETER RINALDI: There was a question raised about what will happen with that.

MS. PATRICIA REILLY: I wanted to go back in the part of the conversation. Just listening to it. It seems to me that if you have provided those photos to the preservation groups when they asked for them previously, you wouldn't be so close to your demolition point. And if they found a piece or two that they thought was significant, it would have been no skin off your teeth to preserve it, and you wouldn't have to have this adversary back and forth.

If they asked for it in the last consulting party meeting, here we are at another one and they still haven't received it. I think if you had a timely turnaround, they may have reviewed it and thought that you made very good choices. That wouldn't have been such a big deal for you.

MR. TIMOTHY STICKELMAN: I hear you. Thank you very much.

MR. ROBERT KORNFELD: I have a general

comment on the idea of mitigation that was used for 6 World Trade Center, which was continuation of what was done during the emergency, where someone was selecting what seemed to be intriguing or significant pieces, remnants that would then be removed to somewhere else or dispositions at some point in the future.

I think that's very far away from the way you have to approach other parts of this site as far as mitigation where you're looking at a place, it has its integrity in place. The footprints are not something that you can remove and take out to Kennedy Airport and put in a memorial center in the future. I think, I see that same approach, sort of picking significant remnants, sort of continuing through this project. And I see that like having a head-on collision. Maybe this is another segue for you. I hope.

MR. BERNIE MCNEILLY: Actually, it is. This is part of what we'll be discussing today.

MR. ROBERT KORNFELD: I would have hoped that you took more of that approach with 6

World Trade of seeing some of the remnants as things that were inherent to the place where they still are, and not sort of picking something up with a crane and putting it on a truck. But I guess maybe that's a moot point by now.

But I do think that I would have preferred that that approach to start earlier in the process.

MR. PETER GOELZ: I mean, we can't focus on 6 World Trade Center this afternoon.

I want to want move, if we could, to the documentation of the footprints. I know that's a critical issue. Let's see if we can spend some real time. Lou and Peter, will you follow up?

MR. LOUIS MENNO: I wanted to follow up about your concerns about the documentation of the footprints and the column bases within the bathtub.

The Port Authority and LMDC are committed to doing that documentation of the footprints. And we will be temporarily uncovering and removing the soil and the fill that covers the footprints of both 1 and 2

World Trade Center. Expose them down to the concrete slab, the columns. But the only areas that would not be exposed as part of this would be the area of the two World Trade Center footprints in the PATH right-of-way and some of the existing stuff that Peter will talk about. But we are committed to doing that.

MR. JACK LYNCH: Lou, will that also include the interior support, the core?

MR. LOUIS MENNO: Yes.

MR. PETER RINALDI: Maybe I can show you what we've been talking about doing. We are committed with LMDC to doing the documentation. So there's a lot of material there that has been brought in over the years.

But what we plan to do, this is the area of the footprint of Tower 1 runs into approximately in this area here. The bridge lands right down into the print. But the box runs under here.

What we plan to do, we would scrape off the heavy material, take some equipment in there and sweep down and try to expose what's

there on the concrete, including the perimeter and the interior supports there. Some of that area is rough and damaged. Pieces of the slabs are crushed; that happened during the collapse and recovery. One of the reasons the fill is there, to even it out and also for drainage. So we would do that.

And Tower 2, which is over in this location here, we could clean off this here and expose what we can. As you know, most of it, almost half of it was under PATH. It would be difficult to get everything down. But we would remove that material. We plan to go through photo documentation, getting the original plans for the basement of the Trade Center and delineating any scenes to see if any of those features are there, to mark it off, off of the original construction drawing. We actually used those to know where things were when we were searching. So we would do that.

And then we plan to put the material back over it. We may even add some material in there to help with drainage protection and

leveling of that to keep it preserved.

That's the plan. We plan to do that probably sometime between now and the fall, as we're looking to get a contract together. It is a major amount of work in terms of taking all that material, sweeping, and there will be a photographer and documentation. It would be videotaped.

Nothing would be happening on the footprints. There's no plan for anything to happen on the footprints of any kind of permanent nature until construction goes forward with the station. We talked about that. The only work that is going on is the preparation for the demolition of 6. All of that is going to be north of the footprint areas. We've made sure the contractor that's doing that work, put in a staging area and a fence line north of the footprints so they'll be inside that area. He does have to drive across the footprint. We've done that all in the recovery. There's no way to access it without going over it. But their work area would be north of here. You'll see today, we have trailers. We've made sure they marked

the areas of the footprints and temporary trailers outside that area. So that's the plan in terms of going forward with the document.

MR. JACK LYNCH: I know this has nothing to do with the actual -- but both the LMDC and Port Authority, and I want to put this into the record, that they assured us they'll try to preserve 97 percent of the north tower and 50 percent of the south tower.

MR. PETER GOELZ: We'll be getting to that.

MR. PETER RINALDI: Next. It's right around those percentages.

MR. ANTHONY GARDNER: Peter, I want to thank the Port Authority and LMDC for finally making this commitment to clean off the few inches of dirt that obstruct these remains to properly photograph and document them.

We've really felt that was important for some time now, at least nine months or so.

Can I ask that you provide, once the footprints are cleaned off, once the footprints are cleaned off for this documentation, could you provide a tour for

the Consulting Parties so they can see the footprints in an uncovered state? Frankly, I think we're the only ones that have been on the footprints when they've been cleaned off, so you can get a sense of what you're really standing in. That you're standing in a total historic footprint; not just the columns that define the footprints, but the space and everything that they defined wholistically. That's what I would ask.

While you already have them cleaned off, if you could just squeeze in a tour for the Consulting Parties so they can experience that.

MR. PETER RINALDI: We'll consider it.

MR. TIMOTHY STICKELMAN: That's something that we'll consider. It's a timing issue and may be on short notice, but we'll definitely --

MR. ANTHONY GARDNER: That's why I'm putting the request in now.

MR. PETER GOELZ: Any other questions on this? Because we have a few more, particularly the percentage issue I want to get to because I know that's important.

Any other questions on this? The request is in.

MR. KEN LUSTBADER: On the documentation issue, you're showing it in an aerial photograph. We just suggest some kind of photograph that captures the actual outlines.

MR. PETER RINALDI: We can. That's actually, that picture was probably taken from the Financial Center. It looked about a time of May 30th after the last beam ceremony.

We plan on trying to get an aerial.

MR. JOEL KLEIN: You may want to consider the possibility of figuring out what scale would be most appropriate for the photography. You may wind up with a better photograph utilizing a camera on a crane or balloon camera that's tethered at the site.

MR. PETER RINALDI: I'm not the expert on the photography. These were high aerials here that have been flown just recently. This is not --

MR. JOEL KLEIN: Understand, aerials work well, but the problem from surrounding buildings is it's going to be oblique. While

obliques are helpful in some regard, you want a true vertical photo or a crane photo. It might work. So I'm recommending that you might want to consider those.

MR. LOUIS MENNO: The next area we want to talk was the area within the bathtub, specifically the PATH infrastructure and the impacts on the footprints of both 1 and 2 World Trade Center as well as the interior columns. And that's important. And we wanted to take you through that and go a little more detail about it.

As we mentioned the last time, that the PATH right-of-way and the new tracks, the new permanent tracks, will be virtually in the same location, and the same configuration as they were before September 11. So the track configuration will remain the same as it was before 9/11. Five tracks. No more than five tracks.

The original station had three platforms. The new will have four platforms, some cars in length and three of the platforms will be in the same location, the same configuration as they once were before.

And with the addition of this fourth platform that we're talking about, we'll talk in more detail.

What we mentioned before at prior meetings was that before September 11, in 1 World Trade Center, the PATH right-of-way did not touch any of the footprint or the columns of 1 World Trade Center. And in the pre-9/11 condition, the PATH right-of-way here occupied approximately half of the footprint of 2 World Trade Center. And with the addition of the fourth platform, that has an impact on the north tower footprint, as well as some of the other columns here. And we will be impacting approximately 3 percent of the footprint area. While in 2 World Trade Center, we occupied four percent before, we will now encroach by another two percent. So approximately 50 percent of the area within 2 World Trade Center will be impacted by the new PATH infrastructure that will be built as part of the transportation hub.

MR. PETER GOELZ: Why don't we talk about the need for the platform? I think they're all interconnected.

MR. PETER RINALDI: Did we touch on the --

MS. PATRICIA REILLY: Can I ask a question? Where the potential impact, you have a dotted line under potential affect on the south tower --

MR. LOUIS MENNO: This is where we were talking, if you remember at the last meeting, we indicated that to maintain the level of service during construction of the PATH facilities, that either one or two of the existing tracks would have to be taken out of service for construction. And what we said was that we would put in an additional track in this general area here on a temporary basis. That would be used to provide adequate service publicly, as we take either one or two tracks out of service. We need this other track during construction.

However, that track will be removed upon completion of the transportation project so that we will go back to this configuration that we have here. So that temporary track here has potential interim short-term impacts on the footprint area as well as some of the

columns.

MR. JACK LYNCH: And also in the north tower?

MR. LOUIS MENNO: Yes, right in here. Right in this area.

MR. PETER GOELZ: But the permanent impact was approximately two percent additional in the south tower and a little more than three percent in the north tower.

MS. PATRICIA REILLY: Can I just say something? My only concern is that I remember being in a meeting probably two years ago with the Port Authority when they were talking about the temporary station. And they told us, "It's temporary. It's not permanent. We're going to do everything we can not to put it in the bathtub area, but we need to put it in a temporary structure to get the PATH back up and running."

And I knew sitting there that there's no such thing as a temporary structure. You were never going to come back and all of a sudden demolish it and rebuild it, which you're not. So I'm a little concerned when you say you're going to put a track and then

remove it.
MR. LOUIS MENNO: What we have there is a temporary station. It has not been designed for the long haul. It's not climate controlled by any stretch of the imagination. So that will be gone over the next several years as we build this transportation terminal.
MR. PETER GOELZ: Your concern is: Is the temporary track really going to be temporary?
MR. LOUIS MENNO: Yes. We made that commitment last time. And we will say it again, that is just a temporary track that will be put in during construction to maintain the level of service. The Port Authority has publicly said that we will maintain an adequate level of service for PATH. But once the construction is finished, that track will be removed and we will go back to the original configuration of only five tracks.
MR. PETER GOELZ: Guaranteed?
MR. LOUIS MENNO: Guaranteed.
MR. PETER RINALDI: Originally, back in

January, we thought that track might have to be permanent because of work on the wall. We made that determination that it be temporary.
When you say temporary, it will be made on what's there. The electrical work. It will all be taken off and removed. It also, if you see, it actually goes through, the temporary track goes through the basin through the area that's being proposed. It needs to come out. We don't have a problem.
MR. BRUCE DESELL: My question is why is it that when they opened the station, they named the station Memorial Station?
MR. LOUIS MENNO: I believe we have answered that question. And the question that was asked was about the name of the naming of the temporary station.
MR. ANTHONY GARDNER: World Trade Center Memorial.
MS. ANTHOULA KATSIMATIDES: I think at the time the answer that was given was because it wasn't the memorial. The memorial was what we were calling (inaudible) at the time.

MR. BRUCE DESELL: Well, they named it the World Trade Center and the World Trade Center doesn't exist anymore either.
MS. ANTHOULA KATSIMATIDES: That was a symbolic thing. People know where it was.
MR. BILL WONG: People know where it was.
UNIDENTIFIED SPEAKER: And it's just location.
MS. PATRICIA REILLY: But all of our conversations with the Port Authority early on, when we first had discussions about the reintroduction of the PATH train, was that, you know, we conceded to that without much of a fuss, not that a fuss has done us any good anyway, but we conceded to it and we were silent on it. And we said to the people who were present in that room, you probably remember their names, we have no problem, all ask is that you name it World Trade Center Memorial Station so people understand -- especially when you -- forget about the temporary station, but when you create the new station, something, you know, the naming of that station should reflect the fact that

it's not the World Trade Center. The World Trade Center along with the 3,000 people that died there, that it's Trade Center Memorial Station or something that reflects the fact that this is a place of --
MR. JACK LYNCH: Actually, it was at LMDC meeting, an early one, where we suggested that they call it the World Trade Center Memorial Station, and that within the station somehow reflect memorial artifacts what happened in 9/11. Everybody at the meeting agreed to it.
MR. ANTHONY GARDNER: But also, too, the LMDC deferred to the Port Authority in terms of this. Now you're asking Anthoula, but they told us that it was a Port Authority issue and we conceded to the original configuration. We never conceded to additions. And what we really feel is that especially considering that the south tower, half of it is covered with these tracks, specifically transversed the south tower, it would be very easy for the Port Authority and FTA to incorporate that somehow into the experience. And that was what we really

asked that you consider. And also with the name, the name is something very easy to do. People are not going to think the train station is the memorial. They're going to know that they're coming to a site --

MR. TIMOTHY STICKELMAN: I think we've heard you before. I wasn't at the other meetings, but I know that's a very sensitive subject with a lot of individuals. And the Port Authority is going to consider it and we'll talk to the FTA about it.

MS. ANTHOULA KATSIMATIDES: I don't think it's the time for that.

MR. TIMOTHY STICKELMAN: One of the issues, I know that Lou or Mark may be speaking on it, regarding the experience.

MR. BERNIE MCNEILLY: I am Bernie McNeilly. Some people were asking at the last meeting what was some of the justification of a platform D, which is the furthest of the most west platform.

What I want to do I is briefly describe from an operational prospective is what that need is. I believe Lou touched upon it as far as the operations are concerned. But I

want to talk in the context about what occurred in pre-9/11 and then talk about what's going on in the temporary station. And then talk about the future. And that should set the context for you to understand what's being done and why.

Pre-911, whether you folks realize it or not, although for a number of years there was a fairly constant level of ridership to World Trade Center, over the last several years, just prior to 9/11 there was an experiential growth. And largely it was due because of the increased service to say midtown direct to Penn Station. Penn Station was more crowded. There were more and more people that were trying to ultimately get to downtown lower Manhattan that were using PATH.

So by the time September 11 occurred, there was approximately about 67,000 passengers using the World Trade Center terminal on a daily basis.

From a peak period perspective, which is the peak period is generally the a.m. rush hour or the p.m. rush hour. The a.m. rush

hour, the service was in the 20-some odd thousand riders per hour.

When we're looking forward, we're going to be experiencing about 30,000 passengers in that peak period, morning or evening. So there's going to be a significant increase in the passenger ridership.

I just want to jump back to where we are in the temporary station. Although the configuration was set up with three platforms, which were ten-car platforms, one platform was actually a limited-service platform, which was the platform closest to the 1 and 9 lines. The reason was because of its width. It was not as wide of a platform as the other platforms which were full-width, ten-car platforms.

So, basically, PATH, from an operations perspective, had used platform A to alight and deboard passengers on an emergency basis. It's also where they stored a lot of their trains; particularly in the overnight, non-peak periods. What does that mean pre-9/11? It meant that these two platforms were the primary platforms that had service

coming from both Newark to World Trade Center and from Hoboken to World Trade Center. Keep in mind, PATH used to be two separate systems, and then it became one system. So we had two lines coming into the same point. And there were often cases, pre-9/11, where there were two trains that would be deboarding at the same time but different tracks because one would be Newark train and one would be a Hoboken train.

What happened? A lot of these trains, when they're near capacity, as you recall, we were having 20,000 some-odd passengers on a daily basis. For those have you who traveled down to World Trade Center, it was fairly tight. Roughly speaking, as tight as a car can get, you can cram in without breathing, about 130 people in a car. But generally speaking, it's pretty uncomfortable to stand there as a straphanger when you're in excess of 100 or 110 people. But what that meant, when a car train came in, there were about a thousand people that were coming in and deboarding. And it generally takes about two minutes to clear a platform. But what was

Page 93

happening was because of all the increased ridership pre-9/11, that we were having situations where because of the increased ridership going in the opposite direction, because of reversed commuters going to Jersey City, a lot of the businesses were going to the Jersey City waterfront. We had a lot of passengers coming into the system and were going in the opposite direction. So they were trying to get down stairways or these thousand people that were trying to get up escalators.

Literally speaking, from a vertical circulation perspective, just having one person going down a stairway effectively will block 30 some-odd people that are going up that stairway. What that meant, you were developing, a cue or there were people waiting just physically waiting in a herd. I don't know if any of you remember that, because I used to do it all the time, that you were standing in a cue or a herd to get up the stairs.

The problem is when you were having -- when it was taking some time because people

Page 94

were coming down to get onto a train and you were trying to go up, that cue, there might have been upwards of a couple of hundred people that had not yet gotten off the platform, and yet you had another train coming in with another thousand people. And then what was happening in the peak period of time, is that it was kind of a domino effect. And what it meant was that -- PATH didn't have the ability to get as much trains coming through the track system as it could have possibly done.

Generally speaking, PATH can run about 30 trains through the World Trade Center in any particular peak hour. What's limiting the 30 trains is the fact that we've got the existing infrastructure under the river. We just physically can't get any more trains through from optimizing our rail perspective of getting people in and out of the service. So that was kind of what was happening pre-9/11. We were pretty much near capacity at the existing system as is.

Where we are now, is that although we have restored these platforms, we've restored

Page 95

them to have only eight-car capability where they once had ten-car capability. What it means in a ridership day, we can only handle about 50,000 riders.

Now, I know a lot of people have been asking the question, have we over designed our ridership? We're projecting by the time a few years out, that we'll have 50,000 riders. We had programed to have about 30,000 riders at this point in time. I think we took the ridership numbers in May. We were ramping up from zero to 50. And it should have been around 30,000. We're at 36,000. What that means, is that we are already exceeding our ridership projections. And so it also is kind of a testament that our projections are on the mark of what we think we need.

Having said that, moving forward, when all the infrastructure buildup happens in lower Manhattan, we're expecting 80,000 riders. So we're going from 50, pre-9/11 of the 67, we going to 80. The only way that we can safely get people to alight and board on a platform is by having an additional

Page 96

platform.

Now, Lou had mentioned that the Track 5 is temporary track. What that will allow us to do is have flexibility so that if we're working on another platform, that we can still maintain a level of service. And we'll be able to take that track out when all of the work is done. But this platform will also allow us, in the future condition, to have people get off the train on this platform, while people are getting on the train from the other platforms. It is a much safer situation and will allow us to make sure we're maintaining our 30 cars per hour so we can be able to achieve and meet the ridership projections that we're expecting, which is in excess of 80,000 come the design year.

And that is pretty much a generalization of some things we needed to contemplate as far as why we needed that additional five track.

Is that clear or does anybody have any questions?

MR. JOEL KLEIN: Yes, couple of things.

At the last Consulting Parties meeting, I asked about the basis for the ridership projection, which is ultimately the basis for the need for the fourth platform. And you referred me back to the EIS, Chapter 8 and the appendix there. Quite frankly, I don't see it there.

MR. BERNIE MCNEILLY: It wasn't there. I'll admit, because I was one of the people in the back room saying it was in the appendix. It's not in the appendix. What it's in, the DEIS has got the ridership numbers and it's in Chapter 8 in summary format, which is in a small table where we talk about what the peak period is and what the both a.m. and p.m. of what the ridership numbers are. But we did not include the actual projections as part of the appendix.

MR. JOEL KLEIN: That's what we would like to see, along with the report that went with the methodology so that an independent evaluation can be made of that because quite frankly, the fourth platform is a concern. And we recognize if you take the projections and assume the projections are correct, and

logically they're for maximized level of service, you would like that fourth platform.

So we want to make sure that in fact you're correct in your assumptions. We would prefer that fourth platform not be there, quite frankly to avoid impinging any more than necessary --

MR. BERNIE MCNEILLY: It's actually not as simple as saying we would like the platform; we need the platform. And let me explain why.

I was talking about the domino effect about couple of hundred people trying to get up the stairways and escalators. As that occurs and trains coming through, and you have reverse commuters trying to get on a train and rushing to get down, what happens a lot of times, and it's a human issue, people hold the train door. Kevin Lejda just goes nuts over that. He used to hate when people are holding train doors. And the reason is, he has a great difficulty to try to maintain the train timings. But what happens is, people hold that door, they'll hold it for

their buddy and for the next one. Somebody will scream down, hold the door. What ends up occurring is that anywhere from 20 seconds to a minute to a minute and-a-half that you're delaying. What's happening in a peak period where you're trying to cram through 30 trains per hour to meet the service, you have great difficulty in meeting that service. What he ends up having to do is to rush through in a period of time where you're going to have two vehicles on the same platform at the same time. It's a changed condition because that takes an issue of it just being a nice to have because it will improve level of service to creating a safety condition. Because then we can no longer safely get people off the platforms and into an area of safe refuge. From a domino perspective, it will create a situation that you don't really want to go and try to create a safety situation. You want to make sure that you're optimizing it to the best you can.

MR. PETER GOELZ: Your question, you want to see the data?

MR. JOEL KLEIN: We want to see the data on the ridership. And that then relates to the question: Did the Port Authority have any plans to address the problem before 9/11? Were there any solutions in terms of maybe additional egress and digress platforms to the platforms, some other solution other than an additional platform?

MR. BERNIE MCNEILLY: PATH actually would want five platforms. One of the reasons was that when you were looking at the old H&M terminal, way back when, there were five platforms. There was actually a preference to have five because it maximized operational flexibility.

One of the things we identified in our DEIS is that as a compromise and to make sure we're handling operational issues to the best we can, we try to determine a hybrid solution which was the existing three platform situation, which was the pre-9/11 World Trade Center system, to what is actually the desirable situation which was to have five platforms, hence the reason why the four platforms came in. It is not the desired

Page 101

function that the PATH would want. And actually we're already in a compromised situation.

MR. PETER GOELZ: But your question was, pre-9/11, were there some other solutions on the drawing board on how to relieve this problem that did not involve a fourth?

MR. JOEL KLEIN: Yes and that kind of relates to the next point I want to make. Probably most important thing I'll say here today.

The Families/Coalition really feels there is a need for you to look at a three-platform configuration as an alternative, and do a side-by-side comparison so people can really see exactly what the differences are. We think it's something that you're really obligated to do to satisfy your 4-F obligations. We think it is a prudent -- is a feasible alternative; whether it's a maximum solution. Probably less desirable in terms of the level of service than the four platform solution, but it is a doable construction. And that's why that side-by-side comparison is really necessary.

Page 102

As it stands right now, that is not one of the alternatives that's addressed either in EIS or the 4-F statement.

MR. BERNIE MCNEILLY: I respect your position. But that's why I spent time to talk about what the pre-9/11 condition was, because the pre-9/11 condition with the 67,000 passengers in a day was already in a situation where we were having operational difficulties to run things. We're adding in 25 percent ridership on top of that. So you're suggesting that from an operations perspective, that we're going to take what was a less ideal or problematic situation that existed pre-9/11 and you're going to make it worse. I want you to be aware of that.

MR. JOEL KLEIN: Well, I guess just take that and try to incorporate within that some of the possible solutions you had on the boards pre-9/11 to relieve the situation.

MR. ROBERT KORNFELD: I would assume that if the towers were still there, you wouldn't propose this? Is that right? If

Page 103

the towers were there, would you propose this solution?

MS. ANTHOULA KATSIMATIDES: I don't think there would be such an increased ridership. Don't forget, the increased ridership will come from all the new developments that are going to happen.

MR. ROBERT KORNFELD: It seems to me that you have a lot less office space and a lot of the buildings that are being renovated and new buildings going up were residential.

MS. ANTHOULA KATSIMATIDES: Americas Memorial.

MR. JOEL KLEIN: I don't know the answer to this.

MS. ANTHOULA KATSIMATIDES: I don't understand why you would contemplate jeopardizing thousands of peoples' lives.

MR. JOEL KLEIN: That's not the issue. Do you know what the estimated visitation is?

MS. ANTHOULA KATSIMATIDES: I have no idea.

MR. JOEL KLEIN: Do you know what the visitation was to the old World Trade

Page 104

Center?

MR. BERNIE MCNEILLY: With all due respect, let's get back on point.

MR. PETER GOELZ: People are asking reasonable questions.

MR. ROBERT KORNFELD: This is a line of reasoning that's relevant. Don't cut it off with what's already been dealt with. That issue has been addressed.

MS. ANTHOULA KATSIMATIDES: Which issue?

MR. ROBERT KORNFELD: The basis for projected ridership. That is a bit of information that's going to be provided. We heard the numbers.

I'm saying if the towers were standing, you would not be proposing this solution. So my reasoning is -- excuse me. My reasoning is that you are making a value judgment that now that the towers are gone, that this is the approach you're going to take because you don't think that the memorial or that the historic site has the significance that merits staying off.

In other words, if you're not proposing

going back on the other side of the slurry wall because it would be very expensive. And technically extremely difficult. So you're respecting that as a value that you wouldn't do. But going on to the historic site, you're assigning a lower value. It's cultural factors versus money versus other things. And you're looking the it from one side.

MR. BERNIE MCNEILLY: Actually, I appreciate your opinion, but I can tell you on behalf of Port Authority, we're not looking at it one side. We very much appreciate what your position is, and that's one of the reasons why we've been going through these meetings. We know how important this issue is. One of the reasons we wanted to get up here and explain it is because we're trying very hard to determine how we can minimize the impacts because we do realize how important a resource that is.

We would not been here today unless we were trying to minimize harm for that resource.

MR. ROBERT KORNFELD: So my original question, if the towers were standing, how

would you propose solving this?

MR. PETER GOELZ: Reasonable question.

MR. JACK LYNCH: Most transit authorities have a five-year protection forward planning. And prior to 9/11, I'm sure that existed within the Port Authority. So you had already addressed this problem how you were going to relieve the additional ridership that was coming in. You had plans on the board I'm sure?

MR. BERNIE MCNEILLY: Yes. I can explain. And Mr. Kornfeld, I think it might partially explain your concern.

MR. JACK LYNCH: That's okay. I'll continue my question. So I know that you already have plans. You had them prior to 9/11 how you were going to relieve that question.

Have you addressed those plans to see if they can be incorporated into the situation?

MR. BERNIE MCNEILLY: What was going on pre-9/11, as some of you may well know, the Newark to World Trade Center is the heavier used line relative to the Hoboken and World Trade Line line. And we were running

eight-cars. The plan was to go to a ten-car.

As I mentioned, the World Trade Center was already built pre-9/11 with the three platforms for ten-car platforms. So it would not need any extensive retrofit. The plan that was in place that was understudied and was emerging to be part of the capital plan, but the planning records were on the book at the time was throughout the entire Newark to World Trade Center line was to convert all the stations to ten-car stations. You can not run ten-car service unless you have ten-car platforms throughout the line.

I'll get to you in a minute. Basically speaking, for those of you don't know, Newark to Penn Station was a ten-car platform. Harrison, eight cars. Journal Square had ten cars with modifications. There had to be some adjustments. Grove, eight car. Exchange Place, eight car.

So the plan, which to do with minor retrofits for the World Trade Center, but it was to modify the entire line on other stations so you can provide that ten-car

service. And we would be able to get that increased ridership to go from eight-car to ten-car.

MR. ROBERT KORNFELD: Is that an alternative?

MR. BERNIE MCNEILLY: That plan is feasible today. What is going on and continued to be planned is to have ten-car service from Newark to World Trade Center, and this plan is consistent with that.

MS. PATRICIA REILLY: So you got something additional, because before you would only have three tracks, ten cars. But now you have to retrofit everybody to ten cars, four tracks?

MR. BERNIE MCNEILLY: Right. We would have solved the physical issue of being able to physical land ten cars in these other stations, but we would not have necessarily addressed, unless we did other means, which were just in the planning stages of what we can do with vertical circulation and whatnot. It didn't progress any further than planning stages. But that was some of the things that would have been -- when I say

Page 109

minor retrofits, we would have done vertical circulation work. And we just didn't get there. September 11th occurred and the plans got washed out. We had to restard.

MR. PETER GOELZ: Betsy, do you have a question?

MS. ELIZABETH MERRITT: Yes. It looks like to me in your plan, you're not extending the partial platform that's farthest to the east. I'm asking why you wouldn't extend it?

MR. BERNIE MCNEILLY: Actually it is the same length. Just because of how narrow the platform is, you may not be able to tell from here, and because I spend painfully long days with these plans, this platform A, as far as some of the modifications were occurring, was shifted to the north. And the reason was, because we had a larger width on the northern side of the platform, and we had better utility of the existing platform A. Platform A, there was not any continual width from the north end to the south end. And we were trying to optimize the south end. But what we're showing which you can't see on this

Page 110

plan, these ten-car trains that you can get ten cars. We just shifted it up. That's the modification to platform A.

MR. KEN LUSTBADER: Question: In the FOE, it describes that there may be some infrastructure components put into the footprints of the two towers. Can you go into a little further detail on that at this point or is it still preliminary?

MR. PETER RINALDI: We can talk about it.

MR. KEN LUSTBADER: Not treatments. Utilities and other things.

MR. BERNIE MCNEILLY: Do you want me to handle it?

MR. PETER GOELZ: Let's have a couple more.

MR. ANTHONY GARDNER: I have a question on this because in the draft EIS, one of the alternatives, the most feasible alternative was creating the PATH terminal under Church Street. And I believe that it literally just says that that plan is not being pursued because the economics involved with it; it would cost too much. And don't you think in

Page 111

retrospect, with knowing now the historic resources that exist there, those footprints, wouldn't it have be easier to just build a temporary station under Church Street and then you could have had ten platforms to your heart's content. And now you're faced with this issue that with each platform, and whether you can justify it or not with your ridership estimates, you're encroaching further and further into a very priceless historic resource. It's just the point of, it's really unfortunate that that Church Street alternative, which was in the draft EIS says it's the most feasible, it's unfortunate that you didn't pursue looking into it. A lot of us had this concern that it's really the economics here and the expediency concerns that are driving this whole issue. And the historic resources and the power of what the site is, always takes the back burner.

MR. BERNIE MCNEILLY: I understand your point. I actually think you're interpreting what was in the DEIS about it being the most feasible.

Page 112

If I remember correctly, there was merit to Church Street and merit to the overbuild. What we chose to do was to create -- we tried to take the best of both worlds. What's some advantages of the Church Street alternative and what advantages were here. And that's what we called the hybrid alternative. And then we tried to optimize it from that perspective.

MR. ANTHONY GARDNER: But the prime advantage of having it on Church Street would be you wouldn't be encroaching on the footprints at all.

MR. BERNIE MCNEILLY: Again, keep in mind that what we're talking about is the historic resources, which is the site. Although you may be addressing -- we're trying to not say one particular resource is more important than the other. Because the fact is, if you tried to avoid this resource, you would then be coming back and telling us that we're destroying Vesey and E train, and then we'd have a different issue.

The fact is because of the site, we will be touching elements of the historic resource

Page 113

one way or the other. You have to recognize that. That's part of what the issue is as far as impacts to the overall site.

MS. PATRICIA REILLY: You know what, I'll say something, and take it anyway you want. From my standpoint, the destruction of Vesey and E train, is that what you said, and we would come back to you and say those are historic sites. I don't think too many people died there. These are the two areas where the majority of people worked. So if you were going to give anything weight of value, they have much more value than Vesey Street would have to anybody. I don't think we would come back and argue with that that ferociously.

Can I ask a question? You have 30 trains that can come through underneath the Hudson?

MR. BERNIE MCNEILLY: In a peak hour.

MS. PATRICIA REILLY: You can never have more than that?

MR. BERNIE MCNEILLY: We can never have more than that.

MS. PATRICIA REILLY: Unless you go

Page 114

underground and build more.

MR. BERNIE MCNEILLY: That was one of the constraints, the planning constraints, that we had with the project is that we were not rebuilding or creating new tubes so we can have additional trackage. That was a planning constraint.

MS. PATRICIA REILLY: That's a planning constraint? Let me ask you this --

MR. BERNIE MCNEILLY: Well, just order of magnitude. That, one, it's defining a different project. Just look at what's going on with Amtrak with their third tunnel. That's billions of dollars just for the tunnel.

MS. PATRICIA REILLY: If after ten years or five years, you notice that ridership is more than you anticipated, are you going to come back and further on those footprints?

MR. BERNIE MCNEILLY: No.

MS. PATRICIA REILLY: How do we know that?

MR. BERNIE MCNEILLY: Part of what we're doing here is that -- the ultimate goal of this entire process is get a memorandum for

Page 115

agreement. That memorandum to the agreement is the agreement. That's what you're going to get.

MR. ANTHONY GARDNER: You'd also have to go through another Section 106 process. I don't think you'd want to go through this again.

MR. BILL WONG: We're trying to get a memorial in place.

MR. TIMOTHY STICKELMAN: I need to give the court reporter a five-minute break.

(Off the record.)

MR. PETER GOELZ: I'd like to try to wrap this up in about 15 or 20 minutes because we are scheduling probably at last one, hopefully two more, sessions in August. We could talk about that at the conclusion; see what people's schedules are. Kevin is going to speak a little bit about the operations on the transit. We'll take a couple more questions on this and then we'll move on to other issues.

MR. KEVIN LEJDA: My name is Kevin Lejda, I'm the assistant superintendent for the transportation division of PATH, train

Page 116

operation, revenue collection and station services.

When Mark had mentioned to me that this topic would come up today and not having to be able to address with you in the past, I thought that this might be an only opportunity to talk about this and how important it is for PATH. And maybe I can talk about the issue in the way that it will help to understand where we are coming from as far as the train operations go.

I heard a couple of questions. Maybe I can help to answer them. One of the questions was prior to 9/11, did we have plans to help ourselves increase the World Trade Center handling the passengers. Before 9/11, with 265,000 passengers on the PATH train, we had almost zero opportunity to improve service for the reason running trains more frequently, as opposed to World Trade Center 30 trains per hour, the signal system, the limitations on that would not allow us to do that. The only opportunity through a new car program we have moving forward, would be to lengthen the trains to ten cars from

eight.

That being the case, however, and the 30 trains per hour using the one platform, coupled with our biggest growing ridership base was from New York to New Jersey at that time during peak hours to Jersey City particularly along Exchange Place waterfront, bringing people in at a faster rate, we're trying to take them out at a faster rate was also problematic. Lengthening the trains, being able to bring more people in and trying to get them off the platform.

I heard a question come up with the ways we're trying to address the egress from the platforms. If you had ridden PATH for some time before 9/11 over by Akbars, retail deli, there was another stairway and escalators put in from this platform to accommodate that, I can tell you that after that, the options were over for the current platform. Get no people on and off.

New signal system moving forward about the time the permanent station may be done, coming out of line. That may increase our chances to move trains quicker through the

tunnels from Jersey and back to New Jersey at a little faster rate than 30. If we can get it, that's our goal. Because as I said before, with the prospect of moving maybe 80 thousand people a day, primarily reversed commuters and heavy heaviest line, ten-car trains, the ability to off-load passengers to one platform, load them on the other potentially off loading half of those trains that came in that side, that's going to be a big help to us.

So I just wanted to talk about it in a way that maybe it made sense and this is something that's really vital to us to try to talk about it.

MR. PETER GOELZ: Just a couple more questions on this subject.

MR. ROBERT KORNFELD: Is there a potential with a platform there to configure it differently so it doesn't, by adding the stairs or adding additional vertical circulation, to sort of cut that corner out of it?

MR. KEVIN LEJDA: I couldn't address that.

MR. BERNIE MCNEILLY: On platform B?

MR. ROBERT KORNFELD: If it went further to the north and had additional circulation coming in.

MR. MARK PAGLIETTINI: Right up here, above this line here, I think you can see it right here. This is the east to west connector that's above at the 264 level. Come from the platform up to --

MR. ROBERT KORNFELD: You mean proposed connection?

MR. MARK PAGLIETTINI: Right.

MR. ROBERT KORNFELD: Not something that exists now.

MR. MARK PAGLIETTINI: Not something that exists now, but is part of the overall program that's part of the transportation hub. And that allows -- Lou went through the significance of the east/west connector. And right at this area right here is that if that stair moved any further north, you would be right in that corridor. So you would be landing inside the corridor.

MR. ROBERT KORNFELD: That's Fulton Street.

MR. MARK PAGLIETTINI: Right.

MR. PETER GOELZ: But I think the question, are there other solutions in terms of either minimizing the encroachment, and have you exercised all of the engineering creativity that you can to minimize the encroachment because of the importance of those footprints? I think that's the issue.

I don't want an answer now, but that's the question, isn't it?

MR. ROBERT KORNFELD: I just want to add one thing to the end of that, that one of the things that's notable about 1 World Trade Center is the completeness of it; that there's no existing track crossing it or anything. All the columns are there. And it's complete. And it seems that if you can make some --

MR. MARK PAGLIETTINI: Maybe -- let's talk a little more about it. If I can, where I think you're going, your question. Maybe there's a way that we can do this in a meaningful and symbolic way.

I've heard you guys last meeting I was at. About trying to bring as much of the

historical into the station.

Well, what if somebody who was using this platform knew that they were on the footprint? What if it was -- please don't hold me -- we're all here work-in-session.

What if these were either outlined or -- I don't want to be an architect, because I'm an engineer, but if these are somehow, it symbolized or it's shown inside the platform with a different color. Different finish. Something. And it could also be done down here? I mean --

MR. JACK LYNCH: I like that idea.

MR. MARK PAGLIETTINI: That's the kind of stuff that we're hoping to get from you guys here today.

MR. ROBERT KORNFELD: I was picturing more reconfiguring the platform. But this is a direction that's good.

MR. MARK PAGLIETTINI: Right. The reconfiguring causes a lot of the issues at this time. But we feel very strongly about this. It's not like we came out and took it -- we're trying to look at the 3 percent. We're trying to think of what else we can

do. But what if we made this part of the experience?

MS. ELIZABETH MERRITT: I'd like to just throw in one more sub-question as part of this exploration for the future, which is: Could platform D be narrower because you're only going to be unloading a train on one side of it? Do you need the full width? Just as a way of minimizing the encroachment.

MR. JOEL KLEIN: A will be a functional platform, or will be. And it's narrower.

MR. MARK PAGLIETTINI: Yes, A is narrower. But yes, we could -- part of what you're asking about creative engineering, there are ways that we could try to look at possibly looking at something.

MR. PETER GOELZ: Could we spend a little more time on this next time?

MR. MARK PAGLIETTINI: We could.

MR. JOEL KLEIN: On that one issue. Wouldn't have to be narrower for the whole length of the platform. Just for that length.

MR. PETER GOELZ: Go ahead.

MS. ANDREA FERSTER: Would it be

possible to have it circulated, some more documentation that gives us some information about the pre-9/11 options, for example, that were on the table for dealing with your level of service and safety issues that you had already identified? Or other available information that go into a little more detail about some of the reconfiguration options?

MR. TIMOTHY STICKELMAN: Unfortunately, and if I'm correct, most documents we have were destroyed on September 11. And I don't know if you are aware. I don't know what documentation we have.

MR. KEVIN LEJDA: Maybe I can clear up the first point. There is no documentation about improving service here prior to 9/11 other than a new signal system going forward now, because we couldn't move the trains fast enough with the current system. The technology was just not there.

MR. PETER GOELZ: And you put in the last stairwell.

MR. KEVIN LEJDA: Last stairwell we could on five track by the Akbar.

MR. PETER GOELZ: So that was it.

MS. ANDREA FERSTER: I don't think you understand my question. Obviously you're going through some thought process in a summary format about why you feel like that the options that the other options for avoiding this fourth platform are not prudent. I mean, in your 4-F determination, you reached a conclusion that there are other options, reconfiguration options, out there, but you didn't feel they were prudent because they would involve cost or other disruptive factors.

My question is, that's a conclusive sentence, and what's the underlying thought process? There is some document that you have prepared, that you're relying on that to set out the reason why you feel that those configurations, alternative configurations or alternative options for dealing with your level of service problem, wouldn't work for you. And if you can share that. All we have right now is a conclusion as opposed to an explanation.

MR. TIMOTHY STICKELMAN: I guess, we

hear what you're saying and we'll consider it and we'll get back to you before the next meeting.

MR. MARK PAGLIETTINI: If I could just jump into other topics. Peter will touch on the next topic.

One of the things that you had asked at the last meeting is would there be any major PATH infrastructure inside the footprint. We're saying, there will be no major PATH infrastructure inside the footprint outside the PATH right-of-way. So your 3 percent and your 50 percent, we'll do whatever we can, it's a commitment we're making, to not put anything in here outside the PATH infrastructure.

And there's another topic you want me to jump on in terms of the footprints? You had also asked us, I want to share this with you because we do take this seriously about this infrastructure and preserving the perimeter of the footprints. We don't take it lightly at all, in that over here, you know, the concern with the Fulton Street area, as you described it, is the area where we have the

east/west connector. One of the things we're working with, the SOM and Silverstein Properties and we're working within ourselves with the Port Authority to not impact any other of these tower perimeter columns. So we're working with them. And what we've told them and working on as saying that the face of the structure, of the new structure, should be let's say five feet from the center line of the tower perimeter so there's no impact. That's how we're doing that up here.

MR. PETER RINALDI: Let's clarify that. The structure would be that's where the columns may have to come down and you may have to put some footings this way or something. But the base of the structure would be up here now.

Again, there's going to be a lot more infrastructure that's going to be built in here for memorial and support. And maybe it can also miss it.

MR. JACK LYNCH: Are we maximizing the height in all levels?

MR. PETER RINALDI: Yes -- the height?

That height is being done as part of the design of the memorial. I just wanted to clarify on the utilities going through there that we had talked about, that we didn't want -- what we talked about in the statement in the document that we handed out, said there would be infrastructure in the footprints. That will be in the area that's occupied by PATH now. We don't intend to put any additional infrastructure there, except that there may be a need, the electrical and refrigeration plant, for a utility line to cross across the footprint at some point in the volume of space. That's why we were putting that in there. We wanted to be upfront. Might be a need for that to happen.

MR. ANTHONY GARDNER: The central chiller plant, isn't that the location of the memorial center? L shape?

MR. PETER RINALDI: Below it.

MR. ANTHONY GARDNER: In the discussion about the platform, you mention that possibly there might be a way to visually alert people to the fact that they're within the

footprints. You could also maybe do that with the east/west corridor. They could be aware that they're passing the footprints of the Twin Towers.

MR. MARK PAGLIETTINI: Along the wall.

MR. LOUIS MENNO: That's part of the ideas that we've thrown out to our consulting team about doing something along this corridor here, do we show a remnant structure? Bring it back from JFK, put it there? Or do we put in like a mock up or something or photographs just something so you know what was there.

MR. ANTHONY GARDNER: Put a window in. Make your lives easier.

MR. LOUIS MENNO: That's all coordinated.

MR. ANTHONY GARDNER: One more question. Within the footprints it says memorial WBS-630, what does that mean?

MS. CARLA BONACCI: That's a breakdown structure how we track cloths.

MR. MARK PAGLIETTINI: We try to utilize the drawings. Can we move on?

MR. PETER GOELZ: Let's move on. 6:00

p.m., I promise. Let's try to end this at 6:00.

MR. ANTHONY GARDNER: Can I ask a question about draft DEIS comments that are due. Can you extend that deadline for the Consulting Parties since there's a lot of information that we wanted that we aren't going to be able to get it? Can you extend it to Tuesday?

MR. TIMOTHY STICKELMAN: I hear what you're saying. We'll consider it.

MR. ANTHONY GARDNER: Well, it's due tomorrow. They're due tomorrow.

MR. BILL WONG: We have to think about it. But I don't think we're going to sort of throw comments out.

MR. TIMOTHY STICKELMAN: You'll know by tomorrow.

MR. ANTHONY GARDNER: If we give it to you Tuesday, you're not going to not consider it?

MR. TIMOTHY STICKELMAN: I know tomorrow is the deadline. You'll get your answer.

MR. SHAWN LENAHAN: Shawn Lenahan with Port Authority. There are a few of the

resource impacts that I'll go through. There are a few here. And hopefully more briefly than some of the others.

First, I'll be going through the IRT-1/9 Subway Vesey Street entrance. In looking at the remaining resources that are there, as you see, here, we looked at first to see how the resource as it exists would tie in our overlays over the new development. And looking at the street level plan, this is the location of this resource. This is in Tower 2. And it sort of gives you an indication. A lot of the redevelopment is doing; integrating more into the site than the old World Trade Center super block. This is more was inclusive. At the edge of the building is brought more to the street level. More to the street edge into the urban fabric.

That being the case, this was the face of the complex before September 11 and now we're brought up here.

That being the case, this is a blow up a larger version of this. Where this falls is essentially into the lobby of Tower 2. The white area that you see, the area of Tower 2,

including lobby or retail area, as well as the core of Tower 2. This is a shaft which would be a support for this 60-plus story tower. The yellow area indicates where an entry to the transportation network would be. We're looking at all the transportation infrastructure is come into serve the flow of pedestrians. This is where this could be.

Now, just to give you a point of reference, the view that I think that we feel evokes the most feeling of this resource, is really the view of walking down Vesey Street and getting the stair and escalator that was here. We included this photo which was taken October 31, 2001, which shows the finishes, the railings and all of the other things that were there essentially before September 11.

Since that time, of course everything was taken down. This sign is in the archive in Hanger 17, so it was brought out here. So what really remains, this again being the view that I think most people could have recalled the feeling of this resource. The other views, this view here, overlaid here is essentially looking here. So you're really

inside of this retail space looking at this moving up.

In addition with the other redevelopment and moving towards the street, the remainder of the site is there is some regrading that's going on. One of the other things that would be occurring to this resource is that the level of grade will be higher than it was before September 11, possibly up to 4 feet or possibly even higher. That being the case, the floor of that area could be approximately here, so you would really be losing the bottom of that. This opening here as a point of reference is really here. And so this is where this opening is just down here a bit. And really giving the pre September 11 conditions, this was really into the side of the facade of 3 World Trade, as you see here, and this was across the street. So really there was no rear side looking east as well as the side toward looking toward the north. Those would be the sides that would be most exposed. This really projecting beyond the face of the building. And this being within the entrance.

MR. JACK LYNCH: That's 5 World Trade, right?

MR. TIMOTHY STICKELMAN: Yes, he meant 5. He said 3, but he meant 5.

MR. JACK LYNCH: That's 5 World Trade.

MR. SHAWN LENAHAN: That being the case, so it's in the office tower. The grades are different. And this structure as it exists is being supported by the column base system that existed before September 11. To maintain this in the way that it was previously, you're impacting more than just this. So at the point that we started to get to these conclusions or just knowing how to work into the fabric of the remainder of the development, we just didn't know where to go from there. We wanted to lay out these issues. And some of the issues that we're dealing with, and really open the floor to what thoughts the Consulting Parties have, because the concern we have is that really if this is the most important view or aspect to evoke the feeling of this resource, and that is really essentially the most compromised area of the resource, then the question is,

what is the value, with everything that will be done to incorporate this. In going through this, we're working with Steve Weintraub of the Arts Preservation Services. I would like to ask Steve some of the thoughts from a recent meeting.

Just given sort of bringing it to us who are not as familiar with the detail, the fact that the finish is being gone and what might factor into evoking that feeling.

MR. STEVEN WEINTRAUB: Last week when I saw the images and heard about it, the reaction I had, normally when you look at an historic object or structure, meaning to rise both by the inherent appearance of the object itself, and the second thing is the context. What struck me is the fact that, since you don't have anything remotely (inaudible) to the original, you really have the substructure, which nobody ever saw. And then the context, I guess when it's most troublesome, winds up in the lobby of the building and it's interior. So I'm not sure how meaningful it is.

And the problem that we find all the

time, my specialty is conservation, and you know that when you conserve something, the appearance that people see, usually they're quite literal about it; oftentimes in parts the wrong information.

So for instance, if you see this concrete under structure, people are going to assume that that actually was the result of the damage from 9/11 as opposed to the fact that most of the surface was removed after 9/11. So the appearance is really not as a result of the damage. So there's a question of both the power of the piece and the information that it conveys and the context in which it would be seen and whether it really provides the impact that it would appear to have in those photos.

MR. SHAWN LENAHAN: So with that, I want to open the floor.

MR. BILL LOVE: I walk by there all the time. It's too heavily damaged. It doesn't evoke any feeling in me, in contrast to the east station. If it's going to be a major impediment, I think it's not worth preserving.

MS. PATRICIA REILLY: I think that you probably should have waited for the 106 process before you took that other stuff off of there.

MR. SHAWN LENAHAN: This was done during the cleanup when the time the Port Authority was not in control of the site.

MR. PETER RINALDI: Let me clarify, that structure the way it exists now, except for, I think, the way we locked up the entrance, was the way the Port Authority inherited the site in July of 2002. That was part of the cleanup. There was a lot of debris around there that was done there.

Matter of fact, that was left standing only because we talked about taking it down. It was left because it provided access into the remnants of the 1/9 structure using to clean it out and subsequent construction going on. That's in terms of what happened.

MR. SHAWN LENAHAN: With the destruction of 7 World Trade, I wonder if part of the finish is if it's taken off, maybe the destruction of 7 made it structurally unstable.

MR. BERNIE MCNEILLY: Just for some people to get clarified on, the way it was left is the way that resource was within a period of significance, documented as a period of eligibility.

MR. ROBERT KORNFELD: What you may not know, the period of significance includes the emergency operation. So a lot of what you see is the result of that what took place during the emergency operation. But that is within the period of significance. So it's not only significant if the damage you see is damage that was immediately from debris impact or something like that, it's a product of the whole operation. But subjectively, to me, what I find evocative about it, really is that you climb going up and the remnants of the staircase and probably the steel. You see the structural steel going up above.

I think people around the country feel a sense of emotion about with the World Trade Center, it was the steel. That something that's been incorporated in the hulls of ships. People take sheer studs from beams and weld them on motorcycles. I think that

is one thing you see here. It's not that noticeable. There's a column in the foreground and up at the top. Again, it's a subjective personal feeling. I don't think that the north elevation of it, the stripped finishes and concrete blocks, that doesn't really evoke much for me. I wouldn't mind seeing that with a wall in front of it and certain portions of it exposed.

MR. ANTHONY GARDNER: What I think is really interesting about this resource is that it led to the plaza. And obviously the plaza doesn't exist anymore. And it's reflective of the fact that the World Trade Center was destroyed. I think that's why it is a significant resource because it's leading to nowhere.

MR. SHAWN LENAHAN: Absolutely. And I would agree, but given how that would be in the new surroundings that it would be in, essentially, we're still in the planning with how this all would be done, and the same sense of openness that was there as you walked up and really under the overhang of 5, just the sense of procession, would all --

the decor of this tower, there's really little to do to move it. This being within a one to two stories base, I can't even commit because we're planning with this. There's so much that you would not have.

Because I would agree, when you get to the top, you're open and go next to the plaza. But you lose so much with that that you wouldn't get that sense because of what would be in the surroundings.

MR. ROBERT KORNFELD: One point, I think it's exactly that contrast that may interest people. You look at something and this is what was there. This is part of the original World Trade Center. If you can conceptualize what was there in the past, it doesn't have to be the same as what is there now. When you travel and see a historic ruin, you look as a the reconstruction; this is what's here now, this is what it is looked like 2000 years ago. Seeing something that's modern compared with that, having that tangible remnant, really gives you a sense of what was there. Even if it doesn't look like what was there in the complete sense of having

finishes, I think -- if you've been to the Holocaust Museum in Washington, but they'll have a section of paving stones from the Warsaw ghetto, and you walk on that and it's just an experience. It doesn't look like the Warsaw ghetto. You know you're in Washington, on the second floor of a building, but suddenly you're coming in contact with something which is a real physical remnant. It's something from that time and place and the events that took place so on and so forth. You get that kind of connection mentally that you don't get from just a photograph or illustration.

MR. JACK LYNCH: One question. You're saying you're going to elevate it four feet? Now, looking at that stairwell with the column on the bottom, which is approximately maybe three feet in height, you're going to cover that?

MR. TIMOTHY STICKELMAN: He's looking at the photographs.

MR. JACK LYNCH: And the bottom photograph to the left. You're saying you're going to elevate. So if you'll elevate the

ground four feet, you'll bury that column in the ground.

MR. SHAWN LENAHAN: This column is approximately in this shaft.

MR. JACK LYNCH: You have to expose it --

MR. SHAWN LENAHAN: That's the challenge.

MR. ANTHONY GARDNER: I think the -- they don't want to.

MS. CARLA BONACCI: I think one of the issues is this resource if one could actually take it away and bring it back, I'm not sure if it's feasible because of its state in deteriorating. You're just putting it back at a different elevation and totally different spot, all to save a remnant the recovery. And how historic is that? Can we actually save this thing and not get it and wreck it and have it fall apart? It's not like moving a house off of the foundation. We're struggling with, as we look at this --

MR. ROBERT KORNFELD: Is the entire substructure being demolished?

MS. CARLA BONACCI: Yes. We don't think

we can work around the orange area that's depicted. So can it be saved to something we can look at saving. But what if it gets destroyed? Do we then recreate it? These are all the concerns. We're being honest.

MR. BILL WONG: I would ask -- is it something that could be preserved in the memorial center, relocated on the site just as the Warsaw ghetto paving stones were located? What do people think of that?

MS. PATRICIA REILLY: You know, I didn't know it was there. But it was where I used to get into the World Trade Center. It's weird that I see it now. It's where I used to come down the street. To me, now that I know it's there, it would be nice if it was in the memorial center. And then you had photos of how you looked in its original state.

MR. TIMOTHY STICKELMAN: In regards to removing it, we're looking at it, but Jackie had a comment.

MR. STEVEN WEINTRAUB: It's interesting you mention the Holocaust Museum, I was a conservative at that museum. I was there

when we made a lot of decisions. I think that everything you're saying about the possibility of this is correct. I totally agree. It has historic value. It has meaning and purpose. The problem that we had at the Holocaust Museum, even now we have a warehouse of material and we had to make choices about what we would put on its place. Not to say it's not valid, but the question is, is it that or something else? As an example, just a hypothetical, if you have a lobby and somebody is willing to make a commitment that something relative to 9/11 memorial, is that your statement where for instance, let's say, all the steel we have at Hanger 17, for instance, that you take something from there, because the term that we used to talk a lot about, something called emotional knowledge. That is to say, somebody coming through is not reading that, is not familiar with what's going on. When they see it, do they understand it. The problem I have with this, I am not sure that -- it can be evoke some personal knowledge. But is it strong enough relative to other

possibilities? Not to say is something important or not important. It's really a point of relativity.

MS. PATRICIA REILLY: Except that it's there. So much of the World Trade Center isn't there.

MR. STEVEN WEINTRAUB: That's what I'm saying. The significance is because it's there. It is original. That's not why it is -- to not trivialize it. So is that the strongest statement relative to other things you can do? It's what one has to think of.

MR. ANTHONY GARDNER: Right now there's nothing at street level in the plan.

MR. PHILLIP KRAFT: This may not speak to this particular site. The point is for me, and I don't know for other Consulting Parties, that some of the things in a fixed location, if on every occasion it would determine that would go in the museum, you're sort of bringing all of it into one place rather than expressing the breadth of the experience. I don't want to be disruptive of the construction process. If the Consulting Parties feel fine with this not having stayed

there, so be it. But just that position of an historical artifact that looks ruined, cut out and saved and maybe brought back that one piece in a thing that could be read about is valuable. To show how far away. But in thinking about the whole site there should be experiences in different places. One should not have to go to a particular location in my opinion. In seeing it on-site is always a tangible reminder of the material.

MR. SHAWN LENAHAN: Okay. It's passed 6:00, so I'll move on.

MR. PETER GOELZ: Quickly.

MR. SHAWN LENAHAN: One brief thing I want to go over is the issue of site memorial visibility opportunities and architectural treatments. What we're talking about here is a couple of items. First how the visibility of the slurry wall could be incorporated into the PATH train.

The planning stages, what we are considering is how where the terminal pierces the slurry wall, if there may be areas adjacent to it, above or around that could be left to compose to give it the sense that

you're progressing beyond the bathtub for those who have had that strong feeling. Some areas, where you're moving under West Street. Also from when you're moving from the east side of the bathtub over to the main transportation hub, as well as possibly the east side, perhaps either the track level or mezzanine level. Essentially we're looking at areas where it's adjacent to the slurry wall.

The other issue, the issue of visibility from the PATH terminal into the memorial zone. We're looking at opportunities and working with DC and the memorial planners. I wanted to talk about the repercussions.

First, what are the requirements of the memorial hall and focusing on the footprints and everything there. In the event that either on one of the events or at some point there may be visibility from the PATH terminal into the memorial zone, the concern is, there would then by itself be visibility from the memorial zone into transportation. And the concern would be do we want that? And I just wanted to put that out there.

Something we're looking at. I think it is a concern.

MR. PETER GOELZ: Something to think about.

MR. ANTHONY GARDNER: So there's going to be retail in that east/west corridor?

MR. TIMOTHY STICKELMAN: On the northern side.

MS. CARLA BONACCI: On the northern side of the corridor, there's access to the observation deck and some retail. They would be tasteful development on that side. It's a two-way window.

MR. SHAWN LENAHAN: Doing something to evoke the wall.

One last item because it was specifically raised as a comment at the last meeting. There was a question raised regarding the flow movement from west of the World Trade Center Battery Park and World Trade Center to the transportation hub and how would that be done.

We looked at travel distances. At a spot about just the west side of West Street, which would be the residential areas are west

and south of that and of course north, it's about 1100 foot walk, using city streets, moving across Vesey Street and then moving north on Greenwich and then into Tower 3 into the transportation network. About 1270 foot walk if you were to progress up into the hub, that of course, in addition to being able to get into the transportation network on the west side of West Street.

In addition, in our preliminary planning, and we're confident it will continue to go this way, there will be an opportunity to walk across the memorial at some point. So given the levels of this and how it relates to the street, that's something to look at.

MR. BILL LOVE: I think that's important.

MR. SHAWN LENAHAN: To raise that, there's a lot that's being down more than it was previously.

MS. PATRICIA REILLY: From the families' standpoint, that's really very preliminary, but it's not a 106 discussion. It's a memorial discussion.

MR. ANTHONY GARDNER: But it's worth making the point though that you're creating all these subgrad concourses and concourses around and ways around the sites and you're allowing people just to cut back and forth through the memorial. You may not realize it but it lessens the significance of the memorial itself. You can't go to national memorials and just cut across it as a shortcut, you know. And frankly that's something you should really -- being sympathetic to the residents, frankly their are streets can introduced here that were never here before. You could simply walk down the streets.

MR. SHAWN LENAHAN: The fact is, using city streets, the move can be made relatively easily. That's the point. To the extent -- we're not here to get into the detail of that, so I'm not in that position. This can be done on city streets.

MR. JACK LYNCH: The families would be very opposed to that.

I would like to make a comment on the stairwell. When the towers came down, they

went down within the bathtub. That is what occurred on this side. I think that's important to anybody who's coming to the site and realizes that the structure so fast, went completely into Vesey Street.

MR. ANTHONY GARDNER: And also, I think Phil Kraft's comment was extremely valuable. This site is supposed to be integrated. So that people no matter where they are, they know they're at the site of the former World Trade Center. That's the way to do it. There can be various ways here and there.

MR. BERNIE MCNEILLY: You might have missed one comment. Right here.

MR. BILL LOVE: Actually, sort of leads into the next question. When we're talking about connectivity and crossing this street. I made some comments last meeting and asked about the pedestrian bridge that was mentioned briefly in the document and suggested that a careful look should be taken at that as opposed to the pedestrian concourse. And subsequent followed that up with a letter suggesting for some characteristics that that bridge may have,

that was based on a presumption that the DOT-EIS, that both of those alternatives were compatible with all of the West Street alternatives, including the tunnel.

Subsequent to that, I read more carefully that EIS for the PATH station and there's a statement in there couple of places that says if a short bypass is constructed, NYSDOT would relocate the utilities under West Street to facilitate their proposed traffic tunnel.

This utility relocation will also allow for construction for PATH's subgrade concourse. In the event that the no action or grade alternative for the route 9-A is selected, NYSDOT may not undertake this utility relocation if this were to occur. I'm hoping, although from the point of the residents who very much are against the tunnel, we certainly would take a tunnel and pedestrian overpass that may be the best of both worlds. The decisions should be independent. Should not have the tail wagging the dog. I understand everybody wants to do it on the other guy's dime, but

it might be more better for the Port Authority to put a bridge -- tunnel rather than an upgrade. But I think that's the wrong approach. I hope these are independent decisions.

MR. BERNIE MCNEILLY: The projects are clearly independent. The fact is, whatever decision New York State DOT makes is that subgrade passageway under West Street request be undertaken and can be undertaken by the Port Authority. What was mentioned in the New York State documentation. If the upgrade alternative of being contemplated, that they may consider bridging options particularly on the south side of the bridge in the proximity of the West Street. There used to be a bridge there. They're going to contemplate a bridge, but that's on the New York State DOT that really depends on which recommended alternative, whether they have a bridge or not.

UNIDENTIFIED SPEAKER: I want to make sure that the decision on the pedestrian crossing wasn't driving the decision on the tunnel.

Page 153

MR. BERNIE MCNEILLY: More or less, a construction coordination issue. But as far as the action and undertaking, the projects are separate and clearly being built as a separate undertaking.

MR. BILL LOVE: This language in your EIS is confusing.

MR. BERNIE MCNEILLY: We could probably clarify that.

MR. JOHN HOTOPP: So far we started out with determining of eligibility and we've worked very hard to get that through. And we did an assessment of the facts and I believe you have until the 21st to give us a last comments on that. The next document you will see, that will be prepared probably within the next two to three weeks, hopefully before the next meeting will be the amendment agreement. That will spell out a number of features to it. All whereas and the standards clauses why we're doing this and why in the first place. That will be spelled out. And then the real meat and potatoes is that you want to focus on the stipulations. What will Port Authority do? How will they

Page 154

address the issues that we're talking about? So that will be addressed that they worked very hard at. There will be a section on dispute resolution, what happens if we have a problem. There will be a section on amendment and determination of agreement. When is it going to finish out. Who will actually sign the agreement. That's the next document you'll see.

If you want to take some serious time with the stipulations sections, because that is the meat and potatoes of what we've been doing here. I'm anticipating one or two more meetings on this document alone. Because I think that this will be the most important outcome in the whole process. That's my 20 minute speech in three minutes.

MR. PETER GOELZ: Thank you.

MR. ANTHONY GARDNER: We'd like to make a suggestion. There's a lot of concerns about the cumulative effects of all the various projects going on. In particular, we've raised this issue with the LMDC as well. It doesn't make sense that your project directly impacts the footprints and,

Page 155

yet they're the ones that will determine access. I suggest that you have LMDC -- that you have a signatory on your memorandum of understanding, in particular to the stipulations concerning the footprints. There is a lot of fears we have at this point, and it seems that you really understand the importance of the remains of the footprints.

I think what we're concerned about, we're working towards something good here. And LMDC will turnaround, well within our agreement, we determine access, we want to build and we need infrastructure for the memorial. So we said 90 percent, but you'll get 10 percent. And I think that's why the suggestions we want to put out there, having LMDC signatory, so that there's an understanding when we're dealing with the footprints, if you commit to certain percentages, they have to make that commitment as well.

MR. JOHN HOTOPP: Thank you.

MR. PETER GOELZ: Let's talk about the next meeting. It's been suggested that we

Page 156

meet into August. That we have a meeting in early August during the first week. During the fourth or fifth, somewhere around there? Then we can try to meet again the 18th or 20th, around there because then, we really are tied up and don't want to meet again until after September 15.

MR. PHILLIP KRAFT: Does someone keep a list? Could there be drawings of the footprints for people to look at and consider, if you're talking about mitigating effects? Do we get to see various designs of what it would look like?

MS. CARLA BONACCI: Too early, but as we do here, we do mark where those footprints are relative to the structures. But I don't have any design solutions.

MR. BILL WONG: We won't be at a point to particularly say the color of the pavers.

MS. CARLA BONACCI: We can talk about philosophy and approach and come to terms on that and there's a design process.

MR. PETER GOELZ: Anyone else?

MR. PHILLIP KRAFT: I guess there was some talk about the alternative to PATH

design or people saying that was missing.
MR. PETER GOELZ: I think they said those were destroyed.
MR. PHILLIP KRAFT: Earliest were the artifacts. I may not understand but especially for the artifacts that are not part not officially part of the 106 here. Of the members that want to be part involved, are the family members going to have a say in what gets brought to the museum and the historic preservation?
MR. BILL WONG: That's within the LMDC purview.
MS. PATRICIA REILLY: Why, if the Port Authority owns the artifacts?
MR. BILL WONG: This is the coordination effort that was raised early on. That there will be a coordination effort, but the way it is set up, there was a LMDC panel.
MR. JACK LYNCH: Is there a family member?
MR. BILL WONG: I can't speak for LMDC.
MR. BERNIE MCNEILLY: What we can say is that we hear what your concern is. We are coordinating with LMDC. But we have a

curatorial process in place.
MR. PHILLIP KRAFT: It's not Port Authority. I know you're coordinating. I want to make sure that some of the Consulting Parties can consult with them.
MR. BERNIE MCNEILLY: I hear the point. I don't think we can answer you.
MR. ANTHONY GARDNER: Last question, are you going to consider our comments and get another draft of the findings -- Finding of Effect documents to the Consulting Parties after you review our suggestions?
MR. BILL WONG: We will go and we will take into account and we will answer you at the last meeting.
MS. PATRICIA REILLY: Actually at the meeting we were at with you, you had stated, I don't know your name, Mr. Menno, that you would be redoing that document.
MR. BILL WONG: Do it usually as part of a final response. Interim draft.
MR. PETER GOELZ: You can see that your comments and input are being taken seriously.
I think that this was a good session

today.
MS. ELIZABETH MERRITT: I have a comment on the next meeting dates that you talked about. On August 5 and 6, the advisor counsel is meeting in Minnesota, so I wanted to know if other than August 5 or 6, you can say August 3 or 4. I want all to be here.
MR. PETER GOELZ: Anything else? I think we're done. Thank you.
(Meeting concluded at 6:45 p.m.)

C E R T I F I C A T I O N
STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

I, GINA M. D'ADAMO, a Shorthand Reporter and a Notary Public within and for the State of New York, do hereby certify:
That I reported the proceedings in the within-entitled matter, and that the within transcript is a true record of such proceedings.
I further certify that I am not related, by blood or marriage, to any of the parties in this matter and that I am in no way interested in the outcome of this matter.
IN WITNESS WHEREOF, I have hereunto set my hand this 2nd day of August, 2004.

GINA M. D'ADAMO
NOTARY PUBLIC

A
ABC 47:8
ability 33:1 94:10 118:7
able 35:25 36:4 51:12 52:3,8 53:15 58:5 67:5 96:7,15 108:1 108:17 109:14 116:5 117:11 129:8 148:7
Absolutely 138:18
accept 39:8 60:1
access 19:6 36:17 37:15 77:22 136:17 147:10 155:2,13
accommodate 117:18
account 56:18 158:14
achieve 96:15
acknowledge 12:16
Act 5:10
action 71:3 151:14 153:3
activities 12:22
actual 49:12 78:6 80:6 97:18
Adam 3:19 4:1 10:7,7 11:15,15
adaptive 37:17
add 39:23 76:24 120:11
adding 102:10 118:20,21
addition 51:20,22 55:2 60:19,22 82:1,12 132:3 148:7,10
additional 55:17 67:9 83:14 84:8 95:25 96:21 100:6,8 106:8 108:12 114:6 118:21 119:3 127:10
additions 88:19
address 100:4 116:5 117:14 118:24 154:1
addressed 42:4 46:19 60:11 102:2 104:9 106:7,19 108:20 154:2
addressing 6:2 20:6 56:19 112:17
adequate 61:18 62:5 83:17 85:18
adjacent 49:3 145:24 146:9
adjustments 107:20
admit 97:9
advance 46:19 47:9
advantage 112:11
advantages 112:5 112:6
adversary 72:15
advise 51:13
advising 57:15
advisor 159:4
Advocate 8:18
aerial 80:4,12
aerials 80:20,23
affect 83:5
afternoon 6:23 7:5 12:6 74:11
agencies 44:8 45:25 46:1,23
agency 5:4 44:11 50:19
agenda 15:7
ago 41:18,23 59:22 84:13 139:21
agree 29:4 37:7 138:19 139:6 143:4
agreed 88:12
agreement 59:19 115:1,1,2 153:19 154:6,8 155:13
ahead 33:8 58:20 65:9 66:3,8,13 67:22 68:7,13 122:24
Airport 73:15
Akbar 123:25
Akbars 117:16
AKRF 4:2 10:14 11:14
alert 127:24
alight 91:19 95:24
allocation 43:24
allow 96:3,9,13 116:22 151:12
allowing 149:5
allows 119:18
Alter 3:19 10:7,7
altered 58:8
alternative 31:15 101:15,20 108:5 110:20 111:13 112:5,7 124:19 124:20 151:15 152:13,20 156:25
alternatives 31:20 36:20 38:9 102:2 110:20 151:2,4
amendment 153:18 154:6
AMERICAN 3:4
Americas 103:12
amount 17:25 38:11 57:22 77:5
Amtrak 114:13
Andrea 4:3 10:20 10:20 54:17,17 122:25 124:2
and-a-half 99:4
angel 44:14
Anger 3:3 11:22 41:24
answer 48:14 59:7 65:24 66:8 66:20 67:20 68:24 69:5 86:22 103:14 116:13 120:9 129:23 158:7,14
answered 58:13 86:16
answering 62:1
answers 41:10
Anthony 3:7 8:24 8:24 9:11 20:10 20:18,24 21:13 35:12,12,20 36:14 50:7 51:11 52:6 71:22 78:15 79:20 86:19 88:13 110:18 112:10 115:4 127:18,22 128:14,18 129:3 129:12,19 138:10 141:9 144:13 147:5 149:1 150:6 154:19 158:8
Anthoula 3:14 11:1,1 86:21 87:4 88:15 89:12 103:3,12 103:16,22 104:10
anticipate 67:7
anticipated 114:18
anticipating 154:13
anybody 29:9 43:10 96:23 113:14 150:3
anymore 87:3 138:13
anyplace 24:20
anyway 20:7 28:15 56:19 87:16 113:5
apart 141:20
apologize 40:6
appear 63:25 135:17
appearance 134:15 135:3,11
appendix 97:6,11 97:11,18
appreciate 105:10,13
approach 47:6 73:10,16,25 74:8 104:21 152:4 156:21
appropriate 38:3 64:16,20 80:15
appropriately 49:21
approval 65:13 67:22 68:7,12
approve 68:19,20 68:22
approximate 16:1
approximately 16:16 18:20 21:18,20 22:1,3 62:17 69:23 75:20 82:10,15 82:19 84:7 90:20 132:11 140:18 141:4
April 51:17 52:7
APS 12:1
architect 121:7
architects 11:22 49:24 50:5
architectural 28:18 48:20 145:16
archival 62:15
archive 131:19
archives 63:4 65:21
area 15:25 18:22 18:23 20:14,23 21:23 22:25 23:3,5,13,18 24:7,12,21 26:10,23 27:1 32:19,24 34:18 37:11 39:12 70:9,25 75:4,18 75:20 76:3 77:18,20,23 78:2 81:5,6 82:16,19 83:15 83:25 84:5,17 86:10 99:18 119:20 125:24 125:25 127:8 130:25,25 131:1 131:4 132:11 133:25 142:1
areas 75:3 77:17 78:1 113:10 145:23 146:3,9 147:25

argue 113:15
arguing 52:10
arrows 36:9
artifact 40:1 54:2 145:2
artifacts 39:25 40:10,14 43:19 43:23,24 44:3 48:5 50:8 58:23 71:14 88:10 157:5,6,15
arts 49:13 134:4
ASAP 53:20
asked 19:21 39:23 41:22 52:8,15 61:8 72:9,16 86:17 89:1 97:2 125:7 125:19 150:18
asking 22:17 30:2 35:14 54:4 68:5 68:6,10 88:15 89:18 95:6 104:4 109:10 122:14
aspect 133:22
assess 56:14,15
assessment 153:13
assigning 105:6
assistant 115:24
associated 13:7
Associates 3:3 11:22 41:24
ASSOCIATION 3:4
assume 63:5 97:25 102:23 135:8
assuming 61:1
assumptions 98:5
assured 78:8
attachment 28:19 28:22,25 30:1
August 40:19 53:19 54:2 69:20 115:16 156:1,2 159:4,6 159:7 160:17
authorities 106:4
Authority 1:11 2:1 3:15,18 5:5 6:1 9:8,10,12,17 9:19,21,23,25 10:2,8,23,25 11:13 12:3 22:16 40:8 41:2 41:3,12 44:4,21 44:22 45:3,10 46:9 48:2 49:2 50:19 52:23 56:4 60:24 63:23 64:2 67:21 74:21 78:7,16 84:13 85:17 87:11 88:14,16,23 89:10 100:3 105:11 106:6 126:4 129:25 136:6,11 152:2 152:11 153:25 157:15 158:3
available 7:22 123:6
Avenue 29:10,11
avoid 18:3 44:2 98:7 112:20
avoiding 124:7
aware 13:20 47:18 59:16 69:7 102:16 123:13 128:3
a.m 90:24,25 97:16

B

B 34:14 119:1
back 15:9,10 25:9 25:15 27:8 32:4 33:23 39:11 41:8 42:12,13 42:24 51:17 52:7 61:7 62:4 66:14 67:6 72:5 72:15 76:24 83:22 84:19,22 85:21,25 91:8 97:5,10 100:12 104:3 105:1 111:21 112:21 113:8,15 114:19 118:1 125:2 128:10 141:13 141:15 145:3 149:5
bad 50:14
balloon 80:18
barely 63:9
bar-backs 69:14
base 117:5 126:17 133:9 139:3
based 151:1
basement 76:16
bases 74:19
basically 16:23 17:9 20:7,22 21:16 22:7 47:19 51:18 52:11,13 91:18 107:15
basin 86:9
basis 83:16 90:22 91:20 92:14 97:2,3 104:12
bathtub 18:6 22:13,21 74:20 81:6 84:17 146:1,5 150:1
Battery 3:18 10:7 47:21 147:20
beam 50:17 70:3 80:10
beams 137:24
bear 50:9
began 56:9
beginning 45:19 70:11
behalf 105:11
believe 39:20,22 40:21 49:17 58:18 59:6 61:4 61:6 64:10 86:15 89:24 110:22 153:13
Berger 4:9 10:4
Bernard 3:9 5:1,2 6:22,24 7:17 11:17,17 15:3
Bernie 2:9 9:7,7 22:14 32:25 73:21 89:17,17 97:8 98:9 100:9 102:4 104:2 105:9 106:11,21 108:6,16 109:12 110:14 111:22 112:14 113:20 113:23 114:2,10 114:20,23 119:1 137:1 150:13 152:6 153:1,8 157:23 158:6
best 71:3,12 99:22 100:18 112:4 151:21
Betsy 10:18 53:16 109:5
better 6:15 30:9 80:16 109:20 152:1
beyond 20:14,15 132:23 146:1
big 30:7,13,17 36:13 44:14 46:20 72:22 118:11
bigger 56:9
biggest 117:4
Bill 2:13 3:22 6:11 9:5,5 10:22 10:22 27:14 28:16,23 31:25 36:19 49:19 50:6 53:12 54:8 58:3 62:8 67:4 68:16 69:4,11 87:6 115:8 129:14 135:20 142:6 148:17 150:15 153:6 156:18 157:12 157:16,22 158:13,20
billions 114:14
bit 43:14 62:22 104:13 115:19 132:15
blessed 70:12
block 93:16 130:15
blocks 138:6
blood 160:13
blow 130:22
board 36:11 95:24 101:6 106:10
boards 102:21
Bob 4:13 8:20 10:11,12 19:9
Bonacci 2:4 10:24 10:24 15:16 23:2 24:15,22 25:13 26:16 28:10,17 29:19 29:24 30:15,19 30:25 31:14,18 31:23 32:3,12 32:18 33:3,13 34:1,25 35:4,10 35:16 36:12 37:8,11,24 39:15 128:21 141:11,25 147:9 156:14,20
book 107:9
Borkoski 3:16 11:6
BORKOWSKI 11:5
bothered 63:16
bottom 22:2 132:13 140:18 140:23
bowl 14:3
box 15:25 18:3 75:21
boxed 17:14
Braegelmann 3:10 11:18,19
breadth 144:22
break 38:23 115:11
breakdown 128:21
breathing 92:17
Brian 70:12
bridge 17:12 70:11 75:20 150:19,25 152:2 152:15,17,18,20
bridging 152:14
brief 145:14
briefly 89:22 130:2 150:20
bring 16:23 39:23 117:11 120:25 128:10 141:13
bringing 51:19 117:8 134:7

144:21
BROADWAY 1:12
brought 39:25 57:12 75:16 130:17,21 131:20 145:3 157:10
Bruce 4:15 86:12 87:1
buddy 99:1
build 85:7 111:3 114:1 155:14
building 14:9 48:22,24,25 49:10,11,23 50:2 71:21 130:16 132:24 134:23 140:8
buildings 19:6 80:25 103:10,11
buildup 95:20
built 50:20 82:21 107:4 126:20 153:4
burner 111:21
bury 141:1
business 13:16
businesses 93:6
bypass 151:8
B-1 21:15
B-2 21:15
B-6 22:20

C

C 160:1,1
Calatrava 13:22 48:24,25 49:11
call 35:4 88:8
called 34:22 50:19 112:7 143:18
calling 7:18 86:24
Calvert 4:4 11:14 11:14
camera 80:17,18
cameras 62:15
capability 95:1,2
capacity 92:12 94:22
capital 107:8
captures 80:6
car 92:16,18,22 107:20,21 116:24
care 68:11
careful 150:21
carefully 5:23 15:15 151:6
Carla 2:4 10:24 10:24 15:16 23:2 24:15,22 25:13 26:16 28:10,17 29:19 29:24 30:15,19 30:25 31:14,18 31:23 32:3,12 32:18 33:3,13 34:1,25 35:4,10 35:16 36:12 37:8,11,24 39:15 128:21 141:11,25 147:9 156:14,20
Carol 3:10 11:18 11:18
cars 81:23 96:14 107:18,19 108:13,15,18 110:2 116:25
case 34:17 50:15 117:2 130:19,22 132:10 133:6
cases 92:6
castle 17:14
cataloging 40:14
catalogue 40:15
causes 121:21
CD 40:18 53:10 53:18 54:1,2,5 54:19 55:22 56:2
CDs 53:6 60:21
ceiling 23:23 32:13
center 3:12 5:18 8:18 12:10,18 12:23 13:4,9,12 13:17,23 14:2,9 14:13 16:11,19 17:1,4,6,9,21,23 19:7 24:9 25:5 30:20 34:21 43:25 45:18 49:4 50:20 51:7 51:15 52:22 53:9 57:14,17 70:9 73:2,15 74:11 75:1,5 76:17 80:9 81:9 82:6,8,11,17,20 86:19 87:2,3,20 88:1,2,3,9 90:10 90:21 92:1,2,15 94:14 100:22 104:1 106:23 107:3,11,23 108:9 116:16,21 120:14 126:9 127:20 130:15 137:22 138:15 139:15 142:8,13 142:17 144:5 147:20,21 150:11
central 29:12 127:18
Century 49:1
ceremony 80:11
certain 30:5 44:12 138:9 155:20
certainly 63:13 151:20
certify 160:7,12
challenge 141:8
chances 117:25
change 26:17 28:14 31:12,19 31:24 32:9 37:18 38:16,25 39:11
changed 51:6 99:12
changes 31:8 38:13
changing 28:13 32:23
Chapter 97:5,13
characteristics 150:25
chiller 127:19
choices 72:21 143:8
choose 35:14
chose 112:3
Chris 4:4 11:14 11:14
Christodoulatos 4:5 11:7,8
Church 15:24 21:17 70:6 110:21 111:4,12 112:2,5,11
circular 30:23
circulated 123:1
circulation 18:24 19:24 22:4,5 33:17 93:14 108:22 109:2 118:22 119:3
circulations 18:1
city 3:18 10:8 11:16 30:9 47:21 48:21 49:5 59:4,12 93:6,7 117:6 148:2 149:17,21
clarification 8:1
clarified 137:2
clarify 22:15 67:4 126:13 127:3 136:8 153:9
clauses 153:21
clean 76:10 78:17 136:19
cleaned 78:23,24 79:4,11
cleanup 43:8 136:6,13
clear 18:5 92:25 96:23 123:15
clearly 38:9 50:18 152:7 153:4
climate 85:4
climb 137:17
close 62:19 72:10
closer 38:3
closest 91:13
cloths 128:22
Coalition 3:6,21 5:22 8:23,25 9:1 9:4,5 10:21 35:13 54:18 58:17 59:15,16 60:4
Cohen 3:9 5:1,2 7:17 11:17,17 15:3
Cohn 4:8 10:5,5
Coleman 2:8 12:2 12:2
collapse 76:5
collection 40:1 116:1
collision 73:19
color 60:20,21 121:10 156:19
column 32:2 74:19 133:9 138:2 140:18 141:1,3
columns 13:3 24:1 43:4 75:2 79:7 81:10 82:7 82:14 84:1 120:16 126:5,15
come 7:3 15:9 18:16,17 24:6 25:8,14,19 26:8 30:13 32:21 33:15 47:17 84:22 86:11 96:17 103:6 113:8,15,18 114:19 116:4 117:13 119:9 126:15 131:7 142:15 156:21
comes 14:1 15:10 62:4
coming 14:8 18:6 18:11 22:7 30:15 89:5 92:1 92:5,23 93:8 94:1,6,11 98:16 106:9 112:21 116:10 117:24 119:4 140:8 143:20 150:3
comment 8:4 36:3 50:7 52:14 63:5 68:3,4,16 68:18 73:1 142:22 147:17 149:24 150:7,14 159:2
comments 7:1 14:21 54:23 55:13,16 60:10 67:6,7,7,9 129:4

129:16 150:18 153:15 158:9,23
commercial 45:7
commit 139:3 155:20
commitment 63:21,22,24 64:4 78:17 85:13 125:14 143:13 155:22
committed 39:21 74:22 75:7,14
committing 51:20
commuters 29:13 30:12 93:5 98:17 118:6
compared 139:22
comparison 101:15,25
compatible 151:3
complete 43:3 120:17 139:25
completed 51:2 55:25 60:1
completely 21:10 150:5
completeness 120:14
completion 83:21
complex 13:25 15:23 130:20
complied 65:3,6,7
comply 64:4,6 65:11 66:11
component 31:11
components 13:24 110:6
compose 145:25
compromise 100:17
compromised 101:2 133:24
conceded 87:14 87:16 88:17,18
concept 50:1
conceptualize 139:15
concern 29:15 63:20 84:11 85:9 97:23 106:13 111:16 125:24 133:21
146:21,24 147:2 157:24
concerned 35:22 48:3 56:13 59:20 71:25 84:24 89:25 155:10
concerning 155:5
concerns 6:14 14:21 27:6 60:14 74:18 111:18 142:5 154:20
concluded 159:10
conclusion 115:17 124:9,23
conclusions 133:14
conclusive 124:14
concourse 16:19 23:8 27:19 150:23 151:14
concourses 14:5 149:3,3
concrete 75:2 76:1 135:7 138:6
condition 23:5 82:9 96:9 99:13 99:16 102:6,7
conditions 132:17
confident 148:11
configuration 18:15 81:16,18 81:25 83:22 85:21 88:18 91:10 101:14
configurations 124:19,19
configure 118:19
confusing 33:20 153:7
congratulations 49:3
Congressman 4:11 10:9
connecting 24:8 26:24
connection 17:20 25:4 27:1,8 119:11 140:13
connections 14:8 19:4 20:11
connectivity 150:17
connector 25:19 119:8,19 126:1
connects 23:8
conservation 135:1
conservative 142:25
conserve 135:2
consider 51:14 79:15,17 80:14 81:4 89:1,10 125:1 129:11,20 152:14 156:11 158:9
considered 5:23 55:18
considering 15:17 88:20 145:22
consistent 16:19 62:12 108:10
constant 90:9
constraint 114:7 114:9
constraints 114:3 114:3
constructed 151:8
construction 42:17 52:21 55:4 58:5 67:10 70:19,23 71:7 71:11 76:19 77:12 83:10,13 83:19 85:15,19 101:24 136:19 144:24 151:13 153:2
consult 63:23 158:5
consultant 64:8
consulted 59:22
consulting 1:8 5:8,11 6:12,16 35:21 39:22 45:10,11,13 50:12 52:7,15 53:3 54:20 55:10 72:17 79:1,13 97:1 128:7 129:6 133:20 144:17 144:24 158:4,11
consuming 33:25
contact 140:9
contacted 41:2 61:6 64:11
contained 42:6
contemplate 96:20 103:17 152:17
contemplated 152:13
content 111:6
context 90:1,5 134:16,21 135:14
continual 109:22
continuation 73:3
continue 30:21 46:6 60:14 106:15 148:12
continued 108:8
continuing 54:11 73:18
contract 77:4
contractor 77:17
contrast 135:22 139:12
control 21:24 44:4 136:7
controlled 17:10 85:5
controlling 44:10
convenience 35:2
convenient 25:25 26:12 35:7
conversation 72:6
conversations 87:11
convert 107:11
conveys 135:14
Conway 4:3 10:13 10:13
cooperating 46:9
cooperation 54:11 55:8
coordinate 12:21 45:23 46:3
coordinated 18:9 128:17
coordinating 12:16 13:14 45:4,8 157:25 158:3
coordination 6:15 44:20 45:15,20 46:6,13 57:13 57:19,22 64:1 153:2 157:16,18
copied 66:24
copies 60:18 61:4 61:9 65:19
copy 53:6 54:5 68:5
core 75:10 131:2
corner 13:12 37:12 52:2 69:21 118:22
Corporation 6:11
correct 8:10 20:21 30:11 65:20 97:25 98:5 123:11 143:3
correctly 57:21 112:1
correspondence 5:20
corridor 14:1 18:8,17 19:12 25:21 38:6 119:22,23 128:2 128:9 147:6,10
cost 110:25 124:12
Council 3:17 8:21 19:10
counsel 10:21 159:5
country 137:20
COUNTY 160:3
couple 34:21 43:13 56:25 94:3 96:25 98:14 110:16 115:21 116:12 118:16 145:18 151:7
coupled 117:4
course 71:3,12 131:18 148:1,7

court 115:11
cover 140:20
covered 37:21 39:16,17 40:2 88:21
covering 39:18
covers 32:2 74:25
Cracchiol 9:11,11
cram 92:17 99:6
crane 74:4 80:17 81:2
create 6:3 18:9 19:3 32:16 87:23 99:19,20 112:3
creating 17:20 19:5 99:15 110:21 114:5 149:2
creative 122:14
creativity 120:6
critical 74:14
cross 15:22 70:2 71:18,19 127:13
crossing 120:15 150:17 152:24
cross-section 20:22
crowded 90:15
crushed 76:4
cue 93:18,22 94:2
cultural 49:4 105:6
cumulative 56:10 56:16,20 58:12 154:21
curatorial 43:21 46:21 47:3 158:1
curators 44:1 57:14
curious 37:25 69:6
current 70:18 71:10 117:20 123:20
currently 44:3
curve 27:6
cut 26:18 104:7 118:22 145:3 149:5,9

D

D 89:20 122:6
daily 90:22 92:14
damage 135:9,12 137:12,13
damaged 76:3 135:21
damaging 71:7
data 22:16 99:25 100:1
database 42:21
date 69:9
dates 159:3
day 6:6 25:22 29:17 95:3 102:8 118:5 160:17
days 109:15
DC 146:14
DDC 43:9 59:5
deadline 129:5,23
deal 29:11 43:21 72:22
dealing 38:13 45:17,21 123:4 124:20 133:19 155:19
dealt 43:25 51:18 104:8
deboard 91:20
deboarding 92:8 92:24
debris 136:13 137:13
decide 52:9
decided 61:22
decision 152:8,23 152:24
decisions 143:1 151:22 152:5
deck 147:11
declared 31:8
deconstruction 55:6,11 56:6 66:5 67:11
decor 139:1
deferred 88:14
define 79:8
defined 79:9
defining 114:11
definite 67:19
definitely 79:19
DEIS 97:12 100:17 111:24 129:4
delay 5:1
delaying 99:5
deli 117:16
delineating 76:17
delivered 61:2
demolish 63:11 84:23
demolished 51:15 141:24
demolition 52:3 55:11 61:16 62:6 69:9 70:15 72:11 77:15
Department 4:1 11:16 12:20 39:13
depending 22:4 37:14 70:21
depends 152:19
depicted 142:2
describe 89:22
described 125:25
describes 110:5
description 63:9
Desell 4:15 86:12 87:1
design 4:8 10:6 15:14 32:15 49:24 96:17 127:2 156:17,22 157:1
designated 55:3
designed 13:21 85:4 95:6
designs 156:12
desirable 100:23 101:22
desired 33:2 100:25
destined 38:7
destroyed 52:18 55:19 123:12 138:15 142:4 157:3
destroying 112:22
destroys 36:21
destruction 113:6 136:21,24
detail 62:20 64:20 81:12 82:3 110:8 123:8 134:8 149:19
deteriorating 141:15
determination 5:14 86:3 124:8 154:6
determine 19:24 100:19 105:18 144:20 155:1,13
determined 17:8 48:5
determining 18:14 153:11
developing 16:10 93:18
development 6:11 45:7 130:9 133:16 147:12
developments 103:7
Dey 14:7 17:21 18:8,17 30:22
dialogue 7:11
died 88:3 113:10
difference 21:21 26:7 34:22 37:3
differences 101:17
different 15:15,19 19:2 21:10 22:8 29:25 44:24 45:25 49:20 67:15 92:8 112:23 114:12 121:10,10 133:8 141:16,17 145:7
differently 118:20
difficult 64:15 76:13 105:3
difficulties 102:10
difficulty 98:23 99:8
digress 100:6
dime 151:25
direct 19:6 90:13
direction 93:4,9 121:19
directly 154:25
Director 5:3
dirt 78:18
disconnect 43:22 44:2
discuss 8:7 47:1 58:14 62:9 67:17 71:3
discussed 5:15 7:8 19:13 32:16 67:12
discussing 73:22
discussion 7:24 49:20 67:8 127:22 148:24 148:25
discussions 87:12
disposition 69:25
dispositions 73:7
dispute 59:17 154:4
disruptive 124:12 144:23
distances 147:23
distributed 44:11 44:16 53:18
distribution 43:23 44:5,6,7 47:10
District 3:17 8:21 19:9
diverting 56:8
division 115:25
doable 58:4 101:24
document 5:14 78:4,19 124:16 127:6 150:20 153:15 154:9,14 158:19
documentation 52:16 54:21 56:22 57:16 58:6,7 60:16,24 66:14 74:13,18 74:22 75:15 76:15 77:7 78:25 80:3 123:2,14,16 152:12
documented 137:4
documents 66:10

123:11 158:11
dog 151:24
doing 17:16 42:19 46:11 47:25 48:7 52:3 53:5 65:1 74:22 75:8 75:13,14 77:18 114:24 126:11 128:8 130:13 147:14 153:21 154:13
dollars 114:14
domino 94:8 98:13 99:18
donated 41:1,4 41:11
donation 41:13
door 98:20,25 99:2
doors 23:16 33:22 39:4,12,14 98:22
DOT 152:8,18
dotted 83:5
DOT-EIS 151:2
downtown 4:6,8 10:6 11:11 16:4 17:5,18 90:17
draft 5:13 7:13,15 7:21 110:19 111:13 129:4 158:10,21
drainage 76:7,25
drawbacks 34:12
drawing 15:21 16:6 19:12 76:20 101:6
drawings 7:12,13 7:14,15,22 63:14 128:24 156:9
dressing 33:5
drive 77:20
driving 111:18 152:24
drop 33:17 34:3
dropping 34:2 38:5
droppings 36:11
due 49:2 90:12 104:2 129:5,12 129:13
Dunlap 50:16
D'ADAMO 160:5 160:20

E

E 15:7,14 16:2,2 16:15 23:8,11 24:6 26:24 30:12 33:10,11 112:22 113:7 160:1
EA 47:23
earlier 57:12 74:8
Earliest 157:4
early 87:11 88:7 156:2,14 157:17
easier 111:3 128:15
easily 149:18
east 13:22 18:10 21:25 69:22 109:10 119:7 132:20 135:23 146:5,7
east/west 14:1 17:20 20:11 119:19 126:1 128:2 147:6
easy 88:23 89:2
ebb 57:18
echo 46:14
economics 110:24 111:17
edge 130:16,18
edges 22:6
effect 94:9 98:13 158:11
effectively 19:3 93:15
effects 5:14 154:21 156:12
effort 28:6 43:10 56:5 57:23 157:17,18
efforts 13:15 18:9
egress 100:6 117:14
eight 107:18,20 107:21 117:1
eight-car 95:1 108:2
eight-cars 107:1
EIS 97:5 102:3 110:19 111:14 151:6 153:7
either 30:19 34:15 38:20 61:3 64:15 83:11,18 87:3 102:2 120:4 121:6 146:7,19
electrical 86:6 127:11
element 38:15 55:14
elements 32:8,9 32:15 53:24 112:25
elevate 140:16,25 140:25
elevation 16:14 16:16,17,21 17:2 18:20,25 21:7,8,10,11,18 21:20 22:1,3,7 25:9,12,15 26:6 26:17,20 27:3 28:13,14 37:3 38:14,24 39:11 138:5 141:16
elevations 22:15 25:6
eligibility 45:20 137:5 153:11
eliminate 26:5,15
eliminated 34:23
eliminating 27:2 27:15,16
Elizabeth 3:1 10:18 53:16 109:7 122:3 159:2
emergency 3:23 10:17 31:6 73:4 91:20 137:8,10
emerging 107:8
emotion 137:21
emotional 28:19 28:25 31:11 143:19
emphasize 45:24 46:5
emphatically 53:22
employed 60:7
encourage 7:9
encroach 82:18
encroaching 111:9 112:12
encroachment 120:4,7 122:9
ends 99:2,9
engineer 121:8
engineering 120:5 122:14
enhanced 17:16
entering 30:7
entire 53:9 57:1 57:24,24 70:24 107:10,24 114:25 141:23
entrance 16:2,3 16:15 33:14 130:5 132:25 136:10
entries 15:14
entry 23:11,17 26:11 131:5
envelope 23:24 28:12 32:8
envision 6:24
equipment 75:24
erected 70:9,10
escalator 18:18 131:13
escalators 93:12 98:15 117:17
especially 43:18 87:22 88:20 157:6
essence 27:16,24
essentially 24:18 24:20 26:24 27:10 130:24 131:17,25 133:24 138:21 146:8
establishing 62:19
estimated 103:20
estimates 111:9
evaluation 97:22
evening 91:5
event 146:18 151:14
events 140:11 146:19
eventually 65:20
everybody 17:15 88:11 108:14 151:24
everyday 41:25
evocative 137:16
evoke 133:23 135:22 138:7 143:24 147:15
evokes 131:11
evoking 134:10
ex 46:17 47:7
exactly 24:22 64:20 101:16 139:12
example 51:23 123:3 143:11
exceeding 95:15
excess 92:20 96:17
Exchange 107:21 117:7
excuse 104:18
exercise 35:11
exercised 120:5
exhibition 24:21
exist 25:7 87:3 111:2 138:13
existed 23:21,22 23:22 102:15 106:6 133:10
existing 16:2,7,8 18:12 23:4,20 26:5 75:6 83:12 94:17,23 100:20 109:21 120:15
exists 16:3 119:14,16 130:8 133:8 136:9
exit 33:11,13
expecting 95:21 96:16
expediency 111:18
expensive 105:2
experience 28:24 29:5 36:1,4,23 79:13 88:25 89:16 122:2 140:5 144:23
experiences

145:7
experiencing 91:4
experiential 90:11
expert 80:19
explain 98:12 105:17 106:12 106:13
explained 64:9
explanation 124:24
exploration 122:5
expose 75:1,25 76:11 141:5
exposed 50:17 75:3 132:23 138:9
expressed 6:14
expressing 57:21 144:22
extend 62:10 109:10 129:5,8
extending 109:8
extensive 107:6
extent 61:10 149:18
extremely 105:3 150:7

F

F 160:1
fabric 38:11 130:18 133:15
facade 132:18
face 60:2 126:7 130:19 132:24
faced 111:6
facilitate 151:10
facilities 83:11
facility 14:10 23:10 24:4
facing 40:23
fact 44:11 46:5 62:3 64:17 87:25 88:4 94:16 98:4 112:20,24 127:25 134:8,17 135:9 136:15 138:14 149:16 152:7
facto 46:17 47:8
factor 134:10
factored 5:23
factors 105:7 124:13
facts 153:13
fairly 90:9 92:15
fall 77:3 141:20
falls 130:23
familiar 29:24 65:2 134:8 143:21
families 3:6 5:22 8:23,25 9:2,4 10:12,21 54:18 148:22 149:22
Families/Coalit... 101:12
family 157:9,20
far 34:17 41:13 48:3 73:9,11 89:25 96:21 109:16 113:3 116:11 145:5 153:2,10
fare 21:24
farthest 109:9
fast 123:19 150:4
faster 35:6 117:8 117:9 118:2
Father 70:12
fears 155:6
feasible 101:20 108:7 110:20 111:14,25 141:14
featured 54:24
features 5:13,16 53:23 55:2,17 58:8 76:18 153:20
February 70:17
federal 5:4 46:1
feedback 5:18 15:18 27:13 35:19 53:20,24
feel 49:18 55:16 88:19 121:22 124:5,11,18 131:10 137:20 144:25
feeling 27:18 28:13 31:11 131:11,23 133:23 134:10 135:22 138:4 146:2
feels 101:12
feet 19:14 21:14 22:17,18 23:7 24:18 26:7 126:9 132:9 140:16,19 141:1
felt 78:20
fence 77:19
ferociously 113:16
Ferry 47:16,22,23 48:7
Ferster 4:3 10:20 10:20 54:17,17 122:25 124:2
fiberglass 32:2
fifth 29:10 156:3
figuring 80:14
filed 59:16
fill 42:1 74:24 76:6
final 7:13 158:21
finalize 42:12
finalizing 40:16
finally 48:5 78:16
Financial 14:2 17:23 30:20 80:9
find 41:6 43:13 44:10 71:15 134:25 137:16
Finding 158:10
findings 158:10
fine 29:18 67:1 144:25
finish 23:25 69:19 121:10 134:9 136:23 154:7
finished 53:7 56:24 85:19
finishes 131:15 138:6 140:1
Fire 39:13
first 23:4 28:5 36:2 38:4,8 87:12 123:16 130:4,7 145:18 146:16 153:22 156:2
fit 8:5
five 56:12 81:19 81:19 85:22 96:21 100:10,13 100:14,23 114:17 123:25 126:9
five-minute 115:11
five-year 106:4
fixed 20:3 32:8 144:18
flexibility 96:4 100:15
flight 26:15
floor 32:22,24 132:11 133:19 135:19 140:7
flooring 23:22
flow 57:18 131:7 147:19
flown 80:21
focus 13:10 34:20 74:10 153:24
focused 12:13 14:25
focusing 12:24 146:17
FOE 110:5
folks 90:7
follow 66:16 74:16,17
followed 150:23
follow-up 54:19 54:25 58:11
foot 21:21 37:3 148:2,5
footings 126:16
footprint 21:3,4 75:19 77:16,21 79:7 82:7,10,13 82:16 83:25 121:4 125:9,11 127:13
footprints 13:2 20:12,13,15,16 20:17,19 57:8 58:2,10 73:13 74:13,19,23,25 75:5 77:10,11 77:19 78:1,23 78:24 79:2,4,8 81:8 110:7 111:2 112:13 114:19 120:8 125:18,22 127:7 128:1,3,19 146:17 154:25 155:5,9,20 156:10,15
foreground 138:3
foreseen 49:5
forget 87:22 103:5
form 23:24
format 8:3 40:19 62:14 97:14 124:5
former 34:12 150:10
forth 60:6 72:15 140:12 149:5
forward 6:4 32:16 44:25 47:22 61:22 66:5,25 77:13 78:3 91:3 95:19 106:5 116:24 117:22 123:18
found 70:7 72:11
foundation 141:21
fountain 47:20
four 23:2 24:3 27:10 38:21 49:17 81:22 82:17 100:24 101:23 108:15 140:16 141:1
fourth 26:22 82:1 82:12 97:4,23 98:2,6 101:7 124:7 156:3
four-foot 26:17
frankly 48:25 79:2 97:6,23 98:7 149:10,12
Freedom 19:1 30:21 48:23
frequent 29:4
frequently 116:20
Fresh 58:21,23,25

Friday 5:21
front 138:8
frustrating 26:1 50:11
FTA 3:9 5:3,4 11:17,19,20 88:24 89:11
full 122:8
full-width 91:16
Fulton 14:8 17:21 119:24 125:24
function 38:2 101:1
functional 122:10
Fund 3:23 10:17 31:6
funding 5:4
further 71:23 108:23 110:8 111:10,10 114:19 119:2,21 160:12
furthest 89:21
fuss 87:15,15
future 7:14,21 57:17 73:8,16 90:4 96:9 122:5

G

garage 50:17 53:23 55:12 56:15
Gardner 3:7 8:24 8:24 20:10,18 20:24 21:13 35:12,12,20 36:14 50:7 51:11 52:6 71:22 78:15 79:20 86:19 88:13 110:18 112:10 115:4 127:18,22 128:14,18 129:3 129:12,19 138:10 141:9 144:13 147:5 149:1 150:6 154:19 158:8
general 72:25 83:15
generalization 96:19
generally 90:24 92:18,24 94:13
generic 43:12
gentle 37:4
getting 5:2 50:11 53:5 54:3 68:7 76:15 78:11 94:20 96:11 131:13
ghetto 140:4,6 142:9
GINA 160:5,20
give 19:19 27:12 34:4 40:9 41:9 53:20,24 113:12 115:10 129:19 131:9 145:25 153:14
given 40:15 45:14 47:8 49:9 53:10 63:3,4 65:19 86:22 134:7 138:19 148:14
gives 21:2 27:18 123:2 130:12 139:23
giving 132:16
Glenn 2:15 9:20 9:20
glow-in-the-dark 51:24
go 8:14 15:7 18:19,20,21 20:23 25:15,25 26:21 30:4,6,11 30:19 31:1 32:4 33:8 35:3 36:8 37:2 42:11 48:3 58:20 61:22 65:9 66:3,7,13 66:23,25 67:22 68:7,13 70:22 72:5 76:15 81:11 83:22 85:20 94:2 99:20 107:1 108:2 110:7 113:25 115:5,6 116:11 122:24 123:7 130:1 133:16 139:7 144:20 145:8,15 148:12 149:8 158:13
goal 14:15 17:3 56:23 114:24 118:3
Goelz 3:11 6:9,21 6:22 7:19 8:13 12:4 15:9 24:14 24:17 25:11 26:14 28:21 33:8 34:9,20 35:1,8,18 36:10 37:10,19 40:3 58:9,20 67:3 69:5,10,24 72:2 74:10 78:11 79:22 82:23 84:6 85:9,23 99:24 101:4 104:4 106:2 109:5 110:16 115:13 118:16 120:2 122:17,24 123:22 124:1 128:25 145:13 147:3 154:18 155:24 156:23 157:2 158:22 159:8
goes 62:23 65:21 77:12 86:8,9 98:20
going 7:4,11 12:17 14:18 15:1,16,19,24 17:12,22 18:1 19:19 24:12 28:14 29:5,13 29:16,17 30:7 32:16 35:3 36:4 38:16 39:3,8 41:15 44:24 45:8,23 46:6 47:22,22 48:6 49:8 51:11 52:9 53:17 55:8,13 57:3 61:1 66:5,7 66:13 67:13,25 68:8 70:4 71:15 71:25 77:14,16 77:23 78:3 80:25 84:16,22 84:25 85:10 89:3,4,10 90:3 91:3,6 93:4,5,6 93:9,15,16 95:22,23 99:11 102:13,15 103:7 103:11 104:14 104:21 105:1,5 105:14 106:8,17 106:21 108:7 113:12 114:12 114:18 115:2,19 118:10 120:21 122:7 123:18 124:4 126:19,20 127:3 129:8,15 129:20 130:4 132:6 134:2 135:7,23 136:20 137:17,19 140:16,19,25 143:21 147:5 152:17 154:7,22 157:9 158:9
good 6:22 10:11 12:5 35:9 46:18 49:3 57:16 72:21 87:15 121:19 155:11 158:25
gotten 94:4
grab 43:10,11
grade 132:8 151:15
grades 133:7
Grand 29:12
great 34:11 43:20 44:19 45:15 49:1 98:23 99:8
Greenwich 18:4 148:4
ground 141:1,2
group 59:9 65:14
groups 53:21 56:12 60:9 72:9
Grove 107:20
growing 117:4
growth 90:12
Guaranteed 85:23,24
guess 74:5 102:18 124:25 134:21 156:24
guidelines 64:24
guys 120:24 121:16
guy's 151:25
Guzi 2:15 9:20,20

H

HABS 51:1,3,9,12 52:16 53:6 54:5 54:21 56:2,24 57:1 59:22 60:3 60:16,23 61:7 61:13 63:24 64:7,13,18 65:19 66:1 68:1
HAER 37:23 50:25 51:1,3,9,12 52:16 53:6 54:5 54:21 56:2,24 57:1,9,24 59:22 60:3,7,12,12,16 61:13,17 62:2,3 62:4 63:1,10,13 63:24 64:7,13 64:16,19,21 65:1,16 66:1 68:1 69:3
half 76:12 82:10 88:21 118:9
hall 13:20 16:14 22:2,3 146:17
hampered 64:3
hand 39:6 44:9 160:17
handed 127:6
handle 95:3 110:15
handling 100:18 116:16
handrails 23:21 51:24
handwritten 42:18
hand-selected 43:10
hanger 39:24 40:11,13 42:1,9 42:14,24 48:4 51:19 52:4 59:2 131:20 143:16

hanging 27:7
Hanley 2:7 10:1,1 41:17
happen 48:6 68:1 68:18 70:4 71:25 72:4 77:11 103:7 127:17
happened 76:5 88:11 92:11 136:20
happening 32:19 77:9 93:1 94:7 94:21 99:5
happens 70:5 95:20 98:18,24 154:4
happy 54:6
hard 105:18 153:12 154:3
harm 105:22
Harold 2:12
Harrison 107:18
hate 98:21
haul 85:4
heading 48:15
head-on 73:19
hear 15:18 33:7 47:11 72:23 125:1 129:10 157:24 158:6
heard 20:1 46:4,4 46:25 63:8 67:8 69:7 89:7 104:15 116:12 117:13 120:24 134:12
hearing 6:1
heart's 111:6
heavier 106:23
heaviest 118:6
heavily 25:21 135:21
heavy 75:24 118:6
height 126:24,25 127:1 140:19
held 5:9,12
help 34:8 40:6 76:25 116:10,13 116:15 118:11
helpful 81:1
herd 93:19,22
hereunto 160:16
high 17:2,11,13 53:14 80:20
higher 18:24 22:23 132:8,10
historic 3:17 6:17 8:21 19:9 31:9 35:22 36:15 38:11 56:16,21 79:7 104:23 105:5 111:1,11 111:19 112:16 112:25 113:9 134:14 139:18 141:18 143:4 157:11
historical 121:1 145:2
historically 63:12
hitting 18:3
Hoboken 92:2,10 106:24
hold 26:6,19 71:5 98:20,25,25 99:2 121:5
holding 98:22
holistically 56:18
Holocaust 140:2 142:24 143:6
honest 142:5
honored 63:25
hook 14:6
hooking 14:7 18:7
hope 5:25 6:5 34:15 40:18 73:20 152:4
hoped 49:5 73:24
hopefully 15:21 56:24 115:16 130:2 153:17
hoping 121:15 151:18
hotography 57:9 57:24
Hotopp 3:20 9:13 9:13 62:13 63:17 64:25 65:22 153:10 155:23
hour 90:25,25 91:1,2 94:15 96:14 99:7 113:20 116:21 117:3
hours 117:6
house 141:21
hub 1:6 12:11,14 12:25 13:2 14:4 15:1 30:8,13,18 30:24 82:22 119:18 146:6 147:21 148:6
Hudson 113:19
hulls 137:23
human 98:19
hundred 94:3 98:14
hybrid 100:19 112:7
hypothetical 143:11
H&M 100:12

I

idea 24:12 56:25 73:1 103:23 121:13
ideal 102:14
ideas 5:25 71:23 128:7
identified 100:16 123:6
identify 59:10
illustrate 62:21 63:18
illustration 140:14
images 134:12
imagination 85:6
immediately 137:13
impact 56:11,20 58:12 82:13 83:4 84:7 126:4 126:11 135:16 137:14
impacted 82:20
impacting 82:15 133:12
impacts 13:2 56:16 81:8 83:24 105:19 113:3 130:1 154:25
impediment 135:24
impinging 98:7
implementation 59:18
importance 39:9 64:22 120:7 155:8
important 39:8,9 55:9 78:20 79:25 81:10 101:10 105:16 105:20 112:19 116:8 133:22 144:2,2 148:18 150:3 154:15
improve 99:15 116:19
improved 34:17
improving 123:17
inaudible 10:15 11:24 32:6 33:10 62:14 63:18 86:24 134:18
inches 78:18
inclined 28:7
include 57:4 58:1 75:10 97:17
included 50:21 131:14
includes 45:6 137:7
including 76:1 131:1 151:4
inclusive 130:16
incorporate 15:13 16:8 88:24 102:19 134:2
incorporated 106:20 137:23 145:19
increase 91:6 116:15 117:24
increased 90:13 93:1,3 103:4,5 108:2
independent 97:21 151:23 152:4,7
index 62:22
indicate 61:17
indicated 65:7 83:9
indicates 131:4
indication 130:12
individually 56:17
individuals 89:9
inevitably 6:7
Informally 43:2
information 53:22 104:14 123:2,7 129:7 135:5,14
informed 46:16
infrastructure 16:7,9 18:13 81:7 82:21 94:17 95:20 110:6 125:9,11 125:16,21 126:20 127:7,10 131:7 155:14
inherent 74:2 134:15
inherited 136:11
initiate 61:16
input 158:23
inside 22:20 77:20 119:23 121:9 125:9,11 132:1
installing 69:14
instance 135:6 143:15,16
institutions 44:17
integrate 15:13 17:3
integrated 44:7 150:8
integrating 130:14
integrity 38:12 73:12
intend 127:9
interactive 7:7 8:4
interconnected 82:25
interest 28:18 43:21 46:18 139:12

interested 54:20 160:15
interesting 52:23 138:11 142:23
interfaces 14:17
interim 40:15 83:24 158:21
interior 75:10 76:2 81:9 134:23
intermodal 19:4
interpretation 38:19
interpretative 32:14
interpreting 111:23
interrupt 19:9 48:11
intimately 44:23 45:4
Intrepid 40:22,24 41:5
intriguing 73:5
introduce 8:15
introduced 149:13
introduction 45:14
inventoried 59:1
inventories 50:22
inventory 41:15 41:21,25 52:8 52:17 53:2 54:2
inverse 38:10
involve 63:14 101:7 124:12
involved 12:21 44:23 110:24 157:8
IRT-1/9 130:4
isolated 17:7,14
issue 32:7 33:17 41:20 46:20 56:9,10 58:12 62:12 64:1 65:6 67:23 74:14 79:18,24 80:4 88:17 98:19 99:13 103:19 104:9,11 105:16 108:17 111:7,19 112:23 113:2 116:9 120:8 122:20 145:15 146:11,11 153:2 154:23
issues 6:2 7:10 8:6,6 13:7 25:17 27:5 35:23 40:11,21 48:17 59:20 60:9 89:15 100:18 115:22 121:21 123:5 133:18,18 141:12 154:1
item 15:7 147:16
items 7:8 51:18 51:21,23 52:1 56:5 145:18
I-beam 43:12
I-sections 43:16

J

Jack 3:8 9:1,1 21:5,15 22:10 23:1 39:4,12 40:5 58:20,21 59:8 65:5,12,23 66:2,7,12,19 67:1,15,19 68:6 68:10,21 71:17 75:9 78:5 84:2 88:6 106:3,14 121:13 126:23 133:1,5 140:15 140:23 141:5 149:22 157:20
Jackie 2:7 10:1,1 15:6 40:16,19 41:14,16,17 142:21
Jane 1:25
January 86:1
jeopardizing 103:18
Jersey 1:11 2:1 21:12 51:6 93:5 93:7 117:5,6 118:1,1
Jesi 4:7 11:10,10
JFK 71:5 128:10
Joel 3:6 8:22,22 38:1 39:7 59:14 59:14 61:8,15 61:25 63:8,17 63:20 64:13 67:17 69:1,6 80:13,23 96:25 97:19 100:1 101:8 102:18 103:14,19,24 122:10,20
John 3:20 9:13,13 62:8,13 63:17 64:8,25 65:20 65:22 153:10 155:23
join 14:5
joining 12:6
joint 45:19
Jonathan 4:8 10:5,5
Journal 107:18
judgment 104:19
July 1:10 15:12 136:12
jump 8:1 91:8 125:5,18
June 5:12 61:7 64:11
justification 89:20
justify 111:8

K

Katherine 4:5 11:7,8
Kathy 63:6
Katsimatides 3:14 11:1,2 86:21 87:4 89:12 103:3,12 103:16,22 104:10
keep 16:17 17:24 38:3 71:2,14 77:1 92:2 112:14 156:8
keeping 17:2 18:2 18:5 25:6
Kelley 3:14 6:11 11:3,3 49:19,19 50:4
Ken 3:23 10:16,16 31:5,5,17,21 32:10,14 39:6 56:7 57:3,11 58:11 80:3 110:4,12
Kennedy 71:14 73:14
Kept 23:24,24
Kevin 2:14 9:14 9:14 98:20 115:18,23,23 118:24 123:15 123:24
key 45:24
Kills 58:22,23,25 59:4
kind 27:16 35:20 50:23 58:8 63:11 71:16 77:11 80:5 94:8 94:21 95:16 101:8 121:14 140:12
Klein 3:6 8:22,22 38:1 59:14,14 61:8,15,25 63:8 63:20 64:13 67:17 69:1,6 80:13,23 96:25 97:19 100:1 101:8 102:18 103:14,19,24 122:10,20
knew 84:20 121:3
know 8:13 14:24 21:15 24:10 27:25 28:2,6 34:6 36:3,8 37:22,24 40:8 40:12 41:22 44:22 46:4,7 47:16 48:7,8 49:22 50:21 51:17,23 52:4 52:19 54:12 56:7 58:12,25 59:15 60:2,4,12 62:2 67:9 70:10 71:24 74:13 76:11,20 78:5 79:25 87:5,6,14 87:24 89:5,8,15 93:20 95:5 103:14,20,24 105:15 106:15 106:22 107:16 113:4 114:21 123:13,13 125:23 128:13 129:17,22 133:16 135:2 137:7 140:6 142:11,12,16 144:17 149:10 150:10 158:3,18 159:6
knowing 64:22 111:1 133:14
knowledge 143:19,24
Koenig 47:18,24
Kornfeld 3:17 8:20,20 19:8,9 19:16,22 20:4 38:24 43:2 72:25 73:24 102:23 103:8 104:6,12 105:24 106:12 108:4 118:18 119:2,10 119:13,24 120:11 121:17 137:6 139:11 141:23
Kraft 4:11 10:9,9 144:15 156:8,24 157:4 158:2
Kraft's 150:7

L

L 127:20
lack 34:14
land 108:18
landing 119:23
landmarks 49:1
lands 75:21
language 153:6
large 62:14
largely 90:12
larger 109:19 130:23
late 40:7,19 50:15 53:19 69:19
law 67:24
lay 64:19 133:17

LBG 3:20 9:13
leading 24:20 138:17
leads 150:15
leave 48:16 70:18 71:10
leaving 24:6
Lebrun 3:10 11:20,20
led 138:12
left 33:23 36:20 136:15,17 137:3 140:24 145:25
Legislation 8:18
Lejda 2:14 9:14 9:14 98:20 115:23,24 118:24 123:15 123:24
Lenahan 2:10 129:24,24 133:6 135:18 136:5,21 138:18 141:3,7 145:11,14 147:14 148:19 149:16
length 5:15 81:23 109:13 122:22 122:23
lengthen 116:25
Lengthening 117:10
lessens 149:7
lesser 49:13
letter 5:21 58:16 58:16 150:24
let's 8:14 34:20 74:14 104:3 110:16 120:19 126:9,13 128:25 129:1 143:15 155:24
level 16:24,24 17:8 18:19,21 19:24 20:25 21:2,9,14,17,19 21:22,23,24 22:10,12,16,18 22:18,19,20,21 22:24 25:8 27:22 29:22 30:5 31:1,1,2 32:3,17,22 33:16 35:4 38:10 60:6 63:10,13 64:21 67:10 83:9 85:16,18 90:9 96:6 98:1 99:15 101:22 119:8 123:4 124:21 130:10,17 132:8 144:14 146:7,8
leveling 77:1
levels 21:7 22:9 126:24 148:14
Levine 4:1 11:15 11:15
Levitt 2:12
Lexington 29:11
lightly 125:22
limitations 116:22
limited-service 91:12
limiting 94:15
line 14:6 27:9 41:20 77:19 83:5 104:6 106:24,25,25 107:11,14,24 117:24 118:6 119:6 126:10 127:12
lines 19:5 91:14 92:5
link 24:23
links 57:12
list 156:9
listening 72:7
literal 135:4
literally 93:13 110:22
little 22:23,25 28:1 38:18 40:6 43:14 50:11 62:22 81:12 84:8,24 110:8 115:19 118:2 120:20 122:18 123:7 139:2
lives 103:18 128:15
LMDC 3:13 11:2,4 12:19 13:6,15 14:19 44:2,5,21 45:5,9 46:7,23 47:1 48:19 54:13 56:4,11 57:13 59:21 63:23 64:4,7 66:23 67:20 74:21 75:14 78:6,16 88:7,14 154:23 155:2,12 155:18 157:12 157:19,22,25
LMDC's 54:8 59:17
Lo 3:12
load 118:8
loading 118:9
lobbies 17:8
lobby 130:24 131:1 134:22 143:12
local 46:1
located 13:22 70:5 142:10
location 16:1 70:13,17,19 76:10 81:16,24 87:9 127:19 130:11 144:19 145:8
locations 14:12 63:19 71:6
locked 32:22 136:10
log 71:13
logically 98:1
long 85:4 109:15
longer 99:16
look 52:17 59:10 101:13 114:12 121:24 122:15 134:13 139:13 139:18,24 140:5 141:22 142:3 148:16 150:21 156:10,13
looked 15:15 23:10 25:5 27:1 80:9 130:7 139:20 142:18 147:23
looking 15:22 21:9 25:1 58:19 70:24 73:12 77:4 91:3 100:11 105:8,12 111:15 122:16 130:5,10 131:6 131:25 132:1,20 132:21 140:17 140:21 142:21 146:8,13 147:1
looks 28:1 109:7 145:2
LoPresti 8:17,17 29:3,23 34:11 37:7 43:17 46:12 47:4,13 48:15 49:25 50:6
lose 29:1 38:7 139:8
losing 132:12
lot 8:10 26:19 33:19 41:19 42:5 43:6,7 46:10 58:22 71:24 75:15 89:9 91:21 92:11 93:6,7 95:5 98:19 103:9,10 111:16 121:21 126:19 129:6 130:13 136:13 137:8 143:1,18 148:20 154:20 155:6
Lou 8:9,13,14 9:16 22:14 74:15 75:9 89:15,24 96:2 119:18
Louis 2:3,16 4:9 8:12 9:16,24,24 10:4 12:5 15:5 15:11 19:15,18 20:1,5,13,20 21:1,16 22:12 39:16 74:17 75:11 81:5 83:7 84:4 85:2,12,24 86:15 128:6,16
Louise 3:12 8:17 8:17 29:3,23 34:11 37:7 43:17 46:12 47:4,13 48:15 49:25 50:6,10
Love 3:22 9:5,5 27:14 28:16,23 36:19 135:20 148:17 150:15 153:6
lower 3:9,23 5:3 6:10 10:16 22:25 31:1,5 90:17 95:21 105:6
lowest 21:18,22 22:10,12
Lustbader 3:23 10:16,16 31:5,5 31:17,21 32:10 32:14 39:6 56:7 57:3,11 58:11 80:3 110:4,12
Lynch 3:8 9:1,1 21:5,15 22:10 23:1 39:4,12,21 58:21 59:8 65:5 65:12,23 66:2,7 66:12,19 67:1 67:15,19 68:6 68:10,21 71:17 75:9 78:5 84:2 88:6 106:3,14 121:13 126:23 133:1,5 140:15 140:23 141:5 149:22 157:20

M

M 160:5,20
magnitude 114:11
main 14:3 16:13 25:18 146:5
maintain 83:9 85:16,18 96:6 98:23 133:11
maintained 38:12
maintaining 26:23 96:14
major 77:5 125:8 125:10 135:23

majority 113:11
making 26:25 39:7 78:17 104:19 125:14 149:2
Manhattan 3:9,23 5:3 6:10 10:17 31:6 90:17 95:21
manuals 64:19
mark 2:11 3:3 4:14 9:9,9 11:21 11:21,23,23 41:23 42:3 43:5 76:19 89:15 95:17 116:3 119:5,12,15 120:1,19 121:14 121:20 122:12 122:19 125:4 128:5,23 156:15
marked 77:25
markings 39:13 42:16
marriage 160:13
MASS 3:15
master 16:10,25 17:3 45:5 54:13
matching 64:23
material 75:15,24 76:14,23,24 77:6 143:7 145:10
materials 32:1
math 25:16
matter 44:16 136:15 150:9 160:9,14,15
maximized 98:1 100:14
maximizing 126:23
maximum 101:21
McNeilly 2:9 9:7,7 22:14 32:25 73:21 89:17,18 97:8 98:9 100:9 102:4 104:2 105:9 106:11,21 108:6,16 109:12 110:14 111:22 112:14 113:20 113:23 114:2,10 114:20,23 119:1 137:1 150:13 152:6 153:1,8 157:23 158:6
mean 45:22 49:23 74:10 91:23 119:10 121:12 124:8 128:20
meaning 134:14 143:5
meaningful 120:23 134:24
means 22:16 24:11 95:3,14 108:20
meant 91:24 92:21 93:17 94:9 133:3,4
measured 42:15 63:14
meat 153:23 154:12
meet 96:15 99:7 156:1,4,6
meeting 1:8 5:8 5:11,19,24 6:3,8 6:13 12:9,12 15:12 40:22 41:23 43:18 46:25 72:17 83:8 84:12 88:7 88:12 89:19 97:1 99:8 120:24 125:3,8 134:6 147:18 150:18 153:18 155:25 156:1 158:15,17 159:3 159:5,10
meetings 6:17 13:5 82:5 89:8 105:15 154:14
member 157:21
members 55:23 157:8,9
memorandum 114:25 115:1 155:3
memorial 3:12 8:19 43:24 45:6 47:21 54:14 57:13,17 73:15 86:14,20,23,23 87:21 88:3,9,10 89:4 103:13 104:22 115:9 126:21 127:2,20 128:20 142:8,17 143:14 145:15 146:12,14,17,21 146:23 148:13 148:25 149:6,8 155:15
memorials 149:9
Menno 2:3 8:12 8:14 9:16,16 12:5 15:5,11 19:15,18 20:1,5 20:13,20 21:1 21:16 22:12 39:16 74:17 75:11 81:5 83:7 84:4 85:2,12,24 86:15 128:6,16 158:18
mentally 140:13
mention 47:15 52:18 127:23 142:24
mentioned 6:24 58:18 81:13 82:4 96:2 107:3 116:3 150:20 152:11
merchandise 37:16
merit 112:1,2
merits 104:24
Merritt 3:1 10:18 10:18 53:16,16 109:7 122:3 159:2
mesh 55:15
met 51:17
method 57:16
methodology 97:21
mezzanine 14:10 21:23 146:8
mid 69:19
midtown 90:13
mind 18:2 92:3 112:15 138:7
minimal 17:25 63:10
minimize 105:19 105:22 120:6
minimizing 120:4 122:9
Minnesota 159:5
minor 107:22 109:1
minute 50:9 99:4 99:4 107:15 154:17
minutes 34:21 92:25 115:14 154:17
missed 150:14
missing 157:1
mitigating 156:11
mitigation 55:23 60:6 61:21 73:1 73:11
mixing 14:3
mock 128:11
mode 25:25
modern 139:21
modification 110:3
modifications 107:19 109:17
modify 26:4 107:24
Moloney's 4:11 10:10
moment 19:19
momentum 6:4
money 105:7
month 41:23 57:25 58:4
months 41:18 42:8 78:21
moot 74:5
morning 10:11 25:20 91:5
motorcycles 137:25
move 24:25 26:3 40:4 47:24 48:9 49:6 71:5,8,12 74:12 115:22 117:25 123:19 128:24,25 139:2 145:12 149:17
moved 42:8,13 48:2 70:16,20 119:21
movement 17:25 18:10,24 30:3 147:19
movements 19:2
moves 35:5
moving 6:4 24:15 48:12,14 49:14 95:19 116:24 117:22 118:4 132:2,4 141:21 146:3,4 148:3,3
MTA 11:6 23:17 45:13 47:16
mumble 34:10,10
museum 24:7,21 28:4 140:2 142:24,25 143:6 144:20 157:10

N

N 14:6 18:7 160:1
name 5:2 7:20 40:7 86:17 87:20 89:2,2 115:23 158:18
named 86:14 87:1
names 87:19
naming 86:18 87:24
narrow 109:13
narrower 122:6 122:11,13,21
national 3:1,12 5:9 8:19 10:19 53:17 59:23 60:8 61:7 65:21 149:8
naturally 70:6
nature 60:3 77:12
navigability 34:14
near 7:14,21 70:8 92:12 94:22
necessarily 108:19
necessary 65:13 70:14 98:8 101:25
necessitates

70:20
need 6:15,18 7:25 8:6 26:21 46:2 65:13 82:24 83:19 84:18 89:24 95:18 97:4 98:11 101:13 107:6 115:10 122:8 127:11,16 155:14
needed 38:19 62:20 96:20,21
needing 71:2
needs 34:18 35:10 86:11
negatives 62:16
network 131:5 148:5,8
never 59:5,22 64:18 84:22 88:18 113:21,23 149:14
new 1:11,11,13 1:13 2:1,1 4:1 7:10 8:6 11:15 11:23 12:19 14:9,10,11 16:3 16:24,24 21:12 23:23,25 29:12 33:14 48:21 50:12,19 51:5,6 51:6 59:4,12 60:17 61:4,12 61:13,20 64:9 64:12 65:18 66:17 68:2,9,18 81:14,14,22 82:21 87:24 103:6,11 114:5 116:23 117:5,5 117:22 118:1 123:18 126:8 130:9 138:20 152:8,12,18 160:2,3,7
Newark 92:1,9 106:23 107:10 107:16 108:9
Newman 10:3,3
Newmann 4:10
nice 44:5 99:14
142:16
nine 78:21
non-peak 91:23
normally 134:13
north 14:4 15:23 18:25 20:18 70:11 77:16,19 77:24 78:9 82:13 84:2,9 109:18,23 119:3 119:21 132:21 138:5 148:1,4
northern 109:19 147:7,9
northwest 13:12 51:2,10,16,22 52:2 53:7 54:6 54:11,22 55:24 56:3 60:17 61:21 69:21
notable 120:13
Notary 160:6,20
notice 79:18 114:17
noticeable 138:2
noticed 64:17
number 15:7,10 30:10 40:14 62:25 90:8 153:19
numbers 25:23 42:12 95:11 97:13,17 104:15
nuts 98:21
NYSDOT 13:6 14:19 151:9,16
NYSDOT's 45:12

O

O 160:1
object 39:1 134:14,15
obligated 59:24 101:18
obligations 101:19
oblique 80:25
obliques 81:1
observation 147:11
obstruct 78:18
obviously 21:10
28:1 124:3 138:12
occasion 144:19
occupied 82:10 82:17 127:8
occur 151:17
occurred 46:16 90:2,19 109:3 150:2
occurring 70:7 99:3 109:17 132:7
occurs 98:16
October 70:12 131:15
odd 91:1
office 3:9 4:11 5:4 10:10 103:9 133:7
offices 61:2
official 41:12
officially 157:7
off-load 118:7
oftentimes 135:4
oh 39:5
okay 20:5 32:10 34:2 35:11 39:5 47:13 48:13 106:14 145:11
old 25:15 100:12 103:25 130:14
once 14:13 71:4 78:22,23 81:25 85:19 95:2
ones 33:11 34:21 79:3 155:1
ongoing 46:18 48:18
on-site 145:9
open 133:19 135:19 139:7
opened 86:13
opening 132:13 132:15
openness 138:23
Opera 49:5
operation 38:8 116:1 137:8,10 137:15
operational 89:23 100:15,18 102:9
operations 89:25
91:18 102:12 115:20 116:11
opinion 105:10 145:9
opportunities 145:16 146:13
opportunity 116:7,18,23 148:13
opposed 55:1 116:20 124:23 135:9 149:23 150:22
opposite 93:4,9
optimize 109:24 112:8
optimizing 94:19 99:22
option 24:14,16 24:17,25 26:3 26:22 38:4
options 15:15,19 23:3 24:3 25:1 27:11 29:2 117:19 123:3,9 124:6,6,10,10 124:20 152:14
orange 142:1
order 114:10
organization 59:9
organizations 49:13
original 14:12,12 16:18 38:2 42:17 60:5 64:17 76:16,19 81:21 85:21 88:17 105:24 134:19 139:14 142:18 144:9
originally 17:6 38:7 39:5 49:4 85:25
outcome 154:16 160:15
outhouse 63:12
outlined 121:6
outlines 57:5 80:6
outside 22:6,24 78:2 125:11,15
overall 19:20
34:16 56:21 113:3 119:16
overbuild 112:2
overhang 138:24
overhead 23:18
overlaid 131:24
overlap 14:24
overlays 130:9
overnight 91:22
overpass 151:21
owner 45:3
owners 12:23 13:17
owns 44:22 157:15

P

Pagliettini 2:11 9:9,9 119:5,12 119:15 120:1,19 121:14,20 122:12,19 125:4 128:5,23
painfully 109:15
panel 47:2 157:19
paper 47:10
Park 3:18 10:8 47:21 59:23 61:7 147:20
parking 53:23 56:15
part 7:23 12:9 13:13 17:17 25:4 28:12,25 39:25 43:16 49:16 51:8 54:8 54:12,13,14 55:6 56:1 57:4 63:22 72:6 73:22 75:3 82:22 97:18 107:8 113:2 114:23 119:16 119:17 122:1,4 122:13 127:1 128:6 136:12,22 139:14 157:7,7 157:8 158:20
partial 109:9
partially 106:13
participants 47:7
participate 6:12

particular 14:16 23:5 50:16 94:15 112:18 144:16 145:8 154:22 155:4
particularly 79:24 91:22 117:7 152:14 156:19
parties 1:8 5:11 6:13 35:21 39:22 45:11 50:13 52:8,15 53:3 54:20 55:10 79:1,13 97:1 129:6 133:20 144:18 144:25 158:5,11 160:14
partners 13:16
Partnership 4:8 10:6
parts 73:10 135:4
party 6:17 45:10 45:13 72:17
passageway 25:21 26:5 152:9
passed 145:11
passenger 91:7
passengers 90:21 91:4,20 92:13 93:8 102:8 116:16,17 118:7
passing 128:3
PATH 1:7 5:5 9:15 12:11,24 14:9 18:5,22,23 19:5 21:19 22:22,23 23:9 30:14 44:25 45:1 54:12 56:8 56:14 75:5 76:12 81:7,14 82:6,9,21 83:10 84:19 85:19 87:13 90:18 91:18 92:3 94:9 94:13 100:9 101:1 110:21 115:25 116:8,17 117:15 125:9,10 125:12,15 127:9 145:20 146:12 146:20 151:6 156:25
PATH's 151:13
Patricia 3:7 9:3,3 30:4,17,23 72:5 83:3 84:10 87:10 108:11 113:4,21,25 114:8,16,21 136:1 142:11 144:4 148:22 157:14 158:16
Paul 3:10 11:20 11:20
pavers 156:19
paving 140:3 142:9
peak 90:23,24 91:5 94:7,15 97:15 99:5 113:20 117:6
pedestrian 17:24 150:19,22 151:21 152:23
pedestrians 131:8
Penn 25:19 90:14 90:14 107:17
people 18:10 21:8 21:25 23:9 24:5 25:2,18,19,22 25:24 26:2,8,13 26:20,24 27:7 28:8,10 29:16 29:17 33:10 35:3,25 36:4,7 38:15,20 39:2,9 57:14 59:23 64:15 87:5,6,17 87:21 88:2 89:3 89:18 90:15 92:18,21,23 93:11,16,18,25 94:4,6,20 95:5 95:24 96:10,11 97:9 98:14,19 98:21,25 99:17 101:16 104:4 113:10,11 117:8 117:11,21 118:5 127:24 131:22 135:3,7 137:2 137:20,24 139:13 142:10 149:5 150:9 156:10 157:1
peoples 103:18
people's 28:2 115:18
percent 78:9,10 82:15,17,18,19 84:7,9 102:11 121:24 125:12 125:13 155:15 155:16
percentage 79:24
percentages 78:14 155:21
perception-wise 57:19
perimeter 22:6 57:5 76:2 125:21 126:5,10
period 7:1 52:25 90:23,24 91:5 94:7 97:15 99:6 99:10 137:4,5,7 137:11
periods 91:23
permanent 1:7 5:5 12:10 77:12 81:15 84:6,16 86:2 117:23
person 93:15
personal 138:4 143:24
perspective 90:23 91:19 93:14 94:19 99:19 102:13 112:9
Peter 2:5 3:11 6:8,20,22 7:19 8:13 9:18,18 12:4 15:9 22:19 24:14,17 25:11 26:14 28:21 33:8 34:9,20 35:1,8,18 36:10 37:10,19 40:3 58:9,20 67:3 69:5,10,10,11 69:13,24 70:1 71:19 72:2,3 74:10,15 75:6 75:12 78:11,13 78:15 79:15,22 80:7,19 82:23 83:1 84:6 85:9 85:23,25 99:24 101:4 104:4 106:2 109:5 110:10,16 115:13 118:16 120:2 122:17,24 123:22 124:1 125:5 126:13,25 127:21 128:25 136:8 145:13 147:3 154:18 155:24 156:23 157:2 158:22 159:8
Phil 4:11 10:9,9 150:7
PHILLIP 144:15 156:8,24 157:4 158:2
philosophy 156:21
Phone 7:16
phonetic 4:13 10:12
photo 60:16 63:18 64:7 76:15 81:2,2 131:14
photograph 78:19 80:5,6,17 140:14,24
photographed 42:15,18
photographer 68:19 77:7
photographs 24:19 37:20 53:11 55:22 60:21 62:18 128:12 140:22
photography 51:1 51:1,3,9 53:7,8 60:19,20 61:13 64:14 65:16 68:1,20 80:16 80:20
photos 51:12 62:22 72:8 135:17 142:18
physical 24:23 31:8,12 32:8 108:17,18 140:10
physically 93:19 94:18
picking 73:17 74:3
picture 80:8
pictures 40:25 51:3
picturing 121:17
piece 24:7 28:5 40:23 42:10 47:18,24 48:12 70:6 71:20 72:11 135:13 145:4
pieces 18:12 42:7 42:11,25 43:3,5 44:12 73:6 76:4
pierces 145:22
place 71:11 73:12 73:13 74:2 88:5 107:7,21 115:9 117:7 137:9 140:11,11 143:9 144:21 153:22 158:1
places 145:7 151:7
plan 16:4,10,11 16:22,25 17:3 23:6 45:6 69:23 70:14 71:10 75:18,23 76:14 76:23 77:2,2,10 78:3 80:12 107:1,6,8,22 108:6,10 109:8 110:1,23 130:10 144:14
planned 108:8
planners 146:14
planning 3:4 34:16 106:5 107:9 108:21,24 114:3,7,8 138:21 139:4 145:21 148:11

plans 69:8 70:18 76:16 100:4 106:9,16,19 109:3,16 116:15
plant 127:12,19
plaque 41:1,11
Plate 2:17 9:22 9:22
plates 43:4
platform 25:7 33:23 36:9 82:1 82:12,24 89:20 89:21 91:12,13 91:13,15,19 92:25 94:5 95:25 96:1,5,8 96:11 97:4,23 98:3,6,11,11 99:12 100:8,20 101:23 107:17 109:9,14,16,20 109:21,21 110:3 111:7 117:3,12 117:18,20 118:8 118:19 119:1,9 121:3,9,18 122:6,11,22 124:7 127:23
platforms 14:11 81:22,22,24 91:11,11,16,17 91:24,25 94:25 96:12 99:17 100:6,7,10,13 100:24,25 107:5 107:5,14 111:5 117:15
plaza 138:12,13 139:8
please 121:4
point 6:9,20 7:14 7:19,21 12:8,15 23:15 34:13,14 37:15 38:19 39:7 41:9 42:22 50:13 53:1 66:24 67:1 72:11 73:8 74:5 92:5 95:10 101:9 104:3 110:9 111:11,23 123:16 127:13 131:9 132:13 133:13 139:11 144:3,16 146:19 148:14 149:2,18 151:18 155:7 156:18 158:6
pointed 13:4 15:11
pointing 13:1
Police 41:2,3,12
PONYA 50:18 51:4
Port 1:11 2:1 5:5 6:1 9:8,10,12,16 9:19,20,22,25 10:1,22,24 11:13 12:2 22:15 40:8 41:2 41:3,11 44:4,21 44:22 45:3,9 46:9 48:1 49:2 50:18 51:5,6 52:23 56:4 60:24 61:12 63:23 64:2 67:20 74:21 78:7,16 84:13 85:16 87:11 88:14,16,23 89:10 100:3 105:11 106:6 126:4 129:25 136:6,11 152:1 152:11 153:25 157:14 158:2
portions 13:11 138:9
position 55:5 102:5 105:13 145:1 149:20
positive 6:3 47:6
possibilities 144:1
possibility 80:14 143:3
possible 7:7 21:5 50:2 102:20 123:1
possibly 49:14 64:3 94:12 122:16 127:23 132:9,10 146:6
post 46:17 47:7
potatoes 153:23 154:12
potential 44:6 83:4,5,24 118:19
potentially 118:9
power 111:20 135:13
Pozzyoli 4:7 11:10,10
practical 27:4
practice 48:21
pre 132:16
prefer 54:24 55:1 98:6
preference 29:20 100:14
preferred 74:8
preliminary 36:3 110:9 148:10,23
preparation 69:15,16 77:15
preparations 5:24
prepared 7:15 48:11 124:17 153:16
present 15:16,20 70:17 87:18
presentation 8:11
presented 7:5
preservation 3:23 5:10 10:17,19 31:6 35:23 36:16 55:18 56:12 60:9 72:9 134:4 157:11
preservation-r... 53:21
preserve 15:13 27:22 28:3 72:14 78:9
preserved 19:17 35:25 36:17 55:1 77:1 142:7
preserves 27:25
preserving 28:4 28:18 52:24 71:13 125:21 135:25
Presti 3:12
presumption 151:1
pretty 25:21 27:4 62:11 92:19 94:22 96:19
previous 13:5 62:10
previously 13:4 42:5 46:16 72:10 133:12 148:21
pre-9/11 30:10 32:5 37:23 82:8 90:2 91:24 92:6 93:2 94:22 95:22 100:21 101:5 102:6,7 102:15,21 106:22 107:4 123:3
Pre-911 90:7
priceless 111:10
primarily 12:13 14:25 118:5
primary 91:25
prime 112:10
print 75:21
Prints 62:16
prior 23:7,10,20 23:21,22,23 25:3 37:12 51:5 82:4 90:11 106:5,16 116:14 123:17
proactive 47:6
probably 27:20 36:23 61:1 66:23 69:18,21 70:21 77:3 80:8 84:12 87:18 101:10,21 115:15 136:2 137:18 153:8,16
problem 37:5 51:25 59:13 62:7 80:24 86:11 87:19 93:24 100:4 101:7 106:7 124:21 134:25 143:5,23 154:5
problematic 28:8 102:14 117:10
proceed 66:21
proceeded 62:5
proceeding 67:14
proceedings 160:8,11
process 6:4 12:10 42:20 44:6,9 45:11,12,13 46:8,15 52:12 55:23 61:20 62:13,17 74:9 114:25 115:5 124:4,16 136:3 144:24 154:16 156:22 158:1
processed 62:15
procession 138:25
processional 29:5
product 137:14
program 46:8 49:23 116:24 119:17
programed 95:9
programmatic 59:19
programs 49:17 49:24
progress 6:6 108:23 148:6
progressing 146:1
project 5:6 6:16 12:12,14,25 13:10,13,18 14:16 15:1 44:25 45:2,5 47:17,23 48:1 48:12 49:16 54:13,15 56:1,8 56:14 61:23 66:25 67:5,13 73:18 83:21 114:4,12 154:25
projected 104:13
projecting 95:7 132:23
projection 97:3
projections 95:15 95:17 96:16 97:18,24,25

projects 12:17 14:18,23 44:24 45:16,21 47:15 48:18 152:6 153:3 154:22
promise 129:1
properly 78:19
Properties 61:24 126:3
proposal 60:5
proposals 64:18
propose 102:25 103:1 106:1
proposed 8:3 86:10 119:10 151:10
proposing 104:17 104:25
prospect 118:4
prospective 89:23
protect 40:2
protection 76:25 106:4
protective 39:18
provide 54:23 55:21 56:2 78:22,25 83:16 107:25
provided 5:18 33:15 40:25 42:21 55:19 72:8 104:14 136:17
provides 135:16
providing 55:13
provision 59:18
proximity 152:15
prudent 101:20 124:8,11
psychological 38:15
Public 160:6,20
publicly 83:17 85:17
purpose 143:5
pursue 111:15
pursued 110:23
purview 44:1 157:13
put 23:23,25 48:16 60:6 63:2 73:15 76:23 77:18 78:7 83:14 84:17,18 84:25 85:15 110:6 117:17 123:22 125:14 126:16 127:9 128:10,11,14 143:8 146:25 152:2 155:17
putting 42:20 74:4 79:21 127:15 141:15
p.m 1:14 90:25 97:16 129:1 159:10

Q

qualify 63:9
question 20:10 37:9 41:22 50:1 54:19,25 58:24 59:7 61:9 62:1 65:4,5,23 66:9 66:12 67:23 68:11 70:2 72:3 83:4 86:12,16 86:16 95:6 99:24 100:3 101:4 105:25 106:2,15,18 109:6 110:4,18 113:17 117:13 120:3,10,21 124:3,14 128:19 129:4 133:25 135:12 140:15 143:10 147:18 150:16 158:8
questions 5:15 7:9 16:17 19:21 31:4 60:5 67:3 68:24 79:22 80:1 96:24 104:5 115:21 116:12,14 118:17
quick 19:20 40:9 42:3 49:25
quicker 117:25
Quickly 145:13
quite 17:1 28:5 48:25 97:6,22 98:7 135:4

R

R 14:6 18:7 26:25 160:1
rail 94:19
railing 27:24
railings 131:16
raise 7:10 39:7 148:19
raised 5:16 8:7 29:15 39:6 46:21,24 60:4,9 70:2 72:4 147:17,18 154:23 157:17
ramp 23:16 26:18 27:16,23 28:25 32:20,21 33:6 34:24 36:22
ramping 95:12
ramps 26:6 29:9
rate 117:8,9 118:2
reach 59:11
reached 41:5 124:9
reaction 28:2 134:13
reactions 27:12 28:11
read 145:4 151:5
reading 50:11 143:20
real 37:5 38:23 74:15 140:9 153:23
realize 90:7 105:20 149:6
realizes 150:4
really 6:24 7:8,10 24:11 29:6 32:5 34:19 36:21,22 44:14 45:18 46:5 49:17 50:4 55:9 59:7 60:13 61:25 70:25 78:20 79:5 85:10 88:19,25 99:20 101:12,16 101:18,25 111:12,17 118:14 131:12 131:21,25 132:12,14,16,17 132:19,23 133:19,21,24 134:19 135:11 135:16 137:16 138:7,11,24 139:1,23 144:2 148:23 149:11 152:19 155:7 156:5
rear 132:20
reason 35:1 38:17 39:2 50:24 91:14 98:22 100:24 109:18 116:19 124:18
reasonable 104:5 106:2
reasoning 104:7 104:18,18
reasons 49:6 76:6 100:11 105:14 105:16
rebuild 84:23
rebuilding 4:6 11:11 114:5
recall 92:12
recalled 131:23
receive 66:20
received 5:21 58:15 65:12,24 66:1,3 72:18
recognize 12:15 14:17 38:17,20 97:24 113:1
recognizing 6:6
recommended 152:19
recommending 81:3
reconfiguration 123:8 124:10
reconfiguring 121:18,21
reconstruction 139:19
record 7:23 41:4 78:8 115:12 160:10
recordation 51:9 62:5,9,10,21 64:13,25
recorded 51:4
recording 59:25 60:3,7,12,13 61:17 63:10,13 64:21
records 107:9
recovery 3:9 5:3 76:5 77:22 141:18
recreate 142:4
redevelopment 5:17 54:14 130:13 132:3
redoing 158:19
redressed 33:4
reds 53:14
refer 21:6,6 54:4
reference 131:10 132:14
referenced 64:18
referred 41:19 53:18 97:5
reflect 87:25 88:10
reflected 7:4
reflective 138:14
reflects 88:4
reframed 23:25
refrigeration 127:12
refuge 99:18
refunction 34:4
refurbished 32:4 33:4
refurnished 23:19
regard 38:8 60:25 81:1
regarding 6:17 59:17 89:16 147:19
regardless 66:13
regards 46:8,24 55:23 58:17 142:20
regrading 132:5
regs 65:17 66:17
Reilly 3:7 9:3,3 30:4,17,23 72:5

83:3 84:10 87:10 108:11 113:4,21,25 114:8,16,21 136:1 142:11 144:4 148:22 157:14 158:16
reintegrating 17:17
reintroduction 87:13
relate 14:22
related 160:13
relates 35:21 38:4,25 59:19 63:25 100:2 101:9 148:15
relations 46:18
relationship 38:10 55:12
relative 16:3,6 20:8 106:24 143:13,25 144:11 156:16
relatively 149:17
relativity 144:3
relevant 104:7
relieve 101:6 102:21 106:8,17
relocate 70:14 71:1 151:9
relocated 71:2 142:8
relocation 151:12 151:17
reluctance 64:4,6
relying 124:17
remain 44:15 48:4 70:13 81:18
remainder 132:4 133:15
remained 23:14 70:13
remaining 130:6
remains 78:18 131:21 155:8
remember 52:7 83:8 84:12 87:19 93:20 112:1
remembers 37:22
reminder 145:10
reminiscent 36:5
remnant 13:8 70:16 128:9 139:23 140:10 141:17
remnants 52:24 54:22,24 70:10 73:6,17 74:1 136:18 137:17
remotely 134:18
removal 13:11 69:20
remove 73:14 76:14 85:1
removed 39:19 39:24 52:10 58:24 59:1 73:6 83:20 85:20 86:7 135:10
removing 69:15 74:24 142:21
renovated 103:10
reopening 70:15
repercussions 146:15
report 41:7 97:20
reported 160:8
reporter 115:11 160:6
Reporting 1:25
representation 6:18
representative 6:10
representatives 14:19
request 44:7 79:21 80:2 152:9
requested 60:18 61:3 64:10 65:18
requirements 65:8 146:16
requires 26:10
rescaling 49:10
residential 103:11 147:25
residents 149:12 151:19
resolution 154:4
resource 31:9,13 35:24 36:17 45:17,22 50:21 52:20 56:21 105:20,23 111:11 112:18 112:20,25 130:1 130:8,11 131:11 131:23 132:7 133:23,25 137:3 138:11,16 141:12
resources 6:17 48:17 51:13 53:10 56:17 58:1 111:2,19 112:16 130:6
respect 102:4 104:3
respecting 105:4
respond 66:18
responded 60:11
response 66:23 67:16 158:21
responsible 66:20
rest 17:4 20:8 48:4
restard 109:4
restored 94:25,25
restoring 38:1
result 59:25 135:8,12 137:9
retail 37:14 117:16 131:1 132:1 147:6,11
retrofit 107:6 108:14
retrofits 107:23 109:1
retrospect 111:1
reuse 24:4
reusing 25:1 26:10
revenue 116:1
reverse 98:17
reversed 93:5 118:5
review 31:7 51:12 55:3 69:1,2,2 158:12
reviewed 47:9 72:20
reviewing 54:21
ridden 117:15
riders 91:2 95:4,9 95:10,22
ridership 90:9 91:7 93:2,4 95:3 95:7,11,15 96:16 97:2,12 97:16 100:2 102:11 103:5,6 104:13 106:9 108:2 111:9 114:17 117:4
right 8:16 18:22 19:14 23:6,12 24:4,22 25:16 26:17,19 30:13 30:18 31:17,21 32:19,24 33:14 35:1 47:20 48:8 52:4 61:5 69:4 71:10 75:21 78:13 84:4,5 102:1,25 108:16 119:5,7,12,20 119:20,22 120:1 121:20 124:23 133:2 144:13 150:14
right-of-way 18:5 21:19 75:5 81:14 82:6,9 125:12
Rinaldi 2:5 9:18 9:18 22:19 69:13 70:1 71:19 72:3 75:12 78:13 79:15 80:7,19 83:1 85:25 110:10 126:13 126:25 127:21 136:8
ringing 7:16
rise 134:14
Rising 4:5 11:9
risk 71:7
Rivari 4:13
Rivary 10:11,12
river 94:17
Robert 3:17 4:3 8:20 10:13,13 19:8,16,22 20:4 38:24 43:2 72:25 73:24 102:23 103:8 104:6,12 105:24 108:4 118:18 119:2,10,13,24 120:11 121:17 137:6 139:11 141:23
Rodriguez 2:16 9:24
Rodriquez 9:24
room 8:15 48:19 87:18 97:10
Rose 1:25
rough 76:3
roughly 42:11 92:16
rounded 43:9
route 14:2 15:25 151:15
ruin 139:18
ruined 145:2
rules 65:17 66:17
run 94:13 102:10 107:13
running 84:19 106:25 116:19
runs 18:4 75:19 75:22
rush 90:24,25,25 99:9
rushing 98:18

S

safe 99:18
safely 95:24 99:17
safer 96:13
safety 99:15,21 123:5
salon 37:23
salvage 55:14
salvaged 55:18
Santiago 13:21
satisfy 62:3 101:18
save 3:21 9:6 141:17,19
saved 142:2 145:3

saving 142:3
saw 134:12,20
saying 29:20 36:9 36:14 47:5,12 55:21 68:14 97:10 98:10 104:16 125:1,10 126:7 129:11 140:16,24 143:2 144:8 157:1
says 41:1,11 62:4 110:23 111:14 128:19 151:8
scale 80:15
scaled 50:2
scan 53:14
scenes 76:17
schedule 55:10 67:12 69:8,18
schedules 58:5 115:18
scheduling 115:15
scrape 75:23
scream 99:2
sculpture 47:19
sea 21:8 22:16,17 22:18
searching 76:21
second 28:8 36:21 134:16 140:7
secondary 41:20 42:5 43:6,7
seconds 99:3
section 1:8 5:9 12:9 15:22 19:12,14 25:14 115:5 140:3 154:3,5
sections 43:12 154:11
security 27:6
see 7:24 8:5 15:22 16:1,5,13 17:19 18:15 20:16,21 23:15 24:19 26:16 27:9 28:8 39:18 39:19 52:8 53:25 58:4 73:16,18 74:14 76:18 77:24 79:1 86:8 97:7 97:20 99:25 100:1 101:16 106:19 109:25 115:18 119:6 130:7,7,25 132:18 135:3,6 137:9,12,19 138:1 139:18 142:14 143:22 153:16 154:9 156:12 158:22
seeing 24:12 27:7 74:1 138:8 139:21 145:9
seen 6:5 135:15
sees 37:16
segue 44:19 56:10 73:20
selected 50:5 52:11,12 151:16
selecting 73:4
send 61:10 63:2
sense 24:1 35:17 79:5 118:13 137:21 138:23 138:25 139:9,23 139:25 145:25 154:24
sensitive 89:8
sentence 124:15
separate 45:16 45:21 92:3 153:4,5
September 70:7 81:17 82:5 90:19 109:3 123:12 130:20 131:17 132:9,16 133:10 156:7
serious 60:14 154:10
seriously 125:20 158:24
serve 131:7
service 35:5 38:11 59:23 83:10,13,17,18 85:16,18 90:13 91:1,25 94:20 96:6 98:2 99:7,8 99:15 101:22 107:13 108:1,9 116:19 123:5,17 124:21
services 116:2 134:4
session 6:25 7:6 158:25
sessions 115:16
set 63:3 65:21 67:12 90:5 91:10 124:18 157:19 160:16
shaft 131:2 141:4
Shaming 4:14 11:23,23
shape 127:20
share 14:21 53:2 124:22 125:19
Shawn 2:10 129:24,24 133:6 135:18 136:5,21 138:18 141:3,7 145:11,14 147:14 148:19 149:16
sheer 137:24
shifted 109:18 110:2
ship 71:4
ships 137:24
shop 42:16
short 6:5 79:18 151:8
shortcut 149:10
Shorthand 160:5
short-term 83:24
shots 62:19,20
show 16:6 19:19 37:19 75:12 128:9 145:5
showed 44:13
showing 19:16 24:5 51:4 57:4 80:4 109:25
shown 25:12 52:13 121:9
shows 34:9 131:15
SHPO 51:19 59:17 60:18,22 61:4 61:12,14,20 63:3 64:10,12 65:18 66:18 68:2,9,18 69:2
shy 15:24
side 13:22 38:22 105:1,8,12 109:20 118:10 122:8 132:17,20 132:21 146:5,7 147:8,9,12,24 148:9 150:2 152:15
sides 38:23 132:22
side-by-side 101:15,25
sign 131:19 154:8
signage 23:22 36:9
signal 116:21 117:22 123:18
signatory 155:3 155:18
signature 48:22
significance 43:15,20 49:11 104:23 119:19 137:4,7,11 144:8 149:7
significant 5:13 29:7 52:20 57:22 58:8 63:12 72:12 73:5,17 91:6 137:12 138:16
signing 47:10
silent 87:17
Silverstein 61:23 126:2
similar 60:9
simple 98:10
simply 149:14
sir 8:12
site 5:18 12:18,23 13:9,13,17,23 14:3 16:11 17:1 17:4,11,17 19:7 19:25 24:9 25:5 34:12 43:8 44:23 45:4 48:22 57:1,25 59:20 62:18 64:21 69:22 70:3,8,20,24,25 71:6 73:11 80:18 89:5 104:23 105:5 111:20 112:16 112:24 113:3 130:14 132:5 136:7,12 142:8 144:16 145:6,15 150:3,8,10
sites 113:9 149:4
sits 22:23
sitting 84:20
situation 64:2 96:13 99:19,21 100:21,23 101:3 102:9,14,22 106:20
situations 93:3
six 37:4
sized 49:21
skin 71:20 72:13
skip 15:6
slab 13:12 75:2
slabs 51:2,10,17 51:22 52:11,13 52:14 53:8 54:6 54:11 55:24 56:3 60:17 61:21 67:11 69:16,20 76:4
sleeves 63:2
slice 21:2
slight 43:22
slope 37:5
slurry 13:7 105:1 145:19,23 146:9
small 19:13 37:12 97:14
smaller 49:8
soil 74:24
solution 100:7,19 101:21,23 103:2 104:17
solutions 100:5 101:5 102:20 120:3 156:17
solved 108:17
solving 106:1
SOM 126:2
somebody 35:8

59:10 99:1 121:2 143:12,20
some-odd 92:13 93:16
soon 63:1
sorry 5:1 19:8 20:5
sort 27:17 28:4 35:23 36:5,7 37:4 55:8 73:17 73:17 74:3 118:22 129:15 130:12 134:7 144:21 150:15
sound 33:24
sounds 33:19 34:1
south 14:5 47:16 47:22,23 48:7 78:10 83:6 84:8 88:20,22 109:23 109:24 148:1 152:15
space 79:8 103:9 127:14 132:1
speak 40:17,19 41:14 44:19 52:24 61:5,11 64:7,11 115:19 144:15 157:22
SPEAKER 33:9,19 48:10 87:8 152:22
speaking 46:22 49:18 89:16 92:16,19 93:13 94:13 107:16
speaks 46:7 52:21 56:9
specialty 135:1
specific 23:3
specifically 31:7 81:7 88:22 147:17
speech 154:17
spell 153:19
spelled 153:22
spend 74:15 109:15 122:17
spent 102:5
spirit 55:7
spoke 59:21
sponsoring 46:2
sponsors 6:16
spot 141:17 147:24
spread 42:9
square 23:7 24:18 107:18
squeeze 79:12
ss 160:2
stabilize 69:14
stages 24:4 108:21,24 145:21
staging 77:18
stair 18:18 43:13 119:21 131:13
staircase 71:24 137:18
stairs 25:8 26:5 26:15 27:2,15 27:23 28:24 29:8,9 33:24 34:23 36:22 93:23 118:21
stairway 93:15,17 117:17
stairways 93:10 98:15
stairwell 34:23 123:23,24 140:17 149:25
stamp 51:8
stand 92:19
standard 62:17 62:21
standards 48:20 61:18 62:3,14 62:15 64:19,23 65:1,3 153:21
standing 79:6,6 93:22 104:16 105:25 136:15
standpoint 113:6 148:23
stands 102:1
start 8:9,16 74:8
started 5:2 133:13 153:10
starting 15:23 69:21
starts 8:14
state 4:1 11:24 12:19 63:4 79:2 141:14 142:19 152:8,12,18 160:2,7
stated 158:17
statement 58:17 60:2 102:3 127:5 143:14 144:11 151:7
station 14:11,13 16:15 22:20,24 25:20 77:13 81:21 84:14 85:3 86:13,14 86:14,18 87:21 87:23,24,25 88:4,9,10 89:4 90:3,14,14 91:9 107:17 111:4 116:1 117:23 121:1 135:23 151:6
stations 107:12 107:12,25 108:19
status 40:10 42:1
stayed 144:25
staying 16:21 104:24
steel 40:23 41:19 41:20 42:6,7,8 42:16 43:6,8 44:14 50:17 51:7 58:22 59:3 59:6 69:17 70:3 70:7 137:18,19 137:22 143:15
stellar 44:12
stenciled 50:18
step 40:4 45:9 47:1
Stephanie 2:6 11:12,12,13
stepped 15:3
steps 22:22 23:16 32:20 33:1,6 35:9 37:2,4 38:21,22 39:3 46:24
Steve 2:8 3:5 9:22,22 12:2 134:3,5
Steven 2:17 11:25,25 12:2 134:11 142:23 144:7
stick 16:20
Stickelman 2:2 15:2 34:5 37:21 39:20 40:5,7 43:1 44:18 46:20 47:11,14 48:13 49:15 50:23 51:16 53:4 54:1,10 55:20 56:23 57:6,20 58:15 59:3,11 60:15 61:11,19 64:5 65:4,10,15,25 66:4,10,16,22 67:25 68:8,14 68:17,23 72:23 79:16 89:6,14 115:10 123:10 124:25 129:10 129:17,22 133:3 140:21 142:20 147:7
stipulations 153:24 154:11 155:5
stone 69:15
stones 140:3 142:9
stood 14:13
store 37:15
stored 91:21
storefront 37:13
stories 139:3
story 131:3
straight 27:9
strange 28:1
straphanger 92:20
street 3:21 4:5 9:6 11:8 14:7,8 15:24 16:24,24 17:12,21,22 18:4,8,17 21:14 21:17,17,22 29:10,11 30:22 69:17 70:6,15 71:23 110:22 111:4,13 112:2 112:5,11 113:14 119:25 125:24 130:5,10,17,18 131:12 132:4,19 142:15 144:14 146:4 147:24 148:3,9,15 150:5,17 151:3 151:10 152:9,16
streets 148:2 149:13,15,17,21
stretch 85:5
stripped 138:5
strong 143:25 146:2
strongest 144:11
strongly 121:22
struck 134:17
structural 137:19
structurally 136:24
structure 20:9 55:6,12 70:16 84:18,21 126:8 126:8,14,17 128:10,22 133:8 134:14 135:7 136:9,18 150:4
structures 13:8 156:16
struggling 141:22
studs 137:24
stuff 75:6 121:15 136:3
subgrad 149:3
subgrade 151:13 152:9
subject 89:9 118:17
subjective 31:10 138:4
subjectively 137:15
submissions 7:2
submit 58:6 66:17 68:11
submitted 60:22 61:20 64:9 65:17 66:11 68:2,9
submitting 60:23

62:2 63:6
subsequent 5:19 136:19 150:23 151:5
substructure 134:20 141:24
subway 14:6 18:3 18:7 19:5 23:17 130:5
sub-question 122:4
sudden 84:23
suddenly 140:8
suggest 80:5 155:2
suggested 88:8 150:21 155:25
suggesting 102:12 150:24
suggestion 154:20
suggestions 7:2 155:17 158:12
summary 97:13 124:5
super 130:15
superintendent 115:24
supply 54:7
support 75:10 126:21 131:3
supported 133:9
supports 69:17 76:2
suppose 28:7 31:24
supposed 150:8
sure 37:10 46:14 47:25 48:8 55:15 58:10 60:1 68:4 77:17 77:25 96:14 98:4 99:21 100:17 106:6,10 134:23 141:13 143:23 152:23 158:4
surface 135:10
surrounding 80:24
surroundings 138:20 139:10
swap 32:19
sweep 75:25
sweeping 77:6
symbolic 87:5 120:23
symbolized 121:9
sympathetic 149:12
system 92:4 93:8 94:11,23 100:22 116:21 117:22 123:18,20 133:9
systems 92:4

T

T 160:1,1
table 97:14 123:4
tagged 42:23
tags 42:16
tail 151:23
take 6:21 18:10 18:18,21,23 21:25 23:4,16 30:8,16 33:16 33:24 50:8 51:21 52:4 71:4 71:8,13 73:14 75:24 81:11 83:17 96:7 97:24 102:13,18 104:21 112:4 113:5 115:20 117:9 125:20,22 137:24 141:13 143:16 151:20 154:10 158:14
taken 20:22 34:24 34:25 36:25 42:17 56:17 62:18 64:8 65:16 68:2 80:8 83:12 86:7 131:14,19 136:23 150:21 158:23
takes 23:9 92:24 99:13 111:20
Talbert 2:6 11:12 11:12
talk 14:16,20 50:24,25 57:7 58:2 64:15 69:24 75:7 81:6 82:2,23 89:11 90:1,2,4 97:15 102:6 110:10 115:17 116:7,9 118:12,15 120:20 143:18 146:15 155:24 156:20,25
talked 6:2 77:13 127:4,5 136:16 159:3
talking 13:19 21:13 23:13 31:15 34:7 54:3 64:1 71:17 75:13 82:2 83:8 84:14 98:13 112:15 145:17 150:16 154:1 156:11
talks 50:16
tangible 139:22 145:10
taste 49:3
tasteful 147:12
team 44:1 128:8
technically 53:13 105:3
technology 123:21
teeth 72:13
tell 21:7 41:13 66:6 105:10 109:14 117:19
telling 112:21
temporarily 48:2 74:23
temporary 32:1 47:20 78:1 83:15,23 84:14 84:15,18,21 85:3,10,11,14 86:4,5,9,18 87:23 90:3 91:9 96:3 111:4
ten 38:22 107:18 108:13,14,18 110:2 111:5 114:16 116:25
tenants 49:12
tend 27:20 29:4 37:1
ten-car 91:11,17 95:2 107:2,5,12 107:13,14,17,25 108:3,8 110:1 118:6
term 143:17
terminal 1:7 5:6 12:11,25 16:12 85:8 90:22 100:12 110:21 145:22 146:12 146:21
terms 16:9 17:19 20:11 29:8 34:12 48:18 49:12 67:10 70:22 77:5 78:3 88:14 100:5 101:22 120:3 125:18 136:20 156:21
testament 95:16
testing 62:23
tethered 80:18
thank 8:2 12:5,6 23:1 43:1 50:6 67:2 72:24 78:16 154:18 155:23 159:9
Thanks 6:22
theater 49:22
thing 27:17 30:18 30:24 45:25 50:14,16 63:11 64:15 84:21 87:5 101:10 120:12 134:16 138:1 141:19 145:4,14
things 43:13,14 46:10,22 50:12 56:20 62:20 70:22 74:2 76:21 96:20,25 100:16 102:10 105:7 108:25 110:13 120:13 125:7 126:1 131:16 132:6 144:11,18
think 8:6,9 12:4 15:3 19:22 21:11 24:10 25:16,22,24 27:21 28:17,23 29:1 30:2 35:20 35:23 36:2,10 36:15 37:3,5,14 38:2 39:2 46:17 47:5 50:10 51:13 52:6,10 52:20,22 53:2 55:9 61:1 62:8 63:15,20 64:5 67:24 70:24 71:2,12 72:19 73:9,16 74:7 79:3 82:24 86:21 89:3,6,13 95:10,18 101:17 101:19 103:4 104:22 106:12 110:25 111:23 113:9,14 115:6 119:6 120:2,8 120:21 121:25 124:2 129:14,15 131:10,22 135:24 136:1,10 137:20,25 138:4 138:10,15 139:11 140:1 141:9,11,25 142:10 143:1 144:12 147:1,3 148:17 150:2,6 152:3 154:15 155:10,16 157:2 158:7,25 159:9
thinking 19:23 25:17 71:9,16 145:6
third 114:13
thought 23:3 27:11 42:5 49:9 72:12,20 86:1 116:6 124:4,15
thoughts 133:20 134:6
thousand 91:2 92:23 93:11 94:6 118:5
thousands 103:18

thousand-seat 49:22
three 15:7 43:4 51:18,22 52:13 52:14 81:21,23 84:9 91:10 100:20 107:4 108:13 140:19 153:17 154:17
three-platform 101:14
throw 122:4 129:16
thrown 128:7
tie 130:8
tied 156:6
tight 92:16,16
tile 33:2
Tim 7:17 15:2,10 40:3,7 42:21
time 8:8 20:2 29:12 33:25 34:7 43:11 50:20 52:25 58:10 61:16 70:2,19 71:8,11 74:15 78:21 80:10 81:13 85:13 86:22,25 89:13 90:19 92:8 93:21,25 94:8 95:7,10 99:10,12 102:5 107:10 117:6,16 117:23 121:22 122:18,18 131:18 135:1,21 136:6 140:11 154:10
timely 72:19
times 50:12 98:19
timing 79:17
timings 98:24
Timothy 2:2 34:5 37:21 39:20 40:5 43:1 44:18 46:20 47:11,14 48:13 49:15 50:23 51:16 53:4 54:1,10 55:20 56:23 57:6,20 58:15 59:3,11 60:15 61:11,19 64:5 65:4,10,15,25 66:4,10,16,22 67:25 68:8,14 68:17,23 72:23 79:16 89:6,14 115:10 123:10 124:25 129:10 129:17,22 133:3 140:21 142:20 147:7
today 6:1,5,12,25 7:25 8:11 12:7,8 12:24 15:17 23:7 24:24 25:3 35:15 45:1 66:5 73:23 77:24 101:11 105:21 108:7 116:4 121:16 159:1
today's 5:8,24
told 47:7 52:14 84:15 88:16 126:6
tomorrow 61:3 129:13,13,18,22
tonight 61:3
Tony 9:11
top 102:11 138:3 139:7
topic 116:4 125:6 125:17
topics 125:5
total 79:6
totally 38:8 65:7 141:16 143:3
touch 82:7 83:1 125:5
touched 50:10 89:24
touching 112:25
tour 78:25 79:12
tours 41:18
tower 18:25 19:1 30:21 48:23 75:19 76:9 78:9 78:10 82:13 83:6 84:3,8,9 88:20,22 126:5 126:10 130:11 130:24,25 131:2 131:4 133:7 139:1 148:4
towers 60:25 102:24 103:1 104:16,20 105:25 110:7 128:4 149:25
town 21:12
track 41:7 81:17 83:14,19,20,23 84:25 85:10,14 85:20 86:1,9 94:11 96:2,3,7 96:22 120:15 123:25 128:22 146:7
trackage 114:6
tracks 81:14,15 81:19,20 83:12 83:18 85:22 88:21 92:9 108:13,15
Tracy 4:10 10:3,3
Trade 3:12 5:17 8:18 12:10,18 12:23 13:3,9,11 13:17,23 14:13 16:11,19,25 17:4,6,9 19:7 24:9 25:5 45:18 50:20 51:7,14 52:22 53:9 62:6 70:9 73:2 74:1 74:11 75:1,4 76:17 81:9 82:6 82:8,11,16,20 86:19 87:2,2,20 88:1,2,3,8 90:10 90:21 92:1,2,15 94:14 100:21 103:25 106:23 106:25 107:3,11 107:23 108:9 116:16,20 120:13 130:15 132:18 133:1,5 136:22 137:21 138:14 139:15 142:13 144:5 147:20,21 150:11
traffic 151:11
trafficking 23:15
trailers 77:25 78:2
train 15:8,14 16:2 16:3,15 23:8,11 24:6 26:25 30:14 33:10,12 33:21 87:13 89:3 92:9,10,22 94:1,5 96:10,12 98:18,20,22,24 112:22 113:7 115:25 116:11 116:18 122:7 145:20
trains 91:22 92:7 92:11 94:10,14 94:16,18 98:16 99:7 110:1 113:18 116:19 116:21,25 117:3 117:10,25 118:7 118:9 123:19
traipsing 29:8
transcribed 7:25
transcriber 34:6
transcript 34:9 160:10
Transcription 1:25
transit 3:15 14:9 16:14 17:21 22:2,3 25:4 26:9 26:11,21 106:3 115:20
transition 26:9
transmitted 60:17
transmitting 61:13
transpired 46:15
transportation 1:6 4:1 9:15 11:16 12:11,14 12:20,25 13:1 13:18,20,25 14:4 15:1,23 16:4,12 18:13 20:8 26:23 30:8 30:13,18 38:6 82:22 83:21 85:8 115:25 119:17 131:5,6 146:6,23 147:21 148:5,8
transversed 88:22
travel 30:6 35:6 139:18 147:23
traveled 92:14
traverse 25:25
treads 43:13
treatments 32:15 110:12 145:17
tremendous 43:19
triad 43:3
triads 44:13
triangular 32:21
tried 16:5 112:3,8 112:20
trivialize 144:10
trouble 27:21 36:24
troubles 27:22
troublesome 134:22
truck 69:13 74:5
true 60:12 81:2 160:10
Trust 3:1 10:19 53:17 60:8
try 34:13 75:25 78:9 98:23 99:20 100:19 102:19 115:13 118:14 122:15 128:23 129:1 156:4
trying 17:23 19:11 34:7 35:17 80:12 90:16 93:10,11 94:2 98:14,17 99:6 105:18,22 109:24 112:18 115:8 117:9,11 117:14 120:25 121:24,25
tubes 114:5
Tuesday 129:9,20
tune 7:20
tunnel 114:13,15 151:4,11,20,20

152:2,25
tunnels 118:1
turn 15:2,5 36:12
turnaround 72:19 155:12
turning 6:8
turns 42:10
Twin 128:4
two 15:10 27:15 29:2 31:15 34:21 36:20 44:8 50:9 55:14 56:19,21 60:18 60:25 61:4 63:5 70:21 72:12 75:4 82:18 83:11,18 84:7 84:12 91:24 92:3,5,7,24 99:11 110:7 113:10 115:16 139:3 153:17 154:13
twofold 35:24 36:16
two-hour 6:25
two-way 147:13
type 47:2
typically 43:16

U

ultimate 114:24
ultimately 39:10 90:16 97:3
uncomfortable 49:18 92:19
uncovered 79:2
uncovering 57:4 74:24
underground 114:1
underlying 124:15
underneath 113:18
underpass 17:22
understand 19:11 29:23 31:12 39:3,10 43:17 43:25 46:13 54:15 55:5,10 55:20 80:23 87:21 90:5 103:17 111:22 116:10 124:3 143:22 151:24 155:8 157:5
understanding 155:4,19
understood 63:22
understudied 107:7
undertake 151:16
undertaken 12:19 152:10,10
undertaking 55:7 153:3,5
unfortunate 111:12,15
Unfortunately 16:21 49:15 123:10
UNIDENTIFIED 10:15 33:9,19 48:10 87:8 152:22
unique 44:15
unloading 122:7
unstable 136:25
update 31:25 40:9 42:3 69:10
upfront 54:6 127:16
upgrade 152:3,12
upgraded 32:7
upper 20:25 21:1
upwards 94:3
up/down 30:3
urban 130:18
use 25:18 29:7 49:21
useful 28:4
user 29:4
users 23:8
usually 135:3 158:20
usurious 34:15
utilities 110:13 127:3 151:9
utility 109:21 127:12 151:12 151:17
utilize 33:2 128:23
utilizing 80:17

V

valid 5:15 143:9
valuable 145:5 150:7
value 60:2 104:19 105:4,6 113:13 113:13 134:1 143:4
various 7:7 13:24 19:4 24:3 49:6 71:6 150:12 154:22 156:12
vehicles 99:11
version 130:23
versus 37:17 105:7,7
vertical 17:25 18:23 33:16 35:5 81:2 93:13 108:22 109:1 118:21
Vesey 17:12 69:17 71:23 112:22 113:7,13 130:5 131:12 148:3 150:5
viable 34:19
videotaped 77:8
videotaping 57:9
view 19:20 37:13 49:10 131:10,12 131:22,24 133:22
views 131:24
violated 67:24
VIRGINA 11:5
Virginia 3:16 11:5
virtually 81:15
visibility 145:16 145:18 146:11 146:20,22
visitation 103:20 103:25
visually 127:24
vital 118:14
volume 28:12 127:14
Voors 3:3 11:21 41:24
vote 37:1

W

W 26:25
wagging 151:24
Wagner 3:3 11:21 11:21 41:24 42:3 43:5
wait 66:19
waited 136:2
waiting 56:22 61:15 62:25 93:19,19
walk 25:2 33:21 33:22 38:21 135:20 140:4 148:2,6,13 149:14
walked 138:24
walking 27:19 28:11,24 131:12
wall 4:5 11:8 23:25 32:6 37:17 69:15 86:2 105:2 128:5 138:8 145:19,23 146:10 147:15
walls 13:8 17:11 32:12
want 24:10 31:12 34:2 35:24,25 36:16,17 40:3,9 41:14 45:24 46:5 48:16 50:13,25 51:24 53:5,22 54:15 54:22 55:15 57:23 58:9,12 58:25 69:11,24 74:12,12 78:7 78:15 79:24 80:13 81:1,4,5 89:22 90:1 91:8 98:4 99:20,21 99:25 100:1,10 101:1,9 102:16 110:14 113:6 115:6 120:9,11 121:7 125:17,19 127:4 135:18 141:10 144:23 145:14 146:24 152:22 153:24 154:10 155:13 155:17 156:6 157:8 158:4 159:7
wanted 12:8 19:19 44:17,19 47:15 53:1 72:5 74:17 81:11 105:17 118:12 127:2,15 129:7 133:17 146:15 146:25 159:5
wants 46:7 62:8 151:25
warehouse 143:7
Warsaw 140:4,6 142:9
washed 109:4
Washington 140:2,7
wasn't 20:2 43:9 86:23 89:7 97:8 152:24
waterfront 93:7 117:7
way 17:16,22,24 21:22 25:2 26:12 31:2 33:20,22 36:5,6 38:18 39:1 45:9 45:11,12 64:22 67:5 69:22,22 73:10 77:22 95:23 100:12 113:1 116:9 118:13 120:22 120:23 122:9 126:16 127:24 133:11 136:9,10 136:11 137:2,3 148:12 150:11 157:18 160:15
ways 45:21 117:13 122:15 149:4 150:12
WBS-630 128:20
week 59:22 134:11 156:2
weeks 7:3,20 56:25 153:17
weight 113:12
Weintraub 3:5

11:25,25 134:4 134:11 142:23 144:7
weird 142:14
welcoming 5:7
weld 137:25
went 17:10 29:21 45:21 97:20 119:2,18 150:1 150:4
west 3:21 9:6 15:24 18:11 21:25 70:15 89:21 119:7 146:3 147:19,24 147:24,25 148:9 148:9 151:3,10 152:9,16
we'll 8:9 15:6,7,9 40:16 46:22,25 52:3 53:4,8 54:6 57:6 58:2 60:23 61:22 63:1,5 66:23 69:12 71:3 72:2 73:22 78:11 79:15,17 79:18 82:2 89:11 95:8 96:6 115:20,21 125:1 125:2,13 129:11
we're 12:24 13:19 14:25 17:15,23 19:18 21:20 23:13 24:5,15 25:1 26:10,11 31:15 32:25 35:16 39:8,21 40:14 42:19,19 45:23 48:3 54:3 56:7,18 57:20 58:18 59:20 60:1 62:25 63:6 64:1 65:2 71:9 77:4 79:3 82:2 84:16 91:3,3 95:7,13,21,22 96:4,14,16 100:18 101:2 102:10,13 105:11,18 109:25 112:15 112:17,22
114:23 115:8 117:8,14 121:5 121:15,24,25 125:10,14 126:1 126:3,6,11 129:15 130:21 131:6 133:18 134:3 138:21 139:4 141:22 142:5,21 145:17 146:8,13 147:1 148:11 149:19 150:16 153:21 154:1 155:10,11 155:19 159:9
we've 27:1 42:8 46:16,25 58:15 65:1,3,16 75:13 77:17,21,25 78:20 89:6 94:16,25 105:14 126:6 128:7 153:11 154:12 154:23
whatnot 108:23
WHEREOF 160:16
white 130:25
wholistically 79:9
wide 91:15
width 91:15 109:19,22 122:8
William 3:14 11:3 11:3 49:19 50:4
willing 143:12
wind 80:16
window 37:13,15 37:16 128:14 147:13
winds 134:22
within-entitled 160:9
WITNESS 160:16
WOMAN 10:15
wonder 136:22
Wong 2:13 10:22 10:22 31:25 53:12 54:8 58:3 62:8 67:4 68:16 69:4,11 87:6 115:8 129:14 142:6 156:18 157:12,16,22
158:13,20
words 104:25
work 6:7 7:4 8:2 8:10 16:20,22 17:1 25:20 40:8 53:12 58:5 69:13,19 77:5 77:14,18,23 80:24 81:3 86:2 86:6 96:8 109:2 124:21 133:15 142:1
worked 29:18 113:11 153:12 154:2
working 6:25 7:12 13:6,14 14:20 18:11 41:25 47:16 69:22 96:5 126:2,3,6,7 134:3 146:14 155:11
works 49:8
work-in-session 121:5
World 3:12 5:17 8:18 12:10,18 12:23 13:3,9,11 13:17,23 14:1 14:13 16:10,18 16:25 17:4,6,9 17:23 19:7 24:9 25:5 30:20 45:18 51:14 52:22 53:9 62:6 70:8 73:2 74:1 74:11 75:1,4 81:9 82:6,8,11 82:16,20 86:19 87:2,2,20 88:1,1 88:8 90:9,21 92:1,2,15 94:14 100:21 103:25 106:23,24 107:3 107:11,23 108:9 116:15,20 120:13 130:15 132:18 133:1,5 136:22 137:21 138:14 139:15 142:13 144:5
147:20,20 150:10
worlds 112:4 151:22
worse 102:16
worth 27:21,21 28:6 36:24 135:24 149:1
wouldn't 32:9 33:5,6 71:1 72:10,14,21 102:25 105:4 109:10 111:3 112:12 122:21 124:21 138:7 139:9
wrap 115:14
wreck 141:20
written 5:19 7:2
wrong 65:21 135:5 152:4
WTC 1:6,7 10:11

X

XYZ 47:8

Y

year 70:21 96:18
years 65:2 75:17 84:13 85:7 90:8 90:10 95:8 114:16,17 139:21
yellow 30:17 131:4
York 1:11,13,13 2:1 4:1 11:15,24 12:19 29:13 48:21 50:12,19 51:5,6 59:5,12 60:18 61:4,12 61:14,20 64:9 64:12 65:18 66:17 68:2,9,18 117:5 152:8,12 152:18 160:2,3 160:7

Z

zero 95:12 116:18
zone 146:13,21 146:23

1

1 13:3 17:8 18:3 74:25 75:19 81:8 82:5,8 91:14 120:13
1/9 136:18
10 155:16
10,000 25:22 29:16,17 35:2
100 92:21
106 1:8 5:9 6:4 12:9 47:7 115:5 136:2 148:24 157:7
11 26:7 81:17 82:5 90:19 123:12 130:20 131:17 132:9,16 133:10
11th 109:3
110 92:21
1100 148:2
115 1:12
1270 148:5
130 92:18
14 5:12
15 115:14 156:7
1650 23:6 24:18
17 39:24 40:11,13 48:4 51:19 52:4 59:2 131:20 143:16
18th 156:4
1972 51:5,7

2

2 13:3 17:9 24:14 24:16,25 74:25 76:9 81:8 82:11 82:16,19 130:12 130:24,25 131:2
2nd 160:17
2-A 26:3 34:22
20 1:10 99:3 115:14 154:16
20th 156:5
20,000 92:13
20-some 91:1
200 42:6
2000 139:20
2001 70:8 131:15
2002 70:17

136:12
2004 1:10 160:17
21st 49:1 153:14
24 22:17
243 22:21
25 102:11
250 21:20 22:11 22:13,18
264 18:21 22:1 119:8
265,000 116:17
277 18:20 22:4
295 22:7,8 25:10
296 22:8

3

3 82:15 121:24 125:12 132:18 133:4 148:4 159:7
3,000 88:2
3:30 1:14
30 19:14 21:13 62:18 93:16 94:14,16 96:14 99:6 113:17 116:21 117:2 118:2
30th 80:10
30,000 91:4 95:10,13
300 22:16
306 16:16,18,22 20:3 25:7 26:6,8 32:17,22 33:16
31 131:15
310 16:18,22 17:7 20:3 25:8,15 27:4
324 21:18 22:17
33 42:11
34 42:11
36,000 95:14
360 27:4

4

4 37:3 132:9 159:7
4-F 101:19 102:3 124:8
40 19:14
400 42:7

5

5 96:2 133:1,4,4,5 138:24 159:4,6
50 22:18 78:10 82:19 95:12,22 125:13
50,000 95:4,8
53rd 29:10
533 42:11,24
59th 29:11

6

6 13:11 51:14 62:6 70:9 73:2 73:25 74:11 77:15 159:4,6
6:00 128:25 129:2 145:12
6:45 159:10
60-plus 131:3
67 95:23
67,000 90:20 102:8

7

7 136:22,24
75 21:21

8

8 97:5,13
80 95:23 118:4
80,000 95:21 96:17

9

9 18:3 91:14
9A 14:2 15:25 17:13
9-A 151:15
9/11 3:6 5:22 8:23,25 9:2,4 10:21 14:14 23:7,10,14,21 25:3 37:12 54:18 81:19 88:11 90:11 100:5 106:5,17 116:14,17 117:16 123:17 135:9,11 143:13
90 155:15
97 78:9

WTC TRANSPORTATION HUB
PERMANENT WTC PATH TERMINAL
SECTION 106 CONSULTING PARTIES MEETING

AUGUST 19, 2004
PORT AUTHORITY OF NEW YORK AND NEW JERSEY
225 PARK AVENUE SOUTH
NEW YORK, NEW YORK

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
SECTION 106 CONSULTING PARTIES MEETING

AUGUST 19, 2004

Final Copy Signed 09/12/04, Hanna Roth
JANE ROSE REPORTING 1-866-ROSE-NYC

A P P E A R A N C E S:

Virginia Bopkoski, MTA/NYCT
Carla Bonacci, PA/NYNJ
Lucille Boslen, Shinnecock Nation Cultural Center
Museum Marty Bowers, Louis Berger Group
Carlo Braegelmann, FTA
Paul LeBrun, FTA
Albert Capsouto, Tribeca Organization
Irene Chanal, LMDC
Chris Calood, ANRR
Kim Cifarelli, PA/NYNJ
Bernard Cohen, FTA
Steve Coleman, PA/NYNJ
Robert Conway, AKRF
Beth Cummia, NY SHPO
Bruce Ehrmann, Community Board 1, Manahattan
Robin Forst, Council Member Alan Gerson
Margarita Gagliardi, Downtown Design Partnership
Anthony Gardner, Coalition of 9/11 Families
Glenn Guzi, PA
Jackie Hanley, PA/NYNJ
John Hotopp, LBG
Marilyn Howard, Save West Street
(Continued on next page.)

A P P E A R A N C E S: (Continued)
Shirley Jaffe, Alliance for Downtown NY
William Kelley, LMDC
Richard Kennedy, Community Board 1, WTC Committee
Joel Klein, Coalition of 9/11 Families
Nicholas Koutsomitis, RKK&G
Annie Kurtin, AIA NY Chapter
Harold Levitt, PATH
Shawn Lenahan, PA/NYNJ
Deborah Lester, NYS Assembly Speaker
Sheldon Silver
Bill Love, Save West Street
Ken Lustbader, Lower Manhattan Emergency Pres.
Fund David Martine, Shinnecock Nation Cultural
Center
Bernard P. McNeilly, PA/NYNJ
Lou Menno, PA
Kate Millea, LMDC
Tricia Mire, Lower Manahattan Cultural Council
Lisa Orloff, WTC Survivors Network
Mark Pagliettini, PA/NYNJ
Shilpan Patel, NYS DOT
Noah Pfefferblit, Wall Street Rising
Ruth Pierpont, NYSHPO
(Continued on next page.)

A P P E A R A N C E S: (Continued)
Pat Richards, Con Edison
Peter Rinaldi, PA/NYNJ
Luis Rodriguez, PA/NYNJ
Dave Stanke, BPC United
Ben Stanley, Alliance for Downtown NY
Tim Stickelman, PA
Petra Todorovich, Regional Plan Association
Charlene Vaughn, ACHP
Matt Viggiano, NYS Senator Martin Connor
Mark Wagner, VAA
Steven Weintraub, Art Preservation Services
Bill Wong, PA
Christopher Zaddie, PA/NYNJ

MR. BERNARD COHEN: Good afternoon, everybody. Again, I'm Bernard Cohen, Director of the Lower Manhattan Recovery Office for the Federal Transit Administration. I'd like to welcome you to this third meeting of the Consulting Parties for the Section 106 process for the permanent PATH terminal at the World Trade Center site.

At our last Consulting Parties meeting which was held on July 20th, we discussed a number of topics on which the consulting parties provided input. Taking your comments into consideration, I believe the Port Authority has made progress on a number of fronts to incorporate historic resources in the draft MOU that is being shared with you, including the E train subway entrance area, as well as visual expression of the column perimeters from platforms inside the station.

In reviewing the MOA, you may have noticed that one of the resources that received a lot of discussion at the last meeting, the Vesey Street plaza and subway entrance, are not referenced and that's because the Port Authority has gone back, taken a hard look at its design,

identified another way to create an entrance into the terminal in that area and has determined that it can completely avoid touching this resource.

I'd like to say that FTA is very pleased with that outcome and I'd like to commend the Port Authority for its diligence in going back, taking a good, hard look at its design and determining a way around having to effect this resource.

On another note, there is a point that was addressed specifically to the FTA in one of the comments we received on the DEIS having to do with making a formal referral to the keeper of the National Register of Historic Places regarding the DOE for the World Trade Center site. FTA does not plan on making such a referral.

We believe that the DOE provides a proper basis for the Section 106 review that's now underway. We believe that that review is providing additional information about the site, about mitigation measures that have been and will continue to be discussed and refined throughout this 106 collaborative effort and that the DOE is not constraining this discussion. We do intend

for this 106 process to provide for the appropriate treatment of this historic site and we look forward to continued consulting party participation in developing an MOA for the project that reflects this objective.

That being said, I'd now like to turn the meeting over to Peter and get underway.

THE MODERATOR: My name is Peter Goelz and I am going to serve as the moderator this afternoon of this meeting on the 106 process. Before we get into the formal process, I'd like to, as always, go around the room and introduce ourselves. Why don't we start over here.

(Whereupon, all participants stated their appearances for the record.)

MS. MARILYN VIA TELEPHONE: Thank you for allowing us to participate by conference call. I would ask that with people in the audience who have comments to make, that they speak a little closer to the phone because I only heard about a tenth of the names going around the room.

MR. STICKELMAN: We will send around a portable mike when they start speaking.

MR. BOB KORNFELD: This is Bob Kornfeld from Historic District Council also on the phone.

THE MODERATOR: The goals today are some follow-ups from the July 20th meeting in which we had extended discussion on a number of items. We are going to distribute and discuss the first draft of a partial memorandum of agreement that's part of this process and discuss the next steps that are necessary to finalize the MOA. Those are really the three work items that we want to address today.

Items that we are not going to cover today, items that are being covered in other forums are the removal of the sub-grade slab remnants in the northwest corner, the discussion of the memorial itself and an extended discussion on the artifacts. Although I will ask Jackie if she would give an update, we have committed to do a complete inventory of the JFK material. Jackie, can you give an update on that?

MS. JACKIE HANLEY: We have been in the process of updating the inventory weekly, from the copy that you received sometime back, and I will turn the discussion over to Mark

Wagner from Voorsanger & Associates. He also has a draft copy of the inventory with him.

MR. MARK WAGNER: Most of you know that the initial copy of the inventory that was handed out several months ago was what we are calling the first collection of the primary collection. That was stuff that we handpicked. The second collection, for those of you who were out at the hangar, was piled up. It was steel that came to us later on in the recovery process.

We have now gone through that all, photographed it and put it into a report format. It's becoming a small telephone book and we have about 750 items total in the collection right now. We should be done with that. We are down to the final red-marking stage of the inventory, so it should be done very shortly.

THE MODERATOR: When do you anticipate that being done?

MR. MARK WAGNER: Sometime in mid-September, realistically, to pick up all the red marks, typos, things like that. Most of the data has been entered now. We are just going back and churning through it all.

THE MODERATOR: Thank you. We will get into the discussion of the MOA process, which John Hotopp will be focusing on some remaining stipulations, and anything that comes up in today's meeting or in the near future and then the post MOA process, what goes on once the memorandum of understanding is signed.

If I could just for a second, I will briefly review the 106 progress to date. We've really made some good progress over the past few meetings. We've gone through where we have established the undertaking, we've discussed the effects of historic properties, we have evaluated it, we've had, I think, some significant public input. We have moved towards assessing the adverse effects. We've heard this afternoon already that on the Vesey Street entrance, the Port Authority is changing their need for the entrance at that site to another location, so it will not impact that.

We are now moving into the process of the memorandum of agreement which would then be followed up by the Agency Record of Decision and the final design. In today's discussion we really want to focus on the stipulations that are

being discussed today and on future stipulations that may be included.

The first item for discussion this afternoon is going to be the follow-up and status of some of the items that were raised in the past meetings. The first one we want to discuss is the site documentation with Peter Rinaldi.

MR. PETER RINALDI: Thank you. Specifically, what I just wanted to update is, from the last time, we did speak about site documentation, and specifically the Tower footprints. So we've gone and looked at some of the logistics and timing of what's involved in uncovering the footprints of Towers 1 and 2. The areas we are looking at is this area in that line which is Tower 1.

Our plan is to remove any material that's on top of the lower level B6 slab and remove it for documentation purposes, the features on the lower level. In the area of Tower 2, which is in this area, cleaning off those areas that we can down to the B6 level and also documenting the features that are there on the lower Tower footprints.

Some of the areas where there are exit

stairs and some of the areas where there was some paving for access in and out of the tracks, these stairs, we will not be able to move all the material in that immediate area right there, but we will do it immediately adjacent.

Our plan is, our timing is to shoot for doing this early October, sometime around the first week of October. We will marshal the resources to have that material removed and the documentation done.

Also at that time there was a question about accessibility to the consulting parties at the time that we uncovered the footprints. We have looked at that and we will provide access to those consulting parties at the appropriate time, when it's done, to go down into the footprints to take a look at this area. As you uncover them, we will coordinate that around the site logistics, and also depending on the response and the size of the group, we may have to do it multiple times because I am just concerned about the logistics and the size of the group as we escort you around through the site because it is somewhat of a construction site and also there are a lot of uneven areas and obstructions. So

Page 13

it's more a matter of safety for those parties that would be coming to view this area. We tend to go ahead and do that.

As we get close to this, ahead of time, we will send out a notice about the availability of being able to come in and view that access to the site and coordinate that with those parties that are interested. Thank you.

THE MODERATOR: So for the slabs, the uncovering will take place, we hope, the first week in October, sometime, and a site visit will be arranged.

MR. ANTHONY GARDNER: Anthony Gardner, The Coalition of 9/11 Families. I want to thank the Port Authority and LMDC for finally agreeing to cleaning off these footprints and properly documenting them. I just have a concern. If this doesn't take place until October and you're allowed to finalized your memorandum of agreement and finalize your record of decision, how will our evaluation of this documentation that you bring us be able to factor into the process?

MR. PETER RINALDI: We believe in the documentation. At that time there will be

Page 14

time for the documentation to go out and be reviewed.

MR. DAVE STANKE: Dave Stanke from Battery Park City United. You worked around the area where these items will be uncovered for quite a period of time. Right now they are covered by maybe an eighth, a quarter inch of the dirt that was put in there to straighten, to level everything out. Is that correct?

MR. PETER RINALDI: The thickness of the material varies from an inch to 10 to 12 inches, depending on where it is on the site.

MR. DAVE STANKE: What's under that material? From pictures I've seen, there are square box beam columns that were cut off during the recovery so that we know we have a certain size and shape of a metal outline lying in the cement, essentially.

MR. PETER RINALDI: What underlies the areas of the footprints is the remains of the B6 level of World Trade Center 1 and World Trade Center 2. That consists of the B6 slab. It consists of what's left of the remnants of perimeter columns that penetrated the slab, both in the perimeter and in the center.

Page 15

Also there are areas where the base was destroyed due to the collapse and the recovery operations so there are some areas where the fill is somewhat thicker and some areas where some pits that were left of the outline from where there were elevators or some pumps and other pumping facilities that were located in those areas.

MR. DAVE STANKE: So I guess the question I have or what I am trying to assess is what is the probability of this process uncovering something that wouldn't be known in advance? In other words, what is the likelihood of a surprise that would suddenly change the scenario and the approach to our views in terms of what is preservable, what's important to preserve and what might not be so important? That's maybe a rhetorical question. That's obviously a tough one to answer.

My sense is, from having been down there, there's not going to be a whole lot that surprises me.

MR. PETER RINALDI: Having been there, just to tell you from my experience, having been there during the recovery process,

Page 16

everything that was there at that base level that was not solid concrete or attached was removed, cleaned and searched. The material that's brought back, that's there now is material that was brought in after the recovery was done to make the site level and safe.

MR. DAVE STANKE: Great. Thanks very much.

MEMBER OF THE AUDIENCE: One remnant, Peter, that I don't think you mentioned, the core column remnants are a large sort of giant box beam columns, if you will, that are sort of in the middle of each footprint. They were the columns that supported the Trade Center, is that not correct?

MR. PETER RINALDI: No. I did mention those. I did say there were perimeter columns, as well as columns in the center, at the base, and those that are there that we can uncover will be uncovered when we uncover the footprint.

MEMBER OF THE AUDIENCE: That might be an example of a remnant that might be a surprise to Mr. Stanke because that's not a remnant that people are familiar with. In the

descriptions that you've offered thus far in the Section 106 process, nowhere does it describe the footprints in total.

THE MODERATOR: As I said, when the work begins to uncover it, the PA will reach out to people and let them know when the site visits or visit will be determined and will be held. We are going to move on now to the Vesey Street entrance, the former 1 and 9 entrance.

MR. SHAWN LENAHAN: In our last consulting parties meeting we looked at the issue of the 1 and 9 access at Vesey Street. This is the entrance originally coming down Vesey Street and moving up to what was the plaza. This was an entrance to the 1 and 9 station. This is the location in the plan.

As you recall in our last Consulting Parties meeting, and for those who weren't here, we had some comments from consulting parties that favored the removal of the resource and some comments from consulting parties in favor of retaining the resource, which we took in. What the Port Authority has done in working with MTA is in further looking at how the PATH terminal project may impact the resource and realizing

that one preferable option is to avoid the resource. That is the conclusion that we reached for the PATH terminal project.

The terminal being in yellow, the way that we would most likely avoid the resource is to shift the entrance from the street to the PATH pedestrian entrance or pedestrian network, possibly to the south, or in some other direction to not touch the resource and it would not impact the project. Therefore, the other projects on the site may deal with that resource as necessary, but as far as this process and the Section 106 for the PATH terminal project, we won't be impacting that resource.

THE MODERATOR: Any comments on the Vesey Street entrance, any further observations?

MR. KEN LUSTBADER: Ken Lustbader from the Lower Manhattan Emergency Preservation Fund. I just want to understand, did you say that it's removed from your project parameters, boundaries, or you're not going to be impacting it at all?

MR. SHAWN LENAHAN: The PATH terminal project won't impact the resource.

MR. KEN LUSTBADER: But other

projects could potentially impact it?

MR. SHAWN LENAHAN: Yes.

MR. KEN LUSTBADER: So in terms of mitigation or design treatments, there is no proposed design treatment that would be incorporated into the MOA, such as some of the other issues we discussed about the box beam columns, architectural treatments. The Port Authority is not proposing that at this point?

MR. SHAWN LENAHAN: Correct.

MS. LISA ORLOFF: Hi, my name is Lisa Orloff. I'm the executive director of September Space and I am also a World Trade Center Survivors Network board member. I am here representing the Board of the World Trade Center Survivors Network on the issue of the Stairway to Nowhere. I discussed it and it's appropriate at this time to mention it, but I wanted to make sure their views were expressed here. You're talking about the resources, so I wanted to ensure you're speaking about the Stairway to Nowhere in what you're addressing.

One of the things that they had requested was that in speaking about the Stairway to Nowhere, really changing the name perhaps to

Survivors Stairway because that's where most of the people who survived came out of. I have documentation and a full letter requesting that for anybody that would like it.

MR. JOEL KLEIN: Joel Klein for the Coalition of 9/11 Families. Over the last several meetings we have been told over and over about the close cooperation between the Port Authority and LMDC regarding all aspects of their respective projects and the cumulative impacts. Has the Port Authority had any specific discussions with LMDC regarding LMDC's plans to effect the Vesey Street stairs, irregardless of commitments made by the Port Authority? If the LMDC has plans that would affect them, any commitments made by the Port Authority essentially become moot.

MR. SHAWN LENAHAN: The Port Authority has spoken to LMDC that the PATH project is not going to affect this resource, but the LMDC process is that they are not at that stage yet. They just know, they've been informed that we are not in the PATH project affecting this resource.

MR. TIM STICKELMAN: The LMDC 106

process will start. They have a programmatic agreement.

MS. PETRA TODOROVICH: Hi, Pat Todorovich from Regional Plan Association. I see that it's in the footprint of the plan for Tower 2 and I was just wondering if anyone can give me an impression of how this might be dealt with. I assume this might be something that would be -- what grade would it be at when Tower 2 is built? Would this be something that would conflict with the sub-one level of a future office building or the grade level of a future office building and would LMDC manage that process?

MR. TIM STICKELMAN: I believe that's just a schematic drawing basically. You can see Tower 2. It's such a preliminary draft, they are not even sure what Tower 2 is going to look like, but that will be dealt with under the programmatic agreement.

MR. SHAWN LENAHAN: Among the things that we mentioned in our last meeting last month was that there would be a grade change to what the grade is currently, to what the grade of the street and the surrounding structures will

be. So those are things that would factor into that. But since the PATH terminal won't be impacting that, that's something that will be addressed in those forums.

MS. PETRA TODOROVICH: And it would probably be sub-grade, this structure.

MR. SHAWN LENAHAN: There is actually maybe a 4- to 6-foot difference in grade, so it's not a significant difference but it's noticeable.

MR. TIM STICKELMAN: It's just unknown right now. They just don't know.

THE MODERATOR: As most of you know, last time we had extended discussion on the need for Platform D, and the Port Authority agreed that they would return today and discuss their rationale and the data that justifies the need for Platform D. We are going to ask Lou Menno to come up and discuss that.

MR. LOU MENNO: Good afternoon, everyone. Thank you for joining us. I'm going to begin by going over and doing a recap about the history of this project from when it first started, going back two and a half, almost three years ago. It's hard to believe that so much

time has passed.

It's important that we look at some of the history because a lot of good work has been accomplished during that time. It's important that we remember that, because I think sometimes we fail to remember. As we get into heated discussions at times, we seem to forget all of the accomplishments we made and the collaborative spirit with which we work together and at the same time to again demonstrate the Port Authority's firm commitment to document as well as to preserve to the fullest extent possible the historic resources, such as the Tower footprints and the columns of 1 and 2 World Trade Center.

We made a lot of commitments and we have been able to live up to those commitments. When we look at track configuration, platform configuration, we met the promises that we made and we will continue to do so. It's important to keep that in mind as we move forward.

When this planning process started some time ago, we had to start looking at developing the goals and the objectives for this permanent PATH terminal, this transportation hub which is just not the PATH station itself. It's

more than that. We had to look at what we had before 9/11, and then we had to look at what was going to happen in the future. We had to look at all of Lower Manhattan, not just the World Trade Center site and we had to develop the goals and the objectives to meet all of the parties' important criteria for the rebuilding of Lower Manhattan after the events of 9/11.

When we look at what we had before 9/11, when we look at what we lost, we lost a lot and we need to restore a lot of those pre-9/11 functions in a more enhanced and more effective way than ever before. When we look at the PATH station, the PATH facilities that we had at the World Trade Center, we had a station that was designed in the twentieth century, a station that had three platforms with five tracks, three ten-car platforms, and we were at full capacity with that station. We were experiencing ridership growth, especially on the Newark line. We were experiencing ridership growth in the reverse commute as residences were beginning to prosper in Lower Manhattan, more people living in Lower Manhattan.

And what was happening, we were having

situations of overcrowding on those platforms and safety was in question. What could we do for the future? We did not have the ability to expand that station, to relocate it. It was fixed. We had no way to move it. And the best that we could really forecast was a decrease in the level of service as the ridership was going to grow in the future.

Then we looked to the future and we looked at what was happening, not only at the World Trade Center site, with the restoring of 10 million square feet of office space, the rebuilding of 7 World Trade Center, but all of the retail space, the cultural facilities, the memorial, as well as all of the other businesses that were coming back downtown and the residential population that was growing. The residential population is growing. We realize it's going to further increase the reverse commute in Lower Manhattan as we look to the future.

As we look up to the year 2025 and the EIS, the draft EIS, you saw the amount of ridership levels increasing. It was important that when we established our goals, it was to

establish a transportation complex, not just the PATH station but a transportation complex that would address the needs of all the parties affected in Lower Manhattan and also be very mindful and sensitive to the issues of mitigating the impacts on the historic resources. We did that and we will continue to do so.

When we developed the initial plans for this downtown transportation terminal, we laid out corridors, we laid out all the new intermodal connections between PATH and virtually all of the subways, connections to the cultural facilities, memorial, and we avoided with those corridors, with those concourses going east-west, north-south, avoiding the areas of the footprints, the areas where the columns stood. If I only talk about footprints, I also mean columns. I'm talking about all of the historic resources.

And then when we looked at the PATH facilities and we looked at the ridership growth, we had developed with our planners initially a plan, what would be the best for us to have as we build and plan for the future. Initially, our planners came back to us early on and said we

need five tracks and five platforms. We looked at that and we really didn't like it. First of all, a lot of the layouts were nice to have, and more importantly, it also affected the resources of the footprints and the column bases. What we did was go back to the drawing board, do something more effectively, more efficiently in a layout that would address the needs for the future. We presented about a year ago the layout that you see here of five tracks and four platforms.

Early on, when we first presented this plan, Track 1, right here, was located here, further into the footprint. We pointed that out. We didn't hide it. We explained why, because we thought that the slurry wall along Greenwich Street would have to be reinforced, which would then impact that track. We made a commitment that we would do our damndest to make sure that we could avoid doing that. We did that and we were able to come back to the parties and say that Track 1 will remain where it is and have less of an impact on the footprint, as well as the column bases of 1 World Trade Center and 2 World Trade Center. We lived up to our

commitment.

At the same time, we also made a commitment that these five tracks will remain in virtually the same location and the same configuration as before. We also said that these three platforms were also going to remain in the same location and the same configuration as before, ten cars in length, but we needed this fourth platform. We presented to you and we worked very hard at explaining the amount of impact, how many columns, how much area we were covering by this fourth platform. This fourth platform, we explained why it was needed in terms of ridership growth and safety. Keep in mind, we have to build and plan for the future but also still remember what was there and what happened on that horrible day. We are also survivors here.

The need for Platform D, let me go through that for a moment. When we design a PATH station, when we design any station, there is a basic premise. You design for the peak period, and the peak period for this PATH station is in the morning peak. You have to design for that. And more importantly, you have to clear the

platforms before the next train comes into the station. If a train is coming in at a three-minute headway and the first train comes into the station and unloads its passengers, they have to clear that platform within three minutes. When you think about clearing the platform and how long it takes, it's made up of a number of different components. I'm going to do my best to try to explain it as simply as I can.

The time that it takes to clear a platform is made up of increments of time that, added up, gives you this time frame to clear a platform. The first time interval is how long does it take to exit the train. You add to that increment of time now another increment, which is how long does it take to walk on that platform to a queuing area and then the time it takes to get up a vertical circulation element, whether it be a stair or whether it be an escalator. All of that time, all of that clearance time has to be less than the headway.

Next, that clearance time to get off the platform is also affected by the number of vertical circulation elements, how many stairs, how many escalators. When we look at this

station, we look at the platforms, there is only an optimal amount of vertical stairs, vertical elements that you can put into a station before they begin to affect one another and before it becomes a negative, whether it be from a geometry point of view or whether it be from people walking in front of each other. If you have cross-connecting stairs at times coming up to a mezzanine, it's also taking away valuable circulation space on the platform. So there is an optimal amount.

Now, if you remember, I said that there is that reverse commute, that growing residential population in Lower Manhattan. They are doing that reverse commute, so when you look at this calculation of how long, this analysis, of how long it takes to get off a platform, you have to look at that not every single stair or escalator is used to clear a platform. You need to allocate some of that vertical circulation for this reverse commute.

I'm not even going to talk about failure of management here if one or two escalators go out of service. Just keeping that in mind, vertical circulation, reverse commute,

and when we look at and do the analysis of three platforms for the Newark service on Platform C, the time it takes to clear that platform is greater than the three-minute headway. That's a negative. That is a negative. That creates blocking, backup on the platforms. By the addition of this fourth platform, it alleviates that condition. It greatly reduces that clearance time.

We, as a public agency, have to think about safety and safety is very, very important. Safety has been one of our primary objectives here, as well as being a secured environment. Safety is important and we are not going to jeopardize safety for our passengers now and in the future. It would not be, I believe, in everyone's, in the parties' best interest to say that we are willing to sacrifice or jeopardize safety. We have to keep this in mind.

What that extra platform does, it allows for improved circulation of our passengers, allows the passengers to move around more effectively and help us with that projected growth that is coming to Lower Manhattan.

When you think about it, what did we

have before 9/11? We had a constricted station that had reached its limits, and for us to go back and build a station that is a replacement in kind does not serve the best interests of all the parties. Keeping in mind as we move forward, we are very cognizant and very understanding and sensitive to the historic resources that are going to be affected. We will do our damndest to mitigate the impact on those resources, but to put safety at risk and not allow for future ridership growth is not in the best interest of Lower Manhattan and all of the parties concerned. Thank you.

THE MODERATOR: Any questions for Lou, and comments?

MEMBER OF THE AUDIENCE: Most of the push-back in these sessions has been in terms of the Port Authority having to justify this Platform D, which I'm sorry to see that you have to present so defensively because it does seem obvious that you have to be able to handle the traffic in a safe manner.

I want to push it a little further and ask will Platforms A, B, C and D be adequate for the long run or has there been consideration on

whether a fifth platform mike might be necessary to handle the long-term traffic?

MR. LOU MENNO: To respond to that question, the ridership is going to be greater in the future on the Newark line compared to the Hoboken line so that we looked at the analysis, and with the configuration that is being proposed here, it will support the future ridership growth on both the Newark and Hoboken lines coming into the Trade Center.

MR. BOB KORNFELD: May I ask a question? This is Bob Kornfeld. One of the issues that came up at the previous meeting was the idea of reconfiguring the part of that platform that crosses the 1 World Trade Center footprint to clear the columns. Have you explored that any further? It seems like that's a relatively minor change compared to not having another platform at all.

THE MODERATOR: The question was how much consideration or has consideration been given to simply reconfiguring the north end of Platform D? I assume that means, Bob, narrowing it or something like that?

MR. BOB KORNFELD: Right, or kind

of cutting it off and angle it like where work goes across the footprint and maybe reconfiguring the stair or something like that.

MR. LOU MENNO: I have Bernie McNeilly who will address this question for you.

MR. BERNARD McNEILLY: It's Bernie McNeilly from the Port Authority. The width of the platform is comprised of a couple different elements based on what Lou was saying. Part of it is, if you are familiar with the existing station right now, there is a safety strip. There is a distance to be able to get around vertical circulation elements, to stay in accordance with some code requirements, specifically, the American Disabilities Act, ADA, as well as the width that's associated with the vertical circulation elements. Based on that, we are not going to be able to decrease the width of the platforms.

We did take a hard look as far as the number of vertical circulation elements that would be required, and based on the way we were trying to look at this situation, we right now have the minimum amount of vertical circulation elements that we need to maintain an adequate

level of service so that we can make sure we are addressing this platform clearance issue that we are talking about.

Hopefully, that answers your question.

MR. BOB KORNFELD: I don't think that really does answer the question. I think you've got a big problem with that.

MR. BERNARD McNEILLY: Could you be a little bit more specific about the problem?

MR. BOB KORNFELD: I think the problem is that that's an unacceptable impact, I mean, adverse effect. I think you're very close to being able to configure that platform in a way where it will not have an adverse affect on 1 World Trade Center. I think you're so close to having a hundred percent of that footprint, figuring out some way to address that would just move your process along a lot faster.

MR. BERNARD McNEILLY: I understand your point, Bob. We did in fact figure out how to address that there will be an impact. If you could see the slides, and I don't know if you have the slides in front of you, if you look at the coloration that is there for the proposed Platform D configuration, what is

represented in the darker color red is to represent one of the things that was explored. It seemed at the last meeting that there was some reasonably positive feedback about it, about architecturally enhancing and treating both the platform and areas that would represent the Tower area, particularly in the areas where you would be, in fact, either the World Trade Center Tower 1 or 2 footprint area.

In our opinion, what that would mean is that although it is an impact, it would give you an adequate representation, just because of that treatment of increasing your awareness in expressing that you are in fact in either the Tower 1 or Tower 2 footprint. That is how we would be addressing the potential impact to the resource.

MR. NOAH PFEFFERBLIT: I'm Noah Pfefferblit from Wall Street Rising. Mr. Menno, you depicted this in very technical terms in terms of the headways and so on. I am wondering, are you suggesting that if there were an emergency at this location in the future when it was at maximum usage that there could be risk and real endangerment to people trying to evacuate

Page 37

from the platforms?

MR. LOU MENNO: Without Platform D, the fourth platform, we would have a serious condition that, God forbid, if there were an emergency and we had an overcrowding situation, we wouldn't be able to clear people off in an adequate period of time. There would be some risk.

MR. JOEL KLEIN: For both Lou and Bernie, we keep coming back to this. At the meeting we had almost two months ago, we asked for the backup information to support your ridership projections. We were referred to the EIS. At the last meeting, you acknowledged it was not in the EIS. I believe a commitment was made to provide that information.

In addition, we had not had an opportunity to look at any of the engineering studies to support your contentions about how long it would take to clear the platforms and allow for an independent assessment of that being done. It's clear that that's a very key issue here.

One of the other points that is continually obfuscated is the fact that I believe

Page 38

that there never was ten-car service into the World Trade Center prior to 9/11. There were ten-car platforms, but as other stations in the system, they could only accommodate eight-car trains. Only eight cars were going into the Trade Center.

You are also showing by your own projections in the year 2025, approximately a 20 percent increase in ridership. You're also now going to be increasing the number of cars on each train by 20 percent because for the first time, with this new station, you will have an opportunity to have ten cars operating throughout the system.

In addition, the Port Authority has contracted for new cars for the system. There's been no information as to the ridership, if there is any difference in the capacity of those cars versus the new ones, the length of those cars, the number of doorways to facilitate ingress and egress. Also, there's been no side-by-side comparison of how passengers would exit the platforms compared to the original condition, the current condition and what's being proposed.

So how is anyone to do their own

Page 39

evaluation as to whether or not you, in fact, are telling us the truth or not? Essentially, we are being told trust us and I'm not sure that a lot of the consulting parties here feel that we are at the point where we can trust, as an absolute, all the things we hear from the Port Authority.

MEMBER OF THE AUDIENCE: First of all, there are things about the projections that I'm not necessarily sure that I trust. One is in 20 years I think the ability to project they will only have a 20 percent increase in usage is a leap of faith. We could as easily have a 40 percent increase in usage over a period of that time.

So I think in terms of long-range planning, I would expect that this being a significant passage into the city and a very important component of bringing workers in and out and residents in and out, that you have to plan to be very conservative to be able to meet future demands because down the line, as we know from before 9/11, if you underplan it, you are not going to be able to change it in 20 years without a huge cost to the City and the State.

So you know, I have an economics

Page 40

background and I don't trust economic projections, and so I would be very conservative with that. I think the platforms that you have seem to be reasonably conservative. There will be new trains, faster trains and better, but one thing that doesn't change over a period of time is how fast people walk and how they can clear stations.

Another thing I'd like to say is that I think if you look at the World Trade Center site, probably even within two or three years, the highest volume of visitors to this site is not going to be tourists, it's not going to be residents walking across it, it's not going to be business people in offices. It's going to be people coming into this PATH train. Everywhere on the site has the recollection and the use that it had prior to 9/11. That we walk through and pass and use it in a way that we used it prior to 9/11 is incorporated with reminders of the world before 9/11. It's a far more valuable piece to restore this site and protect the memory of the World Trade Center than protecting a few artifacts of metal and concrete beneath the surface.

Page 41

I think the design of this PATH station is very important because I think it will be a reminder to everybody who used it on a regular basis. The fact that it takes one through the footprints and people will be walking through the footprints of the World Trade Center and know that when they used to cross through these areas that above them were two towers that are now gone will be an incredibly meaningful part of our daily lives.

So I think those are the main points that I have here. That resource, I think the resource or the ability to be in the space is more valuable than the specific resources of specific columns under the ground.

MR. MATT VIGGIANO: Hi, I'm Matt Vigiano from the State Senator Martin Connor's office. One of the largest goals for Lower Manhattan has been enumerated by many Lower Manhattan organizations, which is to retain this area as the third largest business district in the country. One of the things that is going to help to do that is providing the capacity that would be needed in the future by the workers returning from New Jersey to downtown Manhattan.

Page 42

I think following the community's lead, this is something that will help us greatly in securing this and keeping this the third largest business district in the city. Thank you.

MS. CHARLENE VAUGHN: I don't know where to begin. First, I'd like to just touch on something that Mr. Stanke said. I actually kind of disagree with that. I think 50 years from now PATH trains are not really going to communicate the September 11th attacks in the way that the actual tangible footprints, that are the scar from the attack, the way that they would be able to provide that powerful connection without words.

I think many people also forget that 3,000 people were killed at this site and cremated remains of those people were found on these bedrock footprints. So they have more than just a historic value, they have a spiritual value. The fact that we are family members is irrelevant. This is a historic preservation position. Check the comments, all the historic preservation groups that are participating in this process have been battling to save these footprints.

Page 43

Having just been provided with this information that justifies the Platform D, we haven't had a chance to review this yet, but based on what we've seen so far, we do not think that Platform D is justified and we agree with the Historic District Council that a hundred percent of the North Tower should be preserved as opposed to that 97 percent which we had originally agreed to.

The Port Authority and FTA had promised us that they will begin to look at the footprints in total, not just the columns that define them but the total historic footprint. They told us they would speak percentages. Here we are looking at a memorandum of agreement and there is not a single percentage in here in terms of discussion of the footprint of 1 World Trade Center or 2 World Trade Center. I'd like to know where the draft finding of effects document fits into all of this because we haven't seen a revised version of that since you've received all of our comments.

It looks like we are just getting steamrolled into the memorandum of agreement that's going to be finalized. The consulting

Page 44

parties that we speak with frequently have concerns about the cumulative affects of the LMDC's projects and your projects. A prime example of that is that Vesey Street staircase where you're telling us don't worry, our project is not going to impact it, not telling us what LMDC's impact on that will be, which at the last meeting you mentioned that that Vesey Street staircase was going to essentially, based on the design for the office tower that's going in that location, would essentially be in the lobby and that it wouldn't be practical to preserve it.

I think the consulting parties need to be able to have the ability to look at the entire World Trade Center redevelopment in one cumulative package because otherwise, whatever you tell us, even if you finally keep your promise and begin to look at the footprints in total and start talking percentages, it's going to be irrelevant because LMDC at the end of the day was able to sign an extremely vague programmatic agreement where they just provide access and their definition of the footprints isn't even accurate. They talk about access to the box beam columns that form portions of the

lower footprints. We know from these ongoing meetings they don't form portions, they form the entire historic footprint.

Some people may think these are just steel columns embedded in concrete, but there are those of us who feel they have much more importance and importance in the sense of 50, 100, 200 years from now. The PATH train is not going to speak to future generations about the September 11th attacks, but these physical footprints can. None of the preservation groups are saying you can't have your PATH train, you can't have your office towers, residents can't have their access around the site, which is a different issue.

So the point I'm trying to make is that it's infuriating when people try to downplay the historic significance of these footprints. It really is very difficult to listen to the Port Authority talking about safety issues when maybe you could tell us if the new World Trade Center is even being built under the legal jurisdiction of local building and fire codes because I know that that's another issue.

THE MODERATOR: Try to keep it on

Platform D.

MR. MATT VIGGIANO: Well, we talked about safety features.

THE MODERATOR: I know. They were talking about evacuation of the station. That's not the issue today.

MS. ROBIN FORST: Robin Forst from Council Member Alan Gerson's office. Listening to the different points of view, I am sort of reminded of the lessons that we have learned from 9/11. I think one of the most important lessons that we learned is the critical importance of safety as we go forward. Sadly, it feels like the world is a more dangerous place today than it was on 9/10 or 9/11. I think the creation of easier access into and out of the station through the establishment of the creation of an additional platform makes tremendous sense from a safety standpoint.

One of the other lessons that we learned in the aftermath of 9/11 is that we need to progress, we need to move forward while at the same time preserving the memory of what occurred on that day and also preserving our past. I would ask, and I know there's been some

discussion, I'm sorry I missed the last Consulting Parties meeting on this. I think Anthony is right, that the footprint remains important to our collective memory and if there is a way that that is identified through engineering or designating the area on the platform that represents the footprint, I think that that is an important thing to be done.

I would also say that the memory of what happened 50 years from now or 100 years from now, in my opinion, is better told by the memorial itself and the memorial museum. I don't think the footprint itself will tell a story.

Thank you.

MR. RICHARD KENNEDY: Good afternoon. I'm Richard Kennedy from Community Board 1. I'd like to thank the Port Authority and all the agencies involved for your hard work on this. I agree with much of what Robin said and everyone else. I think we have to look at the folks who live and work here and who come to visit Lower Manhattan. I think that needs to be taken a look at and what the future will bring here. We are the third largest business district, as someone has just previously

mentioned. We are going to add possibly 15,000 residential units which are going to put additional demands on this.

I think if you take a look at that and what needs to happen to make this work, your plan works. I think planning for the future and allowing for growth and capacity, possibly beyond what you're considering today, is a reality. I think the fourth platform is important to serve the community and the safety issues. The folks who live and work here are survivors. I personally do both. I live downtown and I work downtown. On that horrible day I watched what happened and I really don't want anyone to be put at risk ever again. I don't think that's an issue that's debateable, I don't think that's something we can even remotely consider. The ability to be sure we are safe, this works and we are doing all the right things for the people who live, work and are here. It's critical. Sometimes they are the silent majority. They don't come up and talk to you about it, they don't voice it so much, but they are the day-to-day folks who are here. I think that's really important.

I guess if I sound a little emotional, I probably am. Because of that, I think safety is critical, I think the understanding that we are the central business district that's going to grow, the incorporation of the merging of the transportation systems will further increase what we are, making us a greater global city. The need to be sure this all works and ties together is important. So I think the ability to expand is critical. I think the safety issue that was brought up before is an issue that is one that we can't put at risk under any circumstances. Thank you.

MR. BOB KORNFELD: May I make another comment?

THE MODERATOR: In just a second, Bob.

MS. PETRA TODOROVICH: One of the first consensus points that emerged from the civic community after September 11th, in thinking about the planning for rebuilding Lower Manhattan was that restoring the transportation connections to the rest of the city in the region is one of the most important things that could be done to restore the economic vitality of Lower Manhattan

and provide for sufficient capacity and long-term growth of this very important business and residential district and visitors district.

So RPA strongly supports a PATH station that can accommodate this growth over the long term and we feel that a three-platform solution would not be viable. If we are going to invest this much money in the station, it should be able to sustain and promote economic growth in Lower Manhattan over the long term.

That being said, I don't think that the Tower footprints are something that can be taken lightly and I don't believe that the Port Authority is taking them lightly. We are not prepared yet to fully support the solution that's been presented in front of us for platforms. I'm sorry I missed the last meeting. I was very intrigued by Mr. Kornfeld's suggestion over the speakerphone that the platform in some way be narrowed. I'd like to see a greater explanation of how different options might still clear the first footprint. Obviously, this isn't most desirable from a transportation, from a commuting perspective.

I'm thinking about the South Ferry

station which we are now correcting, where you have to walk back a couple cars to exit. If that fourth platform were in fact shorter than the rest, you might be able to provide some additional capacity but not the full capacity as if you'd have four platforms.

Obviously, we would need to review all these options. I would be interested in seeing just a few more options for how to explore this because we are so close to preserving that entire footprint which RPA feels is a very symbolic element that if at all possible, what can be preserved, should be.

I just want to throw our support for having as much capacity as possible for the long-term economic growth downtown, but I'd also like to see some more solutions and see if the Port Authority could provide us with a few more options as to how to deal with this. Thank you.

THE MODERATOR: Bob, you can go now and then we will go to the back of the room.

MR. BOB KORNFELD: I just want to say that I think this is being portrayed by a number of the parties as sort of like a safety versus preservation thing. I think that's a

false premise. It's not that at all. The whole issue of the Section 106 review is to identify historic resources and then see how to minimize an adverse effect. I think that's what we should be doing.

I think making speeches about how we need safety and everything, there is no one who is against safety. There is no one who is against having a good PATH station, but I think that not enough has been done really to bring some imagination and creativity into the design process. I think that that can happen. I don't think it will impact PATH service or safety. I think those are non-issues and they are not really that relevant to the historic review.

MR. ALBERT CAPSOUTO: I'm Albert Capsouto from Tribeca Organization. One, I do want to emphasize the reverse commute point. I think that's a point that is not really taken here that much, but Tribeca and the financial district are some of the fastest growing residential districts, much of which are going to be employed on the Jersey side. I think prior to 9/11, that was not as much of a component as I see down in the future. So down 10, 20, 25

years, I do see the reverse commute being a very important process.

I want to address again the question of the historic preservation versus the symbolism of the historic preservation. I think having a life through historic preservation elements will actually enhance the memory, not detract from it.

MS. SHIRLEY JAFFE: Hi, I'm Shirley Jaffe from the Alliance for Downtown New York. I guess a lot of people have said things that I would just like to reinforce. We've been around since the middle of the '90s and we watched a lot of things happen to Lower Manhattan. We represent the residents and the businesses downtown. It's critical that Lower Manhattan move forward.

I would like to say that I think this process has been very responsive. To the point of the man on the phone, the point is that you look at the conditions on the side, you look at potential resources and you try to address the conflicts, but you try to address the conflicts as best you can. Sometimes you can and sometimes you can't. I think this process has been very responsive.

The future of Lower Manhattan is essential. It is the third largest business district, it's going to have a glorious future and I think everybody who lives, works and visits downtown wants to see it move forward as quickly and as impressively as possible. I think that we need to design for the future and not look at a station that the -- the station at the South Ferry station is an incredibly archaic station and the notion that you would even think about designing something as a throwback to that is absurd at this point. This is a moment in history where, fortunately or fortunately, we can actually think about designing for the future and looking at capacity and looking at growth.

Growth is always underestimated. We look at a slow economy right now and we think, oh, it will never change, buildings will never fill up. There are cycles and people forget that there are cycles, and ultimately, Lower Manhattan will grow. Both the residential population and the worker population will grow tremendously. I think we do need to move forward and build a proper PATH station that doesn't just accommodate today but definitely accommodates tomorrow.

Finally, I'd like to say that I think that the footprint is important, but there are different ways of preserving things. I actually think it's a fairly ingenious way that you've come up with and it's not disrespectful and it's not dismissing the importance of the footprint. There are many, many ways of looking at it, preserving and keeping a memory of important historic events and monuments. You can see them all around the world.

MS. DEBORAH LESTER: I'm Deborah Lester from New York State Assembly Speaker Sheldon Silver's office. I wanted to let you guys know that the Speaker supports the position of Community Board 1 and the residents of Lower Manhattan who seem to be in agreement that the PATH station should move forward and that your plan takes into consideration the footprints. Anything else that you can come up with, I'm sure would be appreciated by all the consulting parties. But at the end of the day, the PATH station and the improvement of the PATH station is vital to Lower Manhattan. Thanks.

MR. JOEL KLEIN: A lot of the people who have spoken have sort of accepted the

premise that the Port Authority has put forward that Platform D is the only solution to the problem of dealing with increased ridership and proper circulation to get people in and out of the station.

I repeat again, there has been no independent evaluation of that data. You have not made it available to the consulting parties. This is the same agency that told us there was no way to avoid having a fifth platform, there was no way to avoid destroying the E train entrance, there was no way to avoid destroying the Vesey Street stairs.

The heart of the Section 106 process is the need for the process, as well as the consideration of alternatives. The only alternative, one of the three alternatives that the Port Authority and FTA have put forward in their EIS and their 4-F statement is what I refer to as a mega alternative which was unbuildable on its face, which was the construction of new tubes under the Hudson River.

Well, if you're going to look at alternatives that are so outrageous, that would do nothing toward solving the problem, then I can

suggest alternatives to Platform D that would function very well and would preserve the footprint. Why not have another level in the station? There are alternatives that could be looked at. At least give them the courtesy of analysis. They may not be viable, but the point is you have started from the premise that this is the only solution that meets the problem.

We are not convinced that that is the case, and your reluctance to provide the information upon which those conclusions are based to outside review by professionals and traffic, engineering and transportation engineering makes the entire process very, very suspect.

And so I would call upon you again to make that information available so that it can be reviewed by independent parties. I would urge you again, as I had done in prior meetings, not to view these historic resources as impediments but to look at them as challenges. There may be other solutions that you have not yet considered. We think they exist and we think if you get beyond this attachment that borders almost as a rationale to having this fourth

platform as the only solution, that there may be some way to provide an alternative that allows for safe operation of the facility in a manner that meets your future demands and not just the projected demands of 2025.

People talked about not being able to rely on those projections and they talked about the dangers of underestimating future ridership. Well, perhaps there are alternatives that you could consider, such as possibly double decking some of these platforms that would allow for even greater expansion of capacity.

That's all we are asking for and that's what's called for in both the Section 4-F, the Section 106 and the need for processes.

MR. BRUCE EHRMANN: Bruce Ehrmann, chair of Lettermarks Committee of Community Board 1 of Manhattan. I can relate to the issue of trust. It's always a problematic issue when individuals are dealing with either government entities or large private entities. I also appreciate the notion that was raised a little while ago, that had this process been approached more wholistically as an examination of the entire site, I think the view of the

historic preservation mission would be much clearer.

If one viewed this entire process so far on one screen, one would see that, for instance, the World Trade Center Memorial Advisory Committee, of which I was a member, painstakingly went to preserve everything that we really could preserve. Everything on the surface and much below the surface will be starkly evident. Access to the slurry wall is manifest. All kinds of committee members from all approaches worked together to achieve this. The Mission of Historic Preservation, as I see it, is to try to sustain historic resources and make them usable in a modern context. We don't live in a museum, per se.

Community Board 1 has the second most applications for alterations to historic districts or individual buildings of any in the city. We have a long history of strict constructionist preservation. However, so much is being preserved here, including the footprints at the surface, including the slurry wall. The list that was just mentioned of all the things that you said you couldn't preserved that you

have preserved, that you are now preserving, the last people just addressed, is an example of this process working and your malleability on this matter.

I'm not in love with the Port Authority, I don't dislike the Port Authority, but I'm at a loss to understand in the C-106 process as opposed to, for example, the Memorial Committee process, which had as much family members as community members and other elements, I'm at a loss to understand why every small area, every small segment, section, item of discussion is prosecutorial, is one of contention. So far this process has been an enormous success by conventional preservation standards in term of what has been preserved. Thanks.

MR. NOAH PFEFFERBLIT: I don't feel qualified to assess and analyze the presentation that's been made, but accepting at face value what has been said, while I think there is definitely a need to honor the footprints, honor the feelings of the family members, I think that the one thing that for me trumps everything else is the need for safety.

If there is deemed to be a need for

the fourth platform to protect the safety of future users and the future growth of the area because it will mean that there will be that many more users of the station, I think to me there is no question. It would be unconscionable to prevent that from happening.

While there could be other analyses, other people could take a look at this to see if there are other creative solutions that they can come up with, if what we have here turns out to be what we have in the final analysis, then certainly Wall Street Rising would support the plan as it's presented.

MR. KEN LUSTBADER: I'm not prepared to comment on behalf of the five groups that I represent about the intrusions on the two towers. However, I just want to go back, for the record, the concern that we have, which has been discussed before, is the cumulative impact of all projects. I think that's where the frustration comes from the five groups that I deal with, that we can't appropriately evaluate this project without knowing the cumulative impact of other projects, such as the memorial, the Memorial Center, the other cultural buildings.

For example, today being told that, okay, the Vesey Street staircase is now just taken off the table and put into another pile, so we can't even evaluate what the impact is going to be on that, which feels very disingenuous about the entire process. From purely a frustration point of view, that's where the Lower Manhattan Emergency Preservation Fund stands on this.

We do appreciate the Port Authority's efforts to preserve the footprints, we do appreciate the work that's being done to mitigate the impact on the E train, but I think the frustration is the kind of consensus of how to go forward as a team in evaluating this 106 process.

MEMBER OF THE AUDIENCE: There is one dimension of this that we haven't really spoken about and it relates back to some of the other options of what might have been done or what might be doable in order to handle the capacity and that is the dimension of cost. Is there anybody here who is actually paying for this or who represents organizations that have the budget that is responsible for paying for this? I guess it's coming from the FTA, is that

correct?

THE MODERATOR: Indirectly, a lot of people in this room are paying, so to speak.

MEMBER OF THE AUDIENCE: Very much so, I would think. One of the big limits on this, they are realistic limits. We are all paying for it. One of the issues in terms of options is cost. I'm in the middle of renovating my own place and I have to decide whether to take down a wall or keep a wall back up, you know, relating to construction that was done. Keeping a wall up is a heck of a lot less expensive than taking a wall down.

I know some of the early ideas that were considered were taking the platforms, moving them right through the slurry wall to the other side of the site. The expense of that would obviously be prohibitive. The idea of taking the trains up a level and then having to build a structure to support train level weights in two levels, obviously, vastly more expensive.

We are sitting in a situation where we know we don't have the money from insurance, federal government, et cetera, to rebuild. I don't even know what the percentage of what was

lost is. We have to use those funds wisely, we have to find effective ways of using what's there and leveraging it. Ideas that take us into the 20, 30, 40 percent more, you have to consider what is the value of what we are preserving for the dollars that it's going to cost to do that.

We aren't going to be able to go and say we need 50 percent more just because we realigned this PATH station. It's not going to be politically viable down the road. That's just another thought that I would like to be considered in the record.

THE MODERATOR: We will move on. Mr. Hotopp, are you available, sir? We are now going to discuss the partial draft memorandum of agreement and John Hotopp will have an extensive or at least a few issues to discuss.

MR. JOHN HOTOPP: We had prepared a partial MOA that we had circulated for your review. Some of the whereas clauses are in there so you can get a sense of how they are going to look. We are focusing specifically on some of the stipulations. This goes right back to the discussion I believe we are currently having right now.

The first thing I will mention is the documentation that is being proposed and that is that everything will be photographically documented. I put a little bit in here about how that will be done and to what level. I've been in recent consultation with HABS and HAER. They have decided to make it a HABS study rather than an engineering study. The problem we are having with this is really it's a documentary study, we are documenting an event. Nevertheless, we are going to go with the HABS designation. They are providing a number for us and a relationship so that all of these various pieces that are so documented can be brought together in a single document.

I believe that HABS is also going to become very involved in selecting drawings and things that relate to the towers themselves. It's becoming a much larger scale project than was originally envisioned.

The first paragraph talks about how it will be generally done to a Level 2, which is using documentary sources, drawings or maps and things like that, floor plans and other things that will be photographically reproduced, with

occasional sketches, as necessary. Measure drawings, only in the event that they actually would be required to tell the story.

So anyway, so far we have circulated some photographs of the first recordation which was the parking deck, so you have an opportunity to see that. Anyway, that's Paragraph 1 or A.

Now, the tower perimeter column remnants, we are back into that particular issue. In the first place, we are talking about that we are going to make a very careful job to photograph them correctly so that everyone will have a good record of them. The second stip in here was to focus particularly on the east-west pedestrian quarter. You will remember last time we talked about making sure that it stayed away from the footprints. That stipulation has been spelled out in here. You can stop me if you have questions at any point.

MR. BOB KORNFELD: I have a question on 2, the east-west pedestrian corridor. Does that have an impact on LMDC's proposed circulation around 1 World Trade Center, the memorial at grade level? I recall an article in the paper a few months ago saying that they may

need to make the opening smaller than the actual footprint due to surrounding circulation.

MR. JOHN HOTOPP: I don't have any information on that.

Anybody else want to try to answer that question or do we note it and get back to you next time?

MR. BOB KORNFELD: That seems to go to the issue of cumulative impact.

MEMBER OF THE AUDIENCE: Was the opening in the corridor discussed?

MR. JOHN HOTOPP: This was of course discussed, not the impact of Point Number 2, the corridor on the memorial, but the memorial, its configuration, the museum to some extent, what will be on the surface. In every possible iteration it was discussed and it appears in the draft summary of the Memorial Advisory Committee. I don't know what opening is being referred to.

MR. BOB KORNFELD: I thought there was circulation around the memorial wall that might be impacted by this pedestrian corridor.

MR. JOHN HOTOPP: I don't recall this coming up.

MEMBER OF THE AUDIENCE: One of the problems with this whole process, from our point of view, has been we are talking about preserving these various remnants. There's been very little about the tradeoffs involved and what some of the costs are.

I notice with Item 2 here, this commitment to avoid the column bases is an absolute commitment compared to some of the other commitments that are being suggested here, where we use phrases like more "practicable and beneficial to the maximum extent feasible" and so forth.

I guess my question is, is there any significant compromise that's being made in that corridor in order to make this commitment absolute or are we making it because we are absolutely confident and we won't have to compromise because a lot of people are going to be spending a lot of time in this corridor?

If we are sacrificing anything material there, if we are sacrificing a significant amount of retail space or whatever, then maybe we should consider hedging this with some of the same type of language. If there is

no impact at all, then I can understand how you can make an absolute commitment. That's the question.

MR. ANTHONY GARDNER: In response to the gentleman's question, phrases like to the maximum and feasible if practicable are qualifiers that quite frankly minimize the effectiveness of the PA. While this comes across as an absolute, it's actually where you want to get with mitigation, knowing what the agency is committed to do, why, how, when, whatever.

So I think, for instance, in Number 3, it talks about the locations of column remnants of both towers that will be covered by the proposed Platform D, "Shall be visually expressed on this platform through appropriate architectural treatment." That leaves room for interpretation. Anybody picking up this agreement can interpret that, when you don't have any criteria set forth in here, to establish what it is you're trying to achieve with this.

So I would suggest, as we talk about mitigation measures, that we try to move more toward absolutes. And to the extent that we cannot, that we have criteria listed here where

we know what we are evaluating it against. It begs interpretation. I don't know who the final arbiter ultimately becomes when something needs to be interpreted down the road.

MEMBER OF THE AUDIENCE: What is the plan execution date of this draft?

MR. JOHN HOTOPP: Another two months, wouldn't you guess, Tim? Probably within the next couple of months.

MEMBER OF THE AUDIENCE: What we would like to avoid, and I would like to say this in advance and it was the subject of discussion in a consulting parties call two days ago, we would like to avoid the situation that occurred with LMDC where a proposed draft was sent out. We delivered our comments only to find that the final copy was signed and executed without our final say on it.

MEMBER OF THE AUDIENCE: Quick comment that speaks to what Charlene was saying, the promise of looking at the footprints in total and referring to them as percentages. You've thrown around numbers over the last couple of meetings and I think for some of us that do feel that the remains of the footprints are a

significant historic resource that must be preserved, we need that absolute in there. We need to know the percentages that you're looking at in terms of preserving, especially when there seems to be no remedy here that you're willing to explore or implement to resolve this issue with the cumulative effects with LMDC's vague programmatic agreement.

MR. JOHN HOTOPP: I think what we are really talking about is the stage of design where things aren't as firm as they are. I know that Platform D has been going back and forth through the design process. Charlene, to answer the question, it's not as firm as it could be in terms of exact number of column bases that might be impacted. I think in the case of the east-west corridor, the designers were comfortable in placing it where they are placing it now. They are very comfortable with that phase of the design. I think that's why it got a little firmer.

I think you also see in Item Number 3, to go to Mr. Gardner's point, that there is an opportunity to revisit these things as the design becomes more firm. We are going to have a review

period in here for the consulting parties to actually comment on things as the designers get a little closer to the exact impacts. So I think that's Items A.

Item B is difficult. As you well know, we've been wrestling with that for the bulk of the afternoon. Why don't we go to Number C, which is kind of pleasant in a sense because the Port Authority has been able to accommodate practically all of the concerns with C. We are going to be able to take care of the E train subway entrance and preserve it more or less as it stands now, subject to codes and things like that. Nevertheless, it will be a functional, viable part of the operation.

As New Yorkers know, you've got to go up and go down in this city, so you won't have any problem going up three or four steps and traveling some distance and then back down again. I don't think that's a problem. I was very tickled to see that that did work out well in the design. Item C, are there any questions on that, on the E train?

The slurry wall is an area that the designers are still working with somewhat to the

greatest extent feasible, Charlene, wiggle words. We are trying to accommodate some views of the slurry wall on the east side. That again is contingent on the final design of the station itself and will probably be a subject of some discussion with parties. Any questions on that?

MEMBER OF THE AUDIENCE: I accept that the design phase is not advanced enough to provide enough details to have explicit mitigation measures developed, but in that regard, what about having some operating principles or design guidelines or something that are over-arching here? When you talk about where practicable and beneficial, are we talking about looking at engineering issues, are we talking about access, are we talking about safety, are we talking about consistency with some design guidelines that are used for this project overall? None of that is set forth in this.

So again, you have to interpret or make a lot of assumptions. The more open-ended that process is, the more you're going to have contention and debate because people don't know the frame work in which the design is proceeding.

At the outset, why can't we just say that the design process is still ongoing and is proceeding within this context, then say what it is that's guiding it. The engineers and the architects clearly have to know. They have a contract, they know where they are trying to go. Why can't we understand that in the context of trying to do the 106 consultation?

MR. JOHN HOTOPP: You want that as a preamble?

MEMBER OF THE AUDIENCE: Or something.

MR. JOHN HOTOPP: The other item that we put in this particular piece of the MOA was the penetration of the west slurry wall. That is obviously to get the east-west pedestrian quarter in place. So we've got some description here. We are not quite far enough along with it.

Again, this is a matter of coordination with LMDC and the section of this west slurry wall that they are going to preserve as to whether or not we will be able to view that from the quarter. We don't have a clue yet. And so we've we got some wiggle room in here too, Charlene, to say that as the design proceeds a

little further.

I think you may find in the next iteration of the MOA that we will probably be a little bit firmer in some of the areas because this design is proceeding, as we speak. Anyway, there is a comment on Item E.

MEMBER OF THE AUDIENCE: My concern on E, again, is the question of what is being sacrificed to provide the visibility of the slurry wall from the corridors. I think a lot of residents don't want to be in the position of having to view that thing every day as they go back and forth and have this constant reminder of what happened on 9/11. We started out with a standard, as I understand it, that appropriate access will be provided to portions of the west slurry wall and then we are going from that to providing visibility as people walk back and forth.

Again, I hope nothing is sacrificed for that. I keep talking about retail space, but those of us who live in the area I think remember very fondly the shopping concourse we had there. It was one of the most successful in the country, both for workers and for residents. I would not

sacrifice one square foot of good retail space for one single view of the slurry wall. I think if people want to see the slurry wall, there will be an opportunity for them to do that.

MEMBER OF THE AUDIENCE: I just want to reiterate one point. In our written comments to FTA and the Port Authority, we feel it's really critical that you begin to now address these cumulative impacts in a legally binding way. I think what Charlene was addressing is right on point and in line with what we've been thinking about how there is too much wiggle room in here and there is no absolutes, but the problem is the way we see it, if LMDC doesn't sign on to your programmatic agreement and agree to your terms in terms of how you're dealing with mitigation with the footprints, it's going to render the whole document meaningless because you could say we are going to preserve a hundred percent of the North Tower and then LMDC could come back to us and say, well, that's all well and good but we need to build a chiller plant on the footprint, which I think is on the table right now, and you're only going to get 10 percent. So we

really want, again, to urge you to explore that option.

MR. LOU MENNO: I just want to make a comment. There is no chiller plant that's going on the footprints. We made that clear.

MEMBER OF THE AUDIENCE: That's probably just a rumor.

MR. LOU MENNO: I think that's just an invalid rumor, just as we tried to clarify whether there were six or five tracks. We clarified that. We made it very clear that there will be no chiller plant.

MEMBER OF THE AUDIENCE: We heard this from LMDC that they are looking at breaking up the chiller plant to try to maximize access to the footprint. I don't know if that's true.

MS. IRENE CHANG: I don't think we have any authority on how the chiller plant is built.

MR. JOHN HOTOPP: We were sort of talking about the slurry walls.

The last point we have in this particular document so far was talking about relocating the cross and that will have to be done at some point during the construction. I

think Peter pointed out that it can probably stay in place for some period of time, but eventually, construction will impact that area and it will be taken down and removed during Hangar 17, pending its final disposition with the other artifacts.

Then we move on to a number of other items that we haven't quite gotten finished yet, draft of the Hudson River bulkhead section that will have to be completed out and you will see that in the next week or two.

The vibration impact section, that is also in process, and other anticipated archeological resources and anticipated discoveries are in this document. That gives you a beginning of an idea of how you deal with something that comes up in the site that you didn't plan for, you didn't expect to see and you do see, how do you deal with that. Monitoring is in process and some of it will have to be monitored as construction moves ahead.

Finally, the dispute resolution section. When one of the agencies might become unhappy, how do you work through that. That's also a draft at the moment. You should see that in a week or so. We are pushing hard to get

there.

MEMBER OF THE AUDIENCE: What is the context of Section 3?

MR. JOHN HOTOPP: The context of Section 3, we are talking about the vibration impacts of construction on these historic buildings and a way of monitoring that and assessing it so that we don't wind up with shaking down the Verizon building, for example, causing some sort of harm.

Anyway, what I anticipate is that within the next week or two you, the parties, will get a much expanded draft to look at and we will try to get out a number of the questions you raised today and see how much of that we can get incorporated.

MR. JOEL KLEIN: It's a comment, in general. It's short. I just want to go on record as saying that Port Authority and FTA should not take the fact that the families have not commented extensively on this document today to mean that we do not have comments or concerns about it.

MR. JOHN HOTOPP: Not at all. I'm encouraging you to comment.

MR. JOEL KLEIN: I will say that there is almost literally not a sentence on Page 2 with which we do not take issue. There is an awful lot of wishy-washiness about this, there are some statements in here that are quite frankly offensive, there are some that appear to us to be an attempt to get around regulatory constraints by deliberately using some words in lieu of others.

I will give you just one example very quickly. There is reference to features that would be impacted as opposed to affected. Affected is a defined term in regulatory language, impacted is not. We have to wonder whether that is an accident or whether that was done deliberately. I know you've done literally dozens of these documents and I am surprised to see that word used in that way.

So this is just to let you know that we will be having extensive comments. We would hope to have a document that's a little farther along than this, especially given the amount of time since this process has started. The fact that there is not even a draft of the dispute resolution clause available at this point is

really of concern. I think you know that we are extremely unhappy with the workings of the dispute resolution clause that currently exists in the LMDC programmatic agreement. We would hope that that language does not become a blueprint for this document.

MEMBER OF THE AUDIENCE: You all should consider adding a section to this coordination of mitigation with other agencies because I think there is a lot of overlap with the LMDC and FHWA projects where you all will ultimately find yourself coordinating how to mitigate some of the impacts to the WTC site if no more than for economy of scale or because your project is so interrelated.

So I think having that provision here and spelling out how you envision that happening and what it is you will do to effectively implement mitigation measures is beneficial for all three of you to work together on some aspect of it rather than going off on separate tracks. I just think that is a provision that will be very helpful and I think it will clarify a lot for people who are asking how are you dealing with this wholistically and all the cumulative

effects or whatever.

I think by the three agencies going on record as being committed to working together, you will advance that discussion a lot more.

MR. BOB KORNFELD: Bob Kornfeld again. In number 3, I am just wondering if there is a reason that some of the other historic properties around the site haven't been mentioned, like St. Paul's Chapel, 90 Church Street and 90 West Street.

MR. JOHN HOTOPP: I'm not sure. Are you telling me that the list isn't complete, that's what your concern is?

MR. BOB KORNFELD: Right. I'm not sure even what issues are being addressed. It's just that those buildings seem to fall into the same category.

MR. JOHN HOTOPP: According to the code, it's within 90 feet of any of the construction areas that you have to do monitoring on those sites for vibration impact. That's what's driving that particular section. So we will be looking at that issue in terms of this particular project. The other projects will also have the same problems and we will be looking at

it from their points of view as well.

The document you have is fairly incomplete, although it's the beginnings of the framework that you will see a far more complete document within the next two weeks. I would expect that we would get a fair amount of comment on it and we will give you a couple weeks to consider. I believe sometime in the middle of next month we would like to have another session with you and then following that session, you will have a review period to comment on everything that we said or seen or talked about and ideas that we have.

I do want to thank you for everything today because this to me has been as useful as the comments we got on the determination we got on the report which, as you know, we did a substantial amount of work on. Thank you for your comments so far. I am going to turn it back to the moderator.

THE MODERATOR: We are expecting to see a further draft within the next two weeks or so, two, three weeks. We would then move towards a meeting in mid-September that would be focused on that draft. Is that correct?

MR. JOHN HOTOPP: Correct.

THE MODERATOR: I think we are just about there. Irene, do you have some comments that you want to make concerning the LMDC process?

MS. IRENE CHANG: I was asked by the Port Authority to provide an update at today's meeting on where LMDC is, and I think based on some of the comments that were made today, I want to provide some assurances and maybe take us, as Lou did, a few steps back into where we are in the process.

Folks have thrown around some words that may or may not have legal significance, but in terms of whether there is cumulative effects or things that we haven't considered, I think it might be useful for me to just spend a minute on the backdrop as to how everyone got to here.

I think LMDC at its earliest inception always respected the fact that the Port Authority owns the property on which our plan is targeted and that additional areas surrounding the World Trade Center site were intended to be part of an overall redevelopment plan. We recognize that there are existing features at this site, and

Page 85

with some of your input and the input of many, many other agencies and individuals, we began the Section 106 process last year, towards the end of last year, as we embarked on the environmental review process for our project.

At that time we conducted the process in cooperation with the Port Authority. The plan was developed with a tremendous amount of public input that fed both at the selection of the Liebskind design, the modification of that design, the incorporation of the architectural plans by Silverstein Properties and many other considerations as to the structural features, both old and new that exist at the site today.

With the Port Authority we developed this plan and we recognize that we could only be allowed the opportunity to implement the memorial and cultural pieces of that plan, which we identified very specifically as the memorial itself, which we selected at the beginning of this year, a museum, which we now call the Memorial Center and two cultural buildings which we very recently selected institutions to consider and develop as potential occupants and fitters of those facilities.

Page 86

So as we embarked on this process, we thought it was important and we thought we heard that it was important that we state our principles and the things that we thought were significant from a historic standpoint. Notwithstanding the different approaches to MOA's and what programmatic agreements can be, we wanted to, at your request, prepare a programmatic agreement that addressed what we all concurred was important.

I want to take us through the very basic structure of that programmatic agreement and acknowledge that it expects that future work is necessary because we still have planning to do. We had selected things, but folks said, well, how do we know? We want you to put it on paper. So we did. Now we understand that, yes, it doesn't say everything because we couldn't say everything in April of this year, but we wanted to make those commitments as we finalized our EIS.

What we did in Stipulation 1, which is the subject of much letter-writing on my part as well, we agreed that we would consider the existing documentation about the site because we

Page 87

heard from folks that no one was concerned about documenting the current state of the site. In reality, our consultants who had been preparing the EIS and the draft, had taken lots of color photography with respect to the individual aspects that continue to be on the site.

At the end of that process, we also acknowledged that many individuals had photographs that documented significant points in time since the events of September 11th and none of that had been prepared with an understanding that it was supposed to satisfy HABS/HAER standards. It was significant because it captured a point in time that is now gone. So we recognize that. We address the fact that we needed to consult about that existing documentation.

It is not traditional that HABS and HAER, the National Park Service consider this information, but it may be that when we are done with our documenting process, they may agree, as we did, that there is some significance to those photos, notwithstanding the fact that they were not in quote/unquote archival formats. We have spoken with them and they say there is a couple

Page 88

of things we need to discuss and think about but that our discussions will continue.

So with that done, we agreed that certainly we were going to commit in the programmatic agreement to the commitments that we made in our final EIS, which is the document where, at the request of the consulting parties, we excerpted to attach to this programmatic agreement so you have in one place all of the commitments that we made to historic resources and really moving from those details to the true purpose of LMDC's plan which was to create and build the memorial complex which included the Museum Center and the most likely avenue with which any artifacts that were preserved or any remnants that are removed could be displayed for the future.

So in Stipulation 3, we went to the issue of the design of the memorial and we made a very concrete commitment here that as we developed the memorial, we would incorporate portions of the western slurry wall and the truncated box beam column bases and that we would provide reasonable and appropriate access.

Now, that wasn't really intended to be

a wiggle spot, but to provide assurance to folks because someone had suggested, oh, well, are we going to have to crawl, so we thought what words can we find to make it meaningful. You could probably debate it, but for us the spirit of what we wanted to do was to provide people access.

Folks asked us for adjectives, we wanted to provide assurance. We are not here to debate whether this was intended to minimize. It's not. We wanted to articulate the commitment that we had made which is that the memorial or the Memorial Center will provide a means by which you can access the box beam column bases.

Now, we noted, though, that we weren't in a position to tell you exactly how we could do that and so this is probably the most updated portion that I can give you today. While we had selected the memorial, Michael Arad and Peter Walker -- and Michael Arad specifically was not an architectural firm that could take the project through necessarily on his own. In the past few months we issued an RFP and we selected Davis Brody Bond as an associate architect to help him go through the process, he and Peter Walker, to realize the design of the memorial.

What we took is that now a larger team of architects, along with our own planners, and Bill Kelly, who you've seen here from the very beginning, Betty Chen, who is our VP for planning who many of you have met, a new team of folks will help to address the memorial and the design features of that memorial, will take this project forward with this programmatic agreement in hand because this document was the result of a lot of the efforts and records really for the future, all of the things that everyone did through this process.

The public comment process and the environmental process have really been embodied in one place which I thought was a great thing, that all the documents that were relevant could be handed off to the folks who will do the actual designs that will make this vision real.

What we have, as we've reported in a couple of letters recently -- we ended up writing letters every month to keep you up-to-date and in late September, maybe to not strain you, so that you are all ready with this group in early October to bring the team, the design team forward so that you can hear from them and they

can hear from you more about how they will realize this vision.

Right now, however, we are only at the point that probably one of the footprint areas can be discussed in any detail, but as progress is made, we will keep you posted on what the agenda for that meeting will be. We would like to provide an agenda in advance of that meeting so you see who will be in attendance, what we will address so that you can look forward to probably the first substantive meeting on sort of the future design and implementation that we can have.

In that regard, just yesterday we learned that Davis Brody Bond has also retained a historic preservation consultant, Higgins & Quasebard, who will be assisting them so that we will have a comprehensive team that will look at ways that none of us in this room could possibly conceive of as to how you can address different features.

So as Bruce mentioned, since we last met with you, the Memorial Center Advisory Committee, which was also something that this group called for had met, prepared guidelines

that were released for public comment and now they've been finalized just at the time of our last board meeting last week. So those will also feed the process.

All of the principles that people should keep in mind will be kept in mind in the form of documents as well as personnel and ongoing sessions. We think that the design teams will be the ones who really will be the ones meeting with the Section 106 process consulting parties on a going-forward basis.

With respect to the artifact review, I think Jackie and Mark already discussed that they are in the final stages of updating the inventory. I expect to go and, along with some members of the design team, look at the fully laid out or whatever format is at Hangar 17 to see what we have. We will be doing that hopefully in the next few weeks or maybe we will wait until the inventory is available.

Along with that, we have, through the Memorial Center Advisory Committee, thought in much greater detail about some of the future artifacts, preservation and presentation possibilities. But again, I don't think that we

are anywhere near having compiled the team of curators and museum experts that we should have for the museum in the future.

So we are really only at the beginning of that process, preservation being the first step in how it will be displayed, which ones, which other ones. We can't make that determination on how, but our goal is to look and to preserve and to know what's available so that others can make those decisions in the future. In that respect, we did something that was not required by any of these documents and that was at the suggestion of the Lower Manhattan Emergency Preservation Fund, which was to explore what forms of non-traditional and other media we could use to record the current state of the site. This was an effort that our memorial department really undertook with a lot of input. It was probably the most coordinated effort internally at LMDC about something that grew out of this process, which is that we hired three different videographers to go to the site and to take recordings on the theory that people have different perspectives.

Just like this group of consulting

parties, we hired three different videographers, two that went below ground into the pit and around the site, one that did an at-grade walk to record inside the perimeter of the current viewing wall. And then also a photographer who could put together a 360 virtual tour of the site from a few different perspectives. All of those folks are in the process of preparing samples of those materials.

If it becomes possible, we will see what we can do about sharing some of that material with you. They spent a lot of time and the primary goal was to have raw footage that we could save so that people who prepare documentaries or museum presentation materials would have the raw footage to work with, to edit, to put together, whether it was all three of these folks' existing materials, future materials, that there would be a library of raw footage that people could use to compile the material for communicating to future generations what existed at the site before the project, the rebuilding project began.

The one fundamental point that I want to address is that the redevelopment program is a

program being implemented by the Port Authority. We may have created some confusion in our LMDC meetings and the PATH meetings, those being a different team of folks that are within Port Authority, maybe not different, but a set team within the Port Authority.

LMDC and the Port Authority, though, have worked very closely and I think they said that I want to reassure you that that's going on as well, to look at how the redevelopment and the memorial program will fulfill the objectives of this programmatic agreement and the overall historic philosophy that, obviously, our memorial and redevelopment program tries to fulfill.

So when folks were asking how do you consider the cumulative impacts, I'm not sure that it is cumulative because we are very clear in our EIS that the plan is a plan that addresses most of the areas that you've seen. Exhibit F to the programmatic agreement, the commitments made relating to the western slurry wall, the commitments made to provide access to the box beam column footprints, those are commitments that we made as part of the memorial and redevelopment plan.

These commitments are incorporated into the EIS and the ROD, the Record of Decision that arose out of that process. They are not going anywhere, those commitments, and whether they are part of the memorial plan, whether they are part of the redevelopment or part of the cultural programming that we will implement, they remain consistent throughout that building process.

So while I think this project suggests that the PATH project may also have impacted some of the resources we discussed, I think what was revealed today is there are some that they will not, so then it's not cumulative. It's about what our project, meaning the memorial and redevelopment project, will ultimately affect.

So as part of the commitment that we made in the programmatic agreement as individual plans for structures that may impact on the resource are developed, we would share them as part of our regular update process in the programmatic agreement.

Yes, everyone knows that the Freedom Tower has already been designed. That's why in April when we met with you, we shared the World

Trade Center garage sub-grade column and slab work with you because we knew how that building plan would address that structure.

As we move forward to Tower 2, I'm sure that the design team and the architects will be able to explain to you and discuss with you some of whatever may be impacted with respect to the 1 and 9 staircase, escalator remnant. We will come to you when the time comes to discuss the possible impacts and then to discuss the mitigation, as it may be appropriate.

I was a little long-winded, but I thought it was important to go over some of the context. Our main goal is to meet with you again probably in a month or very early in October so we can introduce you to some of the members of the design team that you have not met but who certainly know about all of you and have read these documents and intend to fulfill the mission and the commitments that we've made. I don't know if anybody wanted to ask me any questions.

MEMBER OF THE AUDIENCE: Just a quick question, Irene. Before LMDC in a Family Advisory Council meeting had mentioned that they were going to look into the suggestion of the

Historic Preservation League in terms of the videography and documentation of the site, at that point we asked to be sure that when that happened if you could be sure to clean off those few inches of dirt that currently obstruct the remains of the footprints, as Peter had mentioned earlier. I just was wondering if at that time that that videography was conducted if that had happened.

MS. IRENE CHANG: That happened because the Port Authority really had to be the chief architect of how that brushing-off process had to take place. We were very concerned that we had the videographs in before July 4th when the ceremonial start-up construction took place. The videographs that went into the bathtub went in June, before any of the prep work really began.

MEMBER OF THE AUDIENCE: I think that speaks to the urgency. If you could try to expedite the documentation of the physical remains of the footprints, it could probably be helpful to have that information for the consulting parties before you finalize this memorandum of agreement so that people can get a

sense of the physical remains of the footprints that exist. You can then complete your inventory of this documentation that you did previously.

MR. TIM STICKELMAN: That's not Irene's MOA, that's the Port Authority's MOA. Peter spoke about the footprints and what the Port Authority has committed and those will be considered. We hear what you're saying.

MS. IRENE CHANG: I'm sorry, I meant to say that we were considering some of the details. We will keep reading the MOA and we will see if it's appropriate for LMDC to sign it. We haven't ruled that out at all. We don't know the full contents yet.

MEMBER OF THE AUDIENCE: It's not a question, it's a comment. I didn't want to miss this opportunity and I didn't want to let this go by. The first speaker here today, Bernard Cohen from the FTA had the courtesy of at least addressing for the first time directly a question that has been put to all the agencies involved here. That was a request that the determination of eligibility be forwarded to the keeper of the National Register for review. We appreciate the answer, even though we are not

happy with what that answer is.

We cannot help but wonder why the agencies are afraid to take that step. I think virtually every one of the preservation organizations, and that includes Professional Historic Preservation personnel, has recommended that that procedure be taken because they all have concerns with the content and extent of the determination of eligibility contrary to some of the statements that were made here today.

I want to address this particularly to the Port Authority personnel and the Port Authority engineers. One of the things that the determination of eligibility does not do is address the significant contributions of various Port Authority people whose major life's achievement was represented by the World Trade Center. Austin Tobin, Tobin Plaza, now obliterated. Ray Martin, I think the Port Authority recently named a scholarship after him, Guy Tozzoli and John Kent.

These individuals' crowning achievement in their life's work was the construction of the World Trade Center. Yet in spite of requests from the preservation groups

Page 101

that the significant contributions of these individuals be recognized as part of the determination of eligibility and that the World Trade Center as an engineering and construction achievement be recognized, those requests have been completely ignored and eliminated from the final determination of eligibility. It's one of the reasons that we feel that a formal referral to the keeper of the National Register is necessary.

And so I would ask the engineers and personnel from the Port Authority to remember this as we move forward, that you missed an opportunity to commemorate the achievements of your past colleagues and other agencies here have allowed you to, I think the word is be bulldozed into belittling the achievements of those people.

MEMBER OF THE AUDIENCE: The whole concept of referring this DOE to the keeper is set forth in the council's regulations, so I think perhaps I need to go on record and speak to this whole issue. When the 9/11 Family Coalition and the Consortium of Preservation has raised a number of issues about getting clarity on the

Page 102

form of DOE, we thought it was worth pursuing.

We also found that the DOE, as written, didn't have the limits on it that we initially envisioned and that through consultation, good-faith consultation in some instances, the mitigation that was being developed far exceeded the limits that we thought would be inherent in and sticking strictly to the DOE. So we felt there was progress that was made in spite of some flaws or deficiencies in this document.

When we did an informal referral to the keeper, her response back was at best a recitation of information we already had seen. There was nothing beyond that or to embellish what we did. Internally, we would have put out regulations, we would have to suggest to the agencies that they refer this DOE to the keeper to get a formal determination.

FTA and FHWA have been unequivocal in telling us they are not inclined to do it, they think they are making great strides and progress in consulting with people and see opportunities to go even farther, i.e., the identification of Port Authority personnel. That could be

Page 103

incorporated into a memorial. You could go as far as you want to irregardless of what's set forth in the DOE.

I think the final comment I need to make is that we are hedging our bets on a keeper coming back, getting us detailed information, when in my experience, the keeper with referral of formal DOE's checks a box that says "eligible" and it says nothing more. It looks at the information that's provided, typically doesn't go any farther than what's already submitted for the analysis. So we can wait 45 days and achieve very little but a box check that says eligible. We are already treating it as eligible.

So my position, and I think that of the council's is what could be the value added and what, based on initial comment from the keeper, could we possibly anticipate them providing that would advance these discussions. And quite frankly, I don't have full confidence that it will be anything more than them looking at it and checking the box.

THE MODERATOR: That wraps it up. We will get a notification up to people looking towards a meeting in the second or third week in

Page 104

September and a further elaboration of the MOU will come out as well in the next couple of weeks.

(Whereupon, the meeting was concluded at 4:00 p.m.)

CERTIFICATE

STATE OF NEW YORK)
: SS:
COUNTY OF KINGS)

I, HANNA ROTH, a Shorthand Reporter and Notary Public within and for the State of New York, do hereby certify:

That the hearing herein before set forth, was duly recorded by me, and that such hearing is a true record of the proceedings.

I further certify that I am not related to any of the parties to this action by blood or by marriage, and that I am in no way interested in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand this 13th day of September 2004.

_____
HANNA ROTH

A
ability 25:3 39:10 41:13 44:14 48:18 49:9
able 12:3 13:6,22 23:16 27:21 32:21 34:12,18 35:13 37:6 39:20,23 42:12 44:14,21 50:9 51:4 58:6 64:7 72:9,11 74:22 97:6
absolute 39:5 68:9,17 69:2,9 71:2
absolutely 68:18
absolutes 69:24 76:14
absurd 54:12
accept 73:7
accepted 55:25
accepting 60:19
access 12:2,14 13:7 17:12 44:23,24 45:14 46:16 59:10 73:16 75:16 77:15 88:24 89:6,13 95:22
accessibility 12:12
accident 80:15
accommodate 38:4 50:5 54:24 72:9 73:2
accommodates 54:25
accomplished 23:4
accomplishme... 23:8
accurate 44:24
achieve 59:12 69:21 103:12
achievement 100:17,23 101:5
achievements 101:14,17
ACHP 4:9
acknowledge 86:13
acknowledged 37:14 87:8
Act 34:15
action 105:14
actual 42:11 67:1 90:17
ADA 34:15
add 29:14 48:1
added 29:12 103:16
adding 81:8
addition 31:7 37:17 38:15
additional 6:21 46:18 48:3 51:5 84:22
address 8:12 26:3 27:8 34:5 35:17 35:21 53:3,21 53:22 76:9 87:15 90:6 91:10,20 94:25 97:3 100:11,15
addressed 6:11 22:4 60:2 82:15 86:9
addresses 95:18
addressing 19:22 35:2 36:16 76:11 99:20
adequate 32:24 34:25 36:12 37:7
adjacent 12:5
adjectives 89:7
Administration 5:4
advance 15:13 70:12 82:4 91:8 103:19
advanced 73:8
adverse 10:16 35:12,14 52:4
Advisory 59:6 67:19 91:23 92:22 97:24
affect 20:15,20 30:4 35:14 96:16
afraid 100:3
aftermath 46:21
afternoon 5:2 7:10 10:16 11:4 22:20 47:16 72:7
agencies 47:18 78:22 81:9 82:2 85:2 99:21 100:3 101:15 102:18
agency 10:23 31:10 56:9 69:10
agenda 91:7,8
ago 9:5 22:25 23:22 27:9 37:11 58:23 66:25 70:13
agree 43:5 47:19 76:16 87:21
agreed 22:16 43:9 86:24 88:3
agreeing 13:16
agreement 8:9 10:22 13:20 21:2,20 43:15 43:24 44:22 55:16 64:16 69:19 71:8 76:16 81:4 86:9 86:12 88:5,9 90:8 95:12,20 96:18,22 98:25
agreements 86:7
ahead 13:3,4 78:20
AIA 3:7
AKRF 2:15
Alan 2:18 46:8
Albert 2:9 52:16 52:16
alleviates 31:7
Alliance 3:2 4:6 53:9
allocate 30:20
allow 32:10 37:21 58:11
allowed 13:19 85:17 101:16
allowing 7:18 48:7
allows 31:21,22 58:2
alterations 59:18
alternative 56:17 56:20 58:2
alternatives 56:16,17,24 57:1,4 58:9
American 34:15
amount 25:23 28:10 30:2,11 34:24 68:23 80:22 83:6,18 85:8
analyses 61:7
analysis 30:16 31:1 33:6 57:6 61:11 103:12
analyze 60:18
angle 34:1
Annie 3:7
ANRR 2:11
answer 15:19 35:6 67:5 71:13 99:25 100:1
answers 35:4
Anthony 2:20 13:13,13 47:3 69:4
anticipate 9:20 79:11 103:18
anticipated 78:12 78:13
anybody 20:4 62:22 67:5 69:18 97:21
anyway 66:4,7 75:5 79:11
appear 80:6
appearances 7:16
appears 67:18
applications 59:18
appreciate 58:22 62:10,12 99:25
appreciated 55:20
approach 15:15
approached 58:24
approaches 59:12 86:6
appropriate 7:2 12:15 19:17 69:16 75:15 88:24 97:11 99:12
appropriately 61:22
approximately 38:8
April 86:19 96:25
Arad 89:18,19
arbiter 70:3
archaic 54:9
archeological 78:13
architect 89:23 98:12
architects 74:5 90:2 97:5
architectural 19:8 69:17 85:11 89:20
architecturally 36:5
archival 87:24
area 5:17 6:2 11:15,20,21 12:4,17 13:2 14:5 28:11 29:17 36:7,9 41:21 47:6 60:11 61:2 72:24 75:22 78:3
areas 11:15,22,25 12:1,25 14:20 15:1,3,4,8 26:15 26:16 36:6,7 41:8 75:4 82:20 84:22 91:4 95:19
arose 96:3
arranged 13:12
Art 4:12
article 66:24
articulate 89:10
artifact 92:12
artifacts 8:18 40:24 78:5 88:15 92:24
asked 37:11 84:6 89:7 98:3
asking 58:13 81:24 95:15
aspect 81:20

aspects 20:9 87:6
Assembly 3:10 55:12
assess 15:10 60:18
assessing 10:15 79:8
assessment 37:21
assisting 91:17
associate 89:23
associated 34:16
Associates 9:1
Association 4:8 21:4
assume 21:8 33:23
assumptions 73:21
assurance 89:1,8
assurances 84:10
attach 88:8
attached 16:2
attachment 57:24
attack 42:12
attacks 42:10 45:10
attempt 80:7
attendance 91:9
at-grade 94:3
audience 7:20 16:9,22 32:16 39:7 62:16 63:4 67:10 68:1 70:5 70:10,19 73:7 74:11 75:7 76:5 77:6,13 79:2 81:7 97:22 98:19 99:15 101:19
AUGUST 1:9
Austin 100:18
authority 1:6 5:13,24 6:6 10:18 13:15 17:23 19:9 20:9 20:11,14,16,19 22:15 32:18 34:7 38:15 39:6 43:10 45:20 47:17 50:14 51:18 56:1,18 60:6,6 72:9 76:7 77:18 79:19 84:7,20 85:7,15 95:1,5,6,7 98:11 99:7 100:12,13 100:16,20 101:12 102:25
Authority's 23:11 62:10 99:5
availability 13:6
available 56:8 57:17 64:14 80:25 92:20 93:9
avenue 88:14
avoid 6:3 18:1,5 27:20 56:10,11 56:12 68:8 70:11,14
avoided 26:13
avoiding 26:15
awareness 36:13
awful 80:4

B

B 32:24 72:5
back 5:25 6:7 8:24 9:25 16:4 22:24 25:16 26:25 27:6,21 32:3 37:10 51:2 51:21 61:17 62:18 63:10 64:23 66:9 67:6 71:12 72:19 75:13,18 76:21 83:19 84:11 102:13 103:6
backdrop 84:18
background 40:1
backup 31:6 37:12
base 15:1 16:1,19
based 34:9,17,22 43:4 44:9 57:12 84:9 103:17
bases 27:5,24 68:8 71:15 88:23 89:13
basic 28:22 86:12
basically 21:16
basis 6:19 41:4 92:11
bathtub 98:16
Battery 14:4
battling 42:24
beam 14:15 16:12 19:7 44:25 88:23 89:13 95:23
becoming 9:14 65:19
bedrock 42:18
began 85:2 94:23 98:18
beginning 24:22 78:15 85:20 90:4 93:4
beginnings 83:3
begins 17:5
begs 70:2
behalf 61:15
believe 5:13 6:18 6:20 13:24 21:15 22:25 31:16 37:15,25 50:13 64:24 65:16 83:8
belittling 101:17
Ben 4:6
beneath 40:24
beneficial 68:12 73:14 81:19
Berger 2:6
Bernard 2:13 3:16 5:1,2 34:6 35:8,19 99:19
Bernie 34:4,6 37:10
best 25:5 26:23 29:9 31:17 32:4 32:11 53:23 102:13
Beth 2:16
bets 103:5
better 40:5 47:11
Betty 90:4
beyond 48:7 57:24 102:15
big 35:7 63:5
Bill 3:12 4:13 90:3
binding 76:10
bit 35:9 65:4 75:4
blocking 31:6
blood 105:15
blueprint 81:6
board 2:17 3:4 19:14,15 27:6 47:17 55:15 58:18 59:17 92:3
Bob 8:1,1 33:11 33:12,23,25 35:5,10,20 49:14,17 51:20 51:22 66:20 67:8,21 82:5,5 82:14
Bonacci 2:4
Bond 89:23 91:15
book 9:14
Bopkoski 2:3
borders 57:24
Boslen 2:5
boundaries 18:21
Bowers 2:6
box 14:15 16:12 19:7 44:25 88:23 89:13 95:22 103:8,13 103:22
BPC 4:5
Braegelmann 2:7
breaking 77:14
briefly 10:9
bring 13:22 47:23 52:10 90:24
bringing 39:18
Brody 89:23 91:15
brought 16:4,5 49:11 65:14
Bruce 2:17 58:16 58:16 91:22
brushing-off 98:12
budget 62:24
build 26:24 28:15 32:3 54:23 63:19 76:23 88:13
building 21:12,13 45:23 79:9 96:8 97:2
buildings 54:18 59:19 61:25 79:7 82:16 85:22
built 21:10 45:22 77:19
bulk 72:6
bulkhead 78:8
bulldozed 101:16
business 40:15 41:21 42:3 47:24 49:4 50:2 54:2
businesses 25:15 53:15
B6 11:18,22 14:21 14:22

C

C 2:1 3:1 4:1 31:2 32:24 72:7,10 72:22 105:1,1
calculation 30:16
call 7:19 57:16 70:13 85:21
called 58:14 91:25
calling 9:6
Calood 2:11
capacity 24:18 38:18 41:23 48:7 50:1 51:5,5 51:15 54:15 58:12 62:21
Capsouto 2:9 52:16,17
captured 87:14
care 72:11
careful 66:11
Carla 2:4
Carlo 2:7
cars 28:8 38:5,10 38:13,16,18,19 51:2
case 57:10 71:16
category 82:17
causing 79:10
cement 14:18
center 2:5 3:15 5:8 6:15 14:21 14:22,25 16:14 16:18 19:14,15 23:14 24:5,15

25:11,13 27:24 27:25 33:10,15 35:15 36:8 38:2 38:6 40:10,23 41:6 43:18,18 44:15 45:21 59:5 61:25 66:23 84:23 85:22 88:14 89:12 91:23 92:22 97:1 100:18,24 101:4
central 49:4
century 24:16
ceremonial 98:15
certain 14:17
certainly 61:12 88:4 97:18
certify 105:9,13
cetera 63:24
chair 58:17
challenges 57:21
Chanal 2:10
chance 43:3
CHANG 77:17 84:6 98:10 99:9
change 15:14 21:23 33:18 39:23 40:6 54:18
changing 10:18 19:25
Chapel 82:9
Chapter 3:7
Charlene 4:9 42:5 70:20 71:13 73:1 74:25 76:10
check 42:22 103:13
checking 103:22
checks 103:8
Chen 90:4
chief 98:12
chiller 76:23 77:4 77:12,15,18
Chris 2:11
Christopher 4:14
Church 82:9
churning 9:25
Cifarelli 2:12
circulated 64:19 66:4
circulation 29:18 29:24 30:10,20 30:25 31:21 34:13,17,21,24 56:4 66:23 67:2 67:22
circumstances 49:12
city 14:4 39:17,24 42:4 49:7,23 59:20 72:17
civic 49:20
clarified 77:11
clarify 77:10 81:23
clarity 101:25
clause 80:25 81:3
clauses 64:20
clean 98:4
cleaned 16:3
cleaning 11:21 13:16
clear 28:25 29:5 29:10,12 30:19 31:3 33:16 37:6 37:20,22 40:7 50:21 77:5,11 95:17
clearance 29:20 29:22 31:9 35:2
clearer 59:2
clearing 29:6
clearly 74:5
close 13:4 20:8 35:12,15 51:10
closely 95:8
closer 7:21 72:3
clue 74:23
Coalition 2:20 3:5 13:14 20:6 101:23
code 34:14 82:19
codes 45:23 72:13
cognizant 32:6
Cohen 2:13 5:1,2 99:19
Coleman 2:14
collaborative 6:24 23:8
collapse 15:2
colleagues 101:15
collection 9:6,7,8 9:15
collective 47:4
color 36:1 87:4
coloration 35:24
column 5:18 16:11 27:5,24 66:8 68:8 69:13 71:15 88:23 89:13 95:23 97:1
columns 14:15,24 16:12,14,18,18 19:8 23:14 26:16,18 28:11 33:16 41:15 43:12 44:25 45:5
come 13:6 22:19 27:21 47:21 48:22 55:5,19 61:10 76:21 97:9 104:2
comes 10:4 29:1 29:3 61:21 69:8 78:16 97:9
comfortable 71:18,19
coming 13:2 17:13 25:16 29:2 30:8 31:24 33:9 37:10 40:16 62:25 67:25 103:6
commemorate 101:14
commend 6:5
comment 49:15 61:15 70:20 72:2 75:6 77:4 79:17,25 83:6 83:11 90:13 92:1 99:16 103:4,17
commented 79:21
comments 5:12 6:12 7:20 17:19 17:21 18:15 32:15 42:22 43:22 70:16 76:7 79:22 80:20 83:16,19 84:4,9
commit 88:4
commitment 23:11 27:19 28:1,3 37:15 68:8,9,16 69:2 88:20 89:10 96:17
commitments 20:14,16 23:15 23:16 68:10 86:20 88:5,10 95:20,22,23 96:1,4 97:20
committed 8:19 69:11 82:3 99:7
committee 3:4 58:17 59:6,11 60:9 67:19 91:24 92:22
communicate 42:9
communicating 94:21
community 2:17 3:4 47:16 48:10 49:20 55:15 58:18 59:17 60:10
community's 42:1
commute 24:22 25:20 30:13,15 30:21,25 52:18 53:1
commuting 50:23
compared 33:5 33:18 38:23 68:9
comparison 38:22
compile 94:20
compiled 93:1
complete 8:20 82:12 83:4 99:2
completed 78:9
completely 6:3 101:6
complex 26:1,2 88:13
component 39:18 52:24
components 29:8
comprehensive 91:18
comprised 34:8
compromise 68:15,19
Con 4:2
conceive 91:20
concept 101:20
concern 13:18 61:18 75:8 81:1 82:13
concerned 12:21 32:13 87:1 98:13
concerning 84:4
concerns 44:2 72:10 79:22 100:8
concluded 104:4
conclusion 18:2
conclusions 57:11
concourse 75:23
concourses 26:14
concrete 16:2 40:24 45:5 88:20
concurred 86:10
condition 31:8 37:4 38:23,24
conditions 53:20
conducted 85:6 98:8
conference 7:18
confidence 103:20
confident 68:18
configuration 23:17,18 28:5,7 33:7 35:25 67:15
configure 35:13
conflict 21:11
conflicts 53:22,22
confusion 95:2
connection 42:13
connections 26:11,12 49:22

Connor 4:10
Connor's 41:17
consensus 49:19 62:14
conservative 39:20 40:2,4
consider 48:17 58:10 64:4 68:24 81:8 83:8 85:24 86:24 87:19 95:16
consideration 5:13 32:25 33:21,21 55:18 56:16
considerations 85:13
considered 57:23 63:15 64:12 84:16 99:8
considering 48:8 99:10
consistency 73:17
consistent 96:8
consists 14:22,23
Consortium 101:24
constant 75:13
constraining 6:25
constraints 80:8
constricted 32:1
construction 12:24 56:21 63:11 77:25 78:3,20 79:6 82:20 98:15 100:24 101:4
constructionist 59:21
consult 87:16
consultant 91:16
consultants 87:3
consultation 65:6 74:8 102:5,5
consulting 1:7 5:6,9,11 7:3 12:12,15 17:11 17:17,19,21 39:4 43:25 44:13 47:2 55:20 56:8 70:13 72:1 88:7 92:10 93:25 98:24 102:23
content 100:8
contention 60:13 73:23
contentions 37:19
contents 99:14
context 59:15 74:3,7 79:3,4 97:14
contingent 73:4
continually 37:25
continue 6:23 23:19 26:7 87:6 88:2
continued 2:25 3:1,25 4:1 7:3
contract 74:6
contracted 38:16
contrary 100:9
contributions 100:15 101:1
conventional 60:15
convinced 57:9
Conway 2:15
cooperation 20:8 85:7
coordinate 12:18 13:7
coordinated 93:19
coordinating 81:12
coordination 74:20 81:9
copy 1:24 8:24 9:2,4 70:17
core 16:11
corner 8:16
correct 14:9 16:15 19:10 63:1 83:25 84:1
correcting 51:1
correctly 66:12
corridor 66:21 67:11,14,23 68:16,20 71:17
corridors 26:10 26:14 75:10
cost 39:24 62:21 63:8 64:6
costs 68:6
Council 2:18 3:19 8:2 43:6 46:8 97:24
council's 101:21 103:16
country 41:22 75:24
COUNTY 105:5
couple 34:8 51:2 70:9,23 83:7 87:25 90:20 104:2
course 67:13
courtesy 57:5 99:19
cover 8:13
covered 8:14 14:7 69:14
covering 28:12
crawl 89:3
create 6:1 88:12
created 95:2
creates 31:5
creation 46:15,17
creative 61:9
creativity 52:11
cremated 42:17
criteria 24:7 69:20,25
critical 46:12 48:20 49:3,10 53:15 76:8
cross 41:7 77:24
crosses 33:15
cross-connecting 30:8
crowning 100:22
cultural 2:5 3:14 3:19 25:14 26:12 61:25 85:18,22 96:7
Cummia 2:16
cumulative 20:10 44:2,16 61:19 61:23 67:9 71:7 76:9 81:25 84:15 95:16,17 96:14
curators 93:2
current 38:24 87:2 93:16 94:4
currently 21:24 64:24 81:3 98:5
cut 14:15
cutting 34:1
cycles 54:19,20
C-106 60:7

D

D 22:15,18 28:19 32:19,24 33:23 35:25 37:3 43:2 43:5 46:1 56:2 57:1 69:15 71:12
daily 41:10
damndest 27:19 32:8
dangerous 46:14
dangers 58:8
darker 36:1
data 9:24 22:17 56:7
date 10:9 70:6
Dave 4:5 14:3,3 14:13 15:9 16:7
David 3:14
Davis 89:22 91:15
day 28:17 44:21 46:24 48:13 55:21 75:12 105:18
days 70:13 103:12
day-to-day 48:24
deal 18:11 51:19 61:21 78:15,18
dealing 56:3 58:20 76:17 81:24
dealt 21:7,19
debate 73:23 89:5,9
debateable 48:16
Deborah 3:10 55:11,11
decide 63:9
decided 65:7
decision 10:23 13:21 96:2
decisions 93:10
deck 66:6
decking 58:10
decrease 25:6 34:18
deemed 60:25
defensively 32:20
deficiencies 102:10
define 43:13
defined 80:13
definitely 54:25 60:21
definition 44:23
DEIS 6:12
deliberately 80:8 80:16
delivered 70:16
demands 39:21 48:3 58:4,5
demonstrate 23:10
department 93:18
depending 12:19 14:12
depicted 36:20
describe 17:2
description 74:17
descriptions 17:1
design 2:19 5:25 6:7 10:24 19:4,5 28:20,21,22,24 41:1 44:10 52:11 54:7 71:10,13,20,24 72:22 73:4,8,12 73:17,24 74:2 74:25 75:5 85:10,11 88:19 89:25 90:6,24 91:12 92:8,16 97:5,17
designating 47:6
designation 65:11
designed 24:16 96:24
designers 71:17 72:2,25
designing 54:11 54:14
designs 90:18

desirable 50:23
destroyed 15:2
destroying 56:11 56:12
detail 91:5 92:23
detailed 103:6
details 73:9 88:11 99:11
determination 83:16 93:8 99:23 100:9,14 101:3,7 102:19
determined 6:2 17:7
determining 6:8
detract 53:7
develop 24:5 85:24
developed 26:8 26:22 73:10 85:8,15 88:21 96:20 102:7
developing 7:4 23:23
difference 22:8,9 38:18
different 29:8 34:8 45:15 46:9 50:21 55:3 86:6 91:20 93:22,24 94:1,7 95:4,5
difficult 45:19 72:5
diligence 6:6
dimension 62:17 62:21
direction 18:8
directly 99:20
director 5:3 19:12
dirt 14:8 98:5
Disabilities 34:15
disagree 42:8
discoveries 78:14
discuss 8:7,9 11:6 22:16,19 64:15,17 88:1 97:6,9,10
discussed 5:10 6:23 10:12 11:1 19:7,17 61:19 67:11,13,17 91:5 92:13 96:12
discussion 5:22 6:25 8:6,16,17 8:25 10:2,24 11:3 22:14 43:17 47:1 60:12 64:24 70:12 73:6 82:4
discussions 20:12 23:7 88:2 103:19
disingenuous 62:5
dislike 60:6
dismissing 55:6
displayed 88:16 93:6
disposition 78:5
dispute 78:21 80:24 81:3
disrespectful 55:5
distance 34:12 72:19
distribute 8:7
district 8:2 41:21 42:4 43:6 47:25 49:4 50:3,3 52:21 54:3
districts 52:22 59:19
doable 62:20
document 23:11 43:19 65:15 76:19 77:23 78:14 79:21 80:21 81:6 83:2 83:5 88:6 90:9 102:11
documentaries 94:15
documentary 65:9,23
documentation 11:7,11,19 12:10 13:22,25 14:1 20:3 65:2 86:25 87:17 98:2,21 99:3
documented 65:4 65:14 87:9
documenting 11:23 13:17 65:10 87:2,21
documents 80:17 90:16 92:7 93:12 97:19
DOE 6:15,18,24 101:20 102:1,2 102:9,18 103:3
DOE's 103:8
doing 12:7 22:22 27:20 30:15 48:19 52:5 92:18
dollars 64:6
doorways 38:20
DOT 3:22
double 58:10
downplay 45:17
downtown 2:19 3:2 4:6 25:16 26:9 41:25 48:12,13 51:16 53:9,15 54:5
dozens 80:17
draft 5:15 8:8 9:2 21:17 25:23 43:19 64:15 67:18 70:6,15 78:8,24 79:13 80:24 83:22,25 87:4
drawing 21:16 27:6
drawings 65:17 65:23 66:2
driving 82:22
due 15:2 67:2
duly 105:11

E

E 2:1,1 3:1,1 4:1 4:1 5:17 56:11 62:13 72:11,23 75:6,8 105:1,1
earlier 98:7
earliest 84:19
early 12:7 26:25 27:12 63:14 90:23 97:15
easier 46:16
easily 39:12
east 73:3
east-west 26:14 66:14,21 71:17 74:16
economic 40:1 49:25 50:9 51:16
economics 39:25
economy 54:17 81:14
Edison 4:2
edit 94:16
effect 6:8 20:13 35:12 52:4
effective 24:12 64:2
effectively 27:7 31:23 81:18
effectiveness 69:8
effects 10:13,16 43:19 71:7 82:1 84:15
efficiently 27:7
effort 6:24 93:17 93:19
efforts 62:11 90:10
egress 38:21
Ehrmann 2:17 58:16,17
eight 38:5
eighth 14:7
eight-car 38:4
EIS 25:23,23 37:14,15 56:19 86:21 87:4 88:6 95:18 96:2
either 36:8,14 58:20
elaboration 104:1
element 29:18 51:12
elements 29:24 30:3 34:9,13,17 34:21,25 53:6 60:10
elevators 15:6
eligibility 99:23 100:9,14 101:3 101:7
eligible 103:8,13 103:14
eliminated 101:6
embarked 85:4 86:1
embedded 45:5
embellish 102:15
embodied 90:14
emerged 49:19
emergency 3:13 18:19 36:23 37:5 62:8 93:14
emotional 49:1
emphasize 52:18
employed 52:23
encouraging 79:25
endangerment 36:25
ended 90:20
engineering 37:18 47:6 57:13,14 65:8 73:15 101:4
engineers 74:4 100:13 101:11
enhance 53:7
enhanced 24:12
enhancing 36:5
enormous 60:14
ensure 19:21
entered 9:24
entire 44:14 45:3 51:10 57:14 58:25 59:3 62:6
entities 58:21,21
entrance 5:17,23 6:1 10:17,19 17:9,9,13,15 18:6,7,16 56:11 72:12
enumerated 41:19
environment 31:13
environmental 85:4 90:14
envision 81:17
envisioned 65:20 102:4
escalator 29:19 30:19 97:8
escalators 29:25 30:24

escort 12:23
especially 24:20 71:4 80:22
essential 54:2
essentially 14:18 20:17 39:2 44:9 44:11
establish 26:1 69:20
established 10:12 25:25
establishment 46:17
et 63:24
evacuate 36:25
evacuation 46:5
evaluate 61:22 62:4
evaluated 10:13
evaluating 62:15 70:1
evaluation 13:21 39:1 56:7
event 65:10 66:2
events 24:8 55:9 87:10
eventually 78:2
everybody 5:2 41:3 54:4
everyone's 31:17
evident 59:10
exact 71:15 72:3
exactly 89:15
examination 58:24
example 16:23 44:4 60:2,8 62:1 79:9 80:10
exceeded 102:7
excerpted 88:8
executed 70:17
execution 70:6
executive 19:12
Exhibit 95:19
exist 57:23 85:14 99:2
existed 94:22
existing 34:10 84:25 86:25 87:16 94:18
exists 81:3
exit 11:25 29:14 38:22 51:2
expand 25:3 49:9
expanded 79:13
expansion 58:12
expect 39:16 78:17 83:6 92:15
expecting 83:21
expects 86:13
expedite 98:21
expense 63:17
expensive 63:12 63:21
experience 15:24 103:7
experiencing 24:19,21
experts 93:2
explain 29:9 97:6
explained 27:15 28:13
explaining 28:10
explanation 50:20
explicit 73:9
explore 51:9 71:6 77:1 93:14
explored 33:17 36:2
expressed 19:19 69:15
expressing 36:14
expression 5:18
extended 8:6,17 22:14
extensive 64:16 80:20
extensively 79:21
extent 23:12 67:16 68:12 69:24 73:1 100:8
extra 31:20
extremely 44:21 81:2

F

F 95:19 105:1
face 56:21 60:20
facilitate 38:20
facilities 15:7 24:14 25:14 26:13,21 85:25
facility 58:3
fact 35:20 36:8,14 37:25 39:1 41:4 42:20 51:3 79:20 80:23 84:20 87:15,23
factor 13:22 22:1
fail 23:6
failure 30:23
fair 83:6
fairly 55:4 83:2
faith 39:12
fall 82:16
false 52:1
familiar 16:25 34:10
families 2:20 3:5 13:14 20:6 79:20
family 42:20 60:9 60:22 97:23 101:23
far 17:1 18:12 34:20 40:21 43:4 59:4 60:13 66:4 74:18 77:23 83:4,19 102:7 103:2
farther 80:21 102:24 103:11
fast 40:7
faster 35:18 40:5
fastest 52:21
favor 17:21
favored 17:20
feasible 68:12 69:6 73:1
features 11:20,23 46:3 80:11 84:25 85:13 90:7 91:21
fed 85:9
federal 5:4 63:24
feed 92:4
feedback 36:4
feel 39:4 45:6 50:6 60:18 70:24 76:7 101:8
feelings 60:22
feels 46:13 51:11 62:5
feet 25:12 82:19
felt 102:9
Ferry 50:25 54:9
FHWA 81:11 102:20
fifth 33:1 56:10
figure 35:21
figuring 35:17
fill 15:4 54:19
final 1:24 9:17 10:24 61:11 70:2,17,18 73:4 78:5 88:6 92:14 101:7 103:4
finalize 8:10 13:20 98:24
finalized 13:19 43:25 86:20 92:2
finally 13:15 44:17 55:1 78:21
financial 52:20
find 64:2 70:16 75:2 81:12 89:4
finding 43:19
finished 78:7
fire 45:23
firm 23:11 71:11 71:14,25 89:20
firmer 71:21 75:4
first 8:8 9:6 11:3 11:6 12:8 13:11 22:23 27:2,12 29:3,13 38:11 39:7 42:6 49:19 50:22 65:1,21 66:5,10 91:11 93:5 99:18,20
fits 43:19
fitters 85:25
five 24:17 27:1,1 27:10 28:3 61:15,21 77:10
fixed 25:4
flaws 102:10
floor 65:24
focus 10:25 66:14
focused 83:25
focusing 10:3 64:22
folks 47:21 48:10 48:24 84:13 86:15 87:1 89:1 89:7 90:5,17 94:8,18 95:4,15
followed 10:23
following 42:1 83:10
follow-up 11:4
follow-ups 8:5
fondly 75:23
foot 76:1
footage 94:13,16 94:20
footprint 16:13 16:21 21:5 27:14,23 33:16 34:2 35:16 36:9 36:15 43:13,17 45:3 47:3,7,13 50:22 51:11 55:2,6 57:3 67:2 76:23 77:16 91:4
footprints 11:12 11:14,24 12:13 12:16 13:16 14:20 17:3 23:13 26:16,17 27:5 41:5,6 42:11,18,25 43:12 44:18,23 45:1,11,18 50:12 55:18 59:22 60:22 62:11 66:17 70:21,25 76:18 77:5 95:23 98:6 98:22 99:1,6
forbid 37:4
forecast 25:6
forget 23:7 42:15 54:19
form 44:25 45:2,2 92:7 102:1
formal 6:13 7:11 101:8 102:19 103:8
format 9:13 92:17
formats 87:24
former 17:9
forms 93:15

Forst 2:18 46:7,7
forth 68:13 69:20 71:12 73:19 75:13,19 101:21 103:3 105:11
fortunately 54:13 54:13
forums 8:15 22:4
forward 7:3 23:20 32:5 46:13,22 53:16 54:5,23 55:17 56:1,18 62:15 90:8,25 91:10 97:4 101:13
forwarded 99:23
found 42:17 102:2
four 27:10 51:6 72:18
fourth 28:9,12,12 31:7 37:3 48:9 51:3 57:25 61:1
frame 29:12 73:24
framework 83:4
frankly 69:7 80:6 103:20
Freedom 96:23
frequently 44:1
front 30:7 35:23 50:16
fronts 5:14
frustration 61:20 62:7,14
FTA 2:7,8,13 6:4 6:11,16 43:10 56:18 62:25 76:7 79:19 99:19 102:20
fulfill 95:11,14 97:19
full 20:3 24:18 51:5 99:14 103:20
fullest 23:12
fully 50:15 92:16
function 57:2
functional 72:14
functions 24:12
Fund 3:14 18:19 62:8 93:14
fundamental 94:24
funds 64:1
further 17:24 18:16 25:19 27:14 32:23 33:17 49:6 75:1 83:22 104:1 105:13
future 10:5 11:1 21:11,12 24:3 25:3,8,9,21 26:24 27:9 28:15 31:16 32:10 33:5,8 36:23 39:21 41:24 45:9 47:23 48:6 52:25 54:1,3,7 54:14 58:4,8 61:2,2 86:13 88:17 90:10 91:12 92:23 93:3,10 94:18 94:21

G

Gagliardi 2:19
garage 97:1
Gardner 2:20 13:13,14 69:4
Gardner's 71:23
general 79:18
generally 65:22
generations 45:9 94:21
gentleman's 69:5
geometry 30:5
Gerson 2:18
Gerson's 46:8
getting 43:23 101:25 103:6
giant 16:12
give 8:19,21 21:7 36:11 57:5 80:10 83:7 89:17
given 33:22 80:22
gives 29:12 78:14
Glenn 2:21
global 49:7
glorious 54:3
go 7:12 12:16 13:3 14:1 27:6 28:19 30:24 32:2 46:13 51:20,21 61:17 62:14 64:7 65:11 67:9 71:23 72:7,16 72:17 74:6 75:12 79:18 89:24 92:15 93:22 97:13 99:18 101:22 102:24 103:1,10
goal 93:8 94:13 97:14
goals 8:4 23:23 24:5 25:25 41:18
God 37:4
Goelz 7:9
goes 10:6 34:2 64:23
going 6:6 7:9,22 8:7,13 9:24 11:4 15:21 17:8 18:22 20:20 21:18 22:18,21 22:22,24 24:3 25:7,19 26:14 28:6 29:8 30:22 31:14 32:8 33:4 34:18 38:5,10 39:23 40:13,13 40:14,15 41:22 42:9 43:25 44:6 44:9,10,19 45:9 48:1,2 49:4 50:7 52:22 54:3 56:23 62:4 64:6 64:7,9,15,21 65:11,16 66:11 68:19 71:12,25 72:11,18 73:22 74:21 75:17 76:18,20,25 77:5 81:21 82:2 83:19 88:4 89:3 95:9 96:4 97:25
going-forward 92:11
good 5:1 6:7 10:10 22:20 23:3 47:15 52:9 66:13 76:1,22
good-faith 102:5
gotten 78:7
government 58:21 63:24
grade 21:9,12,23 21:24,24 22:9 66:24
great 16:7 90:15 102:22
greater 31:4 33:4 49:7 50:20 58:12 92:23
greatest 73:1
greatly 31:8 42:2
Greenwich 27:17
grew 93:20
ground 41:15 94:2
group 2:6 12:20 12:22 90:23 91:25 93:25
groups 42:23 45:11 61:15,21 100:25
grow 25:7 49:5 54:21,22
growing 25:17,18 30:13 52:21
growth 24:20,21 26:21 28:14 31:24 32:11 33:8 48:7 50:2,5 50:9 51:16 54:15,16 61:2
guess 15:9 49:1 53:10 62:25 68:14 70:8
guidelines 73:12 73:18 91:25
guiding 74:4
Guy 100:21
guys 55:14
Guzi 2:21

H

HABS 65:6,7,11 65:16 87:18
HABS/HAER 87:12
HAER 65:6 87:19
half 22:24
hand 90:8 105:18
handed 9:5 90:17
handle 32:21 33:2 62:20
handpicked 9:7
hangar 9:9 78:4 92:17
Hanley 2:22 8:22
Hanna 1:24 105:7 105:20
happen 24:3 48:5 52:12 53:13
happened 28:16 47:10 48:14 75:14 98:4,9,10
happening 24:25 25:10 61:6 81:17
happy 100:1
hard 5:25 6:7 22:25 28:10 34:20 47:18 78:25
harm 79:10
Harold 3:8
headway 29:3,21 31:4
headways 36:21
hear 39:6 90:25 91:1 99:8
heard 7:22 10:16 77:13 86:2 87:1
hearing 105:10 105:12
heart 56:14
heated 23:6
heck 63:12
hedging 68:24 103:5
held 5:10 17:8
help 31:23 41:23 42:2 89:23 90:6 100:2
helpful 81:23 98:23
hereunto 105:17
Hi 19:11 21:3 41:16 53:8
hide 27:15
Higgins 91:16

highest 40:12
hired 93:21 94:1
historic 5:15 6:14 7:2 8:2 10:13 23:13 26:6,18 32:7 42:19,21 42:22 43:6,13 45:3,18 52:3,15 53:4,5,6 55:9 57:20 59:1,13 59:14,18 71:1 79:6 82:7 86:5 88:10 91:16 95:13 98:1 100:6
history 22:23 23:3 54:13 59:20
Hoboken 33:6,9
honor 60:21,22
hope 13:10 75:20 80:21 81:5
hopefully 35:4 92:19
horrible 28:17 48:13
Hotopp 2:23 10:3 64:14,16,18 67:3,12,24 70:7 71:9 74:9,13 77:20 79:4,24 82:11,18 84:1
Howard 2:24
hub 23:24
Hudson 56:22 78:8
huge 39:24
hundred 35:16 43:6 76:20

I

idea 33:14 63:18 78:15
ideas 63:14 64:3 83:13
identification 102:24
identified 6:1 47:5 85:19
identify 52:2
ignored 101:6
imagination 52:11
immediate 12:4
immediately 12:5
impact 10:20 17:25 18:9,24 19:1 27:18,23 28:11 32:9 35:11,22 36:11 36:16 44:6,7 52:13 61:19,23 62:4,13 66:22 67:9,13 69:1 78:3,11 82:21 96:19
impacted 67:23 71:16 80:12,14 96:11 97:7
impacting 18:14 18:22 22:3
impacts 20:10 26:6 72:3 76:9 79:6 81:13 95:16 97:10
impediments 57:20
implement 71:6 81:19 85:17 96:7
implementation 91:12
implemented 95:1
importance 45:7 45:7 46:12 55:6
important 15:16 15:17 23:2,4,19 24:7 25:24 31:11,14 39:18 41:2 46:11 47:4 47:8 48:9,25 49:9,24 50:2 53:2 55:2,8 86:2 86:3,10 97:13
importantly 27:4 28:25
impression 21:7
impressively 54:6
improved 31:21
improvement 55:22
inception 84:19
inch 14:7,11
inches 14:12 98:5
inclined 102:21
included 11:2 88:13
includes 100:5
including 5:16 59:22,23
incomplete 83:3
incorporate 5:15 88:21
incorporated 19:6 40:20 79:16 96:1 103:1
incorporation 49:5 85:11
increase 25:19 38:9 39:11,13 49:6
increased 56:3
increasing 25:24 36:13 38:10
incredibly 41:9 54:9
increment 29:15 29:15
increments 29:11
independent 37:21 56:7 57:18
Indirectly 63:2
individual 59:19 87:5 96:18
individuals 58:20 85:2 87:8 100:22 101:2
informal 102:12
information 6:21 37:12,16 38:17 43:2 57:11,17 67:4 87:20 98:23 102:14 103:6,10
informed 20:22
infuriating 45:17
ingenious 55:4
ingress 38:20
inherent 102:8
initial 9:4 26:8 103:17
initially 26:22,24 102:4
input 5:12 10:15 85:1,1,9 93:18
inside 5:19 94:4
instance 59:5 69:12
instances 102:6
institutions 85:23
insurance 63:23
intend 6:25 97:19
intended 84:23 88:25 89:9
interest 31:17 32:11
interested 13:8 51:8 105:16
interests 32:4
intermodal 26:11
internally 93:20 102:16
interpret 69:19 73:20
interpretation 69:18 70:2
interpreted 70:4
interrelated 81:15
interval 29:13
intrigued 50:18
introduce 7:13 97:16
intrusions 61:16
invalid 77:9
inventory 8:20,23 9:2,4,17 92:15 92:20 99:2
invest 50:8
involved 11:13 47:18 65:17 68:5 99:22
Irene 2:10 77:17 84:3,6 97:23 98:10 99:9
Irene's 99:5
irregardless 20:13 103:2
irrelevant 42:21 44:20
issue 17:11 19:16 35:2 37:22 45:15,24 46:6 48:16 49:10,11 52:2 58:19,20 66:10 67:9 71:6 80:3 82:23 88:19 101:23
issued 89:22
issues 19:7 26:5 33:13 45:20 48:10 63:7 64:17 73:15 82:15 101:25
item 11:3 60:12 68:7 71:22 72:5 72:22 74:13 75:6
items 8:7,11,13 8:14 9:15 11:5 14:5 72:4 78:7
iteration 67:17 75:3
i.e 102:24

J

Jackie 2:22 8:18 8:21,22 92:13
Jaffe 3:2 53:8,9
JANE 1:25
jeopardize 31:15 31:18
Jersey 1:6 41:25 52:23
JFK 8:20
job 66:11
Joel 3:5 20:5,5 37:9 55:24 79:17 80:1
John 2:23 10:3 64:16,18 67:3 67:12,24 70:7 71:9 74:9,13 77:20 79:4,24 82:11,18 84:1 100:21
joining 22:21
July 5:10 8:5 98:14
June 98:17
jurisdiction 45:22
justified 43:5
justifies 22:17 43:2
justify 32:18

K

Kate 3:18
keep 23:20 28:14 31:19 37:10 44:17 45:25 63:10 75:21 90:21 91:6 92:6 99:11
keeper 6:13 99:24 101:9,20 102:13,18 103:5 103:7,18
keeping 30:24 32:5 42:3 55:8 63:11
Kelley 3:3
Kelly 90:3
Ken 3:13 18:18,18 18:25 19:3 61:14
Kennedy 3:4 47:15,16
Kent 100:21
kept 92:6
key 37:22
killed 42:16
Kim 2:12
kind 32:4 33:25 42:7 62:14 72:8
kinds 59:11
KINGS 105:5
Klein 3:5 20:5,5 37:9 55:24 79:17 80:1
knew 97:2
know 9:3 14:16 17:6 20:22 22:12,14 35:23 39:21,25 41:7 42:5 43:18 45:1 45:23 46:4,25 55:14 63:10,14 63:23,25 67:19 70:1,2 71:3,11 72:6,16 73:23 74:5,6 77:16 80:16,19 81:1 83:17 86:16 93:9 97:18,21 99:14
knowing 61:23 69:10
known 15:12
knows 96:23
Kornfeld 8:1,2 33:11,12,25 35:5,10 49:14 51:22 66:20 67:8,21 82:5,5 82:14
Kornfeld's 50:18
Koutsomitis 3:6
Kurtin 3:7

L

laid 26:10,10 92:17
language 68:25 80:14 81:5
large 16:11 58:21
larger 65:19 90:1
largest 41:18,21 42:3 47:24 54:2
late 90:22
layout 27:8,9
layouts 27:3
LBG 2:23
lead 42:1
League 98:1
leap 39:12
learned 46:10,12 46:21 91:15
leaves 69:17
LeBrun 2:8
left 14:23 15:5
legal 45:22 84:14
legally 76:9
Lenahan 3:9 17:10 18:23 19:2,10 20:18 21:21 22:7
length 28:8 38:19
lessons 46:10,11 46:20
Lester 3:10 55:11 55:12
letter 20:3
Lettermarks 58:17
letters 90:20,21
letter-writing 86:23
level 11:18,20,22 14:9,21 16:1,6 21:11,12 25:6 35:1 57:3 63:19 63:20 65:5,22 66:24
levels 25:24 63:21
leveraging 64:3
Levitt 3:8
library 94:19
Liebskind 85:10
lieu 80:9
life 53:6
life's 100:16,23
lightly 50:13,14
likelihood 15:13
limits 32:2 63:5,6 102:3,7
line 11:15 24:20 33:5,6 39:21 76:11
lines 33:9
Lisa 3:20 19:11 19:12
list 59:24 82:12
listed 69:25
listen 45:19
Listening 46:8
literally 80:2,16
little 7:21 32:23 35:9 49:1 58:23 65:4 68:5 71:21 72:3 75:1,4 80:21 97:12 103:13
live 23:16 47:21 48:11,12,20 59:15 75:22
lived 27:25
lives 41:10 54:4
living 24:23
LMDC 2:10 3:3,18 13:15 20:9,12 20:15,19,21,25 21:13 44:20 70:15 74:20 76:15,21 77:14 81:4,11 84:5,8 84:19 93:20 95:2,7 97:23 99:12
LMDC's 20:12 44:3,7 66:22 71:7 88:12
lobby 44:11
local 45:23
located 15:7 27:13
location 10:19 17:16 28:4,7 36:23 44:11
locations 69:13
logistics 11:13 12:19,22
long 29:7,13,16 30:16,17 32:25 37:20 50:6,10 51:15 59:20
long-range 39:15
long-term 33:2 50:1
long-winded 97:12
look 5:25 6:7 7:3 12:17 21:19 23:2,17 24:1,2,3 24:9,10,13 25:20,22 29:25 30:1,15,18 31:1 34:20,23 35:24 37:18 40:10 43:11 44:14,18 47:20,23 48:4 53:20,20 54:7 54:17 56:23 57:21 61:8 64:22 79:13 91:10,18 92:16 93:8 95:10 97:25
looked 11:12 12:14 17:11 25:9,10 26:20 26:21 27:1 33:6 57:5
looking 11:15 17:24 23:22 43:15 54:15,15 55:7 70:21 71:3 73:15 77:14 82:23,25 103:21 103:24
looks 43:23 103:9
loss 60:7,11
lost 24:10,10 64:1
lot 5:22 12:25 15:21 23:3,15 24:10,11 27:3 35:18 39:3 53:10,13 55:24 63:2,12 68:19 68:20 73:21 75:10 80:4 81:10,23 82:4 90:9 93:18 94:12
lots 87:4
Lou 3:17 22:18,20 32:15 33:3 34:4 34:9 37:2,9 77:3 77:8 84:11
Louis 2:6
love 3:12 60:5
lower 3:13,19 5:3 11:18,20,24 18:19 24:4,7,23 24:24 25:20 26:4 30:14 31:24 32:12 41:18,19 45:1 47:22 49:21,25 50:10 53:13,15 54:1,20 55:15 55:23 62:7 93:13
Lucille 2:5
Luis 4:4
Lustbader 3:13 18:18,18,25 19:3 61:14
lying 14:17

M

main 41:11 97:14
maintain 34:25
major 100:16
majority 48:21
making 6:13,16 49:7 52:6 66:16 68:17 102:22
malleability 60:3
man 53:19
manage 21:13
management 30:23
Manahattan 2:17 3:19
Manhattan 3:13

5:3 18:19 24:4,8 24:23,24 25:20 26:4 30:14 31:24 32:12 41:19,20,25 47:22 49:21,25 50:10 53:14,16 54:1,20 55:16 55:23 58:18 62:8 93:13
manifest 59:10
manner 32:22 58:3
maps 65:23
Margarita 2:19
Marilyn 2:24 7:17
Mark 3:21 4:11 8:25 9:3,21 92:13
marks 9:23
marriage 105:15
marshal 12:8
Martin 4:10 41:17 100:19
Martine 3:14
Marty 2:6
material 8:20 11:17 12:4,9 14:11,14 16:3,4 68:22 94:12,21
materials 94:9,15 94:18,19
Matt 4:10 41:16 41:16 46:2
matter 13:1 60:4 74:19 105:16
maximize 77:15
maximum 36:24 68:12 69:6
McNeilly 3:16 34:5,6,7 35:8,19
mean 26:17 35:12 36:10 61:3 79:22
meaning 96:15
meaningful 41:9 89:4
meaningless 76:19
means 33:23 89:12
meant 99:10
Measure 66:1
measures 6:22 69:23 73:10 81:19
media 93:15
meet 24:6 39:20 97:14
meeting 1:7 5:5,9 5:22 7:7,10 8:5 10:5 17:11,18 21:22 33:13 36:3 37:11,14 44:8 47:2 50:17 83:24 84:8 91:7 91:8,11 92:3,10 97:24 103:25 104:4
meetings 10:11 11:6 20:7 45:2 57:19 70:24 95:3,3
meets 57:8 58:4
mega 56:20
member 2:18 16:9,22 19:14 32:16 39:7 46:8 59:6 62:16 63:4 67:10 68:1 70:5 70:10,19 73:7 74:11 75:7 76:5 77:6,13 79:2 81:7 97:22 98:19 99:15 101:19
members 42:20 59:11 60:10,10 60:23 92:16 97:16
memorandum 8:8 10:7,22 13:20 43:15,24 64:15 98:25
memorial 8:17 25:15 26:13 47:12,12 59:5 60:8 61:24,24 66:24 67:14,15 67:18,22 85:17 85:19,22 88:13 88:19,21 89:11 89:12,18,25 90:6,7 91:23 92:22 93:17 95:11,13,24 96:5,15 103:1
memory 40:22 46:23 47:4,9 53:7 55:8
Menno 3:17 22:19 22:20 33:3 34:4 36:19 37:2 77:3 77:8
mention 16:17 19:18 65:1
mentioned 16:10 21:22 44:8 48:1 59:24 82:9 91:22 97:24 98:6
merging 49:5
met 23:18 90:5 91:23,25 96:25 97:17
metal 14:17 40:24
mezzanine 30:9
Michael 89:18,19
middle 16:13 53:12 63:8 83:8
mid-September 9:22 83:24
mike 7:25 33:1
Millea 3:18
million 25:12
mind 23:20 28:14 30:25 31:19 32:5 92:6,6
mindful 26:5
minimize 52:3 69:7 89:9
minimum 34:24
minor 33:18
minute 84:17
minutes 29:6
Mire 3:19
missed 47:1 50:17 101:13
mission 59:1,13 97:19
mitigate 32:9 62:12 81:13
mitigating 26:5
mitigation 6:22 19:4 69:10,23 73:10 76:17 81:9,19 97:11 102:6
MOA 5:20 7:4 8:11 10:2,6 19:6 64:19 74:14 75:3 99:5,5,11
MOA's 86:6
moderator 7:8,9 8:4 9:19 10:1 13:9 17:4 18:15 22:13 32:14 33:20 45:25 46:4 49:16 51:20 63:2 64:13 83:20,21 84:2 103:23
modern 59:15
modification 85:10
moment 28:20 54:12 78:24
money 50:8 63:23
monitored 78:20
monitoring 78:18 79:7 82:20
month 21:23 83:9 90:21 97:15
months 9:5 37:11 66:25 70:8,9 89:22
monuments 55:9
moot 20:17
morning 28:24
MOU 5:15 104:1
move 12:3 17:8 23:20 25:5 31:22 32:5 35:18 46:22 53:16 54:5,23 55:17 64:13 69:23 78:6 83:23 97:4 101:13
moved 10:15
moves 78:20
moving 10:21 17:14 63:15 88:11
MTA 17:23
MTA/NYCT 2:3
multiple 12:21
museum 2:6 47:12 59:16 67:15 85:21 88:14 93:2,3 94:15

N

N 2:1 3:1 4:1
name 7:8 19:11 19:25
named 100:20
names 7:22
narrowed 50:20
narrowing 33:23
Nation 2:5 3:14
National 6:14 87:19 99:24 101:9
near 10:5 93:1
necessarily 39:9 89:21
necessary 8:10 18:12 33:1 66:1 86:14 101:10
need 10:18 22:15 22:18 24:11 27:1 28:19 30:19 34:25 44:13 46:21,22 49:8 51:7 52:7 54:7,23 56:15 58:15 60:21,24 60:25 64:8 67:1 71:2,3 76:23 88:1 101:22 103:4
needed 28:8,13 41:24 87:16
needs 26:3 27:8 47:22 48:5 70:3
negative 30:5 31:5,5
network 3:20 18:7 19:14,16
never 38:1 54:18 54:18
Nevertheless 65:10 72:14
new 1:6,6 26:10 38:12,16,19 40:5 41:25 45:21 53:9

55:12 56:21 72:16 85:14 90:5 105:3,8
Newark 24:20 31:2 33:5,9
nice 27:3
Nicholas 3:6
Noah 3:23 36:18 36:18 60:17
non-issues 52:14
non-traditional 93:15
north 33:22 43:7 76:21
northwest 8:16
north-south 26:15
Notary 105:8
note 6:10 67:6
noted 89:14
notice 13:5 68:7
noticeable 22:10
noticed 5:21
notification 103:24
notion 54:10 58:22
notwithstanding 86:6 87:23
number 5:11,14 8:6 29:8,23 34:21 38:10,20 51:24 65:12 67:13 69:12 71:15,22 72:7 78:6 79:14 82:6 101:25
numbers 70:23
NY 2:16 3:2,7 4:6
NYS 3:10,22 4:10
NYSHPO 3:24

O

obfuscated 37:25
objective 7:5
objectives 23:23 24:6 31:12 95:11
obliterated 100:19
observations 18:17
obstruct 98:5
obstructions 12:25
obvious 32:21
obviously 15:19 50:22 51:7 63:18,21 74:16 95:13
occasional 66:1
occupants 85:24
occurred 46:23 70:14
October 12:7,8 13:11,19 90:24 97:15
offensive 80:6
offered 17:1
office 5:3 21:12 21:13 25:12 41:18 44:10 45:13 46:8 55:13
offices 40:15
oh 54:18 89:2
okay 62:2
old 85:14
once 10:6
ones 38:19 92:9,9 93:6,7
ongoing 45:1 74:2 92:8
opening 67:1,11 67:19
open-ended 73:21
operating 38:13 73:11
operation 58:3 72:15
operations 15:3
opinion 36:10 47:11
opportunities 102:23
opportunity 37:18 38:13 66:6 71:24 76:4 85:17 99:17 101:14
opposed 43:8 60:8 80:12
optimal 30:2,11
option 18:1 77:2
options 50:21 51:8,9,19 62:19 63:7
order 62:20 68:16
Organization 2:9 52:17
organizations 41:20 62:23 100:5
original 38:23
originally 17:13 43:9 65:20
Orloff 3:20 19:11 19:12
outcome 6:5 105:16
outline 14:17 15:5
outrageous 56:24
outset 74:1
outside 57:12
overall 73:19 84:24 95:12
overcrowding 25:1 37:5
overlap 81:10
over-arching 73:13
owns 84:21

P

P 2:1,1 3:1,1,16 4:1,1
PA 2:21 3:17 4:7 4:13 17:5 69:8
package 44:16
page 2:25 3:25 80:2
Pagliettini 3:21
painstakingly 59:7
paper 66:25 86:17
paragraph 65:21 66:7
parameters 18:21
Park 14:4 87:19
parking 66:6
part 8:9 33:14 34:9 41:10 72:15 84:23
86:23 95:24 96:5,6,6,17,21 101:2
partial 8:8 64:15 64:19
participants 7:15
participate 7:18
participating 42:23
participation 7:4
particular 66:9 74:14 77:23 82:22,24
particularly 36:7 66:14 100:11
parties 1:7 5:6,9 5:11 12:12,15 13:1,8 17:11,18 17:19,21 24:6 26:3 27:21 31:17 32:5,12 39:4 44:1,13 47:2 51:24 55:21 56:8 57:18 70:13 72:1 73:6 79:12 88:7 92:11 94:1 98:24 105:14
Partnership 2:19
party 7:3
pass 40:19
passage 39:17
passed 23:1
passengers 29:4 31:15,22,22 38:22
Pat 4:2 21:3
Patel 3:22
PATH 3:8 5:7 17:24 18:3,6,13 18:23 20:19,23 22:2 23:24,25 24:13,14 26:2 26:11,20 28:20 28:23 40:16 41:1 42:9 45:8 45:12 50:4 52:9 52:13 54:24 55:17,21,22 64:9 95:3 96:11
Paul 2:8
Paul's 82:9
paving 12:2
paying 62:22,24 63:3,6
PA/NYNJ 2:4,12 2:14,22 3:9,16 3:21 4:3,4,14
peak 28:22,23,24
pedestrian 18:7,7 66:15,21 67:23 74:16
pending 78:4
penetrated 14:24
penetration 74:15
people 7:19 16:25 17:6 20:2 24:23 30:6 36:25 37:6 40:7,15,16 41:5 42:15,16,17 45:4,17 48:19 53:10 54:19 55:25 56:4 58:6 60:2 61:8 63:3 68:19 73:23 75:18 76:3 81:24 89:6 92:5 93:23 94:14,20 98:25 100:16 101:18 102:23 103:24
percent 35:16 38:9,11 39:11 39:13 43:7,8 64:4,8 76:20,25
percentage 43:16 63:25
percentages 43:14 44:19 70:22 71:3
perimeter 14:24 14:25 16:17 66:8 94:4
perimeters 5:18
period 14:6 28:22 28:23 37:7 39:13 40:6 72:1 78:2 83:11
permanent 5:7 23:24
personally 48:12
personnel 92:7 100:6,12 101:12

102:25
perspective 50:24
perspectives 93:24 94:7
Peter 4:3 7:7,8 11:7,8 13:24 14:10,19 15:23 16:10,16 78:1 89:18,24 98:6 99:6
Petra 4:8 21:3 22:5 49:18
Pfefferblit 3:23 36:18,19 60:17
phase 71:20 73:8
philosophy 95:13
phone 7:21 8:3 53:19
photograph 66:12
photographed 9:13
photographer 94:5
photographically 65:3,25
photographs 66:5 87:9
photography 87:5
photos 87:23
phrases 68:11 69:5
physical 45:10 98:21 99:1
pick 9:22
picking 69:18
pictures 14:14
piece 40:21 74:14
pieces 65:13 85:18
Pierpont 3:24
pile 62:3
piled 9:9
pit 94:2
pits 15:5
place 13:10,18 46:14 63:9 66:10 74:17 78:2 88:9 90:15 98:13,15
Places 6:14
placing 71:18,18
plan 4:8 6:16 11:17 12:6 17:16 21:4,5 26:23,24 27:13 28:15 39:20 48:5 55:18 61:13 70:6 78:17 84:21,24 85:7,16,18 88:12 95:18,18 95:25 96:5 97:3
planners 26:22,25 90:2
planning 23:21 39:16 48:6 49:21 86:14 90:4
plans 20:12,15 26:8 65:24 85:12 96:19
plant 76:23 77:4 77:12,15,18
platform 22:15,18 23:17 28:9,12 28:13,19 29:5,7 29:11,13,16,23 30:10,17,19 31:2,3,7,20 32:19 33:1,15 33:19,23 34:8 35:2,13,25 36:6 37:2,3 43:2,5 46:1,18 47:7 48:9 50:19 51:3 56:2,10 57:1 58:1 61:1 69:15 69:16 71:12
platforms 5:19 24:17,18 25:1 27:1,11 28:6 29:1 30:1 31:2,6 32:24 34:19 37:1,20 38:3,23 40:3 50:16 51:6 58:11 63:15
plaza 5:23 17:14 100:18
pleasant 72:8
pleased 6:5
point 6:10 19:9 30:6 35:20 39:5 45:16 52:18,19 53:18,19 54:12 57:6 62:7 66:19 67:13 68:3 71:23 76:6,11 77:22,25 80:25 87:14 91:4 94:24 98:3
pointed 27:14 78:1
points 37:24 41:11 46:9 49:19 83:1 87:9
politically 64:10
population 25:17 25:18 30:14 54:21,22
Port 1:6 5:13,24 6:6 10:18 13:15 17:23 19:8 20:8 20:11,14,16,18 22:15 23:10 32:18 34:7 38:15 39:6 43:10 45:19 47:17 50:13 51:17 56:1,18 60:5,6 62:10 72:9 76:7 79:19 84:7,20 85:7,15 95:1,4,6,7 98:11 99:5,7 100:12 100:12,16,19 101:12 102:25
portable 7:25
portion 89:17
portions 44:25 45:2 75:16 88:22
portrayed 51:23
position 42:22 55:14 75:11 89:15 103:15
positive 36:4
possibilities 92:25
possible 23:12 51:12,15 54:6 67:17 94:10 97:10
possibly 18:8 48:1,7 58:10 91:19 103:18
post 10:6
posted 91:6
potential 36:16 53:21 85:24
potentially 19:1
powerful 42:13
practicable 68:11 69:6 73:14
practical 44:12
practically 72:10
preamble 74:10
preferable 18:1
preliminary 21:17
premise 28:22 52:1 56:1 57:7
prep 98:17
prepare 86:8 94:14
prepared 50:15 61:15 64:18 87:11 91:25
preparing 87:3 94:8
Pres 3:13
present 32:20
presentation 60:19 92:24 94:15
presented 27:9 27:12 28:9 50:16 61:13
preservable 15:16
preservation 4:12 18:19 42:21,23 45:11 51:25 53:4,5,6 59:1,13 59:21 60:15 62:8 91:16 92:24 93:5,14 98:1 100:4,6,25 101:24
preserve 15:17 23:12 44:12 57:2 59:7,8 62:11 72:12 74:21 76:20 93:9
preserved 43:7 51:13 59:22,25 60:1,16 71:2 88:15
preserving 46:23 46:24 51:10 55:3,8 60:1 64:5 68:4 71:4
prevent 61:6
previous 33:13
previously 47:25 99:3
pre-9/11 24:11
primary 9:6 31:12 94:13
prime 44:3
principles 73:12 86:4 92:5
prior 38:2 40:18 40:19 52:23 57:19
private 58:21
probability 15:11
probably 22:6 40:11 49:2 70:8 73:5 75:3 77:7 78:1 89:5,16 91:4,11 93:19 97:15 98:22
problem 35:7,9 35:11 56:3,25 57:8 65:8 72:18 72:20 76:14
problematic 58:19
problems 68:2 82:25
procedure 100:7
proceeding 73:25 74:3 75:5
proceedings 105:12
proceeds 74:25
process 5:6 7:1 7:11,11 8:9,23 9:11 10:2,6,21 13:23 15:11,25 17:2 18:12 20:21 21:1,14 23:21 35:18 42:24 52:12 53:2,18,24 56:14,15 57:14 58:23 59:3 60:3 60:8,9,14 62:6 62:15 68:2 71:13 73:22

74:2 78:12,19 80:23 84:5,12 85:3,5,6 86:1 87:7,21 89:24 90:12,13,14 92:4,10 93:5,21 94:8 96:3,9,21 98:12
processes 58:15
Professional 100:5
professionals 57:12
program 94:25 95:1,11,14
programmatic 21:1,20 44:22 71:8 76:15 81:4 86:7,9,12 88:5,8 90:8 95:12,20 96:18,22
programming 96:7
progress 5:14 10:9,10 46:22 91:5 102:9,22
prohibitive 63:18
project 7:5 17:25 18:3,10,13,21 18:24 20:20,23 22:23 39:10 44:5 61:22 65:19 73:18 81:15 82:24 85:5 89:20 90:7 94:22,23 96:10 96:11,15,16
projected 31:23 58:5
projections 37:13 38:8 39:8 40:2 58:7
projects 18:10 19:1 20:10 44:3 44:3 61:20,24 81:11 82:24
promise 44:18 70:21
promised 43:11
promises 23:18
promote 50:9
proper 6:19 54:24 56:4
properly 13:17
properties 10:13 82:8 85:12
property 84:21
proposed 19:5 33:7 35:25 38:24 65:2 66:22 69:15 70:15
proposing 19:9
prosecutorial 60:13
prosper 24:23
protect 40:22 61:1
protecting 40:23
provide 7:1 12:14 37:16 42:13 44:22 50:1 51:4 51:18 57:10 58:2 73:9 75:9 84:7,10 88:24 89:1,6,8,12 91:8 95:22
provided 5:12 43:1 75:16 103:10
provides 6:18
providing 6:21 41:23 65:12 75:18 103:19
provision 81:16 81:22
public 10:14 31:10 85:8 90:13 92:1 105:8
pumping 15:7
pumps 15:6
purely 62:6
purpose 88:12
purposes 11:19
pursuing 102:1
push 32:23
pushing 78:25
push-back 32:17
put 9:13 14:8 30:3 32:10 48:2 48:14 49:12 56:1,18 62:3 65:4 74:14 86:16 94:6,17 99:21 102:16
p.m 104:5

Q

qualified 60:18
qualifiers 69:7
quarter 14:7 66:15 74:17,23
Quasebard 91:17
question 12:11 15:10,18 25:2 33:4,12,20 34:5 35:4,6 53:3 61:5 66:21 67:6 68:14 69:3,5 71:14 75:8 97:23 99:16,21
questions 32:14 66:19 72:22 73:6 79:14 97:21
queuing 29:17
quick 70:19 97:23
quickly 54:5 80:11
quite 14:6 69:7 74:18 78:7 80:5 103:20
quote/unquote 87:24

R

R 2:1 3:1 4:1 105:1
raised 11:5 58:22 79:15 101:24
rationale 22:17 57:25
raw 94:13,16,19
Ray 100:19
reach 17:5
reached 18:2 32:2
read 97:18
reading 99:11
ready 90:23
real 36:25 90:18
realigned 64:9
realistic 63:6
realistically 9:22
reality 48:8 87:3
realize 25:18 89:25 91:2
realizing 17:25
really 8:11 10:10 10:25 19:25 25:6 27:2 35:6 42:9 45:19 48:14,25 52:10 52:15,19 59:8 62:17 65:9 71:10 76:8 77:1 81:1 88:11,25 90:10,14 92:9 93:4,18 98:11 98:17
reason 82:7
reasonable 88:24
reasonably 36:4 40:4
reasons 101:8
reassure 95:9
rebuild 63:24
rebuilding 24:7 25:13 49:21 94:23
recall 17:17 66:24 67:24
recap 22:22
received 5:21 6:12 8:24 43:21
recitation 102:14
recognize 84:24 85:16 87:15
recognized 101:2 101:5
recollection 40:17
recommended 100:6
reconfiguring 33:14,22 34:2
record 7:16 10:23 13:20 61:18 64:12 66:13 79:19 82:3 93:16 94:4 96:2 101:22 105:12
recordation 66:5
recorded 105:11
recordings 93:23
records 90:10
recovery 5:3 9:10 14:16 15:3,25 16:5
red 9:23 36:1
redevelopment 44:15 84:24 94:25 95:10,14 95:25 96:6,16
reduces 31:8
red-marking 9:17
refer 56:19 102:18
reference 80:11
referenced 5:24
referral 6:13,17 101:8 102:12 103:7
referred 37:13 67:20
referring 70:22 101:20
refined 6:23
reflects 7:5
regard 73:11 91:14
regarding 6:15 20:9,12
region 49:23
Regional 4:8 21:4
Register 6:14 99:24 101:9
regular 41:4 96:21
regulations 101:21 102:17
regulatory 80:7 80:13
reinforce 53:11
reinforced 27:17
reiterate 76:6
relate 58:18 65:18
related 105:14
relates 62:18
relating 63:10 95:21
relationship 65:12
relatively 33:18
released 92:1
relevant 52:15 90:16
relocate 25:4

relocating 77:24
reluctance 57:10
rely 58:7
remain 27:22 28:3,6 96:8
remaining 10:4
remains 14:20 42:17 47:3 70:25 98:6,22 99:1
remedy 71:5
remember 23:5,6 28:16 30:12 66:15 75:22 101:12
reminded 46:10
reminder 41:3 75:13
reminders 40:20
remnant 16:10,23 16:25 97:8
remnants 8:16 14:23 16:11 66:9 68:4 69:13 88:16
remotely 48:17
removal 8:15 17:20
remove 11:17,19
removed 12:9 16:2 18:21 78:4 88:16
render 76:18
renovating 63:8
repeat 56:6
replacement 32:3
report 9:13 83:17
reported 90:19
Reporter 105:7
REPORTING 1:25
represent 36:2,6 53:14 61:16
representation 36:12
represented 36:1 100:17
representing 19:15
represents 47:7 62:23
reproduced 65:25
request 86:8 88:7 99:22
requested 19:24
requesting 20:3
requests 100:25 101:5
required 34:22 66:3 93:12
requirements 34:14
residences 24:22
residential 25:17 25:18 30:14 48:2 50:3 52:22 54:21
residents 39:19 40:14 45:13 53:14 55:15 75:11,25
resolution 78:21 80:25 81:3
resolve 71:6
resource 6:3,9 17:20,22,25 18:2,5,9,11,14 18:24 20:20,24 36:17 41:12,13 71:1 96:20
resources 5:15,21 12:9 19:20 23:13 26:6,19 27:4 32:7,9 41:14 52:3 53:21 57:20 59:14 78:13 88:10 96:12
respect 87:5 92:12 93:11 97:7
respected 84:20
respective 20:10
respond 33:3
response 12:19 69:4 102:13
responsible 62:24
responsive 53:18 53:25
rest 49:23 51:4
restore 24:11 40:22 49:25
restoring 25:11 49:22
result 90:9
retail 25:14 68:23 75:21 76:1
retain 41:20
retained 91:15
retaining 17:22
return 22:16
returning 41:25
revealed 96:13
reverse 24:22 25:19 30:13,15 30:21,25 52:18 53:1
review 6:19,20 10:9 43:3 51:7 52:2,15 57:12 64:20 71:25 83:11 85:5 92:12 99:24
reviewed 14:2 57:18
reviewing 5:20
revised 43:21
revisit 71:24
RFP 89:22
rhetorical 15:18
Richard 3:4 47:15 47:16
Richards 4:2
ridership 24:20 24:21 25:7,24 26:21 28:14 32:11 33:4,8 37:13 38:9,17 56:3 58:8
right 9:15 12:4 14:6 22:12 27:13 33:25 34:11,23 47:3 48:19 54:17 63:16 64:23,25 76:11,24 82:14 91:3
Rinaldi 4:3 11:7,8 13:24 14:10,19 15:23 16:16
Rising 3:23 36:19 61:12
risk 32:10 36:24 37:8 48:15 49:12
River 56:22 78:8
RKK&G 3:6
road 64:10 70:4
Robert 2:15
Robin 2:18 46:7,7 47:19
ROD 96:2
Rodriguez 4:4
room 7:12,23 51:21 63:3 69:17 74:24 76:13 91:19
ROSE 1:25
Roth 1:24 105:7 105:20
RPA 50:4 51:11
ruled 99:13
rumor 77:7,9
run 32:25
Ruth 3:24

S

S 2:1 3:1 4:1
sacrifice 31:18 76:1
sacrificed 75:9,20
sacrificing 68:21 68:22
Sadly 46:13
safe 16:6 32:22 48:18 58:3
safety 13:1 25:2 28:14 31:11,11 31:12,14,15,19 32:10 34:11 45:20 46:3,13 46:19 48:10 49:2,10 51:24 52:7,8,13 60:24 61:1 73:16
samples 94:8
satisfy 87:12
save 2:24 3:12 42:24 94:14
saw 25:23
saying 34:9 45:12 66:25 70:20 79:19 99:8
says 103:8,9,13
scale 65:19 81:14
scar 42:11
scenario 15:15
schematic 21:16
scholarship 100:20
screen 59:4
se 59:16
searched 16:3
second 9:8 10:8 49:16 59:17 66:13 103:25
section 1:7 5:6 6:19 17:2 18:13 52:2 56:14 58:14,15 60:12 74:20 78:8,11 78:22 79:3,5 81:8 82:22 85:3 92:10
secured 31:13
securing 42:2
see 21:4,17 27:10 32:19 35:22 50:20 51:17,17 52:3,25 53:1 54:5 55:9 59:4 59:13 61:8 66:7 71:22 72:21 76:3,14 78:9,17 78:18,24 79:15 80:18 83:4,22 91:9 92:18 94:10 99:12 102:23
seeing 51:8
seen 14:14 43:4 43:20 83:12 90:3 95:19 102:14
segment 60:12
selected 85:20,23 86:15 89:18,22
selecting 65:17
selection 85:9
Senator 4:10 41:17
send 7:24 13:5
sense 15:20 45:7 46:18 64:21 72:8 99:1
sensitive 26:5 32:7
sent 70:15
sentence 80:2
separate 81:21
September 19:13

42:10 45:10 49:20 87:10 90:22 104:1 105:18
serious 37:3
serve 7:9 32:4 48:9
service 25:7 30:24 31:2 35:1 38:1 52:13 87:19
Services 4:12
session 83:9,10
sessions 32:17 92:8
set 69:20 73:19 95:5 101:21 103:2 105:10,18
shaking 79:9
shape 14:17
share 96:20
shared 5:16 96:25
sharing 94:11
Shawn 3:9 17:10 18:23 19:2,10 20:18 21:21 22:7
Sheldon 3:11 55:13
shift 18:6
Shilpan 3:22
Shinnecock 2:5 3:14
Shirley 3:2 53:8,9
shoot 12:6
shopping 75:23
short 79:18
shorter 51:3
Shorthand 105:7
shortly 9:18
showing 38:7
SHPO 2:16
side 52:23 53:20 63:17 73:3
side-by-side 38:21
sign 44:21 76:15 99:12
signed 1:24 10:7 70:17
significance 45:18 84:14 87:22
significant 10:14 22:9 39:17 68:15,23 71:1 86:5 87:9,13 100:15 101:1
silent 48:21
Silver 3:11
Silverstein 85:12
Silver's 55:13
simply 29:9 33:22
single 30:18 43:16 65:14 76:2
sir 64:14
site 5:8 6:16,21 7:2 10:19 11:7 11:10 12:18,23 12:24 13:7,11 14:12 16:6 17:6 18:11 24:5 25:11 40:11,12 40:17,22 42:16 45:14 58:25 63:17 78:16 81:13 82:8 84:23,25 85:14 86:25 87:2,6 93:17,22 94:3,6 94:22 98:2
sites 82:21
sitting 63:22
situation 34:23 37:5 63:22 70:14
situations 25:1
six 77:10
size 12:20,22 14:17
sketches 66:1
slab 8:15 11:18 14:22,24 97:1
slabs 13:9
slides 35:22,23
slow 54:17
slurry 27:16 59:10,23 63:16 72:24 73:3 74:15,21 75:10 75:17 76:2,3 77:21 88:22 95:21
small 9:14 60:11 60:12
smaller 67:1
solid 16:2
solution 50:7,15 56:2 57:8 58:1
solutions 51:17 57:22 61:9
solving 56:25
somewhat 12:24 15:4 72:25
sorry 32:19 47:1 50:17 99:9
sort 16:11,13 46:9 51:24 55:25 77:20 79:10 91:11
sound 49:1
sources 65:23
south 18:8 50:25 54:8
space 19:13 25:12,14 30:10 41:13 68:23 75:21 76:1
speak 7:21 11:10 43:14 44:1 45:9 63:3 75:5 101:22
speaker 3:10 55:12,14 99:18
speakerphone 50:19
speaking 7:25 19:21,24
speaks 70:20 98:20
specific 20:11 35:9 41:14,15
specifically 6:11 11:9,11 34:15 64:22 85:19 89:19
speeches 52:6
spelled 66:18
spelling 81:17
spend 84:17
spending 68:20
spent 94:12
spirit 23:9 89:5
spiritual 42:19
spite 100:25 102:10
spoke 99:6
spoken 20:19 55:25 62:18 87:25
spot 89:1
square 14:15 25:12 76:1
SS 105:4
St 82:9
stage 9:17 20:22 71:10
stages 92:14
stair 29:19 30:18 34:3
staircase 44:4,9 62:2 97:8
stairs 12:1,3 20:13 29:24 30:2,8 56:13
Stairway 19:16 19:21,24 20:1
standard 75:15
standards 60:15 87:13
standpoint 46:19 86:5
stands 62:8 72:13
Stanke 4:5 14:3,3 14:13 15:9 16:7 16:24 42:7
Stanley 4:6
starkly 59:9
start 7:13,25 21:1 23:22 44:19
started 22:24 23:21 57:7 75:14 80:23
start-up 98:15
state 39:24 41:17 55:12 86:3 87:2 93:16 105:3,8
stated 7:15
statement 56:19
statements 80:5 100:10
station 5:19 17:15 23:25 24:14,15,16,19 25:4 26:2 28:21 28:21,23 29:2,4 30:1,3 32:1,3 34:11 38:12 41:2 46:5,16 50:5,8 51:1 52:9 54:8,8,9,9,24 55:17,22,22 56:5 57:4 61:4 64:9 73:4
stations 38:3 40:8
status 11:4
stay 34:13 78:1
stayed 66:16
steamrolled 43:24
steel 9:9 45:5
step 93:6 100:3
steps 8:10 72:18 84:11
Steve 2:14
Steven 4:12
Stickelman 4:7 7:24 20:25 21:15 22:11 99:4
sticking 102:8
stip 66:13
stipulation 66:17 86:22 88:18
stipulations 10:4 10:25 11:1 64:23
stood 26:16
stop 66:18
story 47:13 66:3
straighten 14:8
strain 90:22
street 2:24 3:12 3:23 5:23 10:17 17:9,12,13 18:6 18:16 20:13 21:25 27:17 36:19 44:4,8 56:13 61:12 62:2 82:10,10
strict 59:20
strictly 102:8
strides 102:22
strip 34:11
strongly 50:4
structural 85:13
structure 22:6

63:20 86:12 97:3
structures 21:25 96:19
studies 37:19
study 65:7,8,9
stuff 9:7
subject 70:12 72:13 73:5 86:23
submitted 103:11
substantial 83:18
substantive 91:11
subway 5:17,23 72:12
subways 26:12
sub-grade 8:15 22:6 97:1
sub-one 21:11
success 60:14
successful 75:24
suddenly 15:14
sufficient 50:1
suggest 57:1 69:22 102:17
suggested 68:10 89:2
suggesting 36:22
suggestion 50:18 93:13 97:25
suggests 96:10
summary 67:18
support 33:8 37:12,19 50:15 51:14 61:12 63:20
supported 16:14
supports 50:4 55:14
supposed 87:12
sure 19:19 21:18 27:20 35:1 39:3 39:9 48:18 49:8 55:19 66:16 82:11,15 95:16 97:5 98:3,4
surface 40:25 59:8,9,23 67:16
surprise 15:14 16:24
surprised 80:17
surprises 15:22
surrounding 21:25 67:2 84:22
survived 20:2
survivors 3:20 19:14,16 20:1 28:17 48:11
suspect 57:15
sustain 50:9 59:14
symbolic 51:11
symbolism 53:4
system 38:4,14 38:16
systems 49:6

T

T 105:1,1
table 62:3 76:24
take 12:17 13:10 13:18 29:14,16 34:20 37:20 48:4 61:8 63:9 64:3 72:11 79:20 80:3 84:11 86:11 89:20 90:7 93:23 98:13 100:3
taken 5:25 47:23 50:13 52:19 62:3 78:4 87:4 100:7
takes 29:7,10,17 30:17 31:3 41:4 55:18
talk 26:17 30:22 44:24 48:22 69:22 73:13
talked 46:3 58:6 58:7 66:16 83:12
talking 19:20 26:18 35:3 44:19 45:20 46:5 66:10 68:3 71:10 73:14,15 73:16,17 75:21 77:21,23 79:5
talks 65:21 69:13
tangible 42:11
targeted 84:21
team 62:15 90:1 90:5,24,24 91:18 92:16 93:1 95:4,5 97:5 97:17
teams 92:8
technical 36:20
telephone 7:17 9:14
tell 15:24 44:17 45:21 47:13 66:3 89:15
telling 39:2 44:5 44:6 82:12 102:21
ten 28:8 38:13
tend 13:2
tenth 7:22
ten-car 24:18 38:1,3
term 50:6,10 51:16 60:15 80:13
terminal 5:7 6:2 17:24 18:3,4,13 18:24 22:2 23:24 26:9
terms 15:15 19:3 28:13 32:17 36:20,21 39:15 43:16 63:7 71:4 71:15 76:16,16 82:23 84:15 98:1
thank 7:17 10:1 11:8 13:8,15 22:21 32:13 42:4 47:14,17 49:12 51:19 83:14,18
Thanks 16:7 55:23 60:16
theory 93:23
thicker 15:4
thickness 14:10
thing 40:6,9 47:8 51:25 60:23 65:1 75:12 90:15
things 9:23 19:23 21:22 22:1 36:2 39:6,8 41:22 48:19 49:24 53:10,13 55:3 59:24 65:18,24 65:24 71:11,24 72:2,13 84:16 86:4,15 88:1 90:11 100:13
think 10:14 16:10 23:5 29:6 31:10 31:25 35:5,6,10 35:12,15 39:10 39:15 40:3,10 41:1,2,11,12 42:1,8,15 43:4 44:13 45:4 46:11,15 47:2,7 47:13,20,22 48:4,6,9,15,16 48:24 49:2,3,9 49:10 50:11 51:23,25 52:4,6 52:9,12,13,14 52:19,23 53:5 53:17,24 54:4,6 54:10,14,17,23 55:1,4 57:23,23 58:25 60:20,23 61:4,20 62:13 63:5 69:12 70:24 71:9,16 71:20,22 72:3 72:20 75:2,10 75:22 76:2,10 76:24 77:8,17 78:1 81:1,10,16 81:22,23 82:2 84:2,8,16,19 88:1 92:8,13,25 95:8 96:10,12 98:19 100:3,19 101:16,22 102:22 103:4,15
thinking 49:20 50:25 76:12
third 5:5 41:21 42:3 47:24 54:2 103:25
thought 27:16 64:11 67:21 86:2,2,4 89:3 90:15 92:22 97:13 102:1,7
three 8:11 22:24 24:17,17 28:6 29:5 31:1 40:11 56:17 72:18 81:20 82:2 83:23 93:21 94:1,17
three-minute 29:3 31:4
three-platform 50:6
throw 51:14
throwback 54:11
thrown 70:23 84:13
tickled 72:21
ties 49:8
Tim 4:7 20:25 21:15 22:11 70:8 99:4
time 11:10 12:11 12:13,15 13:5 13:25 14:1,6 19:18 22:14 23:1,4,10,22 28:2 29:10,11 29:12,13,15,17 29:20,20,22 31:3,9 37:7 38:12 39:14 40:6 46:23 66:15 67:7 68:20 78:2 80:23 85:6 87:10,14 92:2 94:12 97:9 98:7 99:20
times 12:21 23:7 30:8
timing 11:13 12:6
Tobin 100:18,18
today 8:4,12,14 11:1 22:16 46:6 46:14 48:8 54:25 62:1 79:15,21 83:15 84:10 85:14 89:17 96:13 99:18 100:10
today's 10:5,24 84:8

Todorovich 4:8 21:3,4 22:5 49:18
told 20:7 39:3 43:14 47:11 56:9 62:1
tomorrow 54:25
top 11:18
topics 5:11
total 9:15 17:3 43:12,13 44:19 70:21
touch 18:9 42:6
touching 6:3
tough 15:19
tour 94:6
tourists 40:13
tower 11:11,16 11:21,24 21:6 21:10,17,18 23:13 36:6,8,15 36:15 43:7 44:10 50:12 66:8 76:21 96:24 97:4
towers 11:14 41:8 45:13 61:17 65:18 69:14
Tozzoli 100:21
track 23:17 27:13 27:18,22
tracks 12:2 24:17 27:1,10 28:3 77:10 81:21
Trade 5:8 6:15 14:21,21 16:14 19:13,15 23:14 24:4,15 25:11 25:13 27:24,25 33:10,15 35:15 36:8 38:2,6 40:10,23 41:6 43:17,18 44:15 45:21 59:5 66:23 84:23 97:1 100:17,24 101:4
tradeoffs 68:5
traditional 87:18
traffic 32:22 33:2 57:13
train 5:17 29:1,2 29:3,14 38:11 40:16 45:8,12 56:11 62:13 63:20 72:11,23
trains 38:5 40:5,5 42:9 63:19
Transit 5:4
transportation 23:24 26:1,2,9 49:6,22 50:23 57:13
traveling 72:19
treating 36:5 103:14
treatment 7:2 19:5 36:13 69:17
treatments 19:4 19:8
tremendous 46:18 85:8
tremendously 54:22
Tribeca 2:9 52:17 52:20
Tricia 3:19
tried 77:9
tries 95:14
true 77:16 88:11 105:12
trumps 60:24
truncated 88:23
trust 39:3,5,9 40:1 58:19
truth 39:2
try 29:9 45:17,25 53:21,22 59:14 67:5 69:23 77:15 79:14 98:20
trying 15:10 34:23 36:25 45:16 69:21 73:2 74:6,8
tubes 56:21
turn 7:6 8:25 83:19
turns 61:10
twentieth 24:16
two 22:24 30:23 37:11 40:11 41:8 61:16 63:20 70:7,13 78:10 79:12 83:5,22,23 85:22 94:2
type 68:25
typically 103:10
typos 9:23

U

ultimately 54:20 70:3 81:12 96:16
unacceptable 35:11
unbuildable 56:20
unconscionable 61:5
uncover 12:17 16:20,20 17:5
uncovered 12:13 14:5 16:20
uncovering 11:14 13:10 15:12
underestimated 54:16
underestimating 58:8
underlies 14:19
underplan 39:22
understand 18:20 35:20 60:7,11 69:1 74:7 75:15 86:17
understanding 10:7 32:6 49:3 87:11
undertaking 10:12
undertook 93:18
underway 6:20 7:7
unequivocal 102:20
uneven 12:25
unhappy 78:23 81:2
United 4:5 14:4
units 48:2
unknown 22:12
unloads 29:4
update 8:19,21 11:9 84:7 96:21
updated 89:16
updating 8:23 92:14
up-to-date 90:21
urge 57:18 77:1
urgency 98:20
usable 59:15
usage 36:24 39:11,13
use 40:17,19 64:1 68:11 93:16 94:20
useful 83:15 84:17
users 61:2,4

V

VAA 4:11
vague 44:21 71:7
valuable 30:9 40:21 41:14
value 42:19,20 60:20 64:5 103:16
varies 14:11
various 65:13 68:4 100:15
vastly 63:21
Vaughn 4:9 42:5
Verizon 79:9
version 43:21
versus 38:19 51:25 53:4
vertical 29:18,24 30:2,2,20,25 34:13,17,21,24
Vesey 5:22 10:17 17:8,12,13 18:16 20:13 44:4,8 56:12 62:2
viable 50:7 57:6 64:10 72:15
vibration 78:11 79:5 82:21
videographers 93:22 94:1
videographs 98:14,16
videography 98:2 98:8
view 13:2,6 30:6 46:9 57:20 58:25 62:7 68:3 74:22 75:12 76:2 83:1
viewed 59:3
viewing 94:5
views 15:15 19:19 73:2
Viggiano 4:10 41:16 46:2
Vigiano 41:17
Virginia 2:3
virtual 94:6
virtually 26:11 28:4 100:4
visibility 75:9,18
vision 90:18 91:2
visit 13:11 17:7 47:22
visitors 40:12 50:3
visits 17:7 54:4
visual 5:17
visually 69:15
vital 55:23
vitality 49:25
voice 48:23
volume 40:12
Voorsanger 9:1
VP 90:4

W

Wagner 4:11 9:1 9:3,21
wait 92:20 103:12
walk 29:16 40:7 40:18 51:2 75:18 94:3
Walker 89:19,24
walking 30:7 40:14 41:5
wall 3:23 27:16 36:19 59:10,23 61:12 63:10,10 63:11,13,16 67:22 72:24 73:3 74:15,21 75:10,17 76:2,3 88:22 94:5 95:21

walls 77:21
want 8:12 10:25 11:6 13:14 18:20 32:23 48:14 51:14,22 52:18 53:3 61:17 67:5 69:9 74:9 75:11 76:3 76:6 77:1,3 79:18 83:14 84:4,10 86:11 86:16 94:24 95:9 99:16,17 100:11 103:2
wanted 11:9 19:18,20 55:13 86:8,19 89:6,8 89:10 97:21
wants 54:5
wasn't 88:25
watched 48:13 53:13
way 6:1,8 18:4 24:13 25:5 34:22 35:13,17 40:19 42:10,12 47:5 50:19 55:4 56:10,11,12 58:2 76:10,14 79:7 80:18 105:15
ways 55:3,7 64:2 91:19
week 12:8 13:11 78:10,25 79:12 92:3 103:25
weekly 8:23
weeks 83:5,7,22 83:23 92:19 104:3
weights 63:20
Weintraub 4:12
welcome 5:5
went 59:7 88:18 94:2 98:16,16
weren't 17:18 89:14
west 2:24 3:12 74:15,21 75:16 82:10
western 88:22 95:21
we've 10:9,11,12 10:14,16 11:12 43:4 53:11 72:6 74:17,24 76:12 90:19 97:20
WHEREOF 105:17
wholistically 58:24 81:25
width 34:7,16,18
wiggle 73:1 74:24 76:13 89:1
William 3:3
willing 31:18 71:5
wind 79:8
wisely 64:1
wishy-washiness 80:4
WITNESS 105:17
wonder 80:14 100:2
wondering 21:6 36:21 82:6 98:7
Wong 4:13
word 80:18 101:16
words 15:13 42:14 73:2 80:8 84:13 89:3
work 8:11 17:5 23:3,9 34:1 47:18,21 48:5 48:11,12,20 62:12 72:21 73:24 78:23 81:20 83:18 86:13 94:16 97:2 98:17 100:23
worked 14:4 28:10 59:12 95:8
worker 54:22
workers 39:18 41:24 75:25
working 17:23 60:3 72:25 82:3
workings 81:2
works 48:6,18 49:8 54:4
world 5:7 6:15 14:21,21 19:13 19:15 23:14 24:4,15 25:11 25:13 27:24,25 33:15 35:15 36:8 38:2 40:10 40:20,23 41:6 43:17,18 44:15 45:21 46:14 55:10 59:5 66:23 84:22 96:25 100:17,24 101:3
worry 44:5
worth 102:1
wouldn't 15:12 37:6 44:12 70:8
wraps 103:23
wrestling 72:6
writing 90:20
written 76:6 102:3
WTC 3:4,20 81:13

Y

year 25:22 27:9 38:8 85:3,4,21 86:19
years 22:25 39:10 39:23 40:11 42:8 45:8 47:10 47:10 53:1
yellow 18:4
yesterday 91:14
York 1:6 53:10 55:12 105:3,9
Yorkers 72:16

Z

Zaddie 4:14

0

09/12/04 1:24

1

1 2:17 3:4 11:14 11:16 14:21 17:9,12,15 23:14 27:13,22 27:24 33:15 35:15 36:9,15 43:17 47:17 55:15 58:18 59:17 66:7,23 86:22 97:8
1-866-ROSE-NYC 1:25
10 14:11 25:12 52:25 76:25
100 45:8 47:10
106 1:7 5:6 6:19 6:24 7:1,10 10:9 17:2 18:13 20:25 52:2 56:14 58:15 62:15 74:8 85:3 92:10
11th 42:10 45:10 49:20 87:10
12 14:11
13th 105:18
15,000 48:1
17 78:4 92:17
19 1:9

2

2 11:14,21 14:22 21:6,10,17,18 23:14 27:25 36:9,15 43:18 65:22 66:21 67:14 68:7 80:3 97:4
20 38:9,11 39:10 39:11,23 52:25 64:4
20th 5:10 8:5
200 45:8
2004 1:9 105:18
2025 25:22 38:8 58:5
25 52:25

3

3 69:12 71:22 79:3,5 82:6 88:18
3,000 42:16
30 64:4
360 94:6

4

4 22:8
4th 98:14
4-F 56:19 58:14
4:00 104:5
40 39:12 64:4
45 103:12

5

50 42:8 45:7 47:10 64:8

6

6-foot 22:8

7

7 25:13
750 9:15

9

9 17:9,12,15 97:8
9/10 46:15
9/11 2:20 3:5 13:14 20:6 24:2 24:8,10 32:1 38:2 39:22 40:18,20,21 46:11,15,21 52:24 75:14 101:23
90 82:9,10,19
90s 53:12
97 43:8

WTC TRANSPORTATION HUB
PERMANENT WTC PATH TERMINAL
SECTION 106 CONSULTING PARTIES MEETING

NOVEMBER 4, 2004
PORT AUTHORITY OF NEW YORK AND NEW JERSEY
115 BROADWAY
NEW YORK, NEW YORK

WTC TRANSPORTATION HUB
PERMANENT WTC PATH TERMINAL
SECTION 106 CONSULTING PARTIES MEETING

NOVEMBER 4, 2004
PORT AUTHORITY OF NEW YORK AND NEW JERSEY
115 BROADWAY
NEW YORK, NEW YORK

Reporter: Gina M. D'Adamo

JANE ROSE REPORTING 1-866-ROSE-NYC

PORT AUTHORITY OF NEW YORK AND NEW JERSEY
Timothy Stickelman
Louis Menno
Peter Rinaldi
Jackie Hanley
Bernard McNeilly
Shawn Lenahan
Mark Pagliettini
Bill Wong
Steve Plate
Peter Goelz
Louis Rodriguez
Glenn Guzi
Steve Coleman
Paul Gimayo (phonetic)

PORT AUTHORITY TRANS-HUDSON CORPORATION

Kevin Lejda
Harold Levitt

ALSO PRESENT:

BERNARD COHEN, FTA

KEN LUSTBADER, Lower Manhattan Emergency Preservation Fund
FRANK SANCHIS, Municipal Arts Society

BETSY MERRITT, National Trust

BRUCE DECELL, Coalition of 9/11 Families
ANTHONY GARDNER, Coalition of 9/11 Families

ROBERT KORNFELD, Historic Districts Council
JOEL KLEIN, Coalition of 9/11 Families
LOUISE LOPRESTI, Advocate for Congressman and Proposed World Trade Center National Memorial Act
NOAH PFEFFERBLIT, Wall Street Rising
FERNANDO RODAS, Wall Street Rising
SHIRLEY JAFFE, Alliance for Downtown New York

ALBERT CAPSUTTO, Tribeca Organization

DAN SLIPPEN, Pace University

MATT VIGGIANO, Office of Senator Martin Connor
RUTH PIERPOINT, State Historic Preservation Office

CHARLENE VAUGHN, Advisement Council for Historic Preservation

ALSO PRESENT: (Continued)
BETH CUMMING, State Historic Preservation Office

MARILYN GAULL HOWARD, Coalition to Save West Street
BILL LOVE, Coalition to Save West Street

OMI CHIRIFAN (phonetic)

STEVEN WEINTRAUB, Art Preservation Services
CHARLES STARK, FTA, Project Management Oversight Consultant

KATE DALY, New York City Landmarks Commission
STEPHANIE GELD, Battery Park City United

BRUCE EHRMANN, Community Board #1

JOHN HOTOPP, Louis Berger

ADAM LEVINE, New York State Department of Transportation
ROBERT CONWAY, ARKF
PAUL LEBRUN, FTA
BEN STANLEY, Downtown Alliance
CAROL BRAEGELMANN, Federal Transit Administration

DEBRA LESTER, Speaker Silver's office

WILLIAM KELLEY, LMDC

LORRAINE CHANG, LMDC

MARGARITA MORERA, Downtown Design Partnership

ALSO PRESENT: (Continued)
ANDREA BURK
TOM ROGER
MICHELE ADAMS, ABNY
MARK WAGNER, Mark Wagner Architects
JACK DEAN, MTA
PETRA TODOROVICH, Regional Plan Association
ANNIE KURTIN, American Institute of Architects
RICK BELL, American Institute of Architects
DAVE STANKE, Battery Park City United
WILL ESTRADA (phonetic), Battery Park City United
HELENE SEEMAN, Battery Park City United
RICHARD KENNEDY, CB 1, WTC Redevelopment Commission
ROBIN FORST, Councilmember Gerson
JOHN MILNER, John Milner & Associates

MR. BERNARD COHEN: Good afternoon. Welcome to the fourth Consulting Parties meeting that's being held for the Permanent World Trade Center PATH Terminal Project under the Section 106 process of the National Restore Preservation Act.

My name is Bernard Cohen. I'm the director of the Federal Transit Administration Lower Manhattan Recovery Office.

The funding for the PATH terminal project is coming from the FTA through my office, so FTA will continue to play a prominent role as this project goes forward.

At our last Consulting Parties meeting for the PATH project, which took place on August 19, we discussed a number of topics concerning the development of the Memorandum of Agreement. Some of the issues remained unresolved. At that point, one of those unresolved issues had to do with the need for additional capacity at the PATH terminal. And the

impacts of the Port Authority's proposed additional platform, so-called platform D, to serve that capacity.

In light of the discussion that we had at that meeting and some of the concerns that were expressed, the FTA asked the Port Authority to make available to Consulting Parties a PATH Capacity Needs Assessment that identifies and explains the relevant data, the analysis methodology, and the industry standards for reaching conclusions about the need for greater capacity and for evaluating various options.

This kind of analysis is very common and accepted practice in transit industry when agencies are looking to build facilities that will be around for a long, long time, and will need to be functionally effective for a long time into the future.

The data that is used typically includes ridership forecasts, peak period train frequencies, surge factors, numbers of escalators and elevators and stairways

because that affects platform clearance times.

We use professionally-developed measures. For example, how long it typically takes to walk a certain distance. All of that is measured out and is used nationally in terms of these kinds of analysis. And then you apply standards for how long it should take to clear a platform or how much space each passenger waiting on a platform needs in order to draw conclusions about overall capacity needs and options.

Once the capacity needs are determined, then various options and their potential impacts are evaluated. And those impacts include impacts on cost. They include impacts on feasibility. And in the case of the PATH project, they also include impacts on historic resources; in particular, the impacts on the tower footprints and on the box space column footings.

Over the past few weeks, we have been actively engaged with Port Authority

Page 9

in discussing these topics, and look forward to the Port Authority's presentation today, as well as the materials that are being made available to you.

We also understand that the Appendix C2 platform and track planning requirements and an executive summary of Appendix C2 will be handed out today. Please note that these are draft documents; as the analysis are part of the correct NEPA process. And we are currently in the process of preparing the final environmental impact statement.

So the presentation today will supplement the information provided in these documents, and is part of the ongoing evaluation that is part of the Section 106 and NEPA processes.

We have a lot of material to go through today, but I'd like to remind you that the FTA's goal in this process is to have a Section 106 process that will culminate in a Memorandum of Agreement for the design and construction of the

Page 10

permanent PATH terminal that strikes a balance between meeting the future ridership demand and service, and the preservation of historic resources at the World Trade Center site.

I think that it's always condescending when a government official says that the Consulting Parties or the public has been instrumental in effecting a process. But I'm going to say it today, because I believe it. As someone who has attended every single 106 meeting since I assumed this position back in January, I really think you've been listened to. I think that the presentation today will reflect that. And I really think that you've had an important impact on the process.

With that, I'd like to turn the meeting over to the gentleman who has been facilitating all of our Section 106 meetings, Peter Goelz.

MR. PETER GOELZ: Good afternoon, folks.

We are entering the final stages of

Page 11

this 106 consultative process. And today, as Bernard said, we're really going to focus on two important issues that we'll be soliciting comments, questions, concerns. The one is the issue of the platform D configuration and its need. And then the second discussion led by John Hotopp, where he's going to outline the administrative and review processes of the proposed Memorandum of Agreement that's due to be signed or due to have a final draft, final copy, due by later this month or early in December.

I think as all of you know, the final comment period is the 19th of November. So any written comments that you have, need to be in to the Port Authority by the 19th.

I think we're going to start today's discussion or today's presentation with a review of some outstanding issues from past meetings, a status report, particularly focusing on the cleaning of the footprints and the visit to the

Page 12

site.

And we'll start -- Peter would you give us an update on those.

MR. PETER RINALDI: Last time we spoke, we said we'll move forward with cleaning the footprints of Tower 1 and 2 off for documentation purposes and also available for the Consulting Parties to take a tour of the site.

I wanted to update you on where we are right now. We're in the process, and have been for the past two weeks, of removing material that's on top of the footprints.

It has a been a difficult job, I'll tell you. One of the areas that we thought was going to be difficult and that we might not be able to clean off, we were able to (inaudible) a pavement break of it, which there was temporary pavement. So we're actually cleaning off a larger area than we anticipated. And it's taking some additional time.

Also, I'll share with you that because of the expanded 9/11 ceremonies

this year, when we opened up the South Tower footprint, families entered the North Tower footprint, we opened larger areas, there was fill brought in by both the City and ourselves during that process to make the area available and smoother, and for the families to come down, and that added a lot more material that's being taken off.

So with that said, we are planning to have the footprints completed, cleaned off next week. We are scheduling two dates for visits by Consulting Parties. We will confirm this in an e-mail to the Consulting Parties. But on Friday, November 12 at 2:00 p.m., and Monday November 15, at 10:00 a.m. So we tried to find an afternoon time and a morning time.

I would just put a caveat, while we're striving to do the cleaning and then we have to do a sweeping, we may be weather dependent. If we get a lot of rain and it continues over the next several days and into next week, it will

make it difficult for us to complete that. So I'll just put a caveat on it. We don't anticipate that, but that could happen. When it rains in the site, it takes a while for it to drain, and it's difficult for us to sweep up the material when it's under water or it's muddy. So I just put that caveat.

You will meet at Gate 8, which is located at Liberty and Washington Street. For those of you that are familiar, that's the family viewing area entrance. We'll meet you there. We'll assemble inside that area, and then we will escort the parties down into the footprint areas.

I would say that we are asking that each Consulting Party be limited to two individuals. You will be allowed to take photographs. The caveat is that those photographs are for your personal use as part of this consulting process and not to be used for commercial purposes or anything else. We ask that and for you to respect that.

Also, I would ask that due to the nature of the site, that those of you that will be attending, to wear either work shoes or the sturdiest footwear that you have. It was an uneven surface to start with; it's even more uneven now as we clean it off. There's quite a bit of areas there that were damaged as part of the collapse of the towers on the site. And now that we remove that material, the unevenness of the site is more pronounced. So open-toed shoes, light footwear is something you cannot wear. So I would emphasize that also.

As a contact, we prefer if you could contact us by e-mail or fax. My site manager is Nancy Johnson. Her e-mail is njohnson@PANYNJ.gov. And the fax number is 212-435-5560. We ask that you confirm if you will be attending, and we'll get back to you to confirm.

So that is our present plan for visiting the site. If there are any questions on the logistics, we'll answer them by e-mail. If you have a question,

I can ask answer some questions maybe at this time.

MR. ANTHONY GARDNER: I just have one question, Peter. As far as the caveat that you mentioned about the rain being a factor. I just wanted to make sure that you're going to provide this tour. Rain will just be a delay.

MR. PETER RINALDI: Let me clarify. We're striving to clean off the footprints, sweep them down and get them cleaned. If it rains, we have to delay the dates further. It might change the dates -- we intend to meet the dates I just described to you, but I can't control the weather. I know we have some heavy rain coming in tonight and tomorrow. And I don't know to what extent that will stop our operations. And if we have the same problem next week, we might not be able to get the site ready in time. Depending on that. So we might have to push the dates a little further.

MR. ANTHONY GARDNER: Can I ask you

one additional question?

You mentioned the temporary pavement as a substance that was on the footprints. When some of the family members on the anniversary, we noticed on the western perimeter line of the North Tower footprint that it looked like there was some type of slurry mixture. We didn't know the correct lingo to describe it.

Is that the material you're talking about?

MR. PETER RINALDI: No. That material is actually part of the footing that formed the base for the columns for the perimeter of the west side of Tower 1. That's part of the original construction.

What I'm talking about in Tower 2, by the crash wall area in the construction of PATH, during that construction, there was a temporary ramp and pavement that filled over the area, and there was some payment that facilitated both access and some of the

removal of the old station remnants that were there. There was asphalt there and quite a large amount of fill.

MR. ROBERT KORNFELD: I don't think that's what Anthony was referring to. He was thinks, there some areas that looked like there was some sort of slurry residue actually on the steel. Could have been people washing out concrete mixtures or something.

MR. PETER RINALDI: Not that I am aware of.

MR. ANTHONY GARDNER: Can I just show you this photo real quick?

MR. PETER RINALDI: What I would do, you're discussing the footprints and the cleaning of the footprints. We can take a site tour, and it's probably best to address these issues or take a look at it at that time.

What I'm trying to do is really just set up the logistics, and let you know that the footprints will be available at that time.

MR. KEN LUSTBADER: I don't know if

this is an appropriate time. It's documentation --

MR. PETER RINALDI: I think the documentation is comments that will segway into the documentation.

MR. TIM STICKELMAN: What we're doing with the documentation, we're hiring Louis Berger is our consultant. They'll be doing the documentation of the footprints. As they'll also do the entire site and the other historic elements of the site.

In addition, we're trying to get Tito Duprey. Some of you may have heard. He does 360. He's in Nepal right now, so we're trying to arrange for him to come back from Nepal to do a 360 once we uncover the footprints.

And the photo documentation and the other documentation for the footprints, and the rest of the site, will be shared with NYSHPO and consulted with NYSHPO, whether it be included in the New York Archives and sent down to HABS HAER for their consideration. It will be part of

that process.

In addition, I want to update you on the World Trade Center artifacts inventory. It has been completed. When we send the e-mail to you in regards to the tours, we just ask that you send us a written request that you want a copy of it. It's going to be on a CD. If you printed the whole thing, it's about this thick, but we have a CD. So whoever wants it, can just request it and we'll send it to you.

That's really it on the documentation right now. I'll turn it back over to Peter.

MR. PETER GOELZ: Any questions for Tim?

MR. ANTHONY GARDNER: We have a question on the documentation. The MOA talks about HABS HAER level two. Is there a reason why it's not HABS HAER level one?

MR. TIM STICKELMAN: From what I understand, level two is even better than level one. John?

MR. JOHN HOTOPP: Actually, Anthony, the level one documentation would be using extensive drawings. It's most commonly used when you have processes or something that needs to be shown. And so that's why you need a lot of drawings.

Level two is the standard for photographic recordation. What we made a provision for, if there's anything that would show better in a drawing, then we'll have somebody do the drawings to HABS standards as well.

MR. TIM STICKELMAN: You say in the MO, we would consult with NYSHPO if we had to do something else.

MR. ANTHONY GARDNER: The photos would include some sort of aerial view, right? Because that's where you really get the full sense of the footprints.

MR. JOHN HOTOPP: Absolutely.

MR. PETER GOELZ: What are the chances of the 360 getting done?

MR. TIM STICKELMAN: He's in Nepal, so I don't know.

MR. FRANK SANCHIS: Isn't an

accurate set of drawings necessary for the design of what's going to follow?

MR. TIM STICKELMAN: You mean the drawings of the future?

MR. FRANK SANCHIS: Footprints. In other words, don't you need a truly accurate set of drawings of the footprints as a baseline document for the drawings for any construction?

MR. TIM STICKELMAN: After the photographs are done, we'll be consulting with New York NYSHPO.

MR. JOHN HOTOPP: We've been talking to John's Burns. He was lucky to come up and get the as-builts for the towers. And get those drawings. Those are exactly what you're talking about.

MR. FRANK SANCHIS: Seems like the reverse though. In other words -- oh, the as-builts for the towers? And then check them against the actual of where the column bases are?

MR. TIM STICKELMAN: Right. Because we have the as-builts.

MR. FRANK SANCHIS: Okay.

MR. ROBERT KORNFELD: When you issue the set for 6 World Trade Center, it was a plan that showed what remained. It kind of showed the damage. It showed the profile where the crater was kind of blown out through the slabs of 6. It seems to me that it wouldn't be a huge effort to take a plan of the B-6 or B-5, whatever it was called at that time, level of the towers and to do the same thing; basically document what has changed since, sort of like --

MR. TIM STICKELMAN: I hear you. But we don't know what's going to be there until they finish unburying. We really need to focus and discuss with NYSHPO, which we plan on doing.

MR. PETER GOELZ: Now we're going to enter into what I think should be a fairly substantive discussion. We'll ask Lou Menno to come up.

And as all of you know, one of the ongoing issues has been the platform D debate and discussion. And Lou has got a series of slides to discuss not only the

need for the additional platform, but also some options on impact.

MR. LOUIS MENNO: Thank you very much, Peter. Good afternoon everyone, and thank you for joining us today.

Today I'll be talking about platform D and the fourth platform, and all of the various options that we looked at in terms of litigation and historic resources.

I'll begin by talking about the overall ridership capacity on the PATH system.

Before September 11, PATH had five tracks with three, ten-car platforms. The World Trade Center station was the most heavily traveled station in the entire system of PATH.

PATH carried over 250,000 people a day and 67,000 riders used that PATH station before 9/11. And the station was virtually near its capacity.

When we look to the year 2025, we see at ridership growth increasing to 81,000 people a day at the World Trade

Center station. As well as over 320,000 in the overall PATH system over the next 20 years.

And right now, with the temporary station, which was designed to handle 50,000 people a day, that station is already carrying approximately 38,000, and on some peak days, 40,000 people. Close to its capacity. Our forecast, before the station opened, was that by the year end of 2004, we would be at maybe 28 to 30,000. So we see that ridership growing. And we are basically nearing the capacity of the temporary station if that growth does continue.

And in order to address this growth over the next 20 years within the entire PATH system, and not just at the World Trade Center, but PATH is taking several approaches to meet this increased ridership.

They are making operational changes on the most heavily traveled line which is the Newark service. They will be operating ten-car trains with a

three-minute headway. That means three minutes between every train when they're in operation. One train comes in, within three minutes another train comes into a station; a three-minute headway.

And from a capital investment point of view to meet this demand, PATH is out there right now with the RFP process to replace its entire rail fleet, with new cars that have three doors per side. As well as in the future, a new single system that will allow PATH to operate more efficiently their trains and to maintain those tight headways, or the time between two trains.

What that all means is that PATH will be able to carry more people with greater efficiency (inaudible) on the entire system by what they are doing in the years to come to meet this ridership growth.

But when you think about the whole PATH system, you have to think about the World Trade Center station, which is an integral part. It has to be designed to

comply and be in conformance with, in concert with, with whatever else is being done in that system to handle this ridership growth.

And at the World Trade Center site, as we look at what our needs are for this future, we need to have five tracks as we had before. We need two of those tracks on a daily basis for the Hoboken service, and another two tracks for the Newark service, with a fifth track as we had, for failure management to take care of a disabled train.

At the same time, those tracks help us from an operational point of view in that at night, PATH is able to store trains and keep one track in revenue operation for the Newark service, which runs 24/7. And by having those tracks for stand by, we're able to park and keep overnight the Hoboken trains, and allow for easy ramp-up in the morning. And it also prevents that service from being affected in the bad weather; such as what is going to happen in the winter? Ice

storms and snow. So that will have minimal impact on our customers.

When we look at this video, we're showing the video here at 33rd Street, where we have a dedicated platform for boarding and unboarding.

Here we see how it's working very well at 33rd Street, where people are coming off the trains. And then you'll see here, the doors will open and people are able to move into that train very, very easily. We want to prevent a lot of the cross-flow, or the passage friction, by people getting on and off the train on the same side. This is what allows us to operate more efficiently and to handle that growth.

This was recently taken at 33rd Street, but think about this, this is only for a seven-car train. We're talking about ten-car trains on the Newark service with three-minute headway; the time between trains coming into World Trade Center.

Then, when you look at this other

Page 29

video of Exchange Place, you see where you have this cross-flow of people getting on and off from different trains sharing the common platform. And it's not the right situation for our customers. And that especially when you think about the World Trade Center, we have more cross-flow. And we have an increased reverse commute, because the residential population in Downtown is growing.

We need to meet that type of growth. We need to be able to provide for efficient movement of our customers on and off the train in a very safe manner.

Next, when we look at the design of this station, in addition to the operational requirements that I just spoke about, we need to design it following an industry standard, which is the Manual for Transit Capacity -- sorry, Transit Capacity and Quality of Service, the manual. That is the industry standard.

Page 30

And what that industry standard says is that we have to do several things. We have to design for the peak periods on the PATH system. We have to make sure you have the proper amount or size of platforms to accommodate the peak periods.

Those peak periods for PATH occur twice a day; in the morning and in the evening. It's a commuter railroad. So we need to be able to accommodate our riders in the morning, in the evening, and a very safe manner. And what that manual says is that in the morning at the World Trade Center station, where most of the people are coming into the station and are alighting from a train, they need to clear a platform in a certain period of time. And that period of time is the time that is basically equivalent to the headway. So if a train comes in every three minutes, people have to be off the platform within three minutes.

However, the manual recognizes, which is very important, failure

Page 31

management. What happens if a vertical circulation element, such as an escalator goes down, you must provide for that failure management. And that failure management is a range of anywhere between 70 to 80 percent.

So in effect, on the Newark service, with a ten-car train with a train coming in every three minutes, we need to have our customers off that platform in the morning, between a time period of anywhere between 126 and 144 seconds. Not 180 seconds.

When you look at the evening, you need to look at the capacity that the station can handle; the area to allow for people to safely stand on the platform, to board a train when it comes into the station.

And the manual also says we have to provide for failure management. That is a missed headway. What happens if a train doesn't come in within three minutes, four or five minutes? More people are going to be on that platform.

Page 32

And what that manual says, when we do our calculation, for ten-car trains on the Newark service with this headway, we need an effective area of a little over 15,000 square feet of usable area for people to safely stand on that platform.

On the Hoboken, we need approximately 10,400 square feet. And when we look at this, keep those two numbers in mind, we need to have the capacity to handle these requirements. So that if we were to build a station with only three platforms, like we had before 9/11, three platforms, ten cars in length, and if we operated with platform C, the western most platform, ten-car trains by the year 2025, with a three-minute time in between trains, we fail. Our passengers do not get off the platform within 126 and 144 seconds. The analysis shows over 200 seconds. I believe it's 213 seconds, to be exact.

When you look at the analysis from a platform area, it fails unfortunately because we only have an effective area of

a little over -- of approximately 10.4 thousand square feet. Far less than the 15,000 that we require. It doesn't work. It doesn't meet the Transit Capacity Manual. It does not provide for that future growth.

Even if we were to flip the service around, put Hoboken on that platform and move Newark over to the other platform, platform B, it still does not work.

When we look at platform D, which is this fourth platform, I'd like to just point out several things here. The layout of these five tracks in the new station will be in virtually the same location and the same configuration as the pre-9/11 station. These three platforms, A, B and C will be ten cars in length, just as the original World Trade Center station, in the same configuration, in virtually the same location. The difference is this fourth platform; platform D.

By the introduction of this fourth platform, we are now able to meet the

requirements that we have to follow concerning the Transit Capacity and Quality of Service Manual; the industry guidelines.

We now have sufficient time to get people off the platforms before the next train comes in, and we have sufficient area now to have people safely stand on the platform in those rush hour peaks. This is why the need for this fourth platform is very, very important to meet that ridership growth, to meet the operational needs that I just spoke about, the operational needs for failure management, dedicated boarding, and unloading of passengers, to help us address that increased reversed flow, that increased reversed commute because of the residential population that is growing Downtown.

However, this platform has an impact on the footprint of the north tower. We never had an impact before 9/11. Now we have an impact on the columns.

What happens is that that platform

will occupy approximately 3.2 percent of that area, right at that northeast corner of the footprint of 1 World Trade Center.

In addition, it will also impact 12 of the north tower columns; the remanent columns that are there. But this fourth platform, which is a full width platform to meet the operational and the passenger flowing needs for the future, works because it meets the NFPA, it meets the ADA standards. We also comply with the industry standard, the Transit Capacity and Quality of Service Manual. We need all of that anticipated platform clearance requirements, getting people off within that 120 second, 144 second timeframe. It provides the adequate level of service. It significantly reduces that reverse commute, as I just spoke about. You don't get that cross-flow that you saw in the videos over at 33rd Street. It provides for failure management. And again, it does impact the footprint by 3.2 percent of

the footprint, approximately 3.2 percent, and 12 columns.

What this does, it allows for the growth to meet a 2025 ridership growth on the entire PATH system, as well as at the World Trade Center.

In addition, what's very important why this also works, is from a construction point of view. By building this fourth platform, we're able to put in a temporary track that we spoke about many times before. That will just be a temporary track that will be placed and removed. I'll be talking about that in a few moments. And it will allow us to maintain the level of service that we committed to, to maintain PATH operations throughout the time that construction will take place for this terminal. And it will be removed when we are completed.

And by having this platform in place, by having the fourth platform with the temporary track, we're able to stage our work in such a manner that we can

accomplish our goal of building this station within the timeframe that we have.

In addition, it allows us to maintain the level of service for our customers. Because we said, that in order for us to meet the aggressive schedule of building this station, anywhere between one to two of the PATH tracks will be taken out of service at any one particular time. So the ability to put this temporary track in, in conjunction with the permanent platform, makes the construction very, very possible within the time frame that we have.

In addition, the last time we spoke, we do recognize the impacts on those historic resources. We said at the last meeting that we would look at options of how do we represent within that fourth platform where the tower footprint was. Where those columns were.

This just shows two alternatives that we're looking at. There may be

others; special light treatments in this area. For instance, we would show all the columns by different material, compared to the rest of the platform. We would have a uniform treatment of the whole area in terms of the walking service. Or we can do something similar; we would highlight the columns in one material and possibly have the area of where 1 World Trade Center once was highlighted in a different area compared to the rest of the platform.

As I said, there could be other things that we're looking at. Other design opportunities.

MR. ROBERT KORNFELD: May I interrupt?

MR. PETER GOELZ: Let him finish the presentation, and then we can go back.

MR. LOUIS MENNO: So there are a number of options. We're still looking at that. This is not the end-to-end-all here, but there are other options that we're looking.

This is just a highlight of what

we're doing to live up to the commitment that we've made before.

In addition, we've also looked at some other alternatives. And we looked at another alternative that with this platform was we would look at notching out the area by where it goes over the footprint of 1 World Trade Center.

As you can see here with this blow-up, this is the footprint of 1. We would notch out the station to allow for more area to be not touched. And by doing that, it helps mitigate some of the impact to that historic resource there.

And we're looking at the feasibility of this by notching it at the north tower footprint. It does meet our platform clearances for the year 2025, and what we have to do for that, for that design year. It does provide some restriction to passenger flow because it narrows the platform at the northern part of the platform. At the northern part, there are three trains just to the north of that; three, three-cars of a train. So

in case there's a failure management here that I spoke about, say those escalators are out of service, it creates somewhat of an overcrowding situation, funneling people through to the next vertical circulation element further south on that platform.

It does constrain our ability beyond 2025, but it does reduce the area from 3.2 percent impact, to a 2 percent impact on the area. And it does reduce the remanent impacts to those columns from 12 down to 9.

And it does bring along with it added costs to our project, to put something in and take it out, because we need to put a full width platform in just for a temporary in that restricted area, and in order to accommodate the temporary track. We're still looking at this feasibility to see how it works.

We also looked at another option. How do we handle the future growth for 2025? And what we did, we looked at widening platform C. Widening platform

C. And by widening platform C, we have to now relocate track number five further west into the bathtub area.

And we looked at all of that, and that has some implications to it. And what this option looks at, it does impact five perimeter columns in the north tower. It occupies less than one percent of the tower footprint. But it does not work for us. It does not allow us the operational -- doesn't meet our operational requirements. It doesn't meet the overall goals and the objectives of the overall program.

It does not allow for that dedicated boarding and unboarding of passengers. We have that increased cross-flow of people getting on and off a train on the same platform, even though it's wider. It doesn't allow us to handle effectively that reverse commute that's growing in lower Manhattan.

And at the same time what it does, is that by that relocation of that fifth track further into the bathtub, changes

the geometry of that track. And it tightens up that curve. It tightens up the curve that it will force or require PATH to slow down a train to go through that curve. What that does, it affects the through-put of the PATH service into the station. So if it slows down, we can't make or live up to that three-minute headway; the time between the trains.

It will also affect the trains coming out of the tunnel for the Hoboken service. So it has operational impacts. At the same time, a tighter geometry creates wear and tear on the PATH system; to the rails, to the wheels of the new equipment. So it has operational impacts.

But it also has another significant impact on the construction. By putting in this configuration, we would have to build a temporary platform anyway to meet the ridership demands during construction. We'd have to then take that platform out. But in conjunction

with that temporary platform, the feasibility of putting in a temporary track becomes not so feasible anymore. Because that geometry for this temporary track is very tight, that we may not be able to operate a train on that track. Or even though you can work out the geometry, we may not be able to get a full seven-car train into that platform because it would have to be on a curve. And we can't have wide gaps. So it renders, from a construction point of view, not so feasible.

At the same time, it creates now a longer schedule for us, because we're not able to stage the work in such a manner that we can build the station within our established schedule. As the construction takes longer, the costs go up. So this will affect our ability to deliver the program within the very tight $2 billion dollar program that we have.

So because of the operational restrictions, the construction, the impacts it has on construction, and that

it doesn't meet our full goals and the objectives, this widened platform C does not meet our criteria.

I want to now talk about the temporary track, which we've been speaking about over the past several meetings; where we need to put in a temporary track within the World Trade Center site.

This temporary track, it will be located to the west side of this fourth platform. By putting in this temporary track, allows PATH to operate sufficient service throughout construction. Because at any one time, we will be taking out between one and two tracks, as well as some platforms in order to accomplish our goal of building this station.

This temporary track will go temporarily through the footprint, right at this northeast corner. And this temporary track will just cover over some of the footprint area, as well as several of the column bases. Two at the north and five to the south here. It will be

put over it.
When construction is over, it will be removed. The area is still there. The columns are still there. They're not being disturbed.
In addition, just to the south of where that temporary track will come in, we spoke about the construction and the design of the new terminal. And there is a significant arch, structure, that will support the area above the PATH mezzanine. This arch is going to support all of the facilities that will be built above the station; such as the cultural facilities.
We pointed out at that arch needs a footing to transfer all of that weight and all of that load down to solid rock below. And we pointed out that four columns in this area are potentially impacted. And we said that we would look at alternatives to see what could be done to mitigate the impacts on those four resources.
I'm going to show you three of these

options that we are looking at.
This is option one. Let me give you a quick overview. This area here is the proposed fourth platform, platform D, that is the fifth track. And what you see here, that is the temporary track for the train. You see it's dotted; it's temporary. It goes away at the end of the construction. This represents -- this is not what's there, but it represents one of the columns that once made up the exterior wall of 1 World Trade Center. This is that structural arch that comes across the terminal and has to land on a footing.
So the first option that we had was to physically excavate this area, and temporarily remove four of these columns. And then once we would finish placing this footing, we would backfill the area and then replace all four columns in the same location where they once existed. That's one option.
The next option is a little bit similar. Again, this is the temporary

track, it comes out, platform D. There's that structural arch coming down. And the second option is to design a different type of footing that has rock anchors in it, that will anchor it into the rock to prevent up-lifts. And it does avoid touching any of those columns that I just spoke about; those four columns. That's the second option.
The third option is a little bit similar. Again, the temporary track, platform D. There's the arch. That's the column that comes down. And then the third option is to literally excavate or mine under, and to place that footing so we do not disturb those four columns.
Those are the three alternatives that we are considering. We have to look at the schedule impacts. The feasibility of it from a construction point of view, as well as schedule impacts.
So we haven't made any decisions. But these are four options that we're looking at to mitigate the impacts to those four column remnants.

And now I'll turn it over to Peter.
MR. PETER GOELZ: Thank you, Lou. A lot of information. And time for questions and comments.
Before we start, let's go around the room once so we know who we're talking to since we're going into the public discussion phase.
(ALL INTRODUCTIONS MADE:)
"Bernard Cohen, FTA.
Ken Lustbader, Lower Manhattan Emergency Preservation Fund.
Frank Sanchis, for the Municipal Arts Society.
Betsy Merritt for the National Trust.
Bruce DeCell, member of the Coalition for 9/11 families.
Anthony Gardner, Coalition of 9/11 families.
Robert Kornfeld, Historic Districts Council.
Joel Klein, for the Coalition of 9/11 families.
John Milner, John Milner &

Associates.
Louise LoPresti, Advocate for Congressman and Proposed World Trade Center National Memorial Act.
Noah Pfefferblit from Wall Street Rising.
Fernando Rodas, Wall Street Rising.
Shirley Jaffe, Alliance for Downtown New York.
Albert Capsutto from Tribeca Organization.
Dan Slippen, Pace University.
Matt Viggiano, Office of Senator Martin Connor.
Ruth Pierpoint, State Historic Preservation Office.
Charlene Vaughn, Advisement Council for Historic Preservation.
Beth Cumming, State Historic Preservation Office.
Marilyn Gaull Howard, Coalition to Save West Street.
Bill Love, Coalition to Save West Street.
Omi Chirifan (phonetic), September

11th.
Steve Plate, Port Authority.
Peter Rinaldi, Port Authority.
Lou Menno from the Port Authority.
Harold Levitt, PATH.
Mark Pagliettini, Port Authority.
Kevin Lejda, I'm with PATH.
Bernie McNeilly, with the Port Authority.
Steven Weintraub, Art Preservation Services.
Jackie Hanley, Port Authority.
Shawn Lenahan, Port Authority.
Charles Stark, FTA, Project Management Oversight Consultant.
Kate Daly, New York City Landmarks Commission.
Stephanie Geld, Battery Park City Authority.
Bruce Ehrmann, Community Board #1.
Louis Rodriguez, Port Authority.
John Hotopp, Louis Berger.
Adam Levine, New York State Department of Transportation.
Robert Conway, ARKF.

Paul LeBrun, FTA.
Ben Stanley, Downtown Alliance.
Carol Braegelmann, Federal Transit Administration.
Debra Lester, Speaker Silver's office.
William Kelley, LMDC.
Lorraine Chang, LMDC.
Glenn Guzi, Port Authority.
Steve Coleman, Port Authority.
Margarita Morera, Downtown Design Partnership.
Paul Gimayo (phonetic), Port Authority.
Andrea Burk.
Michele Adams, ABNY.
Mark Wagner, Mark Wagner Architects.
Jack Dean, MTA.
Petra Todorovich, Regional Plan Association.
Annie Kurtin, American Institute of Architects.
Rick Bell, American Institute of Architects.
Dave Stanke, Battery Park City

United.
Will Estrada (phonetic), Battery Park City United.
Tim Stickelman, Port Authority."
(INTRODUCTIONS CONCLUDED.)
MR. PETER GOELZ: Go ahead. You had the first question.
MS. LOUISE LOPRESTI: Louise LoPresti.
I appreciate the concerns that you have about providing for increased ridership, as well as the fact that you're anticipating an increase, and you need to provide for that capacity in terms of both design and safety features.
A large part of that, at least in terms of this discussion, is predicated on the reverse commute, and the increasing trend in this neighborhood to be more residential.
I actually work on Wall Street, so I'm very familiar with it. Yes, as has been more publicized, the neighborhood is becoming increasingly residential, but

the point of fact, the majority of the people who are working down here tend to be commuting up to the east side, or they actually work in the neighborhood, as well as living here.

I have someone who works for me who lives at 67 Wall and walks out the door, turns the corner and walks into the next building. That's one of the reasons why people live down here, because we work extended hours.

In addition, I am also familiar with the patterns, reverse commute patterns. People who are going to, let's say, Metro Tech to work, or to Colgate, or to Newport, and I do it frequently, I don't take the PATH and they don't either. We all walk over, we take the ferry. If we need to go to 34th Street, we get on the E Train for any other variety of reasons.

So I think it might be safely said that yes, you're hoping that ridership will increase, which it certainly will, and you're hoping that you will capture

the Downtown residents as part of your ridership, but that is not the current pattern now.

And have you done any studies to establish what trends are taking place in terms of the Downtown residents in their reverse commuting, if it is, in fact, reverse commute?

MR. BERNARD MCNEILLY: I'm Bernie McNeilly, with the Port Authority.

We actually handed out at the last Consulting Party meeting the appendix which had the ridership estimate information in there. And I would certainly welcome anybody to revisit that information.

But what was happening, going through 2025, we're expecting in the a.m. peak in excess of 29,000 and nearly 30,000 riders in total. And the balance of that is 23,300 would be alighting passengers. Alighting means that if they're at the station, or they're going to be getting off at the World Trade Center. And there's about 5,600

passengers that would be boarding. That would be people going west of the Hudson.

MS. LOUISE LOPRESTI: But that's projected. What is that based on?

MR. BERNARD MCNEILLY: That is projected. I'll get to your point in a second.

As far as trends are concerned, generally speaking, the alightings over the period of time going up to the design year, will increase a little less than 4 percent. And although the boarding number is much smaller, 23 versus 5, it's growing at a much more rapid rate. It's increasing by 37 percent in that period of time.

So what that is meaning, is that over time, you're go to have an increased reverse commute, which will be introducing that phenomena that Lou was talking about; which was passenger friction.

But to get to your point about trends, as most of you know, I think it's been well documented in most of the

things going on with the environmental documents, there is also substantive development that's been going on west of the Hudson along the Jersey City Waterfront and other programs that are going on in New Jersey. And what was noticed as far as a trend is concerned from both PATH and Port Authority, is that the boardings at World Trade Center pre-9/11, increased and continued to increase.

And what's happening as we move out towards 2025, the design year, there's additional build and development that continues to go out; for instance, back-office operations that used to be in the Financial District down in lower Manhattan, which seems to be sustained and will be continuing.

Given that, the trends have been to -- the boardings are going to continue to increase from now and as we move out to the design year; although the alightings of people coming into the World Trade Center is going to be growing

Page 57

over that period of time, but at a lower rate.

MS. LOUISE LOPRESTI: Have you looked at the trending between the PATH reverse commute and, for example, the New York Waterway reverse commute; which is taking a larger volume?

MR. BERNARD MCNEILLY: I understand your point. But one thing, as far as trends are concerned, as you know, during the period of time between the temporary station and pre-9/11, ferry ridership was through the roof. And actually, there were increasing routes and the frequency of those routes to meet the demand. And that was largely because there was no service to the World Trade Center.

Since the World Trade Center has been opening, there has been a steady decline of ferry service. And there's been much documentation that has been noted in the publications in the area that ferry service continues to decline. And it's coincidental that while there's a steady decline of ferry service,

Page 58

there's been a steady increase of PATH ridership.

And as Lou had mentioned, we were expecting less than 30,000 riders at this point in time. As we ramp-up to get close to the temporary station needs, we are already in excess of that. We're at 38,000 riders, which is well in excess of the projections that we had made as part of this program.

So as far as a trend is concerned, that trend seems to be very real.

MR. BILL LOVE: This is anecdotal, I know, but I was on a business trip last week with a colleague of mine who lives in Jersey, who rides the ferry. And he was telling me the reason he rides the ferry is because the trains are so packed right now. He comes in from Newark, and he says they're just jammed up. There's an example, for it's not just simply a matter of choice, but it's a matter of the conditions on the trains.

So I think it's important that we focus on the capacity of the system be

Page 59

conservative in our estimates.

Also, anyone like myself, who lives in Battery Park City, who's watched the skyline in Jersey over the last couple of years has just seen that skyline building up. It seems like there's a new building every month. And clearly what's going on, is that businesses, logically because of terrorism, are choosing to jeer of a diversified geographically [sic].

So I think you are going to have this trend. There are more and more people choosing to live in New York because they like New York, but having the ability to work in New Jersey where more and more jobs are located. That just seems like a logical conclusion.

MS. ROBIN FORST: Hello. Robin Forst, Councilmember Gerson's office.

I'd like to pick up on what Bill just said. I'm actually a little bit concerned with something that Lou had mentioned before; which were the projections that had been made for the end of 2004, which is a much smaller

Page 60

number than the actual ridership that you're experiencing.

I'm just wondering going out to 2025, which will only be a few years into the new development, assuming all of the development takes place, and whether or not your estimates for that time in the future are indeed accurate?

I mean, they may be as understated as the estimates were for 2004. And that concerns me both as a member of an elected official staff and also as a resident of lower Manhattan.

MS. HELENE SEEMAN: Helen Seeman, BPC United. I'd like to pick up on something Robin just said.

I'm wondering if your projections of PATH ridership have taken into account the fact that I think as the area grows, and the memorial is completed and the buildings are completed, more people will be discouraged taking buses in, and there will be more people stopping off in Jersey and riding in to visit the sites down here. I'm wondering if you've --

it's hard to project, but I'm wondering if you've taken that into account?

Also, what Bill said, I had occasion twice this past week, I had to go over to the Jersey shoreline, and decided to try the ferries. They've totally cut out one. Because ridership is down, they've cut out one route entirely, and they're really cutting back. So I think the method of transportation has clearly become the PATH.

MR. DAVE STANKE: First of all, in terms of anecdotal of it, I know a number of people who do reverse commute. I think one of the great things about being in Downtown and living here is the fact that you could shoot over to New Jersey. There are offices and companies that have branches at different points around Downtown and New Jersey be able to move back and forth between those offices is part of what makes companies work efficiently, and for us living here, gives us the flexibility to move from locations. I think it's very important

that New Jersey -- I mean, Downtown isn't big enough for a stadium. We don't have room to grow. The new buildings for Downtown have been going up in New Jersey, Brooklyn and other areas. And the functioning of this area as a business center is going to depend on transportation between those commercial and corporate and residential centers. And the PATH is clearly the mode of choice in getting back and forth. The water is not dependable. You have weather issues. You have to walk all the way to the end of the element, so it's not as convenient to many of the buildings Downtown. The Waterway ferries can't support what's going on in the PATH station.

I look out my window everyday, and I see the volume. It's just like the old days again. Can't walk up Church Street at certain times of the day. That's a great thing.

MR. FRANK SANCHIS: Frank Sanchis.

I was thinking along the same lines,

and what I'm wondering is this: When you are trying to provide for ridership based on projections to 2025, I think it would be safe to assume that beyond 2025, 50 years from now and 75 years from now, the demand for transportation between New Jersey and New York is going to keep increasing. We'll be looking at a whole different scenario. And that whatever happens with the PATH train now is not ultimately going to provide, the five platforms is not going to provide the ridership that you need.

What you're measuring that against is its impact against something, which right now today, that footprint has been established that this is on its way to nationally significant artifact. And that's for everyone. That's not going to change in 25 years, 50 years, or 100 years. It's going to be a nationally significant thing.

So why would you be thinking along the lines of adversely impacting something where there's already been made

a pretty clear case, that's going to keep coming back, about the need to design a memorial in that same space, which is somehow going to allow you to perceive the entire footprint.

Here you're talking about making a change which is not going to, I would argue, is not going to provide the capacity that you need in the far future. You're making a change that may answer the capacity in 2025, but it probably logically will not answer some capacity in 2050 or 2075; whereas your impact on that monument is forever.

So why not look at it slightly differently; which is to see how long you can get away with the capacity in the PATH terminal by leaving the number of tracks that you have and doing something else? And then figuring out when that next step is going to have to be provided for. Because it's not going to be there.

Once this expansion of PATH goes in on the World Trade Center site, quite

logically you're not going to be able to expand it again. The only way you could expand it again is to stack it. You're not going to be able to go horizontally.

So, for the sake of that one track at this time, and the impact that it will have forever thereafter, why are you thinking about it that way?

MR. BERNARD MCNEILLY: One slight clarification, because you did raise some good points there.

By the year 2009, we are at the capacity of 50,000 riders that the temporary station has been built for. So the time in the decision is now.

You do raise a good point as far as where things are going in the future, but we are at our capacity in 2009. And from a construction perspective, that's not too far in the distant future.

We realize our pre-9/11 ridership in the range of around, which was 67,000 riders in the range of 2014/2015, and then we reach the ultimate goal of the 81,00 riders in 2025. So, although your

points are valid, the reality is that we are at the capacity of the temporary station in just under four years.

MR. LOUIS MENNO: Just several comments.

First of all, we have to make a decision now because that space will not be there. At the same time, federal funding is limited. We have a limited time frame for it.

You mentioned about stacking tracks and elevating, that's like -- it's not a possibility. Basically we would be designing a roller coaster. PATH is not a roller coaster. And we fully understand where you're coming from, but we have to make a decision.

MR. DAN SLIPPEN: I have a couple of comments and a question, if you don't mind.

I haven't really been at your earlier meetings, but I have been following everything via e-mails and your minutes.

I'm from Pace University, and as you

know, we're not experts in engineering and architecture, but we are experts in education. But we're here in the capacity of representing the largest, private university of lower Manhattan.

Since 1906, we've provided more than a thousand jobs per year in lower Manhattan, and more than 8,000 students do come to study. And approximately 1,200 of our students live Downtown, which means 6,800 commute. And in regards to that, over 1,500 use PATH daily.

Just to go on record, we are in favor of the much needed permanent PATH station. We see this as a major transit resource, as a major lifeline for the stability and growth of lower Manhattan. Pace University believes it is important, as well, to our own growth and development.

As we look to grow, our student population Downtown and attract faculty and staff from the region, we know that many of these new students, faculty and

staff will look to PATH service to accommodate their transportation needs.

To say that the safe, consistent and easy PATH service is important to Pace's future growth Downtown is not an exaggeration. At the same time, Pace University fully understands that there are those who have different views on the PATH station and redevelopment in general.

We understand the loss of loved ones on September 11, and we feel strongly that their memories must be honored. But we also believe, however, in the need for balance. We must continue to look to the future as we honor this past, and to think of what we once thought of as impossibilities, as possibilities.

Lower Manhattan is growing. Downtown has seen its residency more than double in ten years. And our economy is slowly coming back to pre-9/11 levels.

We are moving forward as we should, and it is vital that we continue to make good decisions that achieve our common

goals. We need to make the right decisions so we don't say in 50 years we should have done that.

My question to you all is: Based on what we've heard today, we're only talking about right now. I feel that it's somewhat irresponsible for the Port and FTA as planners to not be looking at the long-term future.

So if anyone can really answer what we are going to look at 50 years from now, I think that is something that really needs to be discussed.

MR. BERNARD COHEN: Since you raised FTA, can I just try to provide a little bit of perspective; because some of this is just a way in which this kind of analysis is done. I don't think it means the Port Authority isn't worried about post-2025 growth. In fact, I know they're very concerned about post-2025 growth.

But when you're doing projections, the credibility of projections beyond a certain period of time diminish. And so,

the way in way in which these analyses are done are predicated on a timeframe where you can have reasonable confidence that the factors that are being taken into consideration when you're running your numbers are foreseeable. So that is why the Port Authority has used 2025. Not because they think the world is going to stop in 2025. Not because they think growth isn't going to take place beyond that. It is simply that you can't really do credible and analytical work beyond a certain timeframe. And it isn't because they think that they're only building for the next 20 years.

MR. NOAH PFEFFERBLIT: As to the 2025 being the benchmark. It seems to me if you're dealing with questions of safety you want to err on the conservative side if you're preparing a transportation facility like this. Because I think certainly those of us have been following the lower Manhattan development, we realize there's a lot of very exciting development projects that

are underway now that are going to make the area more desirable for people coming to work in New Jersey and coming from everywhere. And those are probably going to be coming on line conservatively around 2015. 2020. That will initiate a whole cycle of growth.

I think you make a good point when you say we can't make any long-term predictions. I don't think you're going to be building a new transportation infrastructure after you do these tracks and platforms again in another 20 years. I don't think that will be something that you would consider. So it does seem to me that you want to plan conservatively, and make sure you have something that's going to be sufficient for the ridership.

MR. TOM ROGER: Tom Roger.

Just a comment, Lou, on your proposed option for trying to pay attention to the columns. And just to suggest to you to think about first of all looking at moving that stairwell out

of the corner. You seem like you're taking a very large piece of the corner by the location of that stairwell. I realize there are other design considerations with respect to where the stairwell goes, but it seems like you have a lot more of the platform at the northern end to put the stairwell.

And the other thing is, in terms of how you consider signifying the location of the columns. I've seen situations where you actually have a transparent section of the floor. The actual real columns are visible through the glass floor for people to look down and see them, rather than denoting them on the platform. Because I can just see if they're on the platform, it's just going to be in people's way. So they're going to lose any particular significance, rather than if you considered some other ways of somehow denoting them, like I mentioned, that might have more significance.

MR. LOUIS MENNO: Just wanted to

mention one thing.
You mentioned the significant area to north on that platform. You have to remember, just basically right above that is the east/west corridor and then coming right up into that. So we're still looking at that.
MR. BERNARD MCNEILLY: Can I clarify something? I just want to be clear, because we've actually been investigating this and have been taking this issue quite seriously.
The east/west corridor stays to the north of the north tower. Since that is a principal movement for passengers to come into the terminal, there's a fair zone control immediately to the south and adjacent to that east/west corridor. It's a requirement to maintain a certain amount of spacing from the fair zone control to your vertical circulation elements; it's 30 feet.
We actually reoriented the escalators so that instead of you going into the fair zone control, going through

with your tickets and then you go immediately down a set of escalators or stairs, you have to actually loop back around. And we did that so we could maximize how far we were moving that vertical circulation element to the north, while still maintaining some of the requirements that we have for the vertical situation.
MR. TOM ROGER: I guess what I would comment. The thing I didn't see in your consideration was widening of that D platform in the area between the footprints. You were notching it out on the footprint, but as far as I'm concerned, you could be a hundred feet wide between the footprints; I don't care. But in order to accommodate stairwells, or whatever other things need to go up above or even down at that level. I don't know whether you've looked at that. I see this nice straight platform that somehow lands in the north and south tower footprint. There's no reason why it couldn't have a different

shape to it. Obviously it's not well-suited to loading a train, but may be better suited to accommodating some of these other issues.
MR. BERNARD MCNEILLY: We actually did look at that, as well. That's one of the reasons why there was a notching concept versus an architectural treatment concept.
There are different schools of thought as far as having an architectural treatment which would allow you to experience in the station the fact that you are in the north tower zone.
We had introduced that concept one or two meetings ago, and we received some feedback, which is one of the reasons why we had shown some options as far as treatment is concerned.
The notching takes into consideration another school of thought which is to try to minimize the amount of square foot area impacted as a concerned.
So part of today is to try to gain a

reaction from the Consulting Parties as far as which school of thought makes more sense.
But to answer your other question about transparency, that was another thing that we had investigated with the preliminary design team. And most of you may not be aware, but there are electrical and communication ducts, as well as HVAC ducts, that are under all of the platforms.
So even if we had created a platform with a transparent surface so you could view it down, you'd be looking at duct vents. You wouldn't see the tower remanent bases immediately below.
MR. TOM ROGER: Only in the location of the columns.
MR. BERNARD MCNEILLY: That's correct.
So one of the things we were contemplating was to create some sort of a treatment so that from a placement perspective that you could experience the fact that that is where that particular

remanent base is below.

MR. ROBERT KORNFELD: A couple of issues.

What you were just saying is interesting; the design of the track platforms. Is it really that inflexible as far as locations of duct vents and so on?

I kind of pictured that there would be a potential for designing platforms maybe so you had a long span across that corner for the proposal for putting a platform there. Where maybe at that area, you could have a span or maybe a trust that would be like up-set from the platform to support it, rather than having it supported down, and actually sort of leave the area open where the footprint is there.

MR. TOM ROGER: Candle-leaf (phonetic) it over the footprint.

MR. ROBERT KORNFELD: Yes, candle-leaf over the footprint. And treat those other issues, like utilities, in a different way there. It's not

really a huge span.

I think they're going to the level of just reflecting something that's there and architectural finishes on the surface is really -- I just don't think -- when you have the authentic material there, somehow that doesn't answer the issue really. It's certainly better than nothing. But I think that there has to be something that addresses the authentic material still being there.

I had one question about the slide that showed the column footing where you have a base for the arch support. That didn't show the actual footing of the column. The column goes down and has some sort of big foundation that goes below. Doesn't it have some cribbing or something below the surface? Was that shown?

MR. LOUIS MENNO: No, it wasn't. This was just an illustrative in terms of what we are looking at; options. These are not detailed drawings. Just concepts.

MR. ROBERT KORNFIELD: No, I didn't mean for the new column. I meant for the existing column base. I don't think it sort of scoped out the space.

MR. BERNARD MCNEILLY: Actually, if you'll allow me to clarify.

There was actually several different types of systems for the remanent basis depending on where they were; whether they were interior or along the line.

Along the east line of the north tower was essentially a configuration which was very similar to a spread-footing and if you know what a spread-footing is, it means that it has an integral and linear footing system.

There are grillage type of systems that are in the bathtub on the west side. But along the west side of where we're talking about, the remanent bases that could be impacted by the platform for the temporary track, it's more of a spread-footing configuration. That's one of the reasons we were contemplating some of the options that were presented

earlier.

MR. ROBERT KORNFELD: Can I bring up a third comment? These are from all along; which is, both the presentation that we saw and also the draft MOA refer only to the perimeter columns, specifically; rather than the core columns and some of the concrete slab features and so forth.

I know that the determination of eligibility speaks in those terms. When I brought that up at the LMDC meetings, they said, "Well, we don't really get into it in that level of detail. Doesn't mean that those aren't things that are significant that need to be dealt with as they came up."

So I feel like we've kind of reached the point where you're talking about actually destroying some of this stuff in some cases. You need to say in detail what's being adversely affected.

MR. LOUIS MENNO: Well, what we showed here is just what we're going to impact; just that 4 percent area and

those columns. We're not going into the other areas within the footprints. We've always made that clear that we're staying out of that footprint. This is where we have the impact.

MR. ROBERT KORNFELD: When you talk about column totals, say, in here, I would rather see it where you talk about like 100 percent of the column bases that are there. And then even where you have the existing PATH station where it's accepted generally that the tracks and platforms and so on will be there like on 2 World Trade Center. I would rather see you discuss the ones -- you know, even the ones that we know are going to be adversely affected, that are in that eastern portion of 2 World Trade Center, I think that should be addressed as an adverse affect.

I'm not saying anyone expects you not to have the tracks and the platforms there. I'm saying that that should be the number of columns you discussed.

MR. LOUIS MENNO: We do recognize

that. I know in previous discussions we also mentioned, and maybe I failed to mention about, there are some impacts in the south tower, how the area is going to increase above the pre-9/11. There are some additional columns that are also affected by that. And that we would do a similar type of arrangement in the southern part. We're looking at that also.

MR. BRUCE EHRMANN: Bruce Ehrmann, Community Board #1 Manhattan.

I reviewed the materials before coming here today ad nauseam. And the principals remain that Downtown, especially the area that we're talking about, remains wounded. I've spoken to a number of residents in this regard in the last few weeks, residents south of Tribeca, who feel that their neighborhoods have not healed. That they have lost services, and they have. Because the World Trade Center concourse had just become, finally after 20/30 years, a vital, viable community center

for people to shop and work and meet. That part of the city has not been brought together. There are all kinds of wonderful plans.

We have this opportunity to discuss like we're discussing, public light-rail transportation that will work for Manhattan. It's such a wonderful thing to have. That concept is rarely on the table anywhere in the United States. Here we have it. We're looking how to make it grow, and how to make public transportation, as opposed to automobile transportation, work and bring people in and out of lower Manhattan, and actually heal lower Manhattan.

It's a wonderful thing to have to begin with, and it's a very necessary thing to expand. And I believe I speak for most of Community Board #1 in speaking for this. I certainly can't say all. But we've had many a discussion on this matter.

I want to address something that's come up in the conversation, and that is,

I'm also CHAER of the Landlord Community Board #1. As someone who was here on that day and has lived here before and since, and having spoken to many children, many, many children in our neighborhood, I believe, I actually believe that what can be preserved should be preserved. But in terms of a day-to-day interaction amongst commuters with that site and with the historic elements there, the representation of what was there, the manifestation of what was there, should be notational.

You should not feel, children should not feel, commuters should not feel, like I feel when I go through the exposed parking lot now on the track. You should not feel everyday that you're going through Yad Vashem (phonetic) when you're going to and from work. You shouldn't have that degree of emotional impact every time you come in and out of Manhattan.

There should be notational representation and intellectual

acknowledgment of what happened. A sense of awe. But you should not feel like you're under 100 stories that collapsed and X-thousands of people died here every time you come in and out of Manhattan, with and without your children.

That's my belief in terms of how -- what we're trying to preserve interfaces with the function of a train station.

The last thing I want to bring up is, I still don't think you've answered the question: Okay, we've gone out to 206 and 220, but when you plan an interstate highway nowadays, you have to leave room in the planning for additional lanes when expansion is called for. I still don't understand how you're planning, if expansion is called for, to expand this station that is now completely built out. Where are you going to go? We can't do it above; that's a roller coaster. We can't do it next door, that's the footprint. What options have you left yourself for the future?

MR. PETER GOELZ: Okay, a lot of people want to speak. This gentleman has been waiting for a while. Then we'll go to the back row and then we'll come back to the front.

MR. MATT VIGGIANO: My name is Matt Viggiano. I'm from Senator Connor's office. We represent all of this area Downtown. I actually am a lifelong resident as well.

And I just think that this neighborhood and community has gone through so much, that it's anxious to get back to a sense of normalcy that we had on September 10th, or before. And if we bring back the commuters, if we bring back the presence, some of the things that Bruce, you were just speaking about, we go a long way to healing this community.

And he actually just stepped out, but there are some things that the gentleman over there spoke about, Mr. Sanchis, about anticipating the future growth. If we do nothing to anticipate

this future growth and just wait until we can't handle it, I don't think that the solutions that would be open to us at that point would be viable in terms of having to cope with needing a new track or numerous tracks having to shut down maybe the one or two tracks that are already heavily used to create those new outlets would be really detrimental to the system.

And I want to say that we support, and the Senator supports, rebuilding, but certainly not at any cost. But rebuilding in a responsible manner. And if we can preserve any of that the northern tower footprint, we really must.

MR. PETER GOELZ: In the back, go ahead.

MR. RICHARD KENNEDY: Rick Kennedy. I'm the vice-cHAERman of Community Board #1.

Another piece that is critical here, we need to rebuild our economic health. Get back to good economic health to allow

the residents to grow and business to grow. (inaudible) transportation capability. That is a big issue and planning issue for them. Let me just finish what I'm saying. It's a planning issue. I think it's critical that transportation capacity is there because the due diligence is very important. Many of the businesses on Wall Street, and the businesses that are in Jersey, they rely on that interconnectivity. Some of it will take decisions between the value down here. They spend dollars on the retailers and the restaurant. People that live here are all -- very much the transportation is the key issue. It creates great central businesses here and around the world. I think any compromise we do to that is going to compromise that restoration in restoring the normalcy and rebuilding the rest of the Trade Center. I think it's critical that all those things work.

MR. RICK BELL: I am a resident of New Jersey. I work in New York. Rick

Page 89

Bell, head of the American Institute of Architects. I commute on the PATH everyday. And have, obviously, a lot to commend the Port Authority for the temporary PATH station which made it a whole lot easier for New Jersey-ites to get back to work. Before that, I came through Penn Station.

And in terms of the question about representation of what was there before, Penn Station is emblematic. One can see fragments of what was there before; handrails and the like. There are also some excellent photographs.

I would suggest, respectfully, that the less that is representational and the more that is actual to, quote Frank and someone else on this side of the room, and to talk to the authenticity of what remains. That's irreplaceable.

With respect to Tom; look through glass and see it. And Tom and I walked train stations in Berlin where people were deported. And it's a very emotional feeling to see something represented, but

Page 90

it's even more necessary to see the authentic elements whenever it is possible.

We've been looking at the same slide now for about an hour. And with respect, I would suggest maybe to help the discussion and bring back a slide of the platform, because just like Tom Roger talked about, the possible permutations that may have been studied, and put to the side that may have been commented on in past meetings, but might still be possible for the brain power in this room to think of alternative suggestions. And I am not sure that I know what those might be, having looked at the materials and having given it fresh thought today, but I know one of the disadvantages of commuters both from Long Island and New Jersey and from elsewhere, going through Penn Station, is that the platforms are dismal. Why are they dismal? They're undersized for the ridership as it has increased. But they're also encumbered by stairwells in the wrong positions; by

Page 91

technology of the long distant train leading to encumbrances in the middle of the platforms that make it very difficult for people to exit in a uniform direction.

The difference to my mind in the PATH platforms that you have now, both at World Trade Center and elsewhere, is that it's not so much a question of distributing people who are going to be waiting for a significant period of time, or for a commuter train that isn't in yet, but rather, people loading and unloading and leaving from stairways that could allow for, I think as Tom said more openly than anyone else, train platform that isn't necessarily all uniform and even.

The movement out of platforms on Penn Station is encumbered by stairwells. I would suggest, and maybe it's been done already and rejected, that a notching that takes into account all of the existing columns where they occur might impact on people loading, but

Page 92

probably in the long run isn't going to lead to a diminuation [sic] of time of exiting the platform, if there is a notching down rather than having to pass over, whether it be glass or some representational aspect.

And if that's the key issue, as Frank Sanchis said before, maintaining something forever that would otherwise be replaced or some way filtered down, I don't think it's for all of us, except for those representing the families, to talk about the emotional impact now or before. That is something that's incalculable and irreplaceable.

MS. PETRA TODOROVICH: I'm Petra Todorovich with Regional Plan Association.

RPA has reviewed the projected ridership that the Port Authority provided at the last meeting. And we are satisfied that there is a need for a fourth platform. If anything, we think that the projections are perhaps a little bit conservative because they only go up

through the year 2025.

We understand they do not account for the possible extension of PATH to Newark, and the additional ridership that it might create, or the JFK/LIRR connection, or this is only a short-term thing. But if ferry service was reduced because of the New York Waterway, financial problems, we also might see a rise in ridership.

So we firmly feel that there's a need for the fourth platform. Given that, the question becomes, how do you reconcile this physical conflict between the placement of the fourth platform and the tower footprints, which we truly feel are an important historic resource and it must be preserved and the access to it.

So we are eager to see all of the possibilities. At the last meeting I requested that the Port Authority show some options for how some clearance could be provided. And they have, which I really appreciate. All of those, the notched option, which sort of clears the

platform by narrowing the platform seems perhaps the most viable. But even that, we have some concerns that would create safety problems on the platform.

My thinking has evolved a little bit in the last few weeks or so in thinking about this. In that the conflict between this PATH platform and the tower footprint may actually be an opportunity to have more people as they use the PATH encounter on a day-to-day basis, the representation of this tower footprint. I know there's a lot of differing feelings about that. But I think that it is important that people understand when in this PATH station, that this place has the power of remembrance that transcends it as a daily commuting place.

So I think rather than have a extremely narrowed platform and a wall that you don't quite understand why the platform is narrow there, perhaps the experience of seeing the delineation of the tower footprint represented architecturally in some way, or actually

in some way that can be arrived at, would be more powerful. But it's a very hard judgment to make.

So I just wanted to say that we support the fourth platform, and we're eager to continue to see options of how this physical conflict between two spaces can be resolved and represented in some way.

MR. LOUIS MENNO: I want to say a few words about platform D.

I know people have been asking why just to the year 2025. And I believe that Bernard said it very, very well; why. But by us constructing a full-width platform, does give us this additional capacity beyond 2025.

But beyond that, we have to think about, as I said, when we designed this station, we have to think about the overall system capacity. As I said, all the things that PATH is doing to handle this increased ridership over the next 20 years, but there comes a limit within the PATH system by the size of the tunnels;

how many tunnels we have coming into New York. So there is also a system limitation.

But the platform, the full-width platform, a full 30-width platform, gives us that extra room for that growth beyond 2025.

MR. ANTHONY GARDNER: Anthony Gardner, Coalition of 9/11 Families. I have a couple of quick questions, and then I have a comment that I'm going to reserve to the end because I just want to get through my questions.

One, Lou, the original PATH system, you talked about how it was a three-platform, five track system with ten cars. Isn't it the case, from -- some of the data we've seen suggests that pre-9/11, the PATH system you ran eight cars. You never ran the full ten cars. Is that true?

MR. LOUIS MENNO: That is correct. PATH was not operating eight-car trains. They had it in their capital plan -- sorry, it was not operating ten-car

Page 97

trains. Operating full, eight-car trains. It was in their capital plan to increase the service on the Newark line, which was their most heavily traveled route to ten cars. Part of that expansion was the new cars, Harrison, as well as Grove Street, and well as Exchange Place, were all going to be expanded to fully accommodate ten-car trains.

MR. BERNARD MCNEILLY: The length of that platform pre-9/11 could accommodate ten cars. It's just that PATH ran seven-car service on the Hoboken line, and seven, with the potential to go to eight, on the north to World Trade Center line. But as far as length of platform and sizing of the platform, ten cars.

MR. ANTHONY GARDNER: Isn't it the case though with adding those two cars, you meet your ridership expectations without -- I mean, you're talking about ridership as one of the main factors here for needing platform D.

MR. LOUIS MENNO: We're talking

Page 98

about ridership on the whole system. We're talking about the ridership at the World Trade Center station. The full ten-car train with a headway of in between trains of three minutes helps us provide for that growth, but you need the platform area, and you need the clearance time to get people safely off the platform to conform to the industry guidelines including that failure management that I spoke about.

MR. ANTHONY GARDNER: Two more quick questions.

In the Draft Affect Documents FTA and the Port Authority prepared, you talk about utility rooms being within the space defined by the perimeter columns, which we all know are the footprints of the towers. You didn't discuss impact of utility rooms in your presentation.

Are those utility rooms no longer going to be housed on those footprints?

MR. LOUIS MENNO: Basically just utility lines; we're not building utility rooms that may infringe --

Page 99

MR. ANTHONY GARDNER: So, utility lines, not rooms.

One more and then a quick comment. Lou, if 9/11 never happened, how was the Port Authority going to meet these increased ridership issues? Was it something you were even looking at?

MR. LOUIS MENNO: It was going to be a difficult challenge. I don't think that PATH or the Port Authority would have been able to meet all of the riderships, because I think I said last time, we were restricted. There was no way to grow. We were at basically at the capacity. Even if we were to put the ten-car trains on, PATH was going to be troubled with that cross-flow, with the congestion on the platforms, and that the headways -- maybe we would have a ten-car train, but the headway would have to be longer; maybe four minutes or longer to avoid that situation of having an overcrowded platform. So they were limited. And we've said that before.

MR. ANTHONY GARDNER: My quick

Page 100

comment. Is that okay?

MR. PETER GOELZ: As long as it's not a filibuster.

I want to make an announcement. We're almost at 3:00 o'clock.

MS. LOUISE LOPRESTI: I've had my hand up for fifteen minutes, and you've been dodging me.

MR. PETER GOELZ: Well, there's been a lot of people. You spoke right at the beginning and there are a lot of other people who wanted to speak. This gentleman sitting next to you spoke twice. I'm trying to be fair.

MR. JOEL KLEIN: I haven't spoken at all, and I've had my hand up the whole time.

MR. PETER GOELZ: I'm coming back.

MR. ANTHONY GARDNER: Can I just go real quick?

MR. ANTHONY GARDNER: I have bullet points here.

One, it's very difficult, as you can imagine as a family member, to participate in these meetings. It's very

personal to us. My brother, along with 3,000 other people, were murdered on that site. And it's very offensive when -- we understand there's this layer beneath the service of people being every enthusiastic. And mainly I've heard from residents today about the opportunity that 9/11 has presented to them.

It's an opportunity to honor the people who were killed to preserve our national heritage and to revitalize lower Manhattan. But finding a balance. And it's offensive to hear what a wonderful opportunity it is, because my brother has no more opportunities because he was murdered, along with 3,000 other people.

These discussions that we've heard where Louise and Joel, and other people that are involved in the 106 process because they care about historic preservation. These other issues that so many other people are raising are really NEPA issues as far as ridership and these other issues. There's no place for that in a Section 106 meeting.

Section 106 meetings should be only open to people who care about historic preservation and want to help these agencies to mitigate and preserve as much of our national history as possible.

These other conversations you could take up at a NEPA meeting. And I think any of our advisory councils and our state NYSHPO would attest to that fact.

This is not something that's impossible. Europe has done it for centuries; they route transit systems around the catacombs. This isn't something that's impossible.

The 9/11 families that we represent at these meetings want the redevelopment to move forward. We're not trying to obstruct the revitalization.

But what I can't comprehend as an individual is that the residents that we always see represented in these meetings, you don't see the value of preserving national history. You don't see the value of what it's going to do to your neighborhood, how it's going to bring

people to your neighborhood.

You know, LMDC is importing culture to that site, and they'll destroy the culture that exists that's there. That's authentic. That's irreplaceable.

There's only 1 World Trade Center site in this country, in this world. There's only two authentic, tangible footprints. A reflecting pool 70 feet above them does not replace that. And destroying them to meet ridership for 2050 -- I gotta to tell you, I would hate that if when I'm 50 years old, I have to be back in these meetings trying to continue to fight to protect the remains of the footprints.

This is a 106 process. That's something we should all be working towards, and leave these discussions of opportunity and media and train growth to the NEPA process, which is where it belongs and understand how offensive it is when you talk about this wonderful opportunity that it presents. Because there is an opportunity here, but it's

just way off base.

MR. JOEL KLEIN: Way back to one of the first questions that Frank Sanchis asked, because I don't think he got an answer.

When he asked his question, the response he got was an explanation which was very understandable about why construction needs to start very soon. I think that was very clear.

But Frank's question related to when capacity would be reached. And I think the question really is: At what year in your projections, assuming there was no platform D, does your capacity max out?

MR. LOUIS MENNO: We'll have to get back to you on that.

MR. JOEL KLEIN: Well then, Lou, I have a whole bunch of questions for you. And I apologize in advance if I sound a little prosecutorial because I really don't mean them to be that way.

You refer to the Manual Transportation Capacity and Service. Is that a government document?

MR. BERNARD MCNEILLY: It's a TCRP publication that's readily available.
MR. JOEL KLEIN: That's not my question. Is that a government document?
MR. PETER GOELZ: Well, Joel, let's not make it prosecutorial.
MR. JOEL KLEIN: Well, no, because I am not going to let you do this, Peter.
MR. PETER GOELZ: Are you asking whether it's a document that is prepared by a trade organization, as opposed to a government?
MR. JOEL KLEIN: Yes.
MR. PETER GOELZ: Why don't you ask it that way?
MR. JOEL KLEIN: Well, if it's not a government document --
MR. PETER GOELZ: Is this something that --
MR. JOEL KLEIN: Fine. Answer the question you just asked. I'm perfectly happy with that.
MR. PETER GOELZ: Is it an association document or --

MR. BERNARD MCNEILLY: TCRP is part of the Transportation Board, which is a research engine that this particular documentation was supported. And it's actually referenced on its cover by the Federal Transit Administration.
MR. JOEL KLEIN: Is there any requirement in FTA regs and New York State regs that standards set forth in that manual be adhered to?
MR. BERNARD MCNEILLY: Is the document a standard of industry practice?
MR. JOEL KLEIN: So it's not in any FDA regulations or New York State regulations that it be followed.
Is it illegal to construct a facility that doesn't comply with the manual?
MR. TIM STICKELMAN: Joel, you're asking questions --
MR. JOEL KLEIN: The reason I'm asking these questions is because Lou Menno, three times, said we have to follow it, we must follow it, and it is

required that we follow it.
Who is requiring you to follow this manual?
MR. LOUIS MENNO: Let me put this way, we have to build a station that follows the industry. Why should we be different from any other transit facility in the country who follows these guidelines? Why should we be different when we have to provide service. We as a public agency have to do our best to do the best for all Consulting Parties.
I think we are really trying to do our best for all Consulting Parties by minimizing to the fullest extent possible the impacts. But we have to follow guidelines; industry guidelines for designing a rail system.
MR. JOEL KLEIN: You just said it again.
MR. PETER GOELZ: Here's the issue you're making, Joel. See if I can get it right.
What we have is, they base some of their justification on what are, in fact,

industry best practices, right?
MR. JOEL KLEIN: Understood.
MR. PETER GOELZ: These are best practices that transit authorities try to follow. But are they written in law? Can they be changed? Can they be modified? Are they modified?
The answer is probably yes. Don't you think?
MR. JOEL KLEIN: I would think so, but I would like Lou to say that, and why it can't be done in this case.
MR. PETER GOELZ: Right. And the essential question then is: Is if these best practices are not followed, if we modify them, are there consequences that somehow undercut cut the effectiveness of this facility, as opposed to ignoring the historic importance of these footprints?
MR. JOEL KLEIN: That's what we should be doing. We should be discussing what the consequences are of not adhering to those standards, and what the trade-offs are.
MR. PETER GOELZ: And the question

is: Is it a reasonable trade-off to not follow a best practice to the letter of the law to preserve what is a historic site?

MR. JOEL KLEIN: Other than the term "letter of the law," yes.

MS. LOUISE LOPRESTI: You probably should have let me talk first because I would have made more conciliatory remarks than these guys would have.

MR. PETER GOELZ: I understand.

MS. LOUISE LOPRESTI: I was going to say earlier on about ten minutes ago that we got to a point that we always do in these meetings where somebody says, "We have to forget about 9/11 and move on," and the families go, "What?"

I'm being facetious, but really, it shouldn't come to that.

I work with the families. I'm an historic preservation advodate. I work on Wall Street. I think everybody understands the need to remember and rebuild, and to rebuild right.

I'd like to echo Tom Roger's comment

as a family member and he is in the construction business. He's working on this site, as well as Rick's comments, and Frank Sanchis' comments.

This is the site of the largest attack on the U.S. in history, period. Let's hope we never have a bigger one.

That being said, yes, we want to comply with best practices, okay. And in so doing, in adhering to the numbers, we need best design practices. And as Tom and Rick both pointed out, and Frank, as well, we are not seeing it on the screen here.

This is a design challenge. You guys need to come up with a solution. With absolutely with no offense to you, the Port Authority is not known in this town for being the largest bunch of creative thinkers. It's a statement of fact.

You guys need to go back to the drawing board and think it out. Because for no other reason, and it's the white elephant in the room, and I asked Anthony

if he minded if I mentioned it, next Friday, November 12th, by an extraordinary coincidence, which happens to be the same day you're doing the site tour, is the first appearance in Southern District Court on this issue. And unless you come up with a really good solution that can respect the historic artifacts, as well as meet your needs in terms of transportation and redevelopment for the neighborhood, we'll be in Southern District Court for a long time. We ain't going away. I don't care if it's five people with 250 and a legion behind us. I don't care. And I'm sure Anthony feels the same way.

MR. PETER GOELZ: Let's get your hands up now so we can bring this in. A chance to speak. So who hasn't spoken yet? I do want to give John Hotopp a chance to speak.

MR. KEN LUSTBADER: Ken Lustbader. One of the issues that I've been raising at other meetings, and it comes up frequently when we're trying to mitigate

the impact on the footprints is the issue of cumulative affect. I know this isn't the forum for it, but I would like to propose having a separate meeting, perhaps a smaller group, to discuss with the LMDC and Port Authority how to deal with not just this PATH projects, but with the multiple projects that are going on short-term and long-term on the site, and how Consulting Parties can reflect on what the impact is going to be.

UNIDENTIFIED: Who will be that smaller group?

MR. KEN LUSTBADER: Well, I'm saying the Consulting Parties.

The other issue, talking about what Frank said, we were at a meeting at the LMDC for Consulting Parties a few weeks ago where they showed great examples of artifacts that were kind of stumbled upon, or found, where they were putting together design solutions.

And I feel strongly that this is an opportunity, because we didn't stumble upon this, we have it in front of us, to

use the most innovative design solutions.

With that being said, we should look forward and exploit the fact that those elements are there already, and have innovated design solutions that are not being put forth on the screen.

MR. BEN STANLEY: I just want to answer Anthony, with I would call it an attack on the residents down here.

You made your point. I'd like to make mine.

He's saying that we're taking this as an opportunity. This is not an opportunity for us. We have to survive down here.

MR. ANTHONY GARDNER: That was Bruce's own words. We have to survive down here. We have to make the best of this situation that we can. We have to project what is going to go down in the future, and make a best possible situation of that fact with the proper respect for the people who lost and for the proper artifacts.

Now, just as in the south tower had been infringed upon and artifacts had been no longer been able to be saved there, I feel that there has to be a compromise between what is going to be projected into the future, past 2025, what we can do at this point so that we can satisfy the best possible solution with compromising the least amount of artifacts.

I think this is what the job of this committee is. And obviously you have your point of view. I have my point of view. Bruce has his point of view, which is completely diametrically opposite of yours. We have to come and find the right possible solutions to this.

Now, yes, you can stumble upon artifacts and you have artifacts that are in the ground, we have to find what is an artifact and then what is a symbol of the artifact, and what is going to in the future hold the memory of 9/11 true. And that compromise is what we're here to achieve.

So I don't think it's going to be all on one side or on the other side. I think there has to be a way that we try to do this. And through a good design and through good engineering, I think it can be done.

MR. BILL LOVE: This is real quick. Just a question basically.

I think that a convincing case has been made today for the addition of platform D. I have a question relating to this notching idea. The gain from that seems minimal to me. You go from 97 percent uncovered to 98 uncovered. But let's say you do that and it causes problems on the platform in terms of crowding and safety, could that be reversed at a later date without the cost being exorbitant?

In other words, would you have to -- if you decided later you wanted to fill that notch in, would you then have to reroute the tracks, and then it would be impractical to do?

MR. LOUIS MENNO: We would not have

to touch the tracks because it would be on the western-most wall.

MR. BILL LOVE: So you could fix it?

MR. LOUIS MENNO: There's a wall there and that would basically separate the PATH station to the west, which would be the memorial area.

MS. ELIZABETH MERRITT: I'd like to comment on two issues for the National Trust.

One, is that I think this gentleman's suggestion over here about looking into the idea of being able to see through the platform to the authentic remains of the tower perimeter is one that really deserves further exploration. And the answer about over (inaudible), it didn't really seem that thought through. It may be possible to reroute those. And that could provide the basis for a compromise where you wouldn't have to alter the width of the platform. You could have the full width that you want, but still give people the

Page 117

opportunity to see the real remains below. And I think that really deserves a lot more exploration.

It also provides an opportunity for people who don't want to be exposed to that; to just walk over that portion of the platform. So it seems like the best approach.

And the notch to me sort of was the worst of both worlds because a five-foot notch, you could really notch out the whole corner. It's just sort of too wane a gesture [sic] as it was proposed.

But the thing that really disturbs me is the location of that escalator/stairway right on the corner of the footprint there. That just seems like the worst possible location. I think some additional exploration should be done as to whether that could be relocated somewhere else on the platform.

So those are my comments.

MS. HELENE SEEMAN: I have a quick question, I guess, to the families

Page 118

because we all take our time to come to these meetings. And I appreciate the presentation.

But if the families have decided that there's no compromise, it would have been better for us to know ahead of time.

In other words -- I mean, from what you've said, basically, Louise, you're going to court. If any percent -- it sounds like to me, I don't know if I'm interpreting it correctly, if any percentage of the footprint is covered back, does that mean you're going to court?

MR. PETER GOELZ: No, I don't think that's ever been at issue.

MR. DAVE STANKE: There is an assumption that was stated here that I don't I think is actually 100 percent correct.

Historic preservation is always a game of compromise, finding what's most important, and finding pieces that can be used realistically.

Page 119

I think in the scope of that, we have three-and-a-half or four acres of footprint columns that are all going to be six stories underground below, with a memorial above. And that is a huge volume of historic remnants to used. I am not sure how it's going to be used at this point in time. And I am not sure how many visitors are going to fill it. But we're talking about a train covering three percent of that space that is going to pull in thousands of people a day, to make a difference in how many people's daily momentary lives, versus creating three percent more space in some sort of an underground museum facility that will allow somebody to go to every one of the boxed beam columns, versus some symbolic representation that could be fit in.

I mean, there's all of these other types of ways that could make it clear.

I don't also believe that of the thousands of people who come walking around the site, that anybody, except a few, know about these columns or would

Page 120

consider 100 percent preservation of those columns to be significant. Especially if you are going to ask them to donate money to save those columns. Which, if the federal government is paying for a project, and there are federal funds, I believe those federal funds are limited. So when those funds start getting used up by expensive, creative solutions for getting trains off the ground and up and around things, are we going to go back to President Bush and say, "By the way, we need another billion, please, or, "We need another $500,000"?

There is right now a fund raising effort going on to raise money for the memorial and the memorial center itself. Not sure how well that is even going.

So we have to balance the needs of this nation and the federal funds and what those funds are doing and what they are achieving. It is an important designed compromise.

MS. DEBRA LESTER: My name is Debra

Page 121

Lester, and I'm here representing the Speaker of the New York State Assembly, Sheldon Silver, who is also the representative to lower Manhattan.

I wanted to thank the Port Authority for putting together these meetings and hosting everybody. Since this will be the last of our meetings, I just wanted to say that.

And I also wanted to say that the Speaker fully supports the residents of the lower Manhattan and their position on this, and wholeheartedly urges the Port Authority to take every recommendation and comment made by the residents and the community board very seriously. And that this project is very important. And a lot of the rebuilding depends upon the PATH station being built. And to slow down what will already be a lengthy process, would not be in lower Manhattan or the rest of New York City's best interest.

MR. PETER GOELZ: As disappointing as this may be for the Speaker, this may

Page 122

not be the last meeting.

MR. ANTHONY GARDNER: We didn't talk about the MOA.

I just want to talk about what David had touched on. The remains of the footprints are not three and four acres or five acres. The north tower is about one acre, the full footprint. Half the south tower is already destroyed by the PATH system, so that's only a half acre. We're talking about one-and-a-half acres of bedrock. That's a very fair compromise that half of the south tower is already destroyed.

MR. DAVE STANKE: To whom?

MR. ANTHONY GARDNER: Let me finish.

You talked about the families having to compromise. You could see our point that that's a substantial compromise that we're not fighting that half. We're not asking them to move that, provided it's incorporated into the PATH system.

And also David talked about how these thousands of people this was going to affect. Well, you know what,

Page 123

preservation of the remains of the footprints will affect millions of people for as long as this country exists.

How many millions of people go to stand over the wreckage of the USS Arizona? How many people go over the battle fields of Gettysburg? It is the same situation.

So we are about compromise, but there are certain facts here that not everybody is on the same page.

Also, it's the fault of these agencies that the country doesn't know the remains of the footprints exist. We have been trying to get that out there. We got the New York Times to publish those pictures last year. We sponsored a nationwide poll through Knowledge Networks, which is an academic and polling company. I think, Bernard, you would be interested in this. We showed people the photos of the remains of the footprints to the polling company. We asked these individuals to get a sample of people around the country. And 60

Page 124

percent of the people, once they saw the photos, said, "Absolutely." They agreed that the footprints needed to be preserved and accessible. Only 16 percent said no. And that's coming from our photos, which are not that spectacular. They're just the only photos of the footprints uncovered at this point. That number jumped to 70 percent for the sample of just New York voters.

So maybe they don't live Downtown; maybe they live on the upper east or west side. Maybe they didn't poll the Downtown people, but it seems like there's a great misunderstanding here. The word opportunity was used by several of the residents here. That's why we reacted to that. It wasn't something we just pulled out of our hats.

MR. ROBERT KORNFELD: I have to say that I've heard a lot, especially at this meeting, where it seems like preservation is somehow in the interest of family members and destroying historic resources

is in the interest of the residents. I totally reject both of those things.

I'm here as a preservationist representing a preservation organization. You are looking at a line, this is the National Trust, Municipal Art Society, The State Preservation League.

The people who are in favor of preservation are not family members. People say, like, "Oh, they're doing this as a favor to the families." That is not true. I don't know of a more significant preservation issue in this nation. I don't know of a more historic site in this nation. It's not big. Everybody talks about it like it's that big.

If you look at historic sites of this magnitude of importance around the world, you're go talking about places like Pompeii or the Circus Maximus in Rome. This place will be known a thousand years from now.

The images of the Trade Center disaster, of the recovery, of the ruins, will be in peoples minds 50 years from

now, a 100, a 1,000 years from now. Even if New York City isn't here anymore, that is something that will be etched permanently in human memory. It's not just because of the scale; it's somehow the whole thing, the engineering hubris, if you want to call it that, of the towers, the human drama. The whole thing is so significant. I can't believe that people talk about it in terms of, "Oh, it's just a few acres. You can just nip this off you can nip that off." It's very significant.

If you have something that's a whole, 1 World Trade Center as a whole, an intact whole, for what it is, it's a ruin. It's an entire, complete ruin. Now, as you know, if you look at antiques, an antique that's perfectly intact is very different than an antique that has a chip. So, you can't just think of it in terms of percentages. We're not fighting for percentages. There's a certain level of integrity.

A lot of things are not landmarked

because they've lost their integrity. We're fighting for the integrity of this historic site; not just for percentages. I think you have to understand that. This is something that's in the interest of our nation to preserve. It is our responsibility. That is why these preservation groups are here.

I would like to say, also, I think that this meeting has been entirely insufficient as far as dealing with the Memorandum of Agreement. I think we spent the whole meeting saying how much they want train service.

MR. PETER GOELZ: We'll get to the memorandum.

MR. FRANK SANCHIS: Frank Sanchis. I wanted to go on record as saying that design-wise, this isn't about that two or three percent of the north tower. It's about the integrity of the footprint. It's important to remember that there is some sort of a spatial solution. It's not a footprint, but a spatial solution, to be able to understand that perimeter

that is being discussed, but has not been approached from a design point of view. But if you make this decision to log off the end, then that spatial solution is sort of obviated. And it's important to keep in mind the secrets of decisions about the design.

MR. PETER GOELZ: We're running short. I think I'd like to move on to John and the MOA.

MS. CHARLENE VAUGHN: Can I suggest something? We focused a lot of time on the whole treatment of the footprints and the platform. This Agreement includes a very expansive, comprehensive mitigation plan, and I don't feel that you should give it short shrift because we're running out of time. I'm totally opposed to that.

MR. PETER GOELZ: What would be your suggestion?

MS. CHARLENE VAUGHN: I don't know, but I don't think people should be forced to comment real quick on a quick conversation to respect time. We chose,

Page 129

we made a decision clearly, to have this protracted discussion on the footprints. So I think it was meaningful and good, but don't minimize the need to look at the --

MR. PETER GOELZ: No, no. The MOA is very important.

MR. TIM STICKELMAN: Can we give the court reporter a five-minute break?

(Recess taken.)

MR. PETER GOELZ: I think we've had a spirited discussion today. And it was probably unrealistic to think that we could have accomplished this agenda in the timeframe that we had set aside.

I know many of you have other places to go and promises to keep. I think that what we're going to suggest is that we reconvene this meeting on the 15th or the 16th to focus on the MOA, and to let John Hotopp make his presentation then. I think he'll just do a quick, abbreviated form now so people know what to focus on.

But the key thing to remember is

Page 130

that the November 19th deadline is still there. So if you want to comment, you need to get your comments in in writing so that 19th date is still in play. But we'll get an e-mail out to everybody within the next 24/48 hours. And it looks like we would do it in the afternoon of the 15th or the 16th.

MS. CHARLENE VAUGHN: Peter, can we do it in conjunction with touring the cleaned columns? I mean, just to be efficient.

MR. PETER GOELZ: We're all in favor of efficiency even though many of us work for the government.

John, give us a few minutes, and then we'll wrap it up.

MR. JOHN HOTOPP: I'll very quickly look through the slides and give you an overview what it is we'll be talking about.

These were the key stipulations that are in the Memorandum of Agreement. We've obviously spending the whole layout of the tower perimeter column stipulation

Page 131

as number one. And some other stips, I think, clearly need to be talked about. They deserve their place in the sun as well. So that's why that will become the focus of the next meeting.

What we'll be doing, the arc within the plow print areas, everything is as developed than. And what you're seeing is the 35 percent design stage will be coming out for all of you to be looking at, and NYSHPO as well. So that each step of the way as the agency works through the project, will be 74 and 35 percent. We'll be looking for some input on that.

One of the things that we talked about, and it's in the MOA, I think you've seen it, that NYSHPO gets 30 days to comment on this. And originally the Consulting Parties were given 14 days to get their comments in. The objective of that exercise was to give time for the NYSHPO to incorporate or to review the comments made by the Consulting Parties.

On reflection, we're talking about

Page 132

changing that to 21 days, which basically gives NYSHPO a week to pick up on the comments that all of you are making. But it gives you three weeks which you'll be talking about.

Each one of these will be worked on. The Hudson River Bulkhead, we don't have too much information yet. That's why we'll have to develop a treatment plan. That will all be on the website for all of you to consider. The archeological resource is same thing. We really don't know yet until we get some of the building down and start some of the underground work. So the temporary relocation of some of the elements on this site. We've talked a little bit about relocating the footprints on the perimeter. Take it out to Hanger 17 and then bring it back. We'll have to move the Cross at some point. And some other artifacts may have to be temporarily relocated. It's the same situation we had from the beginning when we talked about do to the artifacts that are

Page 133

off-site contribute to the site? You can decide yes, they do, and they're brought back. That was the decision we made a long time ago.

We'll talk about the next steps in your comment period. Due November 19th. We really need that. We'll be working towards the final MOA. We're talking about another meeting now to talk about all these things and then end up heading towards the final.

That's the way the process is playing out. That's about a five-minute solution.

MR. JOEL KLEIN: Quick question.

You said it will be the final, so there's going to be no interim draft? The next version that we see will be the final version?

MR. JOHN HOTOPP: We haven't toyed the final yet, Joel. May or may not be another version.

MR. JOEL KLEIN: That's my question.

MR. JOHNSON: We're heading towards the final.

Page 134

MS. CHARLENE VAUGHN: Do we have to have a meeting for that final iteration, or can we look at it and send you comments electronically to keep it moving?

MR. JOEL KLEIN: That's fine.

MR. BILL WONG: We'll see how it plays out.

MR. BILL LOVE: The 14 days of the 21-day to comment period on each of these plans, will it be our responsibility literally to check the website everyday, or will we get some e-mail notification?

MR. BILL WONG: We'll give you a notification.

MR. PETER GOELZ: All right.

MR. ANTHONY GARDNER: I have a question. I think Ken Lustbader touched on this earlier, John.

The Coalition of 9/11 Families has a lot of concerns with the MOA, I shouldn't say a lot, but a very significant concern, that LMDC, and we've mentioned this before, we feel really needs to be a signatory on your MOA because we have

Page 135

concerns about how the cumulative affects of their ongoing projects with your own, and especially considering their programmatic agreement is so vague, all they need to do is provide what they determine to be appropriate access to column remnants that form portions of what they call the lower footprints; which, there's no lower or upper footprints. Those are the footprints.

That's really the main comment we'd like to get to you before we move to this final comment because it's something that we feel is so necessary. Otherwise, in our view, all of the work that we've all put into this is rendered meaningless because at the end of the day, FTA and the Port Authority might work towards doing the right thing and spell out percentages that are going to be preserved and mitigation plans we could all wrap our arms around, but then LMDC -- it's the same example like they talked about the Vesey Street staircase which many people advocated for the

Page 136

preservation of. Port Authority came up at one meeting and said, "Don't worry, our plan won't impact it, but we can't tell you the effects that LMDC will have it on it."

So that's a really good sort of anecdotal example.

MS. CHARLENE VAUGHN: I think subsequent to executing the LMDC agreement, we worked with FHWA to include in their agreement. And I think it's proposed in this agreement, a concept that talks about coordination among the agencies. And perhaps what we need to do is explore that in greater detail when we have the next meeting, understanding what kind of commitments are made. Because it seems to be binding, and I don't think any of us will really know the particulars of that. So maybe that could be shared and discussed because I don't really understand it. But it seems like it's a formal arrangement and it does get to cumulative effects, coordination that we don't know a lot about.

MR. PETER GOELZ: So the 15th or 16th. We'll try to do it on the 15th to coordinate with the site visit. Thank you all.

(The hearing was concluded at 3:55 p.m.)

C E R T I F I C A T I O N

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

I, GINA M. D'ADAMO, a Shorthand Reporter and a Notary Public within and for the State of New York, do hereby certify:

That I reported the proceedings in the within-entitled matter, and that the within transcript is a true record of such proceedings.

I further certify that I am not related, by blood or marriage, to any of the parties in this matter and that I am in no way interested in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand this 9th day of November, 2004.

_____
GINA M. D'ADAMO
NOTARY PUBLIC

A
abbreviated 129:22
ability 37:11 40:8 43:20 59:15
able 12:18,19 16:21 26:17 27:16,20 28:11 29:13 30:11 33:25 36:10,24 43:6,8,16 61:20 65:1,4 99:11 114:3 116:14 127:25
ABNY 5:4 51:16
absolutely 21:20 110:17 124:2
academic 123:19
accepted 7:16 81:12
access 17:25 93:18 135:6
accessible 124:4
accommodate 30:6 30:11 40:19 68:2 74:18 97:9,12
accommodating 75:3
accomplish 37:1 44:17
accomplished 129:14
account 60:18 61:2 91:23 93:2
accurate 22:1,7 60:8
achieve 68:25 114:25
achieving 120:23
acknowledgment 85:1
acre 122:8,10
acres 119:2 122:6,7 122:11 126:11
Act 3:14 6:7 49:4
actively 8:25
actual 22:21 60:1 72:13 78:15 89:17
ad 82:14
ADA 35:12
Adam 4:15 50:23
Adams 5:4 51:16
added 13:8 40:15
adding 97:20
addition 19:13 20:2 29:18 35:5 36:7 37:4,17 39:3 45:6 53:12 115:10
additional 6:24 7:2 12:23 17:1 24:1 56:14 82:6 85:15 93:4 95:16 117:19
address 18:19 25:16 34:17 83:24
addressed 81:19
addresses 78:10
adequate 35:18
adhered 106:10
adhering 108:22 110:10
adjacent 73:18
Administration 4:20 6:10 51:4 106:6
administrative 11:10
advance 104:20
adverse 81:20
adversely 63:24 80:22 81:17
Advisement 3:23 49:17
advisory 102:8
Advocate 3:13 49:2
advocated 135:25
advodate 109:21
aerial 21:17
affect 42:11 43:20 81:20 98:14 112:2 122:25 123:2
afternoon 6:1 10:23 13:18 24:4 130:8
agencies 7:17 102:4 123:13 136:14
agency 107:11 131:12
agenda 129:14
aggressive 37:7
ago 75:16 109:13 112:19 133:4
agreed 124:2
agreement 6:21 9:24 11:11 127:12 128:14 130:23 135:4 136:10,11 136:12
ahead 52:6 87:19 118:6
ain't 111:12
Albert 3:18 49:10
alighting 30:17 54:21,22
alightings 55:9 56:24
Alliance 3:17 4:19 49:8 51:2
allow 26:12 27:21 31:16 36:15 39:11 41:10,15,20 64:4 75:12 79:6 87:25 91:15 119:17
allowed 14:19
allows 28:15 36:3 37:4 44:13
alter 116:23
alternative 39:5 90:14
alternatives 37:24 39:4 45:22 47:17
American 5:8,10 51:21,23 89:1
amount 18:3 30:5 73:20 75:22 114:9
analyses 70:1
analysis 7:11,15 8:8 9:11 32:21,23 69:18
analytical 70:12
anchor 47:5
anchors 47:5
Andrea 5:2 51:15
anecdotal 58:13 61:13 136:7
Annie 5:8 51:21
anniversary 17:5
announcement 100:4
answer 15:24 16:1 64:11,12 69:10 76:4 78:7 104:5 105:21 108:8 113:9 116:18
answered 85:11
Anthony 3:9 16:3 16:25 18:5,13 20:18 21:1,16 48:19 96:8,8 97:19 98:12 99:1 99:25 100:19,21 110:25 111:15 113:9,17 122:2,16 134:17
anticipate 14:3 86:25
anticipated 12:22 35:15
anticipating 52:13 86:24
antique 126:19,20
antiques 126:19
anxious 86:13
anybody 54:15 119:24
anymore 43:3 126:2
anyway 42:22
apologize 104:20
appearance 111:5
appendix 9:6,9 54:12
apply 8:8
appreciate 52:10 93:24 118:2
approach 117:8
approached 128:2
approaches 25:20
appropriate 19:1 135:6
approximately 25:7 32:8 33:1 35:1 36:1 67:9
arc 131:6
arch 45:10,12,16 46:14 47:2,12 78:14
archeological 132:12
Architects 5:5,9,10 51:17,22,24 89:2
architectural 75:8 75:11 78:4
architecturally 94:25
architecture 67:2
Archives 19:24
area 12:22 13:6 14:12,14 17:20,23 31:16 32:4,5,24 32:25 34:8 35:2 38:2,6,9,11 39:7 39:12 40:9,11,18 41:3 44:23 45:3 45:11,20 46:3,17 46:21 57:22 60:19 62:6 71:2 73:2 74:13 75:23 77:14 77:18 80:25 82:4 82:16 86:8 98:7 116:8
areas 12:16 13:4 14:16 15:8 18:6 62:5 81:2 131:7
argue 64:8
Arizona 123:6
ARKF 4:17 50:25
arms 135:22
arrange 19:16
arrangement 82:8 136:23
arrived 95:1
Art 4:7 50:10 125:6
artifact 63:18 114:21,22
artifacts 20:3 111:8 112:20 113:25 114:2,10,19,19 132:22,25
Arts 3:5 48:14
aside 129:15
asked 7:7 104:4,6 105:22 110:25 123:24
asking 14:17 95:12 105:10 106:21,23 122:21
aspect 92:6
asphalt 18:2
assemble 14:13
Assembly 121:2
Assessment 7:9
Associates 5:17 49:1
association 5:7 51:20 92:18 105:25
assume 63:4
assumed 10:13
assuming 60:5 104:14
assumption 118:19
as-builts 22:15,20 22:24
attack 110:6 113:10
attended 10:12
attending 15:3,20
attention 71:23
attest 102:9
attract 67:23
August 6:19
authentic 78:6,10 90:2 103:5,8 116:15
authenticity 89:19
authorities 108:4
Authority 1:14 2:1 2:18 7:7 8:25 11:19 50:2,3,4,6,9 50:12,13,19,21 51:9,10,14 52:4 54:10 56:8 69:19 70:7 89:4 92:20 93:21 98:15 99:5 99:10 110:18 112:6 121:5,14 135:18 136:1
Authority's 7:1 9:2
automobile 83:13
available 7:8 9:4 12:8 13:6 18:23

105:2
avoid 47:7 99:22
aware 18:12 76:8
awe 85:2
a.m 13:17 54:18

B

B 33:10,18
back 10:13 15:21 19:17 20:15 38:19 61:9,21 62:11 64:2 68:22 74:3 86:4,4,14,16,17 87:18,25 89:7 90:7 100:18 103:14 104:2,17 110:22 118:14 120:12 132:20 133:3
backfill 46:20
back-office 56:16
bad 27:24
balance 10:2 54:20 68:15 101:12 120:20
base 17:15 77:1 78:14 79:3 104:1 107:24
based 55:4 63:2 69:4
baseline 22:8
bases 22:22 44:24 76:16 79:20 81:9
basically 23:11 25:13 30:20 66:13 73:4 98:23 99:14 115:8 116:6 118:9 132:1
basis 27:9 79:8 94:11 116:22
bathtub 41:3,25 79:18
Battery 4:12 5:11 5:12,14 50:18 51:25 52:2 59:3
battle 123:7
beam 119:18
becoming 52:25
bedrock 122:12
beginning 100:11 132:24
belief 85:7
believe 10:11 32:22 68:14 83:19 84:6 84:7 95:13 119:22 120:7 126:9
believes 67:19
Bell 5:10 51:23 88:24 89:1
belongs 103:22
Ben 4:19 51:2 113:8
benchmark 70:17
beneath 101:4
Berger 4:14 19:8 50:22
Berlin 89:23
Bernard 2:6 3:2 6:1 6:8 11:2 48:10 54:9 55:5 57:8 65:9 69:14 73:8 75:5 76:19 79:5 95:14 97:11 105:1 106:1,11 123:20
Bernie 50:8 54:9
best 18:18 107:11 107:12,14 108:1,3 108:15 109:2 110:9,11 113:19 113:22 114:8 117:7 121:22
Beth 4:2 49:19
Betsy 3:6 48:15
better 20:24 21:10 75:3 78:8 118:6
beyond 40:8 63:4 69:24 70:10,12 95:17,18 96:6
big 62:2 78:17 88:3 125:15,16
bigger 110:7
Bill 2:9 4:5 49:23 58:13 59:20 61:3 115:7 116:3 134:7 134:9,14
billion 43:22 120:14
binding 136:18
bit 15:7 46:24 47:10 59:21 69:16 92:25 94:5 132:17
blood 138:14
blown 23:6
blow-up 39:10
board 4:13 31:18 50:20 82:12 83:20 84:2 87:21 106:2 110:23 121:16
boarding 28:6 34:15 41:16 55:1 55:12
boardings 56:9,21
box 8:23
boxed 119:18
BPC 60:15
Braegelmann 4:20 51:3
brain 90:13
branches 61:19
break 12:20 129:9
bring 40:14 80:2 83:14 85:10 86:16 86:16 90:7 102:25 111:18 132:20
BROADWAY 1:15
Brooklyn 62:5
brother 101:1,14
brought 13:4 80:12 83:3 133:2
Bruce 3:7 4:13 48:17 50:20 82:11 82:11 86:18 114:14
Bruce's 113:18
build 7:17 32:12 42:22 43:17 56:14 107:5
building 36:9 37:1 37:8 44:18 53:9 59:5,6 70:14 71:11 98:24 132:14
buildings 60:21 62:3,16
built 45:13 65:14 85:20 121:19
Bulkhead 132:7
bullet 100:21
bunch 104:19 110:19
Burk 5:2 51:15
Burns 22:14
buses 60:22
Bush 120:12
business 58:14 62:7 88:1 110:2
businesses 59:8 88:9,10,18
B-5 23:8
B-6 23:8

C

C 32:16 33:18 40:25 41:1,1 44:2 138:1 138:1
calculation 32:2
call 113:9 126:7 135:8
called 23:9 85:16 85:18
candle-leaf 77:20 77:23
capability 88:3
capacity 6:25 7:3,9 7:13 8:13,14 24:12,22 25:9,14 29:22,23 31:15 32:11 33:5 34:2 35:13 52:14 58:25 64:9,11,13,17 65:13,18 66:2 67:4 88:7 95:17 95:21 99:15 104:12,15,24
capital 26:6 96:24 97:2
Capsutto 3:18 49:10
capture 53:25
care 27:12 74:18 101:20 102:2 111:13,15
Carol 4:20 51:3
carried 24:19
carry 26:17
carrying 25:7
cars 26:10 32:14 33:18 96:17,20,20 97:5,6,13,18,20
case 8:19 40:1 64:1 96:17 97:20 108:12 115:9
cases 80:21
catacombs 102:13
causes 115:15
caveat 13:20 14:2,8 14:20 16:5
CB 5:15
CD 20:8,10
center 3:14 6:4 10:5 20:3 23:2 24:16 25:1,19 26:24 27:5 28:24 29:7 30:15 33:20 35:4 36:6 38:10 39:8 44:9 46:13 49:4 54:25 56:9 56:25 57:17,18 62:7 64:25 81:14 81:18 82:23,25 88:22 91:8 97:16 98:3 103:6 120:18 125:23 126:15
centers 62:9
central 88:17
centuries 102:12
ceremonies 12:25
certain 8:5 30:18 62:22 69:25 70:13 73:19 123:10 126:24
certainly 53:24 54:15 70:22 78:8 83:21 87:13
certify 138:8,13
CHAER 84:1
challenge 99:9 110:15
chance 111:19,21
chances 21:22
Chang 4:23 51:8
change 16:13 63:20 64:7,10
changed 23:12 108:6
changes 25:22 41:25
changing 132:1
Charlene 3:23 49:17 128:11,22 130:9 134:1 136:8
Charles 4:9 50:14
check 22:21 134:12
children 84:5,5,14 85:6
chip 126:21
Chirifan 4:6 49:25
choice 58:22 62:11
choosing 59:9,13
chose 128:25
Church 62:21
circulation 31:2 40:6 73:21 74:6
Circus 125:20
city 4:10,12 5:11,13 5:14 13:5 50:16 50:18 51:25 52:3 56:4 59:3 83:2 126:2
City's 121:22
clarification 65:10
clarify 16:9 73:8 79:6
clean 12:18 15:7 16:10
cleaned 13:11 16:12 130:11
cleaning 11:24 12:6 12:21 13:21 18:17
clear 8:10 30:18 64:1 73:9 81:3 104:10 119:21
clearance 8:1 35:16 93:22 98:7
clearances 39:18
clearly 59:7 61:10 62:10 129:1 131:2
clears 93:25
close 25:9 58:6
Coalition 3:7,9,12

4:3,5 48:18,19,23 49:21,23 96:9 134:20
coaster 66:14,15 85:22
Cohen 3:2 6:1,8 48:10 69:14
coincidence 111:3
coincidental 57:24
Coleman 2:14 51:10
Colgate 53:15
collapse 15:9
collapsed 85:3
colleague 58:15
column 8:23 22:22 44:24 47:13,25 78:13,16,16 79:2 79:3 81:7,9 130:25 135:7
columns 17:15 34:24 35:6,7 36:2 37:23 38:3,8 40:12 41:7 45:4 45:20 46:11,19,22 47:7,9,16 71:23 72:11,14 76:18 80:6,8 81:1,24 82:6 91:24 98:17 119:3,18,25 120:2 120:4 130:11
come 13:7 19:17 22:14 23:21 26:20 31:23 45:7 67:9 73:16 83:25 84:22 85:5 86:4 109:19 110:16 111:7 114:16 118:1 119:23
comes 26:3,4 30:21 31:18 34:7 46:14 47:1,13 58:19 95:24 111:24
coming 6:13 16:17 28:9,23 30:16 31:8 42:12 47:2 56:24 64:2 66:16 68:22 71:2,3,5 73:5 82:14 96:1 100:18 124:5 131:10
commend 89:4
comment 11:16 71:21 74:11 80:3 96:11 99:3 100:1 109:25 116:10 121:15 128:24 130:2 131:19 133:6 134:10 135:11,13
commented 90:11
comments 11:4,17 19:4 48:4 66:5,19 110:3,4 117:23 130:3 131:21,24 132:3 134:4
commercial 14:23 62:8
Commission 4:11 5:15 50:17
commitment 39:1
commitments 136:17
committed 36:17
committee 114:12
common 7:15 29:4 68:25
commonly 21:4
communication 76:9
community 4:13 50:20 82:12,25 83:20 84:1 86:12 86:20 87:21 121:16
commute 29:9 34:18 35:20 41:21 52:19 53:13 54:8 55:19 57:5,6 61:14 67:11 89:2
commuter 30:10 91:12
commuters 84:9,15 86:16 90:19
commuting 53:3 54:7 94:18
companies 61:18 61:22
company 123:20,23
compared 38:4,11
complete 14:1 126:17
completed 13:11 20:4 36:21 60:20 60:21
completely 85:20 114:15
comply 27:1 35:12 106:18 110:9
comprehend 102:19
comprehensive 128:15
compromise 88:19 88:20 114:5,24 116:22 118:5,23 120:24 122:13,18 122:19 123:9
compromising 114:9
concept 75:8,9,15 83:9 136:12
concepts 78:25
concern 134:23
concerned 55:8 56:7 57:10 58:11 59:22 69:21 74:16 75:19,24
concerning 6:20 34:2
concerns 7:6 11:5 52:10 60:11 94:3 134:21 135:1
concert 27:2
conciliatory 109:9
concluded 52:5 137:5
conclusion 59:17
conclusions 7:12 8:12
concourse 82:23
concrete 18:9 80:8
condescending 10:7
conditions 58:23
confidence 70:3
configuration 11:6 33:16,21 42:21 79:12,23
confirm 13:14 15:19,21
conflict 93:14 94:7 95:7
conform 98:9
conformance 27:1
congestion 99:18
Congressman 3:13 49:3
conjunction 37:13 42:25 130:10
connection 93:6
Connor 3:21 49:14
Connor's 86:7
consequences 108:16,22
conservative 59:1 70:20 92:25
conservatively 71:5 71:16
consider 71:15 72:10 120:1 132:11
consideration 19:25 70:5 74:12 75:21
considerations 72:5
considered 72:21
considering 47:18 135:3
consistent 68:3
constrain 40:8
construct 106:17
constructing 95:15
construction 9:25 17:18,21,22 22:9 36:9,18 37:14 42:20,24 43:12,19 43:24,25 44:14 45:2,8 46:9 47:20 65:19 104:9 110:2
consult 21:14
consultant 4:9 19:8 50:15
consultative 11:1
consulted 19:22
consulting 1:9 6:2 6:17 7:8 10:8 12:8 13:13,15 14:18,22 22:11 54:12 76:1 107:12 107:14 112:10,15 112:18 131:20,24
contact 15:15,16
contemplating 76:22 79:24
continue 6:14 25:15 56:21 68:15 68:24 95:6 103:15
continued 4:1 5:1 56:10
continues 13:24 56:15 57:23
continuing 56:19
contribute 133:1
control 16:16 73:17 73:21,25
convenient 62:15
conversation 83:25 128:25
conversations 102:6
convincing 115:9
Conway 4:17 50:25
coordinate 137:3
coordination 136:13,24
cope 87:5
copy 11:13 20:7
core 80:7
corner 35:2 44:21 53:8 72:1,2 77:12 117:12,16
corporate 62:9
CORPORATION 2:18
correct 9:12 17:9 76:20 96:22 118:21
correctly 118:12
corridor 73:5,13,18
cost 8:18 87:13 115:18
costs 40:15 43:19
Council 3:11,23 48:22 49:17
Councilmember 5:16 59:19
councils 102:8
country 103:7 107:8 123:3,13,25
COUNTY 138:3
couple 59:4 66:18 77:2 96:10
court 111:6,12 118:10,15 129:9
cover 44:22 106:5
covered 118:13
covering 119:10
crash 17:20
crater 23:5
create 76:22 87:8 93:5 94:3
created 76:12
creates 40:3 42:15 43:14 88:17
creating 119:14
creative 110:20 120:10
credibility 69:24
credible 70:12
cribbing 78:18
criteria 44:3
critical 87:23 88:6 88:23
Cross 132:21
cross-flow 28:13 29:2,8 35:22 41:17 99:17
crowding 115:17
culminate 9:24
cultural 45:14
culture 103:2,4
Cumming 4:2 49:19
cumulative 112:2 135:1 136:24
current 54:2
currently 9:13
curve 42:2,3,5 43:10
customers 28:2

29:6,14 31:10 37:6
cut 61:6,8 108:17
cutting 61:9
cycle 71:7
C2 9:7,9

D

D 7:3 11:6 23:23 24:7 33:11,23 46:4 47:1,12 74:12 95:11 97:24 104:15 115:11
daily 27:9 67:13 94:18 119:14
Daly 4:10 50:16
damage 23:4
damaged 15:8
Dan 3:19 49:12 66:18
data 7:10,22 96:18
date 115:18 130:4
dates 13:13 16:13 16:14,14,23
Dave 5:11 51:25 61:12 118:18 122:15
David 122:4,23
day 24:20,25 25:6 30:9 62:22 84:3 111:4 119:12 135:17 138:19
days 13:25 25:8 62:21 131:18,20 132:1 134:9
day-to-day 84:9 94:11
deadline 130:1
deal 112:6
dealing 70:18 127:11
dealt 80:16
Dean 5:6 51:18
debate 23:24
Debra 4:21 51:5 120:25,25
DeCell 3:7 48:17
December 11:14
decide 133:2
decided 61:5 115:21 118:4
decision 65:15 66:7 66:17 128:3 129:1 133:3
decisions 47:22 68:25 69:2 88:12 128:6
decline 57:20,23,25
dedicated 28:5 34:15 41:15
defined 98:17
degree 84:21
delay 16:8,12
delineation 94:23
deliver 43:21
demand 10:3 26:7 57:15 63:6
demands 42:23
denoting 72:16,22
Department 4:15 50:24
depend 62:7
dependable 62:12
dependent 13:23
depending 16:22 79:9
depends 121:18
deported 89:24
describe 17:9
described 16:15
deserve 131:3
deserves 116:17 117:2
design 4:24 9:25 22:2 29:17,20 30:3 38:15 39:19 45:9 47:3 51:11 52:15 55:10 56:13 56:23 64:2 72:4 76:7 77:5 110:11 110:15 112:22 113:1,6 115:4 128:2,7 131:9
designed 25:5 26:25 95:19 120:24
designing 66:14 77:10 107:18
design-wise 127:19
desirable 71:2
destroy 103:3
destroyed 122:9,14
destroying 80:20 103:11 124:25
detail 80:14,21 136:15
detailed 78:24
determination 80:10
determine 135:6
determined 8:15
detrimental 87:9
develop 132:9
developed 131:8
development 6:20 56:3,14 60:5,6 67:21 70:24,25
diametrically 114:15
died 85:4
difference 33:22 91:6 119:13
different 29:3 38:3 38:11 47:4 61:19 63:9 68:8 74:25 75:10 77:25 79:7 107:7,9 126:20
differently 64:16
differing 94:13
difficult 12:15,17 14:1,6 91:3 99:9 100:23
diligence 88:8
diminish 69:25
diminuation 92:2
direction 91:5
director 6:9
disabled 27:13
disadvantages 90:18
disappointing 121:24
disaster 125:24
discouraged 60:22
discuss 23:16,25 81:15 83:5 98:19 112:5
discussed 6:19 69:13 81:24 128:1 136:21
discussing 9:1 18:16 83:6 108:21
discussion 7:4 11:7 11:21 23:20,24 48:8 52:18 83:22 90:7 129:2,12
discussions 82:1 101:17 103:19
dismal 90:22,22
distance 8:6
distant 65:20 91:1
distributing 91:10
District 56:17 111:6 111:12
Districts 3:10 48:21
disturb 47:16
disturbed 45:5
disturbs 117:14
diversified 59:10
document 22:8 23:11 104:25 105:5,11,18,25 106:12
documentation 12:7 19:2,4,5,7,9 19:19,20 20:14,19 21:2 57:21 106:4
documented 55:25
documents 9:11,17 56:2 98:14
dodging 100:8
doing 19:7,9 23:17 26:19 39:1,13 64:19 69:23 95:22 108:21 110:10 111:4 120:22 125:10 131:6 135:19
dollar 43:22
dollars 88:13
donate 120:4
door 53:7 85:23
doors 26:10 28:10
dotted 46:7
double 68:21
Downtown 3:17 4:19,24 29:10 34:20 49:8 51:2 51:11 54:1,6 61:16,20 62:1,4 62:16 67:10,23 68:5,20 82:15 86:9 124:12,15
draft 9:10 11:13 80:5 98:14 133:17
drain 14:5
drama 126:8
draw 8:12
drawing 21:10 110:23
drawings 21:3,6,11 22:1,4,7,9,16 78:24
duct 76:14 77:7
ducts 76:9,10
due 11:12,12,13 15:1 88:8 133:6
Duprey 19:14
D'Adamo 1:23 138:5,23

E

E 53:20 138:1
eager 93:19 95:6
earlier 66:22 80:1 109:13 134:19
early 11:14
easier 89:6
easily 28:12
east 53:3 79:11 124:13
eastern 81:18
east/west 73:5,13 73:18
easy 27:22 68:4
echo 109:25
economic 87:24,25
economy 68:21
education 67:3
effect 31:7
effecting 10:9
effective 7:20 32:4 32:25
effectively 41:20
effectiveness 108:17
effects 136:4,24
efficiency 26:18 130:14
efficient 29:14 130:12
efficiently 26:13 28:16 61:23
effort 23:8 120:17
Ehrmann 4:13 50:20 82:11,11
eight 96:19 97:16
eight-car 96:23 97:1
either 15:3 53:17
elected 60:12
electrical 76:9
electronically 134:4
element 31:2 40:6 62:14 74:6
elements 19:12 73:22 84:11 90:2 113:5 132:16
elephant 110:25
elevating 66:12
elevators 7:25
eligibility 80:11
ELIZABETH 116:9
emblematic 89:11
Emergency 3:3 48:12
emotional 84:21 89:24 92:13
emphasize 15:14
encounter 94:11
encumbered 90:24 91:20
encumbrances 91:2
end-to-end-all 38:22
engaged 8:25
engine 106:3
engineering 67:1

115:5 126:6
enter 23:19
entered 13:2
entering 10:25
enthusiastic 101:6
entire 19:11 24:18 25:17 26:9,19 36:5 64:5 126:17
entirely 61:8 127:10
entrance 14:12
environmental 9:14 56:1
equipment 42:17
equivalent 30:20
err 70:19
escalator 31:2
escalators 7:25 40:2 73:24 74:2
escalator/stairway 117:16
escort 14:14
especially 29:6 82:16 120:3 124:22 135:3
essential 108:14
essentially 79:12
establish 54:5
established 43:18 63:17
estimate 54:13
estimates 59:1 60:7 60:10
Estrada 5:12 52:2
etched 126:3
Europe 102:11
evaluated 8:16
evaluating 7:14
evaluation 9:18
evening 30:10,12 31:14
everybody 109:22 121:7 123:11 125:15 130:5
everyday 62:19 84:18 89:3 134:12
evolved 94:5
exact 32:22
exactly 22:17
exaggeration 68:6
example 8:4 57:5 58:21 135:23 136:7
examples 112:19
excavate 46:17 47:14
excellent 89:14
excess 54:19 58:7,8
Exchange 29:1 97:8
exciting 70:25
executing 136:9
executive 9:8
exercise 131:22
exist 123:14
existed 46:23
existing 79:3 81:11 91:24
exists 103:4 123:3
exit 91:4
exiting 92:3
exorbitant 115:19
expand 65:2,3 83:19 85:19
expanded 12:25 97:9
expansion 64:24 85:16,18 97:6
expansive 128:15
expectations 97:21
expecting 54:18 58:4
expects 81:21
expensive 120:9
experience 75:13 76:24 94:23
experiencing 60:2
experts 67:1,2
explains 7:10
explanation 104:7
exploit 113:4
exploration 116:18 117:3,19
explore 136:15
exposed 84:16 117:5
expressed 7:6
extended 53:11
extension 93:3
extensive 21:3
extent 16:19 107:15
exterior 46:12
extra 96:6
extraordinary 111:3
extremely 94:20
e-mail 13:14 15:16 15:17,25 20:5 130:5 134:13
e-mails 66:23

F

F 138:1
facetious 109:18
facilitated 17:25
facilitating 10:21
facilities 7:18 45:13 45:15
facility 70:21 106:18 107:7 108:18 119:16
fact 52:12 53:1 54:7 60:19 61:16 69:20 75:13 76:25 102:9 107:25 110:21 113:4,23
factor 16:6
factors 7:24 70:4 97:23
facts 123:10
faculty 67:23,25
fail 32:19
failed 82:2
fails 32:24
failure 27:12 30:25 31:4,4,21 34:14 35:24 40:1 98:10
fair 73:16,20,25 100:14 122:12
fairly 23:20
familiar 14:11 52:23 53:12
families 3:8,9,12 13:2,7 48:18,20 48:24 92:12 96:9 102:15 109:17,20 117:25 118:4 122:17 125:11 134:20
family 14:12 17:4 100:24 110:1 124:24 125:9
far 16:4 33:2 55:8 56:7 57:9 58:11 64:9 65:16,20 74:5,15 75:11,18 76:2 77:7 97:17 101:23 127:11
fault 123:12
favor 67:15 125:8 125:11 130:13
fax 15:16,18
FDA 106:15
feasibility 8:19 39:15 40:21 43:2 47:19
feasible 43:3,13
features 52:16 80:9
federal 4:20 6:9 51:3 66:8 106:6 120:5,7,7,21
feedback 75:17
feel 68:12 69:6 80:18 82:20 84:14 84:15,15,16,18 85:2 93:11,16 112:23 114:4 128:16 134:24 135:14
feeling 89:25
feelings 94:14
feels 111:15
feet 32:5,8 33:2 73:22 74:16 103:9
Fernando 3:16 49:7
ferries 61:6 62:16
ferry 53:18 57:12 57:20,23,25 58:16 58:18 93:7
FHWA 136:10
fields 123:7
fifteen 100:7
fifth 27:11 41:24 46:5
fight 103:15
fighting 122:20 126:23 127:2
figuring 64:20
filibuster 100:3
fill 13:4 18:3 115:21 119:9
filled 17:23
filtered 92:10
final 9:14 10:25 11:13,13,16 133:8 133:11,16,19,21 133:25 134:2 135:13
finally 82:24
financial 56:17 93:9
find 13:18 114:16 114:20
finding 101:12 118:23,24
fine 105:21 134:6
finish 23:15 38:18 46:19 88:5 122:16
finishes 78:4
firmly 93:11
first 46:16 52:7 61:12 66:6 71:24 104:3 109:8 111:5
fit 119:19
five 24:14 27:7 31:24 33:14 41:2 41:7 44:25 63:11 96:16 111:13 122:7
five-foot 117:10
five-minute 129:9 133:13
fix 116:3
fleet 26:9
flexibility 61:24
flip 33:7
floor 72:13,15
flow 34:17 39:21
flowing 35:10
focus 11:3 23:16 58:25 129:20,23 131:5
focused 128:12
focusing 11:24
folks 10:24
follow 22:2 34:1 106:25,25 107:1,2 107:16 108:5 109:2
followed 106:16 108:15
following 29:21 66:23 70:23
follows 107:6,8
foot 75:23
footing 17:14 45:17 46:15,20 47:4,15 78:13,15 79:16
footings 8:23
footprint 13:2,3 14:15 17:7 34:22 35:3,25 36:1 37:22 39:8,10,17 41:9 44:20,23 63:16 64:5 74:15 74:24 77:19,21,23 81:4 85:23 87:16 94:9,12,24 117:17 118:13 119:3 122:8 127:21,24
footprints 8:22 11:25 12:6,14 13:11 16:11 17:4 18:16,17,23 19:10 19:18,20 21:19 22:5,8 74:14,17 81:2 93:16 98:18 98:22 103:9,16 108:19 112:1 122:6 123:2,14,23 124:3,8 128:13 129:2 132:18 135:8,10,10
footwear 15:4,13
force 42:3
forced 128:23
forecast 25:9
forecasts 7:23
foreseeable 70:6
forever 64:14 65:7

92:9
forget 109:16
form 129:23 135:7
formal 136:23
formed 17:15
Forst 5:16 59:18,19
forth 61:21 62:11 80:9 106:9 113:7
forum 112:3
forward 6:16 9:2 12:5 68:23 102:17 113:4
found 112:21
foundation 78:17
four 31:24 45:19,23 46:18,21 47:8,16 47:23,25 66:3 99:21 119:2 122:6
fourth 6:2 24:7 33:12,22,24 34:10 35:7 36:10,23 37:21 44:11 46:4 92:23 93:12,15 95:5
fragments 89:12
frame 37:15 66:10
Frank 3:5 21:25 22:5,18,25 48:13 62:24,24 89:17 92:8 104:3 110:4 110:12 112:17 127:17,17
Frank's 104:11
frequencies 7:24
frequency 57:14
frequently 53:16 111:25
fresh 90:17
friction 28:13 55:22
Friday 13:15 111:2
front 86:5 112:25
FTA 3:2 4:9,18 6:13 6:14 7:6 48:10 50:14 51:1 69:8 69:15 98:14 106:8 135:17
FTA's 9:22
full 21:19 35:8 40:17 43:9 44:1 96:5,20 97:1 98:3 116:24 122:8
fullest 107:15
fully 66:15 68:7 97:9 121:11
full-width 95:15 96:4
function 85:9
functionally 7:20
functioning 62:6
fund 3:4 48:12 120:16
funding 6:12 66:9
funds 120:7,8,8,21 120:22
funneling 40:4
further 16:13,24 40:6 41:2,25 116:17 138:13
future 7:21 10:2 22:4 26:11 27:7 33:6 35:10 40:23 60:8 64:10 65:17 65:20 68:5,16 69:9 85:25 86:24 87:1 113:22 114:6 114:23

G

gain 75:25 115:12
game 118:23
gaps 43:11
Gardner 3:9 16:3 16:25 18:13 20:18 21:16 48:19 96:8 96:9 97:19 98:12 99:1,25 100:19,21 113:17 122:2,16 134:17
Gate 14:9
Gaull 4:3 49:21
Geld 4:12 50:18
general 68:10
generally 55:9 81:12
gentleman 10:20 86:2,23 100:13
gentleman's 116:13
geographically 59:10
geometry 42:1,14 43:4,8
Gerson 5:16
Gerson's 59:19
gesture 117:13
getting 21:22 28:14 29:3 35:16 41:18 54:24 62:11 120:9 120:10
Gettysburg 123:7
Gimayo 2:15 51:13
Gina 1:23 138:5,23
give 12:3 46:2 95:16 111:20 116:25 128:17 129:8 130:16,19 131:22 134:14
given 56:20 90:17 93:12 131:20
gives 61:24 96:5 132:2,4
glass 72:14 89:22 92:5
Glenn 2:13 51:9
go 9:20 38:19 42:4 43:19 44:19 48:5 52:6 53:19 55:18 56:15 61:4 65:4 67:14 74:1,20 84:16 85:21 86:3 86:19 87:18 92:25 97:15 100:19 109:17 110:22 113:21 115:13 119:17 120:12 123:4,6 125:19 127:18 129:17
goal 9:22 37:1 44:18 65:24
goals 41:13 44:1 69:1
Goelz 2:11 10:22,23 20:16 21:21 23:18 38:18 48:2 52:6 86:1 87:18 100:2 100:9,18 105:6,10 105:15,19,24 107:21 108:3,13 108:25 109:11 111:17 118:16 121:24 127:15 128:8,20 129:6,11 130:13 134:16 137:1
goes 6:15 31:3 39:7 46:8 64:24 72:6 78:16,17
going 10:10 11:3,9 11:20 12:17 16:7 20:8 22:2 23:14 23:18 27:25 31:25 45:12,25 48:7 53:14 54:17,23 55:2,10 56:1,3,6 56:21,25 59:7,11 60:3 62:4,7,17 63:7,11,12,19,21 64:1,4,7,8,21,22 65:1,4,17 69:11 70:8,10 71:1,4,10 71:18 72:18,19 73:24,25 78:2 80:24 81:1,16 82:4 84:18,20 85:21 88:20 90:20 91:10 92:1 96:11 97:8 98:22 99:5,8 99:16 102:24,25 105:9 109:12 111:13 112:8,11 113:21 114:5,22 115:1 118:10,14 119:3,7,9,11 120:3,12,17,19 122:24 129:18 133:17 135:20
good 6:1 10:23 24:4 65:11,16 68:25 71:8 87:25 111:7 115:4,5 129:3 136:6
gotta 103:12
government 10:7 104:25 105:4,13 105:18 120:5 130:15
great 61:15 62:23 88:17 112:19 124:16
greater 7:13 26:18 136:15
grillage 79:17
ground 114:20 120:11
group 112:5,13
groups 127:8
Grove 97:7
grow 62:3 67:22 83:12 88:1,2 99:14
growing 25:13 29:11 34:20 41:21 55:14 56:25 68:19
grows 60:19
growth 24:24 25:15 25:16 26:21 27:4 28:17 29:13 33:6 34:12 36:4,4 40:23 67:18,20 68:5 69:20,22 70:10 71:7 86:25 87:1 96:6 98:6 103:20
guess 74:10 117:25
guidelines 34:4 98:10 107:9,17,17
guys 109:10 110:16 110:22
Guzi 2:13 51:9

H

HABS 19:24 20:20 20:21 21:12
HAER 19:24 20:20 20:21
half 122:8,10,13,20
hand 100:7,16 138:19
handed 9:9 54:11
handle 25:5 27:3 28:16 31:16 32:11 40:23 41:20 87:2 95:22
handrails 89:13
hands 111:18
Hanger 132:19
Hanley 2:5 50:12
happen 14:4 27:25
happened 85:1 99:4
happening 54:17 56:12
happens 31:1,22 34:25 63:10 111:3
happy 105:23
hard 61:1 95:2
Harold 2:21 50:5
Harrison 97:6
hate 103:12
hats 124:20
head 89:1
heading 133:10,24
headway 26:1,5 28:22 30:21 31:22 32:3 42:9 98:4 99:20
headways 26:14 99:19
heal 83:16
healed 82:21
healing 86:19
health 87:24,25
hear 23:13 101:13
heard 19:15 69:5 101:6,17 124:22
hearing 137:5
heavily 24:17 25:23 87:8 97:4
heavy 16:17
held 6:3
Helen 60:14
HELENE 5:14 60:14 117:24
Hello 59:18
help 27:14 34:16 90:6 102:3
helps 39:13 98:5
hereunto 138:18
heritage 101:11

he'll 129:22
highlight 38:8,25
highlighted 38:11
highway 85:14
hiring 19:8
historic 3:10,22,24 4:2 8:21 10:4 19:11 24:9 37:19 39:14 48:21 49:15 49:18,19 84:10 93:17 101:20 102:2 108:19 109:3,21 111:8 118:22 119:6 124:25 125:14,17 127:3
history 102:5,23 110:6
Hoboken 27:9,21 32:7 33:8 42:12 97:14
hold 114:23
honor 68:16 101:9
honored 68:13
hope 110:7
hoping 53:23,25
horizontally 65:4
hosting 121:7
Hotopp 4:14 11:9 21:1,20 22:13 50:22 111:20 129:21 130:18 133:20
hour 34:9 90:5
hours 53:11 130:6
housed 98:22
Howard 4:3 49:21
HUB 1:7
hubris 126:6
Hudson 55:2 56:4 132:7
huge 23:7 78:1 119:5
human 126:4,8
hundred 74:16
HVAC 76:10

I

Ice 27:25
idea 115:12 116:14
identifies 7:9
ignoring 108:18
illegal 106:17
illustrative 78:22
images 125:23
imagine 100:24
immediately 73:17 74:2 76:16
impact 9:14 10:18 24:2 28:2 34:21 34:23,24 35:5,25 39:14 40:10,10 41:6 42:20 63:15 64:14 65:6 80:25 81:5 84:21 91:25 92:13 98:19 112:1 112:11 136:3
impacted 45:21 75:23 79:21
impacting 63:24
impacts 7:1 8:16,17 8:17,18,20,22 37:18 40:12 42:13 42:18 43:25 45:23 47:19,21,24 82:3 107:16
implications 41:5
importance 108:19 125:18
important 10:18 11:3 30:25 34:11 36:7 58:24 61:25 67:19 68:4 88:8 93:17 94:15 118:24 120:23 121:17 127:22 128:5 129:7
importing 103:2
impossibilities 68:18
impossible 102:11 102:14
impractical 115:24
inaudible 12:19 26:18 88:2 116:19
incalculable 92:15
include 8:17,18,20 21:17 136:10
included 19:23
includes 7:23 128:14
including 98:10
incorporate 131:23
incorporated 122:22
increase 52:13 53:24 55:11 56:11 56:22 58:1 82:5 97:3
increased 25:20 29:9 34:17,18 41:17 52:11 55:18 56:10 90:24 95:23 99:6
increasing 24:24 52:20 55:15 57:14 63:8
increasingly 52:25
individual 102:20
individuals 14:19 123:24
industry 7:11,16 29:21,24 30:1 34:3 35:13 98:9 106:12 107:6,17 108:1
inflexible 77:6
information 9:16 48:3 54:14,16 132:8
infrastructure 71:12
infringe 98:25
infringed 114:2
initiate 71:6
innovated 113:6
innovative 113:1
input 131:14
inside 14:14
instance 38:2 56:15
Institute 5:8,10 51:21,23 89:1
instrumental 10:9
insufficient 127:11
intact 126:16,20
integral 26:25 79:16
integrity 126:24 127:1,2,21
intellectual 84:25
intend 16:14
interaction 84:9
interconnectivity 88:11
interest 121:23 124:24 125:1 127:5
interested 123:21 138:16
interesting 77:5
interfaces 85:8
interim 133:17
interior 79:10
interpreting 118:12
interrupt 38:17
interstate 85:14
introduced 75:15
introducing 55:20
introduction 33:24
INTRODUCTIONS 48:9 52:5
inventory 20:4
investigated 76:6
investigating 73:10
investment 26:6
involved 101:19
irreplaceable 89:20 92:15 103:5
irresponsible 69:7
Island 90:19
issue 11:6 23:1 73:11 78:7 88:3,4 88:6,17 92:7 107:21 111:6 112:1,16 118:17 125:13
issues 6:22,23 11:3 11:22 18:19 23:23 62:13 75:4 77:3 77:24 99:6 101:21 101:23,24 111:23 116:10
iteration 134:2

J

Jack 5:6 51:18
Jackie 2:5 50:12
Jaffe 3:17 49:8
jammed 58:20
JANE 1:25
January 10:14
jeer 59:9
Jersey 1:14 2:1 56:4,6 58:16 59:4 59:15 60:24 61:5 61:17,20 62:1,5 63:7 71:3 88:10 88:25 90:20
Jersey-ites 89:6
JFK/LIRR 93:5
job 12:15 114:11
jobs 59:16 67:7
Joel 3:12 48:23 100:15 101:18 104:2,18 105:3,6 105:8,14,17,21 106:7,14,20,22 107:19,22 108:2 108:10,20 109:5 133:15,21,23 134:6
John 4:14 5:17,17 11:9 20:25 21:1 21:20 22:13 48:25 48:25 50:22 111:20 128:10 129:20 130:16,18 133:20 134:19
Johnson 15:17 133:24
John's 22:14
joining 24:5
judgment 95:3
jumped 124:9
justification 107:25

K

Kate 4:10 50:16
keep 27:17,20 32:9 63:7 64:1 128:6 129:17 134:4
Kelley 4:22 51:7
Ken 3:3 18:25 48:11 111:22,22 112:14 134:18
Kennedy 5:15 87:20,20
Kevin 2:20 50:7
key 88:16 92:7 129:25 130:22
killed 101:10
kind 7:15 23:4,5 69:17 77:9 80:18 112:20 136:17
kinds 8:8 83:3
Klein 3:12 48:23 100:15 104:2,18 105:3,8,14,17,21 106:7,14,22 107:19 108:2,10 108:20 109:5 133:15,23 134:6
know 11:15 16:16 16:18 17:9 18:22 18:25 21:24 23:14 23:22 48:6 55:24 57:10 58:14 61:13 67:1,24 69:20 74:21 79:14 80:10 81:15,16 82:1 90:15,18 94:13 95:12 98:18 103:2 112:2 118:6,11 119:25 122:25 123:13 125:12,14 126:18 128:22 129:16,23 132:13 136:19,25
Knowledge 123:18
known 110:18 125:21
Kornfeld 3:10 18:4 23:1 38:16 48:21 77:2,22 80:2 81:6 124:21
KORNFIELD 79:1
Kurtin 5:8 51:21

L
land 46:15
Landlord 84:1
landmarked 126:25
Landmarks 4:10 50:16
lands 74:23
lanes 85:16
large 18:3 52:17 72:2
largely 57:16
larger 12:22 13:3 57:7
largest 67:4 110:5 110:19
law 108:5 109:3,6
layer 101:4
layout 33:14 130:24
lead 92:2
leading 91:2
League 125:7
leave 77:18 85:15 103:19
leaving 64:18 91:14
LeBrun 4:18 51:1
led 11:8
left 85:24
legion 111:14
Lejda 2:20 50:7
Lenahan 2:7 50:13
length 32:15 33:19 97:11,17
lengthy 121:20
Lester 4:21 51:5 120:25 121:1
letter 109:2,6
let's 48:5 53:14 105:6 110:7 111:17 115:15
level 20:20,22,24,25 21:2,7 23:10 35:19 36:16 37:5 74:21 78:2 80:14 126:24
levels 68:22
Levine 4:15 50:23
Levitt 2:21 50:5
Liberty 14:10
lifeline 67:17
lifelong 86:9
light 7:4 15:12 38:1
light-rail 83:6
limit 95:24
limitation 96:3
limited 14:18 66:9 66:9 99:24 120:8
line 17:6 25:23 71:5 79:10,11 97:3,14 97:17 125:5
linear 79:16
lines 62:25 63:24 98:24 99:2
lingo 17:9
listened 10:15
literally 47:14 134:12
litigation 24:9
little 16:24 32:4 33:1 46:24 47:10 55:11 59:21 69:15 92:24 94:5 104:21 132:17
live 39:1 42:8 53:10 59:13 67:10 88:15 124:12,13
lived 84:3
lives 53:7 58:15 59:2 119:14
living 53:5 61:16,23
LMDC 4:22,23 51:7 51:8 80:12 103:2 112:6,18 134:23 135:22 136:4,9
load 45:18
loading 75:2 91:13 91:25
located 14:10 44:11 59:16
location 33:16,22 46:22 72:3,10 76:17 117:15,18
locations 61:25 77:7
log 128:3
logical 59:17
logically 59:8 64:12 65:1
logistics 15:24 18:22
long 7:19,19,20 8:4 8:9 64:16 77:11 86:19 90:19 91:1 92:1 100:2 111:12 123:3 133:4
longer 43:15,19 98:21 99:21,21 114:3
long-term 69:9 71:9 112:9
look 9:1 18:19 24:23 27:6 28:3 28:25 29:17 31:14 31:15 32:9,23 33:11 37:20 39:6 45:21 47:18 62:19 64:15 67:22 68:1 68:15 69:11 72:15 75:6 89:21 113:3 125:17 126:18 129:4 130:19 134:3
looked 17:7 18:6 24:8 39:3,4 40:22 40:24 41:4 57:4 74:22 90:16
looking 7:17 37:25 38:14,21,24 39:15 40:20 46:1 47:24 63:8 69:8 71:25 73:7 76:14 78:23 82:9 83:11 90:4 99:7 116:14 125:5 131:10,14
looks 41:6 130:7
loop 74:3
LoPresti 3:13 49:2 52:8,9 55:3 57:3 100:6 109:7,12
Lorraine 4:23 51:8
lose 72:20
loss 68:11
lost 82:22 113:24 127:1
lot 9:20 13:8,23 21:6 28:12 48:3 70:24 72:7 84:17 86:1 89:3,6 94:13 100:10,11 117:3 121:18 124:22 126:25 128:12 134:21,22 136:25
Lou 23:21,24 48:2 50:4 55:20 58:3 59:22 71:21 96:14 99:4 104:18 106:23 108:11
Louis 2:3,12 4:14 19:8 24:3 38:20 50:21,22 66:4 72:25 78:21 80:23 81:25 95:10 96:22 97:25 98:23 99:8 104:16 107:4 115:25 116:5
Louise 3:13 49:2 52:8,8 55:3 57:3 100:6 101:18 109:7,12 118:9
Love 4:5 49:23 58:13 115:7 116:3 134:9
loved 68:11
lower 3:3 6:10 41:22 48:11 56:17 57:1 60:13 67:5,7 67:18 68:19 70:23 83:15,16 101:11 121:4,12,21 135:8 135:9
lucky 22:14
Lustbader 3:3 18:25 48:11 111:22,22 112:14 134:18

M
M 1:23 138:5,23
magnitude 125:18
main 97:23 135:11
maintain 26:14 36:16,17 37:5 73:19
maintaining 74:7 92:8
major 67:16,17
majority 53:1
making 25:22 64:6 64:10 107:22 132:3
management 4:9 27:12 31:1,4,5,21 34:15 35:24 40:1 50:15 98:11
manager 15:17
Manhattan 3:3 6:10 41:22 48:11 56:18 60:13 67:5,8,18 68:19 70:23 82:12 83:8,15,16 84:23 85:5 101:12 121:4 121:12,21
manifestation 84:12
manner 29:16 30:13 36:25 43:16 87:14
manual 29:22,24 30:14,24 31:20 32:1 33:5 34:3 35:14 104:23 106:10,19 107:3
Margarita 4:24 51:11
Marilyn 4:3 49:21
Mark 2:8 5:5,5 50:6 51:17,17
marriage 138:14
Martin 3:20 49:14
material 9:20 12:13 13:8 14:6 15:10 17:11,14 38:3,9 78:6,11
materials 9:4 82:13 90:16
Matt 3:20 49:13 86:6,6
matter 58:22,22 83:23 138:10,15 138:17
max 104:15
maximize 74:5
Maximus 125:20
McNeilly 2:6 50:8 54:9,10 55:5 57:8 65:9 73:8 75:5 76:19 79:5 97:11 105:1 106:1,11
mean 22:3 60:9 62:1 79:2 80:15 97:22 104:22 118:8,14 119:20 130:11
meaning 55:17
meaningful 129:3
meaningless 135:16
means 26:1,16 54:22 67:11 69:18 79:15
meant 79:2
measured 8:6
measures 8:4
measuring 63:14
media 103:20
meet 14:9,13 16:14 25:20 26:7,20 29:12 33:4,25 34:11,12 35:9 36:4 37:7 39:17 41:11,13 42:22 44:1,3 57:15 83:1 97:21 99:5,11 103:11 111:9
meeting 1:9 6:3,18 7:5 10:2,12,20 37:20 54:12 92:21 93:20 101:25 102:7 112:4,17 122:1 124:23 127:10,13 129:19 131:5 133:9 134:2 136:2,16
meetings 10:22 11:23 44:7 66:22 75:16 80:12 90:12 100:25 102:1,16 102:21 103:14 109:15 111:24

118:2 121:6,8
meets 35:11,11
member 48:17 60:11 100:24 110:1
members 17:5 124:25 125:9
memorandum 6:21 9:24 11:11 127:12 127:16 130:23
memorial 3:14 49:4 60:20 64:3 116:8 119:5 120:18,18
memories 68:13
memory 114:23 126:4
Menno 2:3 23:21 24:3 38:20 50:4 66:4 72:25 78:21 80:23 81:25 95:10 96:22 97:25 98:23 99:8 104:16 106:24 107:4 115:25 116:5
mention 73:1 82:3
mentioned 16:5 17:2 58:3 59:23 66:11 72:23 73:2 82:2 111:1 134:23
Merritt 3:6 48:15 116:9
method 61:10
methodology 7:11
Metro 53:14
mezzanine 45:12
Michele 5:4 51:16
middle 91:2
millions 123:2,4
Milner 5:17,17 48:25,25
mind 32:10 66:20 91:6 128:6
minded 111:1
minds 125:25
mine 47:15 58:15 113:12
minimal 28:2 115:13
minimize 75:22 129:4
minimizing 107:15
minutes 26:2,4 30:22,23 31:9,24 31:24 66:24 98:5 99:21 100:7 109:13 130:16
missed 31:22
misunderstanding 124:16
mitigate 39:13 45:23 47:24 102:4 111:25
mitigation 128:15 135:21
mixture 17:8
mixtures 18:10
MO 21:14
MOA 20:19 80:5 122:3 128:10 129:6,20 131:17 133:8 134:21,25
mode 62:10
modified 108:7,7
modify 108:16
momentary 119:14
moments 36:15
Monday 13:16
money 120:4,17
month 11:14 59:7
monument 64:14
Morera 4:24 51:11
morning 13:18 27:22 30:9,12,14 31:11
move 12:5 28:11 33:9 56:12,22 61:20,24 102:17 109:16 122:21 128:9 132:20 135:12
movement 29:14 73:15 91:19
moving 68:23 71:25 74:5 134:5
MTA 5:6 51:18
muddy 14:7
multiple 112:8
Municipal 3:5 48:13 125:6
murdered 101:2,16
museum 119:16

N

N 138:1
name 6:8 86:6 120:25
Nancy 15:17
narrow 94:22
narrowed 94:20
narrowing 94:1
narrows 39:21
nation 120:21 125:13,15 127:6
national 3:6,14 6:6 48:15 49:4 101:11 102:5,23 116:10 125:6
nationally 8:7 63:18,21
nationwide 123:18
nature 15:2
nauseam 82:14
near 24:22
nearing 25:14
nearly 54:19
necessarily 91:17
necessary 22:1 83:18 90:1 135:14
need 6:24 7:13,19 11:7,18 21:6 22:6 23:16 24:1 27:7,8 29:12,13,20 30:11 30:17 31:9,15 32:3,7,10 34:10 35:14 40:17 44:7 52:14 53:19 63:13 64:2,9 68:14 69:1 74:19 80:16,21 87:24 92:22 93:12 98:6,7 109:23 110:11,16,22 120:13,14 129:4 130:3 131:2 133:7 135:5 136:14
needed 67:15 124:3
needing 87:5 97:24
needs 7:9 8:11,13 8:14 21:5 27:6 34:13,14 35:10 45:16 58:6 68:2 69:13 104:9 111:9 120:20 134:24
neighborhood 52:20,24 53:4 84:6 86:12 102:25 103:1 111:11
neighborhoods 82:21
NEPA 9:12,19 101:23 102:7 103:21
Nepal 19:15,17 21:23
Networks 123:19
never 34:23 96:20 99:4 110:7
new 1:14,14,16,16 2:1,1 3:17 4:10,15 19:23 22:12 26:9 26:11 33:14 42:16 45:9 49:9 50:16 50:23 56:6 57:5 59:6,13,14,15 60:5 61:17,20 62:1,3,4 63:6,7 67:25 71:3,11 79:2 87:5,8 88:25 88:25 89:6 90:19 93:8 96:1 97:6 106:8,15 121:2,22 123:16 124:10 126:2 138:2,3,7
Newark 25:24 27:10,18 28:22 31:7 32:3 33:9 58:19 93:4 97:3
Newport 53:16
NFPA 35:11
nice 74:22
night 27:16
nip 126:11,12
njohnson@PANY... 15:18
Noah 3:15 49:5 70:16
normalcy 86:14 88:21
north 13:3 17:6 34:22 35:6 39:16 39:24 41:7 44:24 73:3,14,14 74:7 74:23 75:14 79:11 97:16 122:7 127:20
northeast 35:2 44:21
northern 39:22,23 72:8 87:16
Notary 138:6,23
notational 84:13,24
notch 39:11 115:22 117:9,11,11
notched 93:25
notching 39:6,16 74:14 75:7,20 91:23 92:4 115:12
note 9:10
noted 57:22
noticed 17:5 56:7
notification 134:13 134:15
November 1:13 11:17 13:16,17 111:2 130:1 133:6 138:19
nowadays 85:14
number 6:19 15:18 38:21 41:2 55:13 60:1 61:13 64:18 81:24 82:18 124:9 131:1
numbers 7:24 32:10 70:6 110:10
numerous 87:6
NYSHPO 19:22,22 21:14 22:12 23:17 102:9 131:11,18 131:23 132:2

O

O 138:1
objective 131:21
objectives 41:13 44:2
obstruct 102:18
obviated 128:5
obviously 75:1 89:3 114:12 130:24
occasion 61:3
occupies 41:8
occupy 35:1
occur 30:8 91:24
offense 110:17
offensive 101:3,13 103:22
office 3:20,22 4:2 4:21 6:11,14 49:13,16,20 51:6 59:19 86:8
offices 61:18,21
official 10:7 60:12
off-site 133:1
oh 22:19 125:10 126:10
okay 22:25 85:12 86:1 100:1 110:9
old 18:1 62:20 103:13
Omi 4:6 49:25
once 8:14 19:17 38:10 46:11,19,23 48:6 64:24 68:17 124:1
ones 68:11 81:15 81:16
one-and-a-half 122:11
ongoing 9:18 23:23 135:2
open 28:10 77:18 87:3 102:2
opened 13:1,3 25:10
opening 57:19
openly 91:16
open-toed 15:12
operate 26:12 28:16 43:6 44:13

operated 32:15
operating 25:25 96:23,25 97:1
operation 26:3 27:18
operational 25:22 27:15 29:19 34:13 34:14 35:9 41:11 41:12 42:13,17 43:23
operations 16:19 36:17 56:16
opportunities 38:15 101:15
opportunity 83:5 94:9 101:7,9,14 103:20,24,25 112:24 113:14,15 117:1,4 124:17
opposed 83:13 105:12 108:18 128:18
opposite 114:15
option 40:22 41:6 46:2,16,23,24 47:3,9,10,14 71:22 93:25
options 7:14 8:13 8:15 24:2,8 37:20 38:21,23 46:1 47:23 75:18 78:23 79:25 85:24 93:22 95:6
order 8:12 25:16 37:7 40:19 44:17 74:18
organization 3:18 49:11 105:12 125:5
original 17:17 33:19 96:14
originally 131:19
outcome 138:16
outlets 87:9
outline 11:9
outstanding 11:22
overall 8:12 24:12 25:2 41:13,14 95:21
overcrowded 99:23
overcrowding 40:4
overnight 27:21
Oversight 4:9 50:15
overview 46:3 130:20
o'clock 100:5

P

Pace 3:19 49:12 66:25 67:19 68:6
Pace's 68:4
packed 58:18
page 123:11
Paglietti 2:8 50:6
park 4:12 5:11,12 5:14 27:20 50:18 51:25 52:3 59:3
parking 84:17
part 9:11,17,18 14:22 15:8 17:14 17:17 19:25 26:25 39:22,23 52:17 54:1 58:9 61:22 75:25 82:9 83:2 97:5 106:1
participate 100:25
particular 8:21 37:11 72:20 76:25 106:3
particularly 11:24
particulars 136:20
parties 1:9 6:2,17 7:8 10:8 12:8 13:13,15 14:15 76:1 107:12,14 112:10,15,18 131:20,24 138:15
Partnership 4:25 51:12
Party 14:18 54:12
pass 92:4
passage 28:13
passenger 8:11 35:9 39:21 55:21
passengers 32:19 34:16 41:16 54:22 55:1 73:15
PATH 1:8 6:4,12,18 6:25 7:8 8:19 10:1 17:21 24:12 24:14,18,19,20 25:2,18,19 26:7 26:12,16,23 27:16 30:4,8 36:5,17 37:9 42:4,6,15 44:13 45:11 50:5 50:7 53:17 56:8 57:4 58:1 60:18 61:11 62:10,17 63:10 64:18,24 66:14 67:12,15 68:1,4,9 81:11 89:2,5 91:7 93:3 94:8,10,16 95:22 95:25 96:14,19,23 97:13 99:10,16 112:7 116:7 121:19 122:10,22
pattern 54:3
patterns 53:13,13
Paul 2:15 4:18 51:1 51:13
pavement 12:19,21 17:2,23
pay 71:22
paying 120:6
payment 17:24
peak 7:23 25:8 30:3 30:6,8 54:19
peaks 34:9
Penn 89:8,11 90:21 91:20
people 18:9 24:19 24:25 25:6,8 26:17 28:8,10,14 29:2 30:16,22 31:17,25 32:5 34:6,8 35:16 40:5 41:18 53:2,10,14 55:2 56:24 59:13 60:21,23 61:14 71:2 72:15 83:1 83:14 85:4 86:2 88:15 89:23 91:4 91:10,13,25 94:10 94:15 95:12 98:8 100:10,12 101:2,5 101:10,16,18,22 102:2 103:1 111:14 113:24 116:25 117:5 119:12,23 122:24 123:2,4,6,22,25 124:1,15 125:8,10 126:10 128:23 129:23 135:25
peoples 125:25
people's 72:19 119:13
perceive 64:4
percent 31:6 35:1 35:25 36:1 40:10 40:10 41:8 55:12 55:15 80:25 81:9 115:14 118:10,20 119:11,15 120:1 124:1,5,10 127:20 131:9,14
percentage 118:13
percentages 126:22 126:23 127:3 135:20
perfectly 105:22 126:19
perimeter 17:6,16 41:7 80:6 98:17 116:16 127:25 130:25 132:19
period 7:23 11:16 30:18,19 31:11 55:10,15 57:1,11 69:25 91:11 110:6 133:6 134:10
periods 30:3,7,8
permanent 1:8 6:4 10:1 37:13 67:15
permanently 126:4
permutations 90:9
personal 14:21 101:1
perspective 65:19 69:16 76:24
Peter 2:4,11 10:22 10:23 12:2,4 16:4 16:9 17:13 18:11 18:15 19:3 20:15 20:16 21:21 23:18 24:4 38:18 48:1,2 50:3 52:6 86:1 87:18 100:2,9,18 105:6,9,10,15,19 105:24 107:21 108:3,13,25 109:11 111:17 118:16 121:24 127:15 128:8,20 129:6,11 130:9,13 134:16 137:1
Petra 5:7 51:19 92:16,16
Pfefferblit 3:15 49:5 70:16
phase 48:8
phenomena 55:20
phonetic 2:15 4:6 5:12 49:25 51:13 52:2 77:21 84:19
photo 18:14 19:19
photographic 21:8
photographs 14:20 14:21 22:11 89:14
photos 21:16 123:22 124:2,6,8
physical 93:14 95:7
physically 46:17
pick 59:20 60:15 132:2
pictured 77:9
pictures 123:17
piece 72:2 87:23
pieces 118:24
Pierpoint 3:22 49:15
place 6:19 29:1 36:19,23 47:15 54:5 60:6 70:10 94:16,18 97:8 101:24 125:21 131:3
placed 36:13
placement 76:23 93:15
places 125:19 129:16
placing 46:20
plan 5:7 15:22 23:3 23:8,17 51:19 71:16 85:13 92:17 96:24 97:2 128:16 132:10 136:3
planners 69:8
planning 9:7 13:10 85:15,18 88:4,5
plans 83:4 134:11 135:21
Plate 2:10 50:2
platform 7:2,2 8:1 8:10,11 9:7 11:6 23:23 24:1,6,7 28:5 29:4 30:18 30:23 31:10,17,25 32:6,15,16,20,24 33:8,9,10,11,12 33:23,23,25 34:9 34:11,21,25 35:8 35:8,15 36:10,22 36:23 37:13,22 38:4,12 39:6,17 39:22,23 40:7,17 40:25,25 41:1,19 42:22,25 43:1,9 44:2,12 46:4,4 47:1,12 72:7,17 72:18 73:3 74:13 74:23 76:12 77:13 77:16 79:21 90:8 91:16 92:3,23 93:12,15 94:1,1,4 94:8,20,22 95:5 95:11,16 96:4,5,5 97:12,17,18,24 98:7,9 99:23 104:15 115:11,16 116:15,24 117:7 117:22 128:14
platforms 24:15 30:6 32:13,14 33:18 34:6 44:17

63:12 71:13 76:11 77:6,10 81:13,22 90:21 91:3,7,19 99:18
play 6:14 130:4
playing 133:13
plays 134:8
please 9:10 120:14
plow 131:7
point 6:23 26:6 27:15 33:13 36:9 43:12 47:20 53:1 55:6,23 57:9 58:5 65:16 71:8 80:19 87:4 109:14 113:11 114:7,13 114:13,14 119:8 122:18 124:9 128:2 132:21
pointed 45:16,19 110:12
points 61:19 65:11 66:1 100:22
poll 123:18 124:14
polling 123:20,23
Pompeii 125:20
pool 103:9
population 29:10 34:19 67:23
Port 1:14 2:1,18 7:1 7:7 8:25 9:2 11:18 50:2,3,4,6,8 50:12,13,21 51:9 51:10,13 52:4 54:10 56:8 69:7 69:19 70:7 89:4 92:20 93:21 98:15 99:5,10 110:18 112:6 121:5,13 135:18 136:1
portion 81:18 117:6
portions 135:7
position 10:13 121:12
positions 90:25
possibilities 68:18 93:20
possibility 66:13
possible 37:15 90:3 90:9,13 93:3 102:5 107:15 113:22 114:8,17 116:20 117:18
possibly 38:9
post-2025 69:20,21
potential 8:16 77:10 97:15
potentially 45:20
power 90:13 94:17
powerful 95:2
practice 7:16 106:13 109:2
practices 108:1,4 108:15 110:9,11
predicated 52:18 70:2
predictions 71:10
prefer 15:15
preliminary 76:7
prepared 98:15 105:11
preparing 9:13 70:20
presence 86:17
present 3:1 4:1 5:1 15:22
presentation 9:3,15 10:16 11:21 38:19 80:4 98:20 118:3 129:21
presented 79:25 101:8
presents 103:24
preservation 3:4,22 3:24 4:2,7 6:7 10:4 48:12 49:16 49:18,20 50:10 101:21 102:3 109:21 118:22 120:1 123:1 124:23 125:4,7,9 125:13 127:8 136:1
preservationist 125:3
preserve 85:8 87:15 101:10 102:4 109:3 127:6
preserved 84:7,8 93:18 124:4 135:21
preserving 102:22
President 120:12
pretty 64:1
prevent 28:12 47:6
prevents 27:23
previous 82:1
pre-9/11 33:17 56:10 57:12 65:21 68:22 82:5 96:19 97:12
principal 73:15
principals 82:15
print 131:7
printed 20:9
private 67:5
probably 18:18 64:12 71:4 92:1 108:8 109:7 129:13
problem 16:20
problems 93:9 94:4 115:16
proceedings 138:9 138:12
process 6:6 9:12,13 9:22,23 10:10,18 11:1 12:11 13:6 14:22 20:1 26:8 101:19 103:17,21 121:21 133:12
processes 9:19 11:10 21:4
professionally-d... 8:3
profile 23:5
program 41:14 43:21,22 58:10
programmatic 135:4
programs 56:5
project 4:9 6:5,13 6:15,18 8:20 40:15 50:14 61:1 113:21 120:6 121:17 131:13
projected 55:4,6 92:19 114:6
projections 58:9 59:24 60:17 63:3 69:23,24 92:24 104:14
projects 70:25 112:7,8 135:2
prominent 6:15
promises 129:17
pronounced 15:12
proper 30:5 113:23 113:25
proposal 77:12
propose 112:4
proposed 3:13 7:1 11:11 46:4 49:3 71:22 117:13 136:12
prosecutorial 104:21 105:7
protect 103:15
protracted 129:2
provide 16:7 29:13 31:3,21 33:5 39:20 52:14 63:2 63:11,12 64:8 69:15 98:6 107:10 116:21 135:5
provided 9:16 64:21 67:6 92:21 93:23 122:21
provides 35:18,23 117:4
providing 52:11
provision 21:9
public 10:9 48:7 83:6,12 107:11 138:6,23
publication 105:2
publications 57:22
publicized 52:24
publish 123:16
pull 119:12
pulled 124:20
purposes 12:7 14:23
push 16:23
put 13:20 14:2,8 33:8 36:10 37:12 40:15,17 44:7 45:1 72:8 90:10 99:15 107:4 113:7 135:16
putting 42:20 43:2 44:12 77:12 112:21 121:6
p.m 13:16 137:5

Q

Quality 29:23 34:3 35:14
question 15:25 16:4 17:1 20:19 52:7 66:19 69:4 76:4 78:12 85:12 89:9 91:9 93:13 104:6,11,13 105:4 105:22 108:14,25 115:8,11 117:25 133:15,23 134:18
questions 11:5 15:24 16:1 20:16 48:4 70:18 96:10 96:13 98:13 104:3 104:19 106:21,23
quick 18:14 46:3 96:10 98:12 99:3 99:25 100:20 115:7 117:24 128:24,24 129:22 133:15
quickly 130:18
quite 15:7 18:3 64:25 73:12 94:21
quote 89:17

R

R 138:1
rail 26:9 107:18
railroad 30:10
rails 42:16
rain 13:24 16:5,8,17
rains 14:4 16:12
raise 65:10,16 120:17
raised 69:14
raising 101:22 111:23 120:16
ramp 17:22
ramp-up 27:22 58:5
ran 96:19,20 97:13
range 31:5 65:22 65:23
rapid 55:14
rarely 83:9
rate 55:14 57:2
reach 65:24
reached 80:18 104:12
reaching 7:12
reacted 124:19
reaction 76:1
readily 105:2
ready 16:22
real 18:14 58:12 72:13 100:20 115:7 117:1 128:24
realistically 118:25
reality 66:1
realize 65:21 70:24 72:4
really 10:14,17 11:2 18:21 20:13 21:18 23:16 61:9 66:21 69:10,13 70:11 77:6 78:1,5,8 80:13 87:9,16 93:24 101:22 104:13,21 107:13 109:18 111:7 116:17,19 117:2 117:11,14 132:13 133:7 134:24 135:11 136:6,19 136:22
reason 20:21 58:17 74:25 106:22 110:24
reasonable 70:3 109:1

reasons 53:9,21 75:7,17 79:24
rebuild 87:24 109:24,24
rebuilding 87:12,14 88:21 121:18
received 75:16
Recess 129:10
recognize 37:18 81:25
recognizes 30:24
recommendation 121:14
reconcile 93:14
reconvene 129:19
record 67:14 127:18 138:11
recordation 21:8
recovery 6:10 125:24
redevelopment 5:15 68:9 102:16 111:10
reduce 40:9,11
reduced 93:7
reduces 35:20
refer 80:5 104:23
referenced 106:5
referring 18:5
reflect 10:16 112:10
reflecting 78:3 103:9
reflection 131:25
regard 82:18
regards 20:5 67:12
region 67:24
Regional 5:7 51:19 92:17
regs 106:8,9
regulations 106:15 106:16
reject 125:2
rejected 91:22
related 104:11 138:14
relating 115:11
relevant 7:10
relocate 41:2
relocated 117:21 132:23
relocating 132:18
relocation 41:24 132:16
rely 88:11
remain 82:15
remained 6:22 23:3
remains 82:17
89:20 103:15 116:16 117:1 122:5 123:1,14,22
remanent 35:6 40:12 76:16 77:1 79:8,20
remarks 109:9
remember 73:4 109:23 127:22 129:25
remembrance 94:17
remind 9:21
remnants 18:1 47:25 119:6 135:7
removal 18:1
remove 15:10 46:18
removed 36:14,20 45:3
removing 12:13
rendered 135:16
renders 43:12
reoriented 73:23
replace 26:9 46:21 103:10
replaced 92:10
report 11:23
reported 138:9
reporter 1:23 129:9 138:6
REPORTING 1:25
represent 37:21 86:8 102:15
representation 84:11,25 89:10 94:12 119:19
representational 89:16 92:6
representative 121:4
represented 89:25 94:24 95:8 102:21
representing 67:4 92:12 121:1 125:4
represents 46:9,11
request 20:7,11
requested 93:21
require 33:3 42:3
required 107:1
requirement 73:19 106:8
requirements 9:8 29:19 32:11 34:1 35:16 41:12 74:8
requiring 107:2
reroute 115:23 116:21
research 106:3
reserve 96:12
residency 68:20
resident 60:13 86:10 88:24
residential 29:10 34:19 52:21,25 62:9
residents 54:1,6 82:18,19 88:1 101:7 102:20 113:10 121:11,15 124:18 125:1
residue 18:8
resolved 95:8
resource 39:14 67:17 93:17 132:12
resources 8:21 10:4 24:10 37:19 45:24 124:25
respect 14:25 72:5 89:21 90:5 111:8 113:24 128:25
respectfully 89:15
response 104:7
responsibility 127:7 134:11
responsible 87:14
rest 19:21 38:4,12 88:22 121:22
restaurant 88:14
restoration 88:20
Restore 6:6
restoring 88:21
restricted 40:18 99:13
restriction 39:20
restrictions 43:24
retailers 88:14
revenue 27:17
reverse 22:19 29:9 35:20 41:21 52:19 53:13 54:7,8 55:19 57:5,6 61:14
reversed 34:17,18 115:18
review 11:10,22 131:23
reviewed 82:13 92:19
revisit 54:15
revitalization 102:18
revitalize 101:11
RFP 26:8
RICHARD 5:15 87:20
Rick 5:10 51:23 87:20 88:24,25 110:12
Rick's 110:3
riders 24:20 30:12 54:20 58:4,8 65:13,23,25
ridership 7:23 10:3 24:12,24 25:13,21 26:20 27:4 34:12 36:4 42:23 52:12 53:23 54:2,13 57:12 58:2 60:1 60:18 61:7 63:2 63:13 65:21 71:19 90:23 92:20 93:4 93:10 95:23 97:21 97:23 98:1,2 99:6 101:23 103:11
riderships 99:12
rides 58:16,17
riding 60:24
right 12:11 19:15 20:14 21:18 22:23 25:4 26:8 29:5 35:2 44:20 58:19 63:16 69:1,6 73:4 73:6 100:10 107:23 108:1,13 109:24 114:17 117:16 120:16 134:16 135:19
Rinaldi 2:4 12:4 16:9 17:13 18:11 18:15 19:3 50:3
rise 93:10
Rising 3:15,16 49:6 49:7
River 132:7
Robert 3:10 4:17 18:4 23:1 38:16 48:21 50:25 77:2 77:22 79:1 80:2 81:6 124:21
Robin 5:16 59:18,18 60:16
rock 45:18 47:4,6
Rodas 3:16 49:7
Rodriguez 2:12 50:21
Roger 5:3 71:20,20 74:10 76:17 77:20 90:8
Roger's 109:25
role 6:15
roller 66:14,15 85:22
Rome 125:21
roof 57:13
room 48:6 62:3 85:15 89:18 90:13 96:6 110:25
rooms 98:16,20,21 98:25 99:2
ROSE 1:25
route 61:8 97:5 102:12
routes 57:14,15
row 86:4
RPA 92:19
ruin 126:17,17
ruins 125:24
run 92:1
running 70:5 128:8 128:18
runs 27:19
rush 34:9
Ruth 3:22 49:15

S

safe 29:15 30:13 63:4 68:3
safely 31:17 32:6 34:8 53:22 98:8
safety 52:15 70:19 94:4 115:17
sake 65:5
sample 123:24 124:10
Sanchis 3:5 21:25 22:5,18,25 48:13 62:24,24 86:24 92:8 104:3 110:4 127:17,17
satisfied 92:22
satisfy 114:8
save 4:3,5 49:22,23 120:4
saved 114:3
saw 35:22 80:5 124:1
saying 77:4 81:21 81:23 88:5 112:14 113:13 127:13,18
says 10:8 30:1,14 31:20 32:1 58:20 109:15
scale 126:5
scenario 63:9
schedule 37:8 43:15,18 47:19,21
scheduling 13:12
school 75:21 76:2
schools 75:10
scope 119:1

scoped 79:4
screen 110:13 113:7
second 11:7 35:17 35:17 47:3,9 55:7
seconds 31:12,13 32:20,21,22
secrets 128:6
section 1:9 6:5 9:19 9:23 10:21 72:13 101:25 102:1
see 24:24 25:12 28:7,10 29:1 39:9 40:21 45:22 46:6 46:7 62:20 64:16 67:16 72:15,17 74:11,22 76:15 81:8,14 89:11,22 89:25 90:1 93:9 93:19 95:6 102:21 102:22,23 107:22 116:15 117:1 122:18 133:18 134:7
seeing 94:23 110:13 131:8
Seeman 5:14 60:14 60:14 117:24
seen 59:5 68:20 72:11 96:18 131:18
segway 19:5
Senator 3:20 49:13 86:7 87:12
send 20:5,6,12 134:3
sense 21:19 76:3 85:1 86:14
sent 19:24
separate 112:4 116:6
September 24:14 49:25 68:12 86:15
series 23:25
seriously 73:12 121:16
serve 7:3
service 10:3 25:24 27:9,11,18,23 28:22 29:23 31:7 32:3 33:7 34:3 35:14,19 36:16 37:5,10 38:7 40:3 42:6,13 44:14 57:17,20,23,25 68:1,4 93:7 97:3 97:14 101:5 104:24 107:10 127:14
services 4:8 50:11 82:22
set 18:22 22:1,7 23:2 74:2 106:9 129:15 138:19
seven 97:15
seven-car 28:20 43:9 97:14
shape 75:1
share 12:24
shared 19:21 136:21
sharing 29:4
Shawn 2:7 50:13
Sheldon 121:3
Shirley 3:17 49:8
shoes 15:4,12
shoot 61:17
shop 83:1
shoreline 61:5
short 128:9,17
Shorthand 138:5
short-term 93:6 112:9
show 18:14 21:10 38:2 45:25 78:15 93:21
showed 23:3,4,4 78:13 80:24 112:19 123:21
showing 28:4
shown 21:5 75:18 78:20
shows 32:21 37:24
shrift 128:17
shut 87:6
sic 59:10 92:2 117:13
side 17:16 26:10 28:15 44:11 53:3 70:20 79:19,19 89:18 90:11 115:2 115:2 124:14
signatory 134:25
signed 11:12
significance 72:20 72:24
significant 42:19 45:10 63:18,22 73:2 80:16 91:11 120:2 125:12 126:9,13 134:22
significantly 35:19
signifying 72:10
Silver 121:3
Silver's 4:21 51:5
similar 38:7 46:25 47:11 79:13 82:8
simply 58:21 70:11
single 10:12 26:11
site 10:5 12:1,9 14:4 15:2,9,11,16 15:23 16:22 18:18 19:11,12,21 27:5 44:9 64:25 84:10 101:3 103:3,7 109:4 110:3,5 111:4 112:9 119:24 125:14 127:3 132:17 133:1 137:3
sites 60:24 125:17
sitting 100:13
situation 29:5 40:4 74:9 99:22 113:20 113:23 123:8 132:23
situations 72:11
six 119:4
size 30:5 95:25
sizing 97:18
skyline 59:4,5
slab 80:8
slabs 23:6
slide 78:12 90:4,7
slides 23:25 130:19
slight 65:9
slightly 64:15
Slippen 3:19 49:12 66:18
slow 42:4 121:19
slowly 68:22
slows 42:7
slurry 17:8 18:7
smaller 55:13 59:25 112:5,13
smoother 13:7
snow 28:1
Society 3:5 48:14 125:7
soliciting 11:4
solid 45:18
solution 110:16 111:7 114:8 127:23,24 128:4 133:14
solutions 87:3 112:22 113:2,6 114:17 120:10
somebody 21:11 109:15 119:17
somewhat 40:3 69:7
soon 104:9
sorry 29:22 96:25
sort 18:7 21:17 23:12 76:22 77:18 78:17 79:4 93:25 117:9,12 119:15 127:23 128:5 136:6
sound 104:20
sounds 118:11
south 13:1 40:6 44:25 45:6 73:17 74:24 82:4,19 114:1 122:9,13
southern 82:9 111:5,11
so-called 7:2
space 8:10,23 64:3 66:7 79:4 98:17 119:11,15
spaces 95:7
spacing 73:20
span 77:11,14 78:1
spatial 127:23,24 128:4
speak 83:19 86:2 100:12 111:19,21
Speaker 4:21 51:5 121:2,11,25
speaking 44:6 55:9 83:21 86:18
speaks 80:11
special 38:1
specifically 80:7
spectacular 124:7
spell 135:19
spend 88:13
spending 130:24
spent 127:13
spirited 129:12
spoke 12:5 29:20 34:13 35:21 36:11 37:17 40:2 45:8 47:8 86:23 98:11 100:10,13
spoken 82:17 84:4 100:15 111:19
sponsored 123:17
spread-footing 79:14,15,23
square 32:5,8 33:2 75:23
ss 138:2
stability 67:18
stack 65:3
stacking 66:11
stadium 62:2
staff 60:12 67:24 68:1
stage 36:24 43:16 131:9
stages 10:25
staircase 135:24
stairs 74:3
stairways 7:25 91:14
stairwell 71:25 72:3,6,8
stairwells 74:19 90:25 91:21
stand 27:20 31:17 32:6 34:8 123:5
standard 21:7 29:21,25 30:1 35:13 106:12
standards 7:12 8:9 21:12 35:12 106:9 108:23
Stanke 5:11 51:25 61:12 118:18 122:15
Stanley 4:19 51:2 113:8
Stark 4:9 50:14
start 11:20 12:2 15:6 48:5 104:9 120:9 132:14
state 3:22 4:2,15 49:15,19 50:23 102:9 106:9,15 121:2 125:7 138:2 138:7
stated 118:19
statement 9:14 110:20
States 83:10
station 18:1 24:16 24:17,21,21 25:1 25:5,6,10,15 26:5 26:24 29:18 30:15 30:16 31:16,19 32:12 33:15,17,20 37:2,8 39:11 42:7 43:17 44:18 45:14 54:23 57:12 58:6 62:18 65:14 66:3 67:16 68:9 75:13 81:11 85:9,19 89:5,8,11 90:21 91:20 94:16 95:20 98:3 107:5 116:7 121:19
stations 89:23
status 11:23
staying 81:3
stays 73:13
steady 57:19,25 58:1

steel 18:8
step 64:21 131:12
Stephanie 4:12 50:18
stepped 86:21
steps 133:5
Steve 2:10,14 50:2 51:10
Steven 4:7 50:10
Stickelman 2:2 19:6 20:23 21:13 21:23 22:3,10,23 23:13 52:4 106:20 129:8
stips 131:1
stipulation 130:25
stipulations 130:22
stop 16:19 70:9
stopping 60:23
store 27:16
stories 85:3 119:4
storms 28:1
straight 74:22
Street 3:15,16 4:4,5 14:10 28:4,8,19 35:23 49:5,7,22 49:24 52:22 53:19 62:21 88:9 97:7 109:22 135:24
strikes 10:1
striving 13:21 16:10
strongly 68:12 112:23
structural 46:13 47:2
structure 45:10
student 67:22
students 67:8,10,25
studied 90:10
studies 54:4
study 67:9
stuff 80:20
stumble 112:24 114:18
stumbled 112:20
sturdiest 15:4
subsequent 136:9
substance 17:3
substantial 122:19
substantive 23:20 56:2
sufficient 34:5,7 44:13 71:18
suggest 71:24 89:15 90:6 91:21 128:11 129:18
suggestion 116:13 128:21
suggestions 90:14
suggests 96:18
suited 75:3
summary 9:8
sun 131:3
supplement 9:16
support 45:11,12 62:17 77:16 78:14 87:11 95:5
supported 77:17 106:4
supports 87:12 121:11
sure 16:7 30:4 71:17 90:15 111:15 119:7,8 120:19
surface 15:5 76:13 78:4,19
surge 7:24
survive 113:15,18
sustained 56:18
sweep 14:6 16:11
sweeping 13:22
symbol 114:21
symbolic 119:18
system 24:13,18 25:2,18 26:12,19 26:23 27:3 30:4 36:5 42:15 58:25 79:16 87:10 95:21 95:25 96:2,14,16 96:19 98:1 107:18 122:10,22
systems 79:8,17 102:12

T

T 138:1,1
table 83:10
take 8:9 12:9 14:19 18:17,19 23:8 27:12 36:19 40:16 42:24 53:17,18 70:10 88:12 102:7 118:1 121:14 132:19
taken 13:9 28:18 37:10 60:18 61:2 70:4 129:10
takes 8:5 14:5 43:19 60:6 75:20 91:23
talk 44:4 81:6,8 89:19 92:13 98:15 103:23 109:8 122:2,4 126:10 133:5,9
talked 90:9 96:15 122:17,23 131:2 131:16 132:17,24 135:24
talking 17:11,19 22:13,17 24:6,11 28:21 36:14 48:6 55:21 64:6 69:6 79:20 80:19 82:16 97:22,25 98:2 112:16 119:10 122:11 125:19 130:20 131:25 132:5 133:8
talks 20:20 125:16 136:13
tangible 103:8
TCRP 105:1 106:1
team 76:7
tear 42:15
Tech 53:15
technology 91:1
tell 12:16 103:12 136:4
telling 58:17
temporarily 44:20 46:18 132:22
temporary 12:20 17:2,22 25:4,14 36:11,13,24 37:12 40:18,19 42:22 43:1,2,4 44:5,8,10 44:12,19,22 45:7 46:6,8,25 47:11 57:11 58:6 65:14 66:2 79:22 89:5 132:15
ten 32:14 33:18 68:21 96:17,20 97:5,13,18 109:13
tend 53:2
ten-car 24:15 25:25 28:21 31:8 32:2 32:16 96:25 97:9 98:4 99:16,19
term 109:5
terminal 1:8 6:5,12 6:25 10:1 36:19 45:9 46:14 64:18 73:16
terms 8:7 24:9 38:6 52:15,18 54:6 61:13 72:9 78:22 80:11 84:8 85:7 87:4 89:9 111:9 115:16 126:10,22
terrorism 59:9
thank 24:3,5 48:2 121:5 137:3
thick 20:10
thing 20:9 23:11 57:9 62:23 63:22 72:9 73:1 74:11 76:6 83:8,17,19 85:10 93:7 117:14 126:6,8 129:25 132:12 135:19
things 30:2 33:13 38:14 56:1 61:15 65:17 74:19 76:21 80:15 86:17,22 88:23 95:22 120:11 125:2 126:25 131:16 133:10
think 10:6,14,15,17 11:15,20 18:4 19:3 23:19 26:22 26:23 28:19 29:7 53:22 55:24 58:24 59:11 60:19 61:9 61:15,25 63:3 68:17 69:12,18 70:8,9,14,22 71:8 71:10,14,24 78:2 78:5,9 79:3 81:19 85:11 86:11 87:2 88:6,19,22 90:14 91:15 92:11,23 94:14,19 95:18,20 99:9,12 102:7 104:4,10,12 107:13 108:9,10 109:22 110:23 114:11 115:1,3,5 115:9 116:12 117:2,19 118:16 118:20 119:1 123:20 126:22 127:4,9,12 128:9 128:23 129:3,11 129:13,17,22 131:2,17 134:18 136:8,11,18
thinkers 110:20
thinking 62:25 63:23 65:8 94:5,6
thinks 18:6
third 47:10,14 80:3
thought 12:17 68:17 75:11,21 76:2 90:17 116:20
thousand 33:2 67:7 125:22
thousands 119:12 119:23 122:24
three 24:15 26:1,4 26:10 30:22,23 31:9,23 32:13,14 33:17 39:24,25 45:25 47:17 98:5 106:24 119:11,15 122:6 127:20 132:4
three-and-a-half 119:2
three-cars 39:25
three-minute 26:1 26:5 28:22 32:18 42:9
three-platform 96:16
through-put 42:6
tickets 74:1
tight 26:14 43:5,21
tightens 42:2,2
tighter 42:14
Tim 19:6 20:17,23 21:13,23 22:3,10 22:23 23:13 52:4 106:20 129:8
time 7:19,20 12:4 12:23 13:18,19 16:2,22 18:20,24 19:1 23:9 26:15 27:14 28:23 30:19 30:19,20 31:11 32:18 34:5 36:18 37:11,15,17 41:23 42:9,14 43:14 44:15 48:3 55:10 55:16,18 57:1,11 58:5 60:7 65:6,15 66:8,10 68:6 69:25 84:22 85:5 91:11 92:2 98:8 99:13 100:17 111:12 118:1,7 119:8 128:12,18 128:25 131:22 133:4
timeframe 35:18 37:2 70:2,13 129:15
times 8:2 36:12 62:22 106:24 123:16
Timothy 2:2
Tito 19:14
today 9:3,9,15,21 10:11,16 11:2 24:5,6 63:16 69:5

75:25 82:14 90:17 101:7 115:10 129:12
today's 11:20,21
Todorovich 5:7 51:19 92:16,17
Tom 5:3 71:20,20 74:10 76:17 77:20 89:21,22 90:8 91:15 109:25 110:11
tomorrow 16:18
tonight 16:17
top 12:13
topics 6:20 9:1
total 54:20
totally 61:6 125:2 128:18
totals 81:7
touch 116:1
touched 39:12 122:5 134:18
touching 47:7
tour 12:9 16:8 18:18 111:5
touring 130:10
tours 20:6
tower 8:22 12:6 13:2,3 17:7,16,19 34:22 35:6 37:22 39:16 41:8,9 73:14 74:24 75:14 76:15 79:12 82:4 87:16 93:16 94:8 94:12,24 114:1 116:16 122:7,9,13 127:20 130:25
towers 15:9 22:15 22:20 23:10 98:19 126:8
town 110:19
toyed 133:20
track 9:7 27:11,17 36:11,13,24 37:12 40:20 41:2,25 42:1 43:3,5,6 44:5 44:8,10,13,19,22 45:7 46:5,6 47:1 47:11 65:5 77:5 79:22 84:17 87:5 96:16
tracks 24:15 27:7,8 27:10,14,19 33:14 37:10 44:16 64:19 66:11 71:12 81:12 81:22 87:6,7 115:23 116:1
trade 3:13 6:4 10:5 20:3 23:2 24:16 24:25 25:19 26:24 27:5 28:24 29:7 30:15 33:19 35:3 36:6 38:10 39:8 44:8 46:13 49:3 54:24 56:9,25 57:17,18 64:25 81:14,18 82:23 88:22 91:8 97:16 98:3 103:6 105:12 125:23 126:15
trade-off 109:1
trade-offs 108:24
train 7:24 26:2,3,4 27:13 28:11,14,20 29:15 30:17,21 31:8,8,18,23 34:7 39:25 41:18 42:4 43:6,9 46:7 53:20 63:10 75:2 85:9 89:23 91:1,12,16 98:4 99:20 103:20 119:10 127:14
trains 25:25 26:13 26:15 27:17,21 28:9,21,23 29:3 32:2,17,18 39:24 42:10,11 58:18,23 96:23 97:1,2,10 98:5 99:16 120:10
transcends 94:17
transcript 138:11
transfer 45:17
transit 4:20 6:9 7:16 29:22,23 33:4 34:2 35:13 51:3 67:16 102:12 106:6 107:7 108:4
transparency 76:5
transparent 72:12 76:13
transportation 1:7 4:16 50:24 61:10 62:8 63:6 68:2 70:21 71:11 83:7 83:13,14 88:2,7 88:16 104:24 106:2 111:10
TRANS-HUDSON 2:18
traveled 24:17 25:23 97:4
treat 77:24
treatment 38:5 75:8,12,19 76:23 128:13 132:9
treatments 38:1
trend 52:20 56:7 58:11,12 59:12
trending 57:4
trends 54:5 55:8,24 56:20 57:10
Tribeca 3:18 49:10 82:20
tried 13:17
trip 58:14
troubled 99:17
true 96:21 114:23 125:12 138:11
truly 22:6 93:16
trust 3:6 48:16 77:15 116:11 125:6
try 61:5 69:15 75:22,25 108:4 115:3 137:2
trying 18:21 19:13 19:16 63:2 71:22 85:8 100:14 102:17 103:14 107:13 111:25 123:15
tunnel 42:12
tunnels 95:25 96:1
turn 10:19 20:14 48:1
turns 53:8
twice 30:9 61:4 100:14
two 11:3 12:12 13:12 14:18 20:20 20:24 21:7 26:15 27:8,10 32:9 37:9 37:24 44:16,24 75:16 87:7 95:7 97:20 98:12 103:8 116:10 127:19
type 17:8 29:12 47:4 79:17 82:8
types 79:8 119:21
typically 7:22 8:5

U

ultimate 65:24
ultimately 63:11
unboarding 28:6 41:16
unburying 23:15
uncover 19:18
uncovered 115:14 115:14 124:8
undercut 108:17
underground 119:4 119:16 132:15
undersized 90:23
understand 9:6 20:24 57:8 66:16 68:11 85:17 93:2 94:15,21 101:4 103:22 109:11 127:4,25 136:22
understandable 104:8
understanding 136:16
understands 68:7 109:23
understated 60:9
Understood 108:2
underway 71:1
uneven 15:5,6
unevenness 15:11
unfortunately 32:24
UNIDENTIFIED 112:12
uniform 38:5 91:4 91:17
United 4:12 5:11,13 5:14 52:1,3 60:15 83:10
university 3:19 49:12 66:25 67:5 67:19 68:7
unloading 34:16 91:14
unrealistic 129:13
unresolved 6:22,23
update 12:3,10 20:2
upper 124:13 135:9
up-lifts 47:6
up-set 77:15
urges 121:13
usable 32:5
use 8:3 14:21 67:12 94:10 113:1
USS 123:5
utilities 77:24
utility 98:16,20,21 98:24,24 99:1
U.S 110:6

V

vague 135:4
valid 66:1
value 88:13 102:22 102:24
variety 53:20
various 7:14 8:15 24:8
Vashem 84:19
Vaughn 3:23 49:17 128:11,22 130:9 134:1 136:8
vents 76:15 77:7
version 133:18,19 133:22
versus 55:13 75:8 119:14,18
vertical 31:1 40:5 73:21 74:6,9
Vesey 135:24
viable 82:25 87:4 94:2
vice-cHAERman 87:21
video 28:3,4 29:1
videos 35:22
view 21:17 26:7 27:15 36:9 43:13 47:20 76:14 114:13,14,14 128:2 135:15
viewing 14:12
views 68:8
Viggiano 3:20 49:13 86:6,7
virtually 24:22 33:15,21
visible 72:14
visit 11:25 60:24 137:3
visiting 15:23
visitors 119:9
visits 13:13
vital 68:24 82:25
volume 57:7 62:20 119:6
voters 124:11

W

Wagner 5:5,5 51:17 51:17
wait 87:1
waiting 8:11 86:3 91:11
walk 8:5 53:18 62:13,21 117:6
walked 89:22
walking 38:6 119:23
walks 53:7,8
wall 3:15,16 17:20 46:12 49:5,7 52:22 53:7 88:9 94:20 109:22 116:2,5

wane 117:12
want 20:2,7 28:12 44:4 70:19 71:16 73:9 83:24 85:10 86:2 87:11 95:10 96:12 100:4 102:3 102:16 110:8 111:20 113:8 116:25 117:5 122:4 126:7 127:14 130:2
wanted 12:10 16:6 72:25 95:4 100:12 115:21 121:5,8,10 127:18
wants 20:11
washing 18:9
Washington 14:10
wasn't 78:21 124:19
watched 59:3
water 14:7 62:12
Waterfront 56:5
Waterway 57:6 62:16 93:8
way 62:14 63:17 65:2,8 69:17 70:1 70:1 72:19 77:25 86:19 92:10 94:25 95:1,9 99:14 104:1,2,22 105:16 107:5 111:16 115:3 120:13 131:12 133:12 138:16
ways 72:22 119:21
wear 15:3,13 42:15
weather 13:23 16:16 27:24 62:13
website 132:10 134:12
week 13:12,25 16:21 58:15 61:4 132:2
weeks 8:24 12:12 82:19 94:6 112:18 132:4
weight 45:17
Weintraub 4:7 50:10
welcome 6:2 54:15
well-suited 75:2
west 4:4,5 17:16 41:3 44:11 49:22 49:23 55:2 56:3 79:18,19 116:7 124:13
western 17:6 32:16
western-most 116:2
we'll 11:4 12:2,5 14:13,13 15:20,24 20:11 21:11 22:11 23:20 63:8 86:3,4 104:16 111:11 127:15 130:5,17 130:20 131:6,14 132:9,20 133:5,7 134:7,14 137:2
we're 11:2,20 12:11 12:21 13:21 16:10 19:6,7,13,16 23:18 27:20 28:3 28:20 36:10,24 37:25 38:14,21,24 39:1,15 40:20 43:15 47:23 48:6 48:7 54:18 58:7 67:1,3 69:5 73:6 79:20 80:24 81:1 81:3 82:9,16 83:6 83:11 85:8 95:5 97:25 98:2,24 100:5 102:17 111:25 113:13 114:24 119:10 122:11,20,20 126:23 127:2 128:8,17 129:18 130:13 131:25 133:8,24
we've 22:13 39:2,3 44:5 67:6 69:5 73:10 80:18 81:2 83:22 85:12 90:4 96:18 99:24 101:17 129:11 130:24 132:17 134:23 135:15
wheels 42:16
WHEREOF 138:18
white 110:24
wholeheartedly 121:13
wide 43:11 74:17
widened 44:2
widening 40:25,25 41:1 74:12
wider 41:19
width 35:8 40:17 116:23,24
William 4:22 51:7
window 62:19
winter 27:25
within-entitled 138:10
WITNESS 138:18
wonderful 83:4,8 83:17 101:13 103:23
wondering 60:3,17 60:25 61:1 63:1
Wong 2:9 134:7,14
word 124:17
words 22:6,19 95:11 113:18 115:20 118:8
work 15:4 33:4,10 36:25 41:10 43:7 43:16 52:22 53:4 53:10,15 59:15 61:22 70:12 71:3 83:1,7,14 84:20 88:23,25 89:7 109:20,21 130:14 132:15 135:15,18
worked 132:6 136:10
working 28:7 53:2 103:18 110:2 133:7
works 35:10 36:8 40:21 53:6 131:12
world 3:13 6:4 10:5 20:3 23:2 24:16 24:25 25:18 26:24 27:5 28:23 29:7 30:15 33:19 35:3 36:6 38:10 39:8 44:8 46:12 49:3 54:24 56:9,25 57:17,18 64:25 70:8 81:14,18 82:23 88:18 91:8 97:16 98:3 103:6 103:7 125:19 126:15
worlds 117:10
worried 69:19
worry 136:2
worst 117:10,18
wouldn't 23:7 76:15 116:23
wounded 82:17
wrap 130:17 135:22
wreckage 123:5
writing 130:3
written 11:17 20:7 108:5
wrong 90:25
WTC 1:7,8 5:15

X

X-thousands 85:4

Y

Yad 84:19
year 13:1 24:23 25:11 32:17 39:18 39:20 55:11 56:13 56:23 65:12 67:7 93:1 95:13 104:13 123:17
years 25:3,17 26:20 59:5 60:4 63:5,5 63:20,20,21 66:3 68:21 69:2,11 70:15 71:13 82:25 95:24 103:13 125:22,25 126:1
York 1:14,16,16 2:1 3:17 4:10,15 19:23 22:12 49:9 50:16,23 57:6 59:13,14 63:7 88:25 93:8 96:2 106:8,15 121:2,22 123:16 124:10 126:2 138:2,3,7

Z

zone 73:17,20,25 75:14

$

$2 43:22
$500,000 120:15

#

#1 4:13 50:20 82:12 83:20 84:2 87:22

1

1 5:15 12:6 17:17 35:3 38:10 39:8 39:10 46:12 103:6 126:15
1,000 126:1
1,200 67:10
1,500 67:12
1-866-ROSE-NYC 1:25
10th 86:15
10,400 32:8
10.4 33:1
10:00 13:17
100 63:20 81:9 85:3 118:20 120:1 126:1
106 1:9 6:5 9:19,23 10:12,21 11:1 101:19,25 102:1 103:17
11 24:14 68:12
11th 50:1
115 1:15
12 13:16 35:5 36:2 40:12
12th 111:2
120 35:17
126 31:12 32:20
14 131:20 134:9
144 31:12 32:20 35:17
15 13:17
15th 129:19 130:8 137:1,2
15,000 32:4 33:3
16 124:4
16th 129:20 130:8 137:2
17 132:19
180 31:13
19 6:19
19th 11:16,19 130:1 130:4 133:6
1906 67:6

2

2 12:6 17:19 40:10 81:14,18
2:00 13:16
20 25:3,17 70:15 71:13 95:23
20/30 82:24
200 32:21
2004 1:13 25:11 59:25 60:10 138:20
2009 65:12,18
2014/2015 65:23
2015 71:6
2020 71:6
2025 24:23 32:17 36:4 39:18 40:9 40:24 54:18 56:13 60:4 63:3,4 64:11 65:25 70:7,9,17 93:1 95:13,17 96:7 114:6
2050 64:13 103:12
206 85:13
2075 64:13
21 132:1
21-day 134:10
212-435-5560

15:19
213 32:22
220 85:13
23 55:13
23,300 54:21
24/48 130:6
24/7 27:19
25 63:20
250 111:14
250,000 24:19
28 25:12
29,000 54:19

3

3,000 101:2,16
3.2 35:1,25 36:1 40:10
3:00 100:5
3:55 137:5
30 73:22 131:18
30,000 25:12 54:20 58:4
30-width 96:5
320,000 25:1
33rd 28:4,8,18 35:23
34th 53:19
35 131:9,13
360 19:15,17 21:22
37 55:15
38,000 25:7 58:8

4

4 1:13 55:11 80:25
40,000 25:8

5

5 55:13
5,600 54:25
50 63:4,20 69:2,11 103:13 125:25
50,000 25:6 65:13

6

6 23:2,6
6,800 67:11
60 123:25
67 53:7
67,000 24:20 65:22

7

70 31:6 103:9 124:9
74 131:13
75 63:5

8

8 14:9
8,000 67:8
80 31:6
81,00 65:25
81,000 24:25

9

9 40:13
9th 138:19
9/11 3:7,9,12 12:25 24:21 32:14 34:23 48:18,19,24 96:9 99:4 101:8 102:15 109:16 114:23 134:20
97 115:13
98 115:14

WTC TRANSPORTATION HUB
PERMANENT WTC PATH TERMINAL
SECTION 106 CONSULTING PARTIES MEETING

NOVEMBER 15, 2004
PORT AUTHORITY OF NEW YORK AND NEW JERSEY
115 BROADWAY
NEW YORK, NEW YORK

WTC Transportation Hub Permanent
WTC PATH Terminal
Section 106 Consulting Parties Meeting

November 15, 2004
Port Authority of New York and New Jersey
115 Broadway
New York, New York

Transcription by Jane Rose Reporting

PORT AUTHORITY OF NEW YORK AND NEW JERSEY
Timothy Stickelman
Lou Menno
Peter Rinaldi
Bernie McNeely
Shawn Lenahan
Mark Paglietini
Harold Levitt
Bill Wong
Paul DeMeo
Kim Cifarelli
Steve Coleman
Glenn Guzi
Luis Rodriquez
Nancy Johnson

FTA - LOWER MANHATTAN RECOVERY OFFICE
Bernard Cohen
Peter Goelz
Paul Lebrun

November 15, 2004
11:29 a.m.
- - -

BILL WONG: First of all, we found out the middle of last week that some of the e-mail transmittals didn't get to some of the parties.

We had sent out, actually, last Friday, the 5th, an e-mail that was the notification for this meeting, as well as some documents. Some people did not receive the documents, or even that e-mail.

We're looking into what may have been the problem. We don't know if it's entirely at 115 from our e-mail server, but it may also have had something to do with the attachments.

We have hard copies of the attachments that really relate to the Platform D analysis here for you to pick up, and we will also work out how we can get those PDFs of those attachments out via another e-mail server so that we at least cover that base.

And we'll talk about how to keep

up with other communications in case there's other problems going forward in this process.

BERNARD COHEN: Good morning, everyone.

This is a follow-up from our November 4th consulting parties meeting for the Permanent World Trade Center PATH Terminal project under the Section 106 process of the National Historic Preservation Act.

At our last consulting parties meeting, the Port Authority presented its analysis for expanding platform capacity, providing relevant data, describing the analysis methodology, and the industry practices that it followed.

Because of the length of time it took to go through all of that, there wasn't time to start in on the memorandum of agreement, so that is the topic for today's discussion.

There were a number of themes, I thought, that came out of the last meeting. One theme was to make sure that the Port Authority designs the transportation elements of the terminal to meet future needs.

Another theme was to provide options for direct visual access from the platforms to the footprints.

And a third was to look at whether the location of the escalators and the stairs in the corner of the north tower could be shifted.

The Port Authority has been looking into those last two concerns, and I know we will be interested today to hear what they have to present.

I'd also like to address another subject that was raised at our last meeting pertaining to LMDC being a signatory party to this MOA.

The currently proposed signatory parties to the MOA are the Port Authority, the Federal Transit Administration, SHPO, and the Advisory Council for Historic Preservation.

These parties all have explicit responsibilities in carrying out the MOA.

The Section 106 regulations do allow for other invited signatories, when a party outside the required signatories has an actual responsibility to fill, in carrying out

the MOA.

LMDC has no such responsibility in the permanent PATH terminal, so therefore there is no basis for including them as a signatory party.

However, LMDC, as a consulting party to this process, can sign the MOA acknowledging their agreement with its outcome. Currently, LMDC proposes to sign the agreement as noted in the draft MOA you are reviewing.

This option of signing as a concurring party to the agreement is also available to all of you as a consulting party to this process who wish to concur when the MOA is finalized.

With that, we have a lot to cover this morning, and before we head to the tour --

CHARLENE VAUGHN: A point of clarification. Excuse me.

Extending the opportunity to all consulting parties to concur in the agreement is an overture that has no real legal standing. So if anyone declines to sign, it has no bearing on the execution of the agreement.

So we need to be clear about that. It's not something that exerts or comes with any power or authority to change the agreement, stop it from going into effect or whatever.

BERNARD COHEN: Thank you for clarifying that.

So with that, I would like to turn the meeting back to Peter.

PETER GOELZ: Good morning, everybody.

We do have a packed agenda this morning, followed by a tour of the site.

And just as a point of clarification, the Port Authority is going to be scheduling a second tour, given that the first tour was canceled because of the rain on Friday.

You'll be letting people know this week in the same effective way we learned of this meeting, I hope?

BILL WONG: We will have belt and suspenders on.

PETER GOELZ: So there will be a second tour.

The three items that we are going to discuss today:

We are going to revisit the Platform D configuration, and the Port Authority is going to present some new design schemes that they have been working on in response to our last meeting.

We're going to spend some time with John Hotopp on the draft memorandum of agreement.

And then, as I say, we are going to take a tour of the site.

But before we start, let's go around the room and introduce ourselves so that everybody knows who's here and the stenographer can do her job.

Let's start with you, Tim.

TIMOTHY STICKELMAN: Tim Stickelman, Port Authority.

BERNARD COHEN: Bernard Cohen, Director, Lower Manhattan Recovery Office, Federal Transit Administration.

ANDREA BURK: Andrea Burk, AKRF.

ANTHONY GARDNER. Anthony

Gardner, Coalition of 9/11 Families.
JOEL KLEIN: Joel Klein, John Milner Associates, for the Coalition of 9/11 Families.
ROBERT KORNFELD: Bob Kornfeld, Historic Districts Council.
NANCY JOHNSON: Nancy Johnson, Port Authority.
KURT HORNING: Kurt Horning, WTC Families for Proper Burial.
CHARLENE VAUGHN: Charlene Vaughn, Advisory Council for Historic Preservation.
BETH CUMMING: Beth Cumming, State Historic Preservation Office.
DEBRA LESTER: Debra Lester, New York State Assembly Speaker Sheldon Silver's Office.
ALBERT CAPSUTTO: Albert Capsutto, Tribeca Organization.
ROBIN FORST: Robin Forst, Council Member Gerson.
RICHARD KENNEDY: Richard Kennedy, Community Board One.
KEN LUSTBADER: Ken Lustbader,

Lower Manhattan Emergency Preservation Fund.
RUTH PIERPONT: Ruth Pierpont, State Historic Preservation Office.
BILL LOVE: Bill Love, Coalition to Save West Street.
LOU MENNO: Lou Menno from the Port Authority.
HAROLD LEVITT: Harold Levitt, Port Authority.
MARK PAGLIETINI: Mark Paglietini, Port Authority.
BERNARD McNEELY: Bernie McNeely, Port Authority.
KEVIN LEJDA: Kevin Lejda, PATH.
KAREN MATTHEWS: Karen Matthews with PATH.
PETER RINALDI: Peter Rinaldi with the Port Authority.
BILL WONG: Bill Wong, Port Authority.
KATHY HOWE: Kathy Howe, State Historic Preservation Office.
SHAWN LENAHAN: Shawn Lenahan, Port Authority.
NANCY JOHNSON: Nancy Johnson,

Port Authority.
PAUL DeMEO: Paul DeMeo, Port Authority.
JOHN HOTOPP: John Hotopp, LBG.
ADAM LEVINE: Adam Levine, State Department of Transportation.
WILLIAM KELLY: William Kelly, LMDC.
CAROL BRAEGELMANN: Carol Braegelmann, FTA.
PAUL LaBRUN: Paul LaBrun, FTA.
ANNIE KURTIN: Annie Kurtin, American Institute of Art.
STEVE COLEMAN: Steve Coleman, Port Authority.
GLENN GUZI: Glenn Guzi, Port Authority.
PETER GOELZ: Okay. That's everyone.
I think the first presentation is going to be from Lou Menno, who is going to discuss a new orientation of Platform D and the work they have been doing over the past week.
KEN LUSTBADER: Betsy's on the

phone.
TIMOTHY STICKELMAN: And Betsy Merritt from the National Trust.
BETSY MERRITT: I'm here.
And thanks to the Port Authority for making it possible for me to participate by telephone.
PETER GOELZ: Good morning, Betsy.
BETSY MERRITT: Good morning.
PETER GOELZ: Go ahead, Lou.
LOU MENNO: Good morning, everyone, and thank you for joining us.
This morning I'm going to follow up to our last discussion we had about Platform D, because at the end of the last meeting we had a lot of discussion concerning ways that we were going to improve the way we were going to mitigate the impact on the historic resources that were being impacted by Platform D, specifically the columns and the area at the northeast corner of One World Trade Center.
And we listened very, very carefully to a lot of the recommendations that

Page 13

all of you made, and we really put our thinking caps on. And I think what you are going to see today you will be very, very pleased, because our role here is to not only take care of transportation, but to mitigate the impacts on those historic resources, and to improve the visibility and to improve the authenticity of this area.

I'm going to begin with, in this first slide, to show the location of the tracks and the platform in the new World Trade Center station.

As I mentioned the last time, we're going to have five tracks in virtually the same location as they once existed before in the pre-9/11 station.

The three platforms, A, B, and C, will be ten cars in length as before, and virtually in the same location.

The only difference is Platform D, which we went through the extensive discussion and the analysis that's here for everybody's review.

What we pointed out was that Platform D had an impact on the northeast

Page 14

corner of One World Trade Center.

We looked at some mitigation measures the last time that we spoke, and the mitigation measures that we initially presented to you were two options: To physically show within the platform the representations of where the columns once were, where the area of One World Trade Center once was.

And we had two different types of surface treatments, one where the area of the footprint was virtually the same as the rest of the platform, or we highlighted it in a different material.

But we recognized that that wasn't good enough. And as Bernard said before, we looked at, very, very carefully, how do we make this area visible, to show this footprint, to show these columns, for the future, within that station; what do we do with all of the utilities down below that would go through this area to support the station and the PATH operation, looking at the vertical circulation element, can we move it, can we shift it, what can we do.

And we pointed out that this

Page 15

northernmost vertical circulation element was important, because we had three full cars of trains just to the north of this vertical circulation element, and there was a need to make sure that this vertical circulation element was able to carry that amount of passengers coming off a train and also be concerned about the east-west corridor that was right above it at the mezzanine level.

And we were concerned about encroachments of this stair and escalators into that east-west corridor, so we would not disrupt the flow and encroach in this area.

And we listened to all of your comments very, very carefully, and what we did, we pulled together the entire design team, our engineering department, the Downtown Design Partnership, who are our consultants, with the representation from Santiago Calatrava's office who was part of the Downtown Design Partnership, and as well as with Steve Weintraub, the curator for us for the artifacts at JFK. And Steve is also one of the curators for the Holocaust Museum in Washington, D.C.

And with all of this input, we

Page 16

went through a lot of creative thinking. We looked at things structurally, mechanically, from an electrical point of view, HVAC, and this is what we want to present to you, which we believe improves the visibility and the authenticity of the historic resources in this area.

TIMOTHY STICKELMAN: Lou, is this slide three?

LOU MENNO: This is the third slide, which is the elevation at the platform level, which is elevation 250.

This is the platform. You can see the columns of One World Trade Center highlighted here.

And this is the fifth track.

And what we did is, the vertical circulation element, we moved it to hug the western wall, or the end wall that separates the station from the memorial. We moved it to the west.

At the same time, we moved the vertical circulation a little bit further north, so that it would not encroach upon the east-west corridor, because this stairway comes

Page 17

up from the platform in a southern direction.
So we pushed it back further north so that it wouldn't impact that east-west corridor.
What that does now, it allows us to show the corner of One World Trade Center, as well as this entire line of columns along the east wall.
And what we are proposing is several things. With the moving of that vertical separation unit--and we are able to now handle all of that traffic flow from the three cars to the north coming up, we've included the failure management with the stair, the whole thing--we are now looking at creating, just to the southern part of this well -- this vertical circulation well, an open sealed chamber that goes all the way down to the footprint below.
And this area would be a sealed chamber where people would be able to look through a glass wall, there would be a mirror here, and be able to see the footprint and the columns down below.
Approximately 12 columns were

Page 18

initially impacted by our Platform D, but now we are able to expose a good five full columns, and even show, partially, two others.
So you have approximately five to seven columns that would be visible, as well as this area here of the footprint.
And when you go to the northeast corner of One World Trade Center, we would represent that in the platform surface with showing the columns with a tile or with some other design, and also highlighting the area by a different colored floor treatment -- a different type of treatment from the rest of the platform.
And by doing this, we're able to maintain approximately a 12-foot width between the edge of the vertical circulation element and that track.
And from a safety point of view, we're trying not to allow people to linger right in this area, basically because it becomes a safety issue.
And what you will see in the next slide in this area, we were physically able to relocate all of the duct work and

Page 19

electric conduit to hug the east side of this Platform D, so to free up this whole area under here to create this sealed chamber, to create an area that you could look down to, a volume of space, and see bedrock and to see the columns, five to seven of the columns in this area.
When you look at a cross-section -- this here is Track 5, going to the next slide. You will see this is Track 5, this is the platform, and this is the narrowest part, which is about 12 feet between the edge of that chamber and the safety edge of the track.
And under the platform area, in this narrowed area -- narrowed platform area, we would run our electric duct bank throughs, as well as any of the HVAC work, and use that as the plenum, while this whole area would be, now, this sealed space where people would be able to physically look down and see the footprints of One World Trade Center, as well as a number of the column bases.
And what you can see here is that this wall would be transparent glass that

Page 20

would be tilted inward, so that people would be able to lean over and look down into it. There would be a mirror on the western-most wall that would also -- people could just, say, look out and see what's down below without physically having to look over into the glass.
And then this treatment in here, where the columns were not exposed, we would show representation in the slab.
And we believe that this solution, creating this sealed chamber, improves the visibility and the authenticity of the historic resources in this area.
On the next slide, just looking one level above, you are at the concourse level looking down.
So what we did was we moved this vertical circulation element, we hugged the wall, the western wall, and we moved it a little over a foot north to just miss hitting the east-west corridor, and stay within the fare-control line, without encroaching into this area where people will be walking east-west to go to and from World Financial Center or to get to PATH.

Page 21

So we moved this as far north as we could, and we are able to now create that sealed chamber down below here and show the northeast corner of One World Trade Center in a represented fashion as before.

And we did this within the past week, where we literally got people locked up in a room, with Steve Weintraub giving us the proper criteria to look at, to follow, so that we could create a good, preliminary design, which we believe addresses the concerns of visibility, not just to the footprints, but to most of the columns that are impacted by Platform D.

And we're also looking at other mitigation measures here, like, for instance, in the northern ones, the northern columns, to see if we can mitigate any touching or removal of them.

So we're looking at this. We're only in the preliminary engineering; we can't go into final engineering.

But this is a practical and a feasible solution that we could help address all of your concerns about showing the

Page 22

resources in this area.

I thank you.

PETER GOELZ: Well, Lou will take a few questions or any comments, because we need to move on.

Any questions?

JOEL KLEIN: Yes.

I want to say, thank you; we appreciate the work you guys have done, and I have to say, without -- I want to hold off until formal comments and we've had a chance to review this more, but my initial take on this is this is very honest and good, forthright attempt to try to address the problem.

What concerns me is that it starts from a premise that the families are not willing to accept at this point, and that is the need for Platform D.

And I don't want to get into a discussion of that now, because we'll be rendering comments on that.

But we don't feel the Port Authority has yet documented to us sufficiently the need for Platform D.

In the event that that can be

Page 23

done, and we recognize that it's possible, we just feel we don't have the information at this point, this looks to be like a very good point to start working from on first blush.

CHARLENE VAUGHN: The Council would like to go on record saying that we are supportive of Platform D.

I prefer to see this site and this project deal with historic preservation issues on the front side rather than trying to come back five, ten years down the road dealing with it on the flip side where you don't have the luxury of being creative and looking at the broadest array of mitigation measures.

So just as a point of clarification, we feel that there is enough evidence on the record to justify a Platform D.

What we're looking for is how to mitigate it at this point in time so we don't have to start, next year, planning for a route where we can't afford the site maximum protection. So we just need to be clear where we are at with this project.

BETSY MERRITT: This is Betsy Merritt. I have a couple of questions.

Page 24

First of all, on the cross-section slide, I'm at a little disadvantage because I can't see what you are pointing to, but could you explain what's happening above the sealed chamber in that -- is that the next level up? And what's happening there? I can't quite decipher that.

LOU MENNO: That sealed chamber is basically a volume of space that begins right at the surface of the footprint.

BETSY MERRITT: Right. But what's happening above that, above that form?

KEN LUSTBADER: I think she means beyond it.

TIMOTHY STICKELMAN: The mezzanine level.

LOU MENNO: This is at 264.

But at the 264, just to the north of the east-west wall of One World Trade Center, separated, is the east-west corridor that we're not impacting.

And this volume of space with the sealed chamber that we referred to would basically go from the lowest level at approximately elevation 240 all the way up to

Page 25

the underside of the mezzanine level above.
It would be an empty volume of space that would be lit and you would be able to look down into this volume of space to see the footprints, as well as the column bases.
BETSY MERRITT: So you could look down from the upper level too, not just from the platform?
LOU MENNO: No, just at the platform level, not at the mezzanine level. Just at the platform level.
BERNIE McNEELY: Betsy, if you are looking at the section, on the right side, at that upper level, is the fare zone-control area.
And on the left side, that open area, is actually the railing that is around the vertical circulation elements.
If you recall, there are two escalators and one stair at that location.
That area on the left is where it is at that level, where you take the escalators and stairs to go from the mezzanine level down to the platform.
BETSY MERRITT: Okay. Okay.

Page 26

Thanks.
My one other question is, if you go back to the previous slide, what's going to happen to the column bases that are underneath the stairs and escalators? Will they be preserved in place or will they be removed or what?
LOU MENNO: We're looking at that now to see what can be done to preserve them, in place, to the fullest extent possible, because we have to build, just to the north of them, a structural support, to support the stairs and the escalators, that will come up in a southerly direction, and we need to have a wall dividing the stairs from the escalators.
So we're going to look at that.
We're not quite sure what the impacts are, but we're going to do our best to avoid touching them. We may cover them, but we're looking not to disturb them, if at all possible.
BETSY MERRITT: So how many column bases, then, would be represented on the platform? Would it be about three, the ones that would be covered but represented?

Page 27

LOU MENNO: We would have approximately four that could be represented right at the northeast corner.
You have the last two along the north-south wall, then you have the two smaller ones, which would be right at the chamfer corner of the towers. Those four would be represented.
BETSY MERRITT: So is it still possible that you could have a situation where none of them would need to be permanently removed?
LOU MENNO: That's what we're looking at, not to disturb these, just to avoid them, do what we can do to avoid actual removal. They would be obscure, but they would still be there to the fullest extent possible.
PETER GOELZ: Okay.
ALBERT CAPSUTTO: My concern is that you are going to have people who are going to come down there just to view the columns and have nothing to do with going in and out of the trains.
And from what you were talking, or the presentation we had before, you are

Page 28

going basically on a three-minute, four-minute, and you are timing it for people to get out of trains, onto the platform, and off the platform.
How do you think this is going to affect that type of movement of people who are just going to come down to view this as another part of the memorial, as another part of the experience of the memorial situation, as opposed to being a commuter?
LOU MENNO: Well, first of all, this would be in the fare-control zone, so if people --
ALBERT CAPSUTTO: They will buy a ticket.
LOU MENNO: They will pay to see it. But along this one portion of the wall here, if you look at this slide here, this portion that goes north-south would just be a translucent piece of glass, so that would avoid people from congregating here, especially along this whole edge --
ALBERT CAPSUTTO: Because that's narrow.
LOU MENNO: Right.

-- because that's narrow.
But from this point here, where it goes off at an angle, all of that would be the transparent glass and be out of the way of the passenger flow.
ALBERT CAPSUTTO: So you do not think that it will hamper the movement of people who are just there specifically to get in and out of trains?
LOU MENNO: Maybe we are going to have to look at things from an operational point of view once it's in place, once the station is open. If there are people congregating, maybe we need to have someone there just to make sure people keep moving or stay away from this area, a little bit of a crowd control. We don't know.
KEVIN BLEACH: Even in the temporary station -- (inaudible) -- so far it hasn't been. Folks are willing to come down to the mezzanine level, but short of paying the fare to come down to the platform level -- so far.
This is a small enough area that we would be able to manage that, possibly, with

either the issue you have of just keeping escalators strictly going up, or the fare zone up above it.
ALBERT CAPSUTTO: Well, then I commend the Port Authority for their work in trying to mitigate the different concerns of this group.
BERNIE McNEELY: Just to add to the point that we're raising, because you have a valid point that we're concerned about as far as people staying in that area. It's most critical during the peak periods, this issue, so it's less of an issue about people congregating as long during the non-peak periods. But it's going to be very critical during an operational perspective that we make sure people are moving along during the peak periods.
ANTHONY GARDNER: I just have a couple of real quick comments and one question.
One, I just want to say, on the record, that in addition to visibility and preservation of authenticity, the Coalition of 9/11 Families is striving for the maximum amount of physical access to the remains of the

footprints for the public.
Obviously this space is designated towards transportation and that won't be possible. But we want to make that clear as far as the evaluation of moving forward to other aspects of the footprints.
Have you come up with the PATH train is going to obliterate half of the south tower? Do you have plans to recognize where the south tower is impacting the remains -- where the PATH infrastructure is going to be impacting the remains of the south tower?
LOU MENNO: Yes.
Let me go back to the slides here.
Originally, all of this area was taken over by -- was originally occupied by the original PATH right-of-way, and these columns did not go all the way down, I think, as we pointed out, because of the track plan and they were basically bridged over with transfer girders.
However, in the area of the fourth platform, what we would do is we would show the columns and the area in a similar way

as we showed in the other slide with the surface treatment, and to recognize that this was the portion of the south tower. We will do that.
KEN LUSTBADER: Could you go to the other slide, slide 3? I just want a clarification.
Does that -- where the column perimeter is on the north side of that, is that the east-west corridor as well?
LOU MENNO: Right here?
KEN LUSTBADER: Yes.
LOU MENNO: This is the east-west corridor right above this, in this area.
ROBERT KORNFELD: A couple of things.
One is, as far as people congregating at that area, I think you have to remember that this site has been maintained in such a way that the people managing the site have made every attempt to prevent the public from being able to see into the site.
So your thousands of tourists are sort of wandering around the perimeter

Page 33

looking for a little chink where they can see in. Even someplace like the north bridge over West Street, there is a section of that about eight feet long where you can look in at the One World Trade Center footprint, and even that, within the last week, someone put a sheet or towel over it so it blocks off that opening. There's not one single place where people can see.

So anytime you have an opening you get a congregation of people looking for -- I personally don't think it's a voyeuristic sort of thing. I think people are looking for some sort of meaning, they want to see the site, they want to connect with something.

And I think you have to assume that the scheme that's going to be done on this site will allow people to do that in some major way, and they won't be slinking around, looking for some little chink to look through.

So I think if you look at it from the sense that if someone wants to go see the footprints, that they will go and be able to really experience that in some major meaningful way, and not have to go into the

Page 34

PATH station and look at some other area.

That brings up another issue.

I'm just wondering -- I think this is a huge milestone compared to where we were at previous schemes. But I wonder, if a lot of people are going to be going to the site to look at the One World Trade Center footprint from the footprint itself, I'm not sure why this scheme completely obscures it from that direction.

In other words, this is only looking at it from the PATH station back, not from the One World Trade Center footprint, looking at that corner.

It seems like you just have a blank wall going across. I understand it's not detailed that much at this point, but I don't see why you wouldn't want people who are on the One World Trade Center footprint to be able to experience that corner also.

PETER GOELZ: Okay.

ROBIN FORST: I just want to commend the Port Authority for what I think is a very creative solution to a problem that may not be a perfect, end-of-the-day solution, but

Page 35

it seems like we're so much further along with this.

And I would just like to reiterate, on the part of the community, the business community and the residential community, that we do believe that Platform D is a necessity, and are even concerned, as we expressed last time, about some of the estimates toward 2025 going forward. So we think that that's critical and this seems like a great next step in the process. I just wanted to let you know.

KEN LUSTBADER: One question/comment. Not understanding all the technical elements of this, how high is the platform?

And one of the issues, having been on the Memorial Center Advisory Committee, there was issues of access commitments, and when we were down at Ground Zero and we see that today, there is the issue of the importance of seeing kind of the broader picked and chamfered edge and being in the volume of what was the World Trade Center north or south tower.

Page 36

Is there any way to -- I know this is PATH project, but there's no way to knock down the wall that's existing on the -- that there, exactly -- where it can be incorporated into the memorial center?

Or is that just opening a can of worms on design issues and not feasible at all from a pragmatic point of view?

LOU MENNO: We're going to look at the feasibility here. As I said before, we are working very closely with LMDC and their design consultants on the memorial, so we are going to do our best to see how we can better coordinate this.

KEN LUSTBADER: Kind of intuitively you are taking out a corner of a project, letting it be visible from one elevation. However, if you take down a wall, it's kind of like combining two apartments, you have a view shed into the other apartment that can make a more compelling view.

That's all I'm trying to make my point on.

LOU MENNO: We have to be very, very creative here, because we have to create

Page 37

separations by code. But there are probably some creative solutions here.

PETER GOELZ: Couple more comments and then I want to get to John Hotopp. In the back?

DAVID STANKE: Having been on the memorial committee and seeing the design for the memorial itself, I think the whole point of the memorial is that you have to communicate the expanse of what was lost.

And I think that, given that the majority of the people will be coming to that memorial -- and there is no way anybody is not going to miss the fact that there were two one-acre buildings on-site, and to necessarily require that throughout every level all the way down, in that volume, when, in reality, the volume of that building we all knew and we know what was lost, and what we really recognize is the volume of -- what started at ground level and went up 110 floors, that that is going to be marked off as being not there anymore in comparison to the height of a very tall building next to it and the spaces open on the ground.

Page 38

So what I like about this is, you know, I have always felt, since it was lost, that one of the best things that would be able to be done would be to integrate pieces and a memorial and components and memories of the old site and the old World Trade Center into what is our normal life.

You know, it's great that there are facilities for tourists, but I'm not going to be going down to a tourist center every day. It's great that something like this can be in a place so people who were concerned and are connected to the site will have a poignant and meaningful reminder.

So I think this design accomplishes something that has not been done in any other part of the site in a real way in any formal plan that I've seen so far.

So I think this is really great.

The other thing we've talked about, and it came up in a couple of conversations, we've talked about sort of the demand for the PATH station and what are the estimates and how many people will be coming, et cetera.

Page 39

But one of the things we haven't talked about, I think, is, you know, there are a lot of footprints down there, there is an acre and a half of them, and how many people will be coming and how much space is necessary and how many footprints all need to be exposed to handle the volume and the demand for people to see the footprints? What is the demand for the broader audience to see every footprint and be able to go to every column? That's a lot of columns and a lot of space.

So those kind of access demands haven't been addressed. So that's one of my concerns.

WILLIAM KENNEDY: I would like to commend everyone. I think it's terrific what you've done and you've come a long, long way. I think this is a good solution.

I'd like to also speak in support of the platform.

I think the growth is going to occur both in the residential population and the downtown population. And the growth is going to occur in Jersey City eventually, and the office population will be significant

Page 40

irrespective of the size of what the tour buses look like and everything else.

So I think for the safety of both parties, the communities of people who work here on both sides of the water, I think that additional track will give us both comfort and opportunity to do that. So I'm certainly in support of seeing that track.

ANTHONY GARDNER: One other second with Bob Kornfeld, his thoughts about some sort of translucent wall that would show people who are standing on the remains of the footprint east -- west of the station, that that's the corner of the north tower footprint.

I also wanted to make the point that I think this illustrates the problem that we have with cumulative impacts.

We don't know how what you are proposing fits in with LMDC's plans for those footprints, and I can't fathom how -- I can't fathom how LMDC, in your mind, has no responsibility as far as your project. They have a direct impact on your area of potential effect, the remains of the footprints.

And also, there's some

confusion, I think, about what the footprints are. I think you really need to start refining the language.

The individual column remnants outline the footprints, they are not individual footprints. I think they are referred to as footings.

PETER GOELZ: Mm-hmm.

ANTHONY GARDNER: And that's an acre and a half, essentially, because there's one footprint, at least right now, and half of the south tower.

So it's really difficult to make decisions, you know, and a lot of thought is going into this, and you are showing that there is going to be visibility where there can't be physical access.

But there's no way to judge it because there's no way to factor it into what LMDC is proposing.

And you talk about coordination, but if it's not in the MOA, where is it going to be?

Frankly, the Coalition doesn't want to have to attend meetings for the next

ten years until this is done to ensure that the remains of the footprints are preserved and that includes physical access as well.

CHARLENE VAUGHN: I think my comment is related to Anthony's.

I think this is a great concept. I think the devil is in the details.

My concern is the way we set up this agreement, this will come back to people at the 35 percent completion design level and they will be given x-amount of days to comment and then move on.

I think for this particular element of the project there has to be some additional coordination during the development or the blushing out of the concept, and we haven't provided for that.

I know everybody's in a hurry to get the MOA executed, and I appreciate that, but there has to be some mechanism whereby, not a large group, I don't think it needs to be all the consulting parties, but a representative group really works with the Port Authority to try to hammer out some of these elements of the design so that when we get to the 35 percent

stage, we're not in an ongoing dispute or a lot of conflict, and I think we need to make some provisions for that.

The memorial group and LMDC has their own advisory group independent of the 106 process to advise them.

I think that something similar needs to happen, and this project may be on its scaled-down version, but one that really provides people to roll up their sleeves, particularly preservationists and people who have architectural expertise and preservation to deal with some of the design elements early on.

PETER GOELZ: I think you are right. The devil is going to be in the details.

CHARLENE VAUGHN: Right.

PETER GOELZ: If we could, since we want to get to the tour, John Hotopp will now give a presentation on the MOA. He gave a very abbreviated one at the tail end of our last meeting, and I thought that we could spend a little more time on it this morning.

JOHN HOTOPP: I thought last

week's presentation was quite fine and I would like to see if I could do it in about half that time, but people told me that's not acceptable, you have to take a little more time, so I will.

I'm particularly pleased to think about where we are today and where we've come from.

If you remember back, we had the determination of eligibility report that we all put together, and we wrote it up for your review, and you people had some real good input and it became a much more powerful and robust document as a result of the work we all did together on it.

And now we're seeing the same thing as we develop this memorandum of agreement; it's becoming more robust, more powerful, and it really speaks to the issues that you people have identified in the last couple of meetings.

The Port Authority, I think, is probably the most sensitive client that I've worked with in years in trying to accommodate everybody's needs to get a mitigation plan that actually works. So I'm pretty excited about

Page 45

it.

What we have here today, I think, is the document as it now stands, and it's getting very close to the end of the process. But as Charlene pointed out, and quite correctly, we're not quite there yet. We've got a little more work to do with design and some more mitigation things that we want to work out.

Do you want to pass these out?

BILL WONG: These documents are for the platform that people can pick up at the end of the meeting.

JOHN HOTOPP: A couple preparatory comments, then.

At the input of the consulting parties, I think we have made a much more robust set of documents for this, thing. I'm very proud of the work you've done.

The other thing, I will tell you today, is that when we actually do the tour, it's going to be difficult because there's an awful lot of water and a lawful lot of mud and it's an awful big mess down there, dating back to Friday.

Page 46

One of the disadvantages of working deep below the Hudson River is the water comes in and it's very difficult to get out. So you will all see what a challenge this has been.

I would suggest that those of you who are not particularly strong-hearted for mud, you might want to reschedule for later on the next chance we can to get out there, because if God will let it dry a little longer it will be an easier trip.

With that, everything said, let's see where we can start from.

We have been messing around with all of these stipulations, and all of you have seen these.

The tower perimeter columns have become the stipulation of choice. Everybody has really put some serious thought, effort, and time into it, and the work the Port Authority has done in a week to try to accommodate your needs and interests, to me, was a very important step forward.

That's another point I would like to make, Anthony, when you talk about

Page 47

cumulative impact, is that the Port Authority is going to be involved in this whole site development forever; they are the owner, so they can't just walk away.

And I think we've done an excellent job of sensitizing the Port Authority for the concerns of the people who are involved with the process.

I think we've done a real good job, and I can't imagine that the Port Authority, as we've worked with LMDC and everybody else, as we work our way through this process, I can't imagine that they are going to ignore all of our concerns and needs.

So we do have a big advantage, I think. They are going to be totally involved in the process all the way through.

And today I thought we would talk a little bit about some of the steps we haven't really talked about, and to see if you have any concerns that we've missed or comments you want to make about them.

And so I was going to go through them, and last time I went through at double speed. Maybe I will slow down a bit.

Page 48

I'm not going to talk about the perimeter columns. This has been a big subject for the last two weeks and it has been very effectively presented and a lot of input come.

East-side subway entrance, what we are going to do to that and treat that entrance, is we are going to basically memorializing the entrance from the E train into the World Trade. We will have a little bit of an up and a little bit of down, but people in Manhattan are very used to that, I can't see that it will be a problem.

Is there anything we've missed on this that you would like to call us out on? No?

We're comfortable with the E train stipulation?

Because some of these I'd like to put to bed. I'd very much like to say to my clients these are final stips.

JOEL KLEIN: I have to object to your use of the phrase "put it to bed." We haven't reached the deadline for comments on the previous versions of the MOA.

JOHN HOTOPP: I know that. But

Page 49

what I'm saying, Joel, the things that are not particularly controversial we would like to get them off the table so we can really focus on the ones of interest. That's what I'm really talking about.

CHARLENE VAUGHN: I think that we talked about it, but just as a point of clarification and to go on record, I had suggested to the SHPO that consulting parties have a more extended period of time to review documents. As it was written, I think they were given 14 days, and I thought that was just too abbreviated given that they meet with boards and everything.

TIMOTHY STICKELMAN: We are changing it to 21 days.

CHARLENE VAUGHN: I just wanted to clarify that.

ROBERT KORNFELD: One comment on the tower perimeter remnants and the footprint areas. We really haven't dealt with Two World Trade Center at all.

I think there are a lot of issues there, you know, of what's covered, what's intended to be demolished, what's going

Page 50

to go there, how the mezzanine level interacts with the memorial above and that kind of thing. I don't think we've even scratched the surface on Two.

JOHN HOTOPP: I agree. The real focus of the whole meeting has been on One because there we have a whole footprint that reads, and it's very easy to understand what you are seeing, and the two towers are difficult to understand what you are seeing.

I think, for that reason, they haven't focused much on Two. I don't know that there will be a whole lot of impact beyond what they have made -- than what we've already had.

ROBERT KORNFELD: I don't think we've really determined what the impacts are.

BILL WONG: We've made representations.

ROBERT KORNFELD: Does that mean that you are destroying everything that's not out in the -- that's everything east of that line or the PATH track or where the platform is?

JOHN HOTOPP: No.

That's the issue. Are parts

Page 51

going to be visible, are parts going to be preserved but covered?

BILL WONG: They are going to be obscured. I think we outlined that in the original discussions back in June, and that's kind of the level of development.

I don't think that there's ways we can really look at to address the same issue that -- or address the same solution as we have in One World Trade; that's an extraordinary circumstance where we understood that there's a concern about the entire footprint. This is a different type of area in the south tower where we probably can't do the same type of solution.

JOEL KLEIN: I think the engineering constraints are clearly much greater where the south tower is involved, and obviously the facility is going to be on top of that portion of the footprint.

But I think the MOA needs to be more specific in at least addressing the process for how those will be built. Right now I think it's fairly silent on discussion of the south tower footprints.

JOHN HOTOPP: Yes, you are

Page 52

right. I think the real focus has been on the north tower.

BERNIE McNEELY: John, the draft MOA currently speaks to three items that relate to the south tower. One is the historic recordation process, which is going to occur.

The second is that there have been identified with Platform D three column base remnants that could be either temporarily or permanently impacted.

And the third is the stipulation about providing architectural treatments, not only for Platform D, but for all the platforms that are within the footprint of the south tower.

That is information that's all currently in the draft MOA, and then from there it would be to solicit any comments that relate to those three things.

I think those are the three major things that relate to that south tower currently.

JOHN HOTOPP: Okay.

BILL LOVE: I have a half-dozen comments on the documents. Should I give them

Page 53

as we go through?
JOHN HOTOPP: Probably.
BILL LOVE: I have one comment on the section relating to the column remnants.
This is on page 8 -- starts on page 8 where it discusses the efforts to preserve, in this case, 80 column base remnants in the north tower and 39 in the south tower.
There's language in there that is -- I think, provides the Port Authority flexibility, and it refers, for example, in paragraph B(1), to "Shall, to the maximum extent feasible, given project information requirements, preserve in place."
So there's a recognition that certain circumstances could change as we go through here and there's some flexibility built in.
I'm wondering, on page 9, in paragraph 6, you shouldn't also have some sort of conditional language. That basically says that the total extent of the north tower footprint at elevation 242 will not exceed 4 percent of the north tower footprint area.
And then the last line there,

Page 54

"will not exceed 53 percent of the south tower footprint area."
What happens, for example, if you are going through and working on the east-west corridor and something happens that would require a change in the location, maybe an impact on another historic building, maybe something to do with the Hudson River bulkhead, shouldn't there be some conditional language similar to what's in paragraph 1 and 2 to recognize that that might -- there might need to be some flexibility there, otherwise you might find yourself in an impossible situation.
So that's my one comment.
JOHN HOTOPP: Good point.
ANTHONY GARDNER: Can I just say, for the record, we are absolutely opposed to that. We see the point of the MOA is to spell out specific percentages that you will be preserving, not more wiggle-room language.
LOUISE LO PRESTI: This is a design issue, and you need to resolve the design issue.
And Tim Stickelman, last week -- and it is highly foreseeable that even the

Page 55

existing work that you have in scope will have far greater impact than what you are indicating. It's only realistic and you need to account for that.
JOHN HOTOPP: Yeah, well we've become pretty specific.
LOUISE LO PRESTI: It's not specific enough.
JOHN HOTOPP: These agreements are normally drafted far in advance of construction and you can't see where you are going. We are much closer here, and I think we have a much more complete document than you would normally find in a memorandum of agreement.
LOUISE LO PRESTI: That's nice, given the fact that this is the site of the largest attack of the United States in history; yeah, it would be nice if you were accurate and took adequate measures.
BERNIE McNEELY: If you could offer us some specific comments that relate to your question and concern, that would be helpful to us so that we could finalize the MOA.

Page 56

LOUISE LO PRESTI: Yes. I do have a comment that I made to Tim Stickelman last week, namely, I have the utmost respect for the technical team at the Port Authority. However, a project like this is not, by any means, within your normal mandate.
And I don't believe that, despite the excellent skills you have in doing your day-to-day job, that you are equipped to handle this.
And I suggested to Tim --
TIMOTHY STICKELMAN: Louise, I want to stop you.
I know what you are saying, but you were a little late. You missed the first part when Lou went over the Platform D analysis and the different treatments, because they met this week, so what I will do, after this you will get the --
LOUISE LO PRESTI: Does this address my concern to you?
TIM STICKELMAN: Yes, it does.
LOUISE LO PRESTI: And will I be happy with it?
TIMOTHY STICKELMAN: I don't

know, Louise.
LOUISE LO PRESTI: My suggestion to Tim was that we consult with Mr. Calatrava, being one of the finest architects in the world, to come up with a suggestion. If you addressed that, that's wonderful; that alleviates at least 50 percent of my concerns.
KEN LUSTBADER: This raises the issue that the LMDC expressed and Charlene convoluted to this morning, that this project needs someone who has experience in historic preservation.
I know you had Steve Weintraub consulting on this, but I think the MOA has to include that someone from the Secretary of Interior Standards for historic preservation be part of the cultural resources management team, or whatever we want to call it, and that's kind of codified in the document.
I know that we talked about it, but just all these issues, the east-side subway entrance, how is it going to be interpreted, those are all questions that I have and we can't answer right now because it's a design issue, but we can at least make sure that the

solutions or the technical expertise for that type of solution is in place.
CHARLENE VAUGHN: I agree with you whole-heartily. I think that in formalizing the agreement that the Port Authority will have a qualified preservationist on the design team. And I think they probably do, informally, I think it just needs to be codified.
JOHN HOTOPP: I think that was spelled out with the assistant city engineer, for example, and the operational impacts. We have it in that section, but I think it could be expanded -- the role could be expanded.
CHARLENE VAUGHN: Okay.
JOHN HOTOPP: But that's a good point.
ANTHONY GARDNER: Bernie wanted some suggestions about making things more concrete language. And I think we've said this so many times I can't even remember how many.
Ken Lustbader's preservation league, I know they've expressed this. You have to address cumulative impacts. And LMDC

should have to sign on to something, whether it's a separate document or this document, that discusses specifically their projects's impact on the remains of the footprints so that you could coordinate.
I think it would make your job as designers much easier if you knew, Well, LMDC is doing this on this section, and they could make those perimeter lines visible and accessible from here, so we could maybe do this and have it fit and work like one project.
And until you address the cumulative effects, we're not going to be satisfied in any way, because as far as we know, you're working towards a good -- you are going in a good direction where you've acknowledged that the remains of the footprints are significant, you are trying to mitigate against your project's adverse effects.
We have LMDC on the other end where all we have is a vague commitment saying they are going to provide appropriate access. That could be three columns and 5 percent of each footprint, and, frankly, that's not good enough.

The remains of the footprints should have a national designation of protection, and it's only because they are prime New York Manhattan real estate that that hasn't happened yet, and it's a shame.
So you guys are moving in the right direction, but we really feel strongly that LMDC is just going to reverse all of this work, all of the time we are putting in here, by not signing on to an agreement.
JOEL KLEIN: Another comment relating to that very quickly.
We heard earlier today that the decision has been made that LMDC would not ask to be a signatory to the memorandum of agreement, and the explanation given for that, according to Charlene, was because the Port Authority does not have a specific role and responsibilities.
Well, flip that around. The concerns that we have of the fact that the existing programmatic agreement with LMDC essentially gives LMDC the final say over access to the footprints and how they are going to be interpreted.

Page 61

When comments went out on that document, it was specifically suggested that the Port Authority become a signatory as the property owner, which was pointed out here under the Advisory Council's regulation.

The Port Authority had a right to be a signatory to that document and was not committed or refused to sign it.

As a result, the Port Authority essentially relinquished control that they could have maintained to the LMDC, and that's the root of the problem we're having here now, and that's why we've asked that LMDC be made a party to this agreement.

If that can't happen, we would strongly urge you to approach the LMDC and reopen the programmatic agreement to allow the Port Authority to become a signatory, so that any commitments that the Port Authority makes would have to be honored by LMDC as well.

PETER GOELZ: Charlene, did you have one more thing on this?

ALBERT CAPSUTTO: It's just -- did I just see throughout this document, through all of it, you have coordination,

Page 62

historic properties, and it says -- and you have it here:

"The Port Authority shall coordinate treatment of these historic properties with LMDC."

If you want to put a paragraph to state that even more explicitly, fine, but to go through all of this -- I think you already have it enough in this document that there is going to be coordination with LMDC.

So I don't see exactly the main sticking point that if they have to be a signatory, if legally you say that LMDC doesn't have certain participatory situations in the Port Authority attachment area, then that's the situation, that's the legal situation.

If they are signing on that they concur to this document, and if you have, throughout this document, that's there going to be coordination with LMDC, that should be sufficient.

LOUISE LO PRESTI: Albert, this is law school 101. You are a businessperson. You know you can state whatever you want that another party is going to do X, Y and Z, but

Page 63

unless that party is a signatory to the agreement, they are not bound to it.

CHARLENE VAUGHN: You know with the LMDC agreement, I'm sorry, the Port Authority didn't signed and they didn't --

LOUISE LO PRESTI: I say the same thing about that.

CHARLENE VAUGHN: Yeah, but I think we need to be clear about the Port Authority's role and rights and privileges with this site, period.

And, you know, maybe I'm a little dumb here, but why are we putting billions of dollars in redevelopment and there's the perception that these agencies are going to work at cross-purposes?

I'm lost here. Maybe you all know something that I'm not getting because I don't live here, and help me understand that.

But I'm trying to figure out why we're expecting each of these agencies not to coordinate at some point. Why is there the expectation that they are going to undermine one another?

JOEL KLEIN: Charlene, you were

Page 64

at the same meeting we attended when the Vesey Street stairs were discussed and the Port Authority made a very nice presentation about how they were going to preserve them, and when they were specifically asked about how LMDC's project would affect them, their response was "We don't know; it might be affected by LMDC's project."

If that is an example of the kind of coordination and cooperation, we are in a very sore state.

CHARLENE VAUGHN: Maybe they didn't know.

TIMOTHY STICKELMAN: We should cut this off. I know everyone wants an opportunity to talk, but Joel and everyone else here should know that the Port Authority, as the owner of the site, is going to be involved in every step of the process, because they don't know what's going to be built in the northeast corner, which they are talking about, so we will be involved in that.

It's just that it's not going to be part of the PATH project, and that's what we were saying way back when, when we said we were

Page 65

not affecting the northwest stairs that everyone was talking about.

PETER GOELZ: John, please go on.

JOHN HOTOPP: All right.

CHARLENE VAUGHN: Just one minute, John.

I think Anthony did bring up the whole concept of cumulative effect. I did not hear how that would be addressed.

Let's take away the coordination and concept of cumulative effects. I think that has some validity, and if you feel it's addressed in this agreement, tell us where and how, because I'm not finding it.

JOHN HOTOPP: Well, Tim made the point this morning again that the Port Authority is the owner of the site and there will not be anything occurring on the site where the Port Authority is not involved in, Charlene.

CHARLENE VAUGHN: I don't think we are talking about involvement per se, I think we are talking about planning for the potentiality of things to happen incrementally

Page 66

that we just could not have anticipated at this point, because a lot of this is going to unfold. This is just the nature of development.

So as we see these, you know, encroachment on neighborhoods or other factors coming into play that we just did not consider at this point in time, what provision is in this agreement for us to have some ability to address that on a going-forward basis?

It's an unknown; I can see that. But yet, we still don't have a process for dealing with it.

Property owners, what, if after this is all built they look and have, you know, some impact on their neighborhood that clearly was never anticipated, and it's a preservation-related issue. How did they address that? They could just come and address that with the Port Authority on their own? Is there a provision in here to deal with that?

I think that we need to think of what the process will be, recognizing that, at best, we can lay out some steps for the future. But there's just nothing here that addresses it

Page 67

fully, as I see it.

JOHN HOTOPP: Okay. Thank you. Do we have one more comment?

ROBERT KORNFELD: Yes. On Section B, where it lists specific numbers of column remnants and that kind of thing, I think that you really need to show the total number of core columns, along with perimeter columns, and other features of the site.

Once you get that specific, then basically you are saying that anything that is not specifically mentioned is excluded, as I would interpret it. In other words, if it's very general, that's one thing.

And with Two World Trade Center, I think you need to talk about the total number of column remnants that are there.

It's understood that the portion where the PATH tracks and station are, are not going to be exposed as a historic site in the same way that One World Trade Center would be. But I think you need to deal with those numbers.

And instead of just saying 39 and plus 3 are being impacted, that's not

Page 68

really the case, there are dozens. I mean the whole -- you know, other parts of the north and south perimeters and the entire east perimeter, and portions of the core.

So I think that's part of the mitigation, is how those things are addressed. In other words, if they are covered in a way that protects them rather than demolishing them so that at some point in the indefinite future someone could uncover the site if they wanted to.

I think with a site with this level of significance that this is a concern, and I think it should be addressed.

JOHN HOTOPP: A lot of this site is going to be intact and it's going to be preserved underneath things. So again, you are pushing and pushing beyond where I think the designers are with a lot of it.

The Port Authority and the PATH station design is close, and so we can talk about the impact we are making to the platforms and how many things we've got to cover or whatever. But you are right. The rest of the site, the rest of the footprints, I don't know

Page 69

where we are yet. I don't have that information.

ROBERT KORNFELD: The language in the document doesn't describe it.

JOHN HOTOPP: I don't know quite how to address that. We focused on the language that the PATH station is going to have on the project.

ROBERT KORNFELD: But that's what I mean. That's still one of the main impacts, even though no one is disputing that the tracks may impact the east portion of Two World Trade Center.

I think you still need to say what's there, what's going to happen to it. No one disputed the fact that you are not going to uncover that portion due to having operating tracks and construction and so on.

But I think you need to document what's there, on drawings, if not physically uncovering it and say what's happening to the resources there.

JOHN HOTOPP: Part of the documentation will be just that, it's to compare the drawings and photographs and make

Page 70

everything kind of jive as we work through the documentation of the site. But there will be a record created.

BILL LOVE: I have a couple of comments. Are we moving on to the next section?

JOHN HOTOPP: Yes.

BILL LOVE: The penetration of the east-west slurry walls. Page 12 talks about the design providing visibility from within the terminal to a portion of the east or west slurry wall and of certain criteria met.

And I hope when this design is done that the designers will be sensitive to the concerns that have been expressed here before by others and by myself about the fact that residents and people who work in a lot of the buildings like the World Financial Center, who experienced trauma on 9/11, don't necessarily want to be reminded on a daily basis as they go back and forth, being forced to confront views of the slurry wall.

In fact, if you ask residents what they are interested in with respect to that passengerway, they will about retail more

Page 71

than anything else. So I hope the designers will be sensitive to that.

I noticed in the paper this weekend there was an article about the plane crash that took place in November of 2001 in Far Rockaway, and it's interesting, some of the same conflicts have arisen there that have arisen here. Some of the families went back, and they had built -- I guess the plane went down in a neighborhood and they rebuilt houses there, and they moved the memorial some distance away.

The thing that caught my eye about that article was a quote in there from someone who was a manager of a local restaurant who also lost his brother in the World Trade Center. He said, "We were hit real hard on 9/11, and people around here don't want to keep seeing more grief when they walk out of their homes every morning; they want to move on."

And I thought that captured the feelings of a lot of residents down here who were traumatized on 9/11. So I just want to make that comment.

Also, within that same section,

Page 72

it's not directly related to the slurry wall, but there's confusing language in there on what's supposed to happen to the steel beams and cross-form.

Page 13 says that these will be "relocated to Hangar 17 at JFK, or an alternate location, where the object will remain in custody and control of the Port Authority pending final disposition of the artifacts."

And that was my understanding.

But then, if you go over to page 18, I believe it is, "Temporary relocation of historic elements," there it talks about the historic elements potentially anticipated to be, and they mention steel beams and cross-form as being temporarily relocated to protect them from damage during construction of the project.

Then on the next page, page 19, paragraph 2, item C talks about returning the elements to the World Trade Center site.

That seems contradictory to me. In one case it talks about returning it, and in another case, it talks about staying out there pending final disposition.

So I don't know if that's a

Page 73

conflict or not, but I would certainly voice opposition to returning what is clearly a religious symbol for one particular religion to the site--I just think it's just inappropriate--if that is the intent. But I hope that language can be revised. It does seem to be in conflict.

Those are my comments on that section.

JOHN HOTOPP: Thank you.

We were talking about artifacts off the site being impacted by the construction activities, and we have a mechanism now to put them in the hangar, keep them there, preserve them, protect them, whatever, until the decision is made as to what to do with them. Basically that's what we are talking about here.

BILL LOVE: This second set of language seems to suggest, by including them in that list, that they will be brought back to the site. So maybe that just needs to be corrected.

JOHN HOTOPP: I appreciate that.

Page 74

If you remember, we had a ruling from the Register that objects at Hangar 17, when they come back to the site, will go back in to being a significant portion of the site.

That was an issue early on, was what happens to the stuff that's off-site.

You had a question?

ROBERT KORNFELD: I have a question about artifacts.

A large number of artifacts were removed from the site prior to its being returned back over to the Port Authority under DAC and Bovis, and that was an issue -- a lot of things were distributed to, you know, I don't know, museums, firehouses, churches, all around the country, and I'm just wondering if anyone has followed up on what happened.

I've seen a lot of those items; I don't know where they went and I don't know exactly how it worked.

But a lot of those were very significant items, and it seems to me, when someone is putting together a memorial center, that they should be able to consider all of the items -- I don't know the details of ownership,

Page 75

what kind of chain of custody. I'm not trying to get anyone in trouble, but a lot of significant items were removed from the site, and maybe people --

JOHN HOTOPP: As people donate them back to the Port Authority, they are being included in the inventory as that goes along. But that may be a vehicle.

JOEL KLEIN: I think we would like to see the Port Authority make a commitment to being a little more proactive in identifying artifacts removed from the site.

TIMOTHY STICKELMAN: If anyone gives us anything back, the Port Authority will add it to the inventory.

But the Port Authority is not going to search for every item that left the Trade Center when we were not in control of the site.

ROBERT KORNFELD: But there is a -- it wasn't done just chaotically. I believe that there is a list that was maintained of what was given to whom, and it seems that in, whatever, eight months or something, it should have been possible to maintain that list.

Page 76

JOHN HOTOPP: I think a lot of what we've been talking about would be the exhibit designers would be able to collect that kind of information because they have to put the final place together and they may find that very useful as well.

BRUCE EARHMAN: In answer to that question, the Memorial Advisory Committee dealt with that and there is a stipulation in the final document, which is on the Web site of the LMDC, that a group is now seeking out every item that might have been distributed, and what isn't currently cataloged is -- attempts are being made to catalog every item that went out and where it is.

JOHN HOTOPP: Good.

BRUCE EARHMAN: I just want to make some general comments about the discussion so far, and I'm sure my friend Albert will stop me via filibuster. But I've been thinking about this an awful lot since the last meeting.

I, for the first time, tried to discuss with my wife the discussion that was here last time, and, you know, just this -- that discussion of the discussion brought her

Page 77

to tears.
I mean, we are longtime residents here, and I just think that perhaps because the way the Port Authority has perceived this, having dealt with the citizens over the year in a sort of peremptory way, that there is a perception that the Port Authority needs to be -- needs to have its feet held to the fire in this instance.
That being said, I just think there is an ongoing misapprehension or misperception between victims and victimizers.
Last time we were here, this preservationist, who discussed having seen a train station in Germany, which has a memorial -- where a lot of -- where a concentration camp was or was near, or deportation center, it turns out that this station, which was not mentioned in the meeting, is not a regularly used station. It's a train station, but it's not a regularly used commuter platform.
And I think this kind of subtle revisionism has been going on in this discussion.

Page 78

We need to separate here for the larger good, not just for a faction of family members, but for the general good.
We need to separate what defines victims from victimizers.
Saying it's the largest attack in U.S. history overlooks the fact that if you want to preserve much of North and South Dakota, for instance, because we slaughtered Native Americans, we were the victimizers, they were the victims, it makes sense.
If you want to preserve every concentration camp in Germany, that every generation of Germans, yes, should understand what happened, yes, they were the victimizers. Jews, gays, Eastern Europeans, et cetera, Catholics, were the victims.
I can spin this out indefinitely.
Here, New Yorkers were the victims, not the victimizers. In fact, the victimizers were not even from our soil. In fact, the victimizers have not even been caught.
So to conclude that every commuter, that every resident, that every child

Page 79

who lived through this should be oppressed by this station and all remnants of the disaster is to conclude that somehow the victims have become the victimizers and should feel oppression and horror every time they commute down here.
I am as irrevocably against that concept as the son of a family who had to flee Germany and whose great grandparents died in the Holocaust, as this group is irrevocably committed to leaving it as tragic as possible.
We have created a beautiful memorial, we have spent months and years on this project, and there is an insatiable desire to make this -- and the preservation community I might add is divided on this issue, while the head of the HDC, for instance, tends to want full preservation, the vice president of the HDC, who lives here, has difficulty, Roger Vyrem.
KEN LUSTBADER: That's not the preservation committee, though.
ROBERT KORNFELD: That's also an excuse. HDC is my organization, okay? I represent the board here. The opinions of one

Page 80

member do not represent the board.
The board has duly authorized me to represent them at these groups. I do not want you misrepresenting what the HDC is on record saying.
And I would like to say, also, okay, I am not a family member.
Most of the people here that are pro-preservation are preservation groups, not family members.
I also happen to have had the experience being an eyewitness. My office was the city's prime engineering consultant for the emergency. I spent 2000 hours on the site during the emergency in a hard hat and jeans and hiking boots, going around, going through your buildings, office buildings, apartment buildings, seeing what needed to be done to secure them and make them safe for people to go back into. I probably breathed incredible amounts of asbestos, my lungs are probably full of heavy metals.
I'm just saying, you are portraying this like it's the residents versus the family members.

I see this very clearly as a preservation issue. This is one of the most important historic sites in our nation.

To me, the feeling of coming here and fighting for its preservation in a meaningful way is no different than going to the site when it was seven stories of flaming wreckage. I feel the same sense of dedication. And I'm actually shocked that so many of the residents see it as being something foreign. It's usually the residents who come forward trying to preserve something meaningful in their community, and it surprises me.

BRUCE EARHMAN: If I can respond to that?

PETER GOELZ: I would like John to finish.

BRUCE EARHMAN: Okay.

PETER GOELZ: And I would like the tour to depart, and if people want to stay and talk about this -- you know, this is an important philosophical issue and important debate, I'm willing to stay.

CHARLENE VAUGHN: But as the agency that facilitates this whole thing, I

think I would be remiss not to clarify that we are here because, in 1966, Congress passed a law that said when federal agencies were going to expend federal funds or have any federal oversight over a project, they had an obligation to look at the impacts on historic preservation.

And as part of that, you brought in other stakeholders who had related issues.

But this is all about historic preservation, and somehow we are getting confused because other factors come in this is a vibrant community, a modern society, and you have to integrate this.

FTA can't release a dollar of this money until we finish a project about historic preservation.

So that's in the public's interest, which means that everybody's issues have equal weight. There's not one that prevails over another. And for the residents -- my son lives here, my daughter. I can appreciate all the feelings of being a resident.

As a preservationist, I can also

see that this is a site unlike any we'll ever encounter again, and if we don't approach this in a balanced manner with public interest as the prevailing and overarching goal, we are going to regret it, because right now we have these buildings and five, ten years from now you cannot go back and reresurrect or reclaim it. So we've got to work together.

BRUCE EARHMAN: But I must respond now and then I will be silent.

Because you are addressing the chair of the Landmarks Committee, Community Board One, and its monthly meeting is tonight where this is all we do, and we are well known throughout New York as one of the most rigorous preservationist neighborhoods, I have to address your surprise that the neighborhood feels this way.

We are, as I said, extremely preservationist. But the microcosmic examination, as the law requires of us on the site on what needs to be salvaged and what doesn't, in the context of the greater good, is an example of the preservationist community in 40, 45 years, having gone from one of the most

progressive -- one of the most progressive movements in New York City which save incalculable treasures after incalculable treasures were lost, like Penn Station, to becoming, in some respects, one more -- one more special interest group, whose tiny focus is the preservation of every iota, to the extent that some of the greatest architects in the city, including Calatrava, have said that great architecture has been shunted out of New York City for years.

So that's my response to the surprise that downtown residents aren't more preservationist.

LOUISE LO PRESTI: This is very counterproductive.

PETER GOELZ: John, please.

JOHN HOTOPP: I'm going to shift gears to the Hudson River bulkhead, which is one more stipulation that we've got, will be to run our trench through it, test it, see what's there, we don't know, and if it is there, we will do a recordation of it, it will probably be under the HAER standards, because it will be more of an engineering -- it will be a Historic

American Building Survey -- provision in here and we will test it, see what's there and then record it.

BILL LOVE: I will just add our group is supportive of trying to preserve this.

I'm actually very surprised that we haven't heard much on preserving this resource from the preservationist community. This is something that would -- and I'm not knowledgeable on these matters, but would at least seem to be clearly a historic resource.

I know McClellan wasn't a great general, I don't know how he was at bulkheads. But all this focus on preserving the destruction, and here's something that has real historic meaning to it, and we've heard very little from the preservationist community on it.

JOHN HOTOPP: We will get a good look at it, because we don't have a lot of information about it. We have drawings and things like that, but we don't, really, have a lot of information about it.

KEN LUSTBADER: The groups that I respect, the LMPF, are on the

record objection to the -- (inaudible) -- for the 9A project and specifically the one that deals with how it's mitigated here.

JOEL KLEIN: I will point out there are other projects that have been involved with affecting the Hudson River bulkhead. The Cross Hudson Table Project recently had to develop a memorandum of agreement.

There's extensive documentation and drawings available including an excellent study by Michael Greenberg, so you really have to do -- (inaudible) -- baseline available for dealing with impacts.

And I suspect that's the reason that some of the preservationist community has not been spending time on this.

JOHN HOTOPP: It would be nice to get an assessment of condition.

JOEL KLEIN: It's also a resource that's not visible.

JOHN HOTOPP: -- (inaudible) -- impacted, so we are not sure, and this goes back to the coordination issue that Charlene's concerned about. So we are going to see that

going back and forth.

That leads me to other archaeological resources. That's our standard paragraph that there is a lot out there we may or may not know about and some areas where we've done testing and this provides a vehicle for collecting information to evaluate the resource and to see if it meets the criteria and, if so, what we are going to do about it.

It's not terribly detailed because, again, that whole section is not terribly detailed. We are not quite sure how that's going to go. It's pretty far out in the future.

And that gets me back to the earlier comments about LMDC and where we are.

They are not where we are, they are way behind where we are, and that's one of the difficulties we are having now is to coordinate the agencies back and forth and their impact, which they haven't figured out what -- I think the advantage we have is that we are the Port Authority, and we will be involved in our projects from soup to nuts.

Last point, temporary relocation

of historic elements.

I believe you addressed that?

BILL LOVE: Right.

JOHN HOTOPP: I've cleaned the language up. That's basically just a vehicle to get things off site and then return them, if that's what the museum desires.

BILL LOVE: I will just give you my last two comments on the agreement.

On page 22 there is a Section B, "Public comments and dispute resolution."

This seems to be a somewhat confused section in that usually these sections will clarify exactly how disputes get resolved.

For example, the previous one on the prior page, "Objections to plans or reports about signatories," after talking about who will consult with who, has, at the end, "FTA will then take these comments into account in reaching a final decision concerning the dispute." But there is no such language in the Section B "Public comments and dispute resolution."

There's a lot of talk about who should consult, but there's no indication who

would make the final decision. So maybe the answer is FTA again. If it is, I think you should repeat the sentence. But it leaves it sort of in a muddle.

And also, some of the language doesn't make it clear how the process goes.

Paragraph 1 says, "Port Authority will consult with the objector." I mean, does that mean a personal meeting?

And then paragraph 2 says, "Port Authority shall respond to the commenter within thirty days." So it's a bit muddled there where they talk about face-to-face meetings. So that's my comment on that paragraph.

My next comment relates to the point that was made earlier about who is the signatory to the agreement. And I know the intent is to not make -- or the apparent intent is for the LMDC not to be a signatory.

But on the other hand, if you just look at it physically, here's a page in the agreement, as part of the agreement, and they are signing. And the agreement should

make it clear who the parties are and who the signatories are.

In fact, the same language -- the different words are used to refer to the same parties between pages 20 through about 23.

For example, on page 20, it talks about each party "agrees to cooperate with the other parties." But when you turn to the next page, they talk about the signatories.

So I think the way to solve that, if you are referring to the same groups, just use the words "parties" throughout and eliminate the word "signatories." That way, you cure that ambiguity, because you don't want it to be ambiguous.

And then what you could do, back on page 5 of the agreement -- I'm sorry, page 6 of the agreement, in the "Now, therefore" clause, where you say "FTA, SHPO, ACHP, and the Port Authority," you could insert the phrase, "as the parties to this agreement," just to really make it clear.

What I'm talking about is not substantive, it's just legal drafting. But there's no reason leaving legal ambiguities as

to the role of the LMDC, and it's ambiguous now.

LOUISE LO PRESTI: I agree with that.

BRUCE EARHMAN: I agree with that.

CHARLENE VAUGHN: And I think a related comment.

B3 on page 22.

What happens if there is a dispute and the SHPO and the Port Authority can't resolve it and it goes to FTA, I think it should be clear what happens there.

And what basically happens is the matter is referred to the advisory council by the federal agency. We have no veto authority, so we would look at the issue and either issue staff comments or report to our board, as you would, and those comments go to the head of the agency, at which time the agency makes the final call. This is advisory in nature, and I think it's important to have that clarified here, what our role is, the people's expectations are.

JOHN HOTOPP: Okay. Thank you.

What we've done is moved beyond stipulations, and I appreciate that because there are a lot of pieces of the document you haven't seen from earlier iterations and I appreciate the feedback.

PETER GOELZ: Comments are due the close the business on the 19th.

JOHN HOTOPP: I hate to come back to this, but we're going to do a 35 percent design, and we are going to put that information out, so that all of you people will be able to look at it and see it and add your comments as you do, because we felt it was important that you stay involved in the process as we're working on it.

Also, the 75 percent design later on.

CHARLENE VAUGHN: That's why I had made a comment earlier that there needs to be, maybe, a smaller working group. You know, we've suggested that you hire a qualified preservationist or preservation architect to be involved in the earlier stages of fleshing out design concepts. But it still may not be a bad idea to have a smaller group that you work with

for the 35 percent design, just so as not to have to drag this out and have a lot of conflicts.

If you know up front what people's issues are and try to work through them, I think it's much better than using that 35 percent design review to deal with a lot of horror where you are at.

JOHN HOTOPP: Okay. Thank you.

BRUCE EARHMAN: By the way, in terms of hiring a consultant, I agree with that too. And I just might suggest that you not hire a consultant in this instance because the consultant will be with you.

I do suggest that you consult the preservationist group for an architect, because I think if you hire an outside consultant, such as -- I'm just giving an example, he's a wonderful preservation architect, Bill Higgins, whose job it is to try to get things passed through community boards, it would be counterproductive. I think to hire the consultant, it really should be a preservationist architect.

PETER GOELZ: Okay.

JOHN HOTOPP: We are going back to the comment period.

We have extended that 21 days instead of 14, with the plan being that I would still like to have the SHPO have everybody's comments for at least a week before they render their final decision at their point, because I don't want them not to get the information and not be able to incorporate it into the decisions. But there will still be a 30/21 kind of split on that.

ANTHONY GARDNER: With all due respect, it's our position that the SHPO should recuse itself from this role and the National Conference of SHPO should take over.

We invoked a dispute resolution through LMDC's programmatic agreement, we didn't get a response for eight weeks. We were forced to file a lawsuit.

We got a letter over the weekend that SHPO will not speak to us because the issues that we want to address with them are involved in the litigation issue.

The SHPO will not -- is refusing to speak with consulting parties about concerns

and about a dispute resolution that was invoked.

We feel there's a very strong conflict of interest with Bernadette Castro in both roles as the vice chair of the Advisory Council on Historic Preservation and the head of New York State SHPO.

She said, back in January when this process began, she was going to recuse herself from one of those roles. She never did.

Frankly, we don't have very -- we don't have a lot of confidence in the SHPO, especially when we sit in all these meetings and hear comments that there's no place for them in these types of meetings, and they don't even set the record straight. I think that's very frustrating for us.

And I appreciate what Charlene Vaughn did.

ALBERT CAPSUTTO: I think there needs to be a comment about what happens in public comments and dispute resolution when one of the parties then gets into a lawsuit and then does the process move forward or not.

I would like to see, at the very least, if you have a way or a place to have dispute resolution within this document, that, you know, the people who then file a lawsuit doesn't prevent the process from going forward.

Because we have a situation here where you have people who are party to a process, who then file a lawsuit on that process, and then that process essentially gets stopped. And I think not all the consulting parties is to that interest.

ANTHONY GARDNER: It's never stopped.

CHARLENE VAUGHN: The point you make is one point, and most agreements under this resolution or public comments, it clarifies that all other aspects of the project that are not subject of the dispute proceed.

And I think in this particular scenario we need that level of clarity, so that if there is an aspect where there is conflict it doesn't hold up the project in its entirety.

RUTH PIERPONT: I would also like to say that that letter came from our chief counsel, so obviously this is a legal

issue.
We have reviewed this very carefully, we have given comments to Tim on that; we've had conversations with him.
The letter that you sent, as I recall, and I wouldn't swear to it, but it was specific to the issue that is in legal dispute right now, which is what -- I believe that's what he didn't want to speak to.
ANTHONY GARDNER: He spoke to the larger issue of concerns with the redevelopment, and particularly this disposition of the remains of the footprints, and that was clearly something that you should be able to continue to discuss with our groups.
RUTH PIERPONT: And we have been discussing it here. I mean, we have been talking to Tim about it and having discussions.
CHARLENE VAUGHN: And Anthony, just for the record, and also I think this might be useful for the FTA to know, we feel that the council's involvement in this probably will be more long-term than we anticipated, just on the basis of the LMDC agreement.
It's clear to me you can't do

this and then run away and retreat, which is typically what we do. So we need to talk internally about what mechanisms we may have to work with SHPO on the design review.
We have council members who are architects and everything, so we may just need to talk to our chairman about opportunities to work them on this project with us, and that's something that we are willing to explore in the next week or two before this agreement is finalized.
I don't think it needs to be written in here, per se, but you all should know what our intent is to have an ongoing and continuous presence in the follow-up and post-MOA reviews.
PETER GOELZ: If we could, I think we've got to move to Lou Menno.
John, are you about done?
JOHN HOTOPP: No.
But very quickly, the E train and so forth. Every one of these --
PETER GOELZ: Because people want to go on this tour, I assume. That's a high priority.

JOHN HOTOPP: Where are we?
JOEL KLEIN: John?
JOHN HOTOPP: A final treatment plan --
JOEL KLEIN: One item, real quickly.
JOHN HOTOPP: Yes.
JOEL KLEIN: I would like you to consider some alternative mechanism besides just posting things on the Web site.
That, I can see all kinds of potential problems with. We are talking about large scale drawings and people not being able to print them out to work with.
I really would urge you to, at the very least, make available, to consulting parties who request it, hard copies. I don't necessarily want to burden you with sending them out to people who may not be interested in seeing them. But if requested, really, something better than the Web site.
JOHN HOTOPP: I see. Once things have been posted on the Web site, then people who are really interested could call in or write in.

JOEL KLEIN: Exactly.
JOHN HOTOPP: This is the same thing for archaeology. This is pretty much a recap of everything we were talking about. Again, the elements being removed temporarily.
On the 19th, you owe us some comments. We've got a very extensive rewrite to do to this draft, and we've gotten an awful lot of good feedback from an awful lot of people, so we will be working pretty hard on this one.
So there we are. We are heading towards the final, and we are probably an iteration or two away, I'm not sure. But we are a lot further along.
ANTHONY GARDNER: Two quick comments.
We think it would be important for you to include an inventory, once you complete the recordation of the remains of the footprints, to include that somehow in the MOA, because right now in the MOA you only discuss the individual columns that outline the footprints and there's no discussion of the core column remnants or other artifacts that

Page 101

are within the outlines of the footprints.
And also, I would ask that you have a meeting for the consulting parties when you take in all our comments and you create a final version so we could all come together and discuss it as well, because I know a lot of us were very frustrated with the way LMDC's agreement was signed, without giving us a chance to go in and see what comments they incorporated and be able to comment on that further.
JOHN HOTOPP: Okay. Thank you.
I'm going to give it back to Lou.
KEN LUSTBADER: If you could go back to the other slide.
TIMOTHY STICKELMAN: For the contact information.
JOHN HOTOPP: I'm sorry.
PETER GOELZ: Peter, can you come up and we'll get this tour going?
PETER RINALDI: Thank you.
I'm Peter Rinaldi. We've been working trying to clean the footprints off, we had a little bit of a setback the other day, on

Page 102

Friday, the weather, we had quite a bit of rain.
I will tell you right now that the site is still partially under water, it's been draining over the Weekend and we've been pumping the site, but there's quite a bit of ponded water, especially since we've removed hundreds of yards of fill where the water used to accumulate below and drain. So right now there's a lot of low areas on the site.
So we will take you down today. I will make another date available this week. This week's supposed to be fairly dry, so hopefully the site will dry out a little better, and I'd like to schedule and make a date available on Friday morning or afternoon, if morning or afternoon is better a indication for those.
BRUCE EARHMAN: Afternoon.
PETER RINALDI: We can try to make it in the early afternoon on Friday. It should be fairly dry by then.
What I would like to do now is we will leave here, we will meet by Gate 7, which is, if you go down Liberty Street, which

Page 103

is right out in front of the building across by the corner of the site, follow that down as far as you can go, there is a gate there, Gate 7, we will meet in there and assemble and take you down into the site.
I will tell you that the site is very rough, so be careful. Those of you that don't have boots on, we have rubber boots, and you can avail yourselves of those, in terms of water, and then we will escort you around.
We will show you what we have cleaned off so far, and as we've been cleaning it -- the water has been there so it's been quite muddy, but some of the features are exposed on the footprints and some of the core columns and some of the areas we've discussed you can begin to see.
I will tell you that you are going to see a lot of areas there that are muddy in soil. That's because the footprint area was partially destroyed during the collapse of the Trade Center, so in areas where there was no slab, it got destroyed, so there's actually gravel there and soil, and in some areas there is the slab and you will see that

Page 104

combination. You can't sweep and clean off the areas where there is no slab; it's just soil and gravel.
CHARLENE VAUGHN: Is there any way to get a visual from this? I forgot all about the tour, not getting the e-mail. Is there any way to look out the window and get a panoramic view?
PETER RINALDI: You will probably see the details closer up today.
You can, when it's swept a little bit, see an outline of the details as it gets clean this week.
CHARLENE VAUGHN: But not now.
PETER RINALDI: It would be difficult.
BRUCE EARHMAN: I didn't get an e-mail follow-up.
ALBERT CAPSUTTO: A lot of us didn't.
BRUCE EARHMAN: It seems very important. I get huge attachments, but for this tour there was no follow-up, which is bizarre.
TIMOTHY STICKELMAN: We sent it

three times. Apparently there was a problem with the e-mail. We sent it from a different office, I forwarded them, so I don't know if there is something wrong on our end. We are looking into it to find out what happened.

BRUCE EARHMAN: So for the next one, can you make sure that people received it, like putting a received option on your e-mail?

BILL WONG: I would suggest that if you have questions -- there is no problem with us getting incoming e-mails. If there's any further issues, please e-mail your questions to Margie Morera.

BRUCE EARHMAN: Let's pick a time today and also a contact. Is that possible?

BILL WONG: I don't know if there are other consulting parties that are not here today that may have other preferences, but early Friday afternoon, based on some of the feedback.

PETER RINALDI: 1:00 p.m. Friday afternoon.

BRUCE EARHMAN: 1:00 p.m. Where do we meet?

PETER RINALDI: At the same place.

BRUCE EARHMAN: We won't be there, so I don't know where we are meeting.

PETER RINALDI: Gate 7, which is at Liberty Street and Washington Street. There is a gated entrance there.

CHARLENE VAUGHN: Tim, I would like to suggest something for expediency sake.

After the 19th, is there any way you could all try to summarize the comments you received and share them with the consulting parties so that as we see future iterations of the MOA we will have some sense of what any changes or revisions are based on?

Because, in the absence of that, it requires us to do too much talking and coming together. I like meetings, but I think they should be very focused, and I think a summary of the comments and then how you revised or didn't address them in the agreement helps them, and then we, like Betsy, can participate by phone.

BETSY MERRITT: Okay.

TIMOTHY STICKELMAN: Okay.

CHARLENE VAUGHN: And then having a time frame for when we could expect those would also let those of us who are moving into the holiday plan around it and anticipate receiving documents from you.

TIMOTHY STICKELMAN: When we get all the comments we will see what they are and we will figure out a way to summarize them.

CHARLENE VAUGHN: Great.

ANTHONY GARDNER: Charlene, you mentioned if you are able to view the footprints from afar and see the outlines.

At least the day of the closing ceremony, May 30th, 2002, that was possible. We've heard that they have filled in portions of the (inaudible) columns with concrete.

So far as filling in individual columns remnants, we are a little concerned how pronounced the outlines are.

But I would just hope -- where is Mr. Hotopp? -- I would just hope -- and I'm sure this is a no-brainer, you are not doing the recordation until the site's -- the conditions are perfect; right?

JOHN HOTOPP: You are right. It

is a no-brainer.

ANTHONY GARDNER: I don't want you doing it now while it's half flooded.

PETER GOELZ: Okay. Let's pick a time certain. 12:30.

BILL WONG: Anybody that needs to pick up the hard copies of the documents,they are here.

- - -

(Consulting Parties Meeting Adjourned.)

- - -

A
abbreviated 43:22 49:13
ability 66:9
able 15:6 17:11,21,23 18:2,15,25 19:21 20:2 21:2 25:3 29:25 32:23 33:23 34:19 38:4 39:10 74:24 76:3 92:12 94:9 97:15 99:13 101:10 107:11
absence 106:16
absolutely 54:17
accept 22:17
acceptable 44:3
access 5:2 30:25 35:19 39:12 41:17 42:3 59:22 60:24
accessible 59:10
accommodate 44:23 46:22
accomplishes 38:16
account 55:4 88:19
accumulate 102:9
accurate 55:19
ACHP 90:19
acknowledged 59:17
acknowledging 6:8
acre 39:4 41:10
Act 4:9
activities 73:13
actual 5:25 27:15
Adam 11:6,6
add 30:8 75:15 79:16 85:4 92:12
addition 30:22
additional 40:6 42:15
address 5:12 21:24 22:14 51:8,9 56:21 58:25 59:12 66:10,19,19 69:6 83:17 94:22 106:21
addressed 39:13 57:6 65:10 65:14 68:6,14 88:2
addresses 21:11 66:25
addressing 51:21 83:11
adequate 55:20
Adjourned 108:10
Administration 5:18 8:22
advance 55:10
advantage 47:15 87:22
adverse 59:19
advise 43:6
advisory 5:19 9:12 35:18 43:5 61:5 76:8 91:15,21 95:5
afar 107:12
affect 28:6 64:6
afford 23:21
afternoon 102:16,17,19,21 105:20,23
agencies 63:15,21 82:3 87:20
agency 81:25 91:16,20,21
agenda 7:12
agree 50:5 58:3 91:3,5 93:11
agreement 4:19 6:8,9,12,22 6:25 7:4 8:10 42:9 44:17 55:15 58:5 60:10,16,22 61:14,17 63:2,4 65:14 66:9 86:9 88:9 89:19,24,24 89:25 90:17,18 90:21 94:17 97:24 98:10 101:8 106:21
agreements 55:9 96:15
agrees 90:7
ahead 12:11
AKRF 8:24
Albert 9:19,19 27:19 28:14,23 29:6 30:4 61:23 62:22 76:19 95:21 104:19
alleviates 57:7
allow 5:23 18:20 33:18 61:17
allows 17:5
alternate 72:6
alternative 99:9
ambiguities 90:25
ambiguity 90:14
ambiguous 90:15 91:1
American 11:14 85:1
Americans 78:10
amount 15:6 30:25
amounts 80:21
analysis 3:20 4:12,14 13:22 56:16
Andrea 8:23,23
angle 29:3
Annie 11:13,13
answer 57:24 76:7 89:2
Anthony 8:25,25 30:19 40:9 41:9 46:25 54:16 58:19 65:8 94:12 96:12 97:10,19 100:16 107:10 108:2
Anthony's 42:5
anticipate 107:4
anticipated 66:1,17 72:14 97:23
anybody 37:13 108:6
anymore 37:22
anytime 33:10
apartment 36:20 80:17
apartments 36:19
apparent 89:20
Apparently 105:1
appreciate 22:9 42:19 73:24 82:23 92:2,5 95:19
approach 61:16 83:2
appropriate 59:22
approximately 17:25 18:4,16 24:25 27:2
archaeological 87:3
archaeology 100:3
architect 92:22 93:16,20,24
architects 57:4 84:8 98:6
architectural 43:12 52:12
architecture 84:10
area 12:22 13:8 14:7 14:10,17,21 15:13 16:7 17:20 18:6,11,21,24 19:2,4,7,15,16 19:16,19 20:13 20:23 22:1 25:15 25:17,21 29:16 29:24 30:11 31:16,23,25 32:15,19 34:1 40:23 51:13 53:24 54:2 62:15 103:21
areas 49:21 87:5 102:10 103:16,19,22,25 104:2
arisen 71:7,8
array 23:14
Art 11:14
article 71:4,14
artifacts 15:22 72:9 73:11 74:9,10 75:12 100:25
asbestos 80:21

23:24 24:11 25:6 25:12,25 26:22 27:9 106:22,24
Betsy's 11:25
better 36:13 93:6 99:21 102:15,17
beyond 24:14 50:13 68:18 92:1
big 45:24 47:15 48:2
Bill 2:9 3:4 7:22 10:4 10:4,19,19 45:11 50:17 51:3 52:24 53:3 70:4,8 73:19 85:4 88:3 88:8 93:20 105:9 105:17 108:6
billions 63:14
bit 16:23 29:16 47:19 47:25 48:10,10 89:13 101:25 102:1,6 104:12
bizarre 104:24
blank 34:16
BLEACH 29:18
blocks 33:7
blush 23:4
blushing 42:16
board 9:24 79:25 80:1,2 83:13 91:19
boards 49:14 93:21
Bob 9:5 40:10
boots 80:16 103:8,8
bound 63:2
Bovis 74:13
Braegelmann 11:10,11
breathed 80:20
bridge 33:2
bridged 31:21
bring 65:8
brings 34:2
broader 35:22 39:9
broadest 23:14
Broadway 1:7
brother 71:16
brought 73:21 76:25 82:8
BRUCE 76:7,17 81:14,18 83:9 91:5 93:10 102:19 104:17 104:21 105:6,14 105:24 106:3
build 26:11
building 37:18,24 54:7 85:1 103:1
buildings 37:15 70:18 80:17 80:17,18 83:6
built 51:22 53:17 64:20 66:15 71:9
bulkhead 54:8 84:19 86:7
bulkheads 85:13
burden 99:18
Burial 9:10
Burk 8:23,23
buses 40:1
business 35:5 92:7
businessperson 62:23
buy 28:14
B(1) 53:12
B3 91:9

C

C 13:18 72:19
Calatrava 57:3 84:9
Calatrava's 15:19
call 48:14 57:18 91:21 99:24
camp 77:17 78:13
canceled 7:17
capacity 4:12
caps 13:2
Capsutto 9:19,20 27:19 28:14,23 29:6 30:4 61:23 95:21 104:19
captured 71:21
care 13:4
careful 103:7
carefully 12:25 14:16 15:15 97:3
Carol 11:10,10
carry 15:6
carrying 5:21,25
cars 13:18 15:2 17:13
case 4:1 53:7 68:1 72:22,23
Castro 95:4
catalog 76:14
cataloged 76:13
Catholics 78:17
caught 71:13 78:23
center 4:7 12:23 13:11 14:1,8 16:14 17:6 18:8 19:22 20:25 21:4 24:20 33:5 34:7,13,19 35:18,24 36:5 38:6,10 49:22 67:15,21 69:13 70:18 71:17 72:20 74:23 75:18 77:18 103:22
ceremony 107:14
certain 53:16 62:14 70:12 108:5
certainly 40:7 73:1
cetera 38:25 78:16
chain 75:1
chair 83:12 95:5
chairman 98:7
challenge 46:4
chamber 17:18,21 19:3,13 20:11 21:3 24:5 24:8,23
chamfer 27:6
chamfered 35:23
chance 22:11 46:9 101:9
change 7:3 53:16 54:6
changes 106:15
changing 49:16
chaotically 75:21
Charlene 6:19 9:11,11 23:5 42:4 43:18 45:5 49:6,17 57:9 58:3,16 60:17 61:21 63:3,8,25 64:12 65:6,21,22 81:24 91:7 92:18 95:19 96:14 97:19 104:4,14 106:8 107:1,9,10
Charlene's 86:24
chief 96:25
child 78:25
chink 33:1,20
choice 46:18
churches 74:15
Cifarelli 2:11
circulation 14:23 15:1,4,5 16:18,23 17:17 18:17 20:18 25:18
circumstance 51:11
circumstances 53:16
citizens 77:5
city 39:24 58:11 84:2 84:9,11
city's 80:13
clarification 6:20 7:15 23:16 32:7 49:8

completion 42:10
components 38:5
concentration 77:17 78:13
concept 42:6,16 65:9,12 79:8
concepts 92:24
concern 27:19 42:8 51:12 55:23 56:21 68:13
concerned 15:8,10 30:10 35:7 38:12 86:25 107:18
concerning 12:17 88:20
concerns 5:9 21:11,25 22:15 30:6 39:14 47:7,14,21 57:7 60:21 70:15 94:25 97:11
conclude 78:24 79:3
concourse 20:15
concrete 58:21 107:16
concur 6:14,22 62:18
concurring 6:12
condition 86:19
conditional 53:21 54:9
conditions 107:24
conduit 19:1
Conference 94:15
confidence 95:13
configuration 8:4
conflict 43:2 73:1,7 95:4 96:21
conflicts 71:7 93:3
confront 70:22
confused 82:12 88:13
confusing 72:2
confusion 41:1
congregating 28:21 29:14 30:14 32:19
congregation 33:11
Congress 82:2
connect 33:15
connected 38:13
consider 66:7 74:24 99:9
constraints 51:16
construction 55:11 69:18 72:17 73:12
consult 57:3 88:18,25 89:8 93:15
consultant 80:13 93:11,13,14 93:18,23
consultants 15:18 36:12
consulting 1:3 4:6,10 6:6,13 6:22 42:22 45:16 49:9 57:14 94:25 96:10 99:16 101:3 105:18 106:12 108:10
contact 101:18 105:15
context 83:23
continue 97:15
continuous 98:15
contradictory 72:21
control 29:17 61:10 72:8 75:18
controversial 49:2
conversations 38:22 97:4
convoluted 57:10
cooperate 90:7
cooperation 64:10
coordinate 36:14 59:5 62:4 63:22 87:20
coordination 41:21 42:15 61:25 62:10,20 64:10 65:11 86:24
copies 3:18 99:17 108:7
core 67:8 68:4 100:25 103:15
corner 5:6 12:22 14:1 17:6 18:8 21:4 27:3,7 34:14,20 36:16 40:14 64:21 103:2
corrected 73:23
correctly 45:6
corridor 15:8,12 16:25 17:4 20:21 24:20 32:10,14 54:5
council 5:19 9:6,12,22 23:5 91:15 95:6 98:5
council's 61:5 97:22
counsel 96:25
counterproducti... 84:16 93:22
country 74:16
couple 23:25 30:20 32:16 37:3 38:21 44:20 45:14 70:4
cover 3:23 6:17 26:19 68:23
covered 26:25 49:24 51:2 68:7
crash 71:5
create 19:3,3 21:2,10 36:25 101:4
created 70:3 79:12
creating 17:16 20:11
creative 16:1 23:13 34:24 36:25 37:2
criteria 21:9 70:12 87:8
critical 30:12,15 35:10
Cross 86:7
cross-form 72:4,15
cross-purposes 63:16
cross-section 19:9 24:2
crowd 29:17
cultural 57:17
Cumming 9:14,14
cumulative 40:17 47:1 58:25 59:13 65:9,12
curator 15:22
curators 15:23
cure 90:14
currently 5:16 6:9 52:4,17 52:22 76:13
custody 72:8 75:1
cut 64:15

D

D 3:20 8:4 11:23 12:16,21 13:21 13:25 18:1 19:2 21:14 22:18,24 23:7,17 35:6 52:8,13 56:16
DAC 74:13
daily 70:20
Dakota 78:9
damage 72:17
data 4:13
date 102:12,16
dating 45:24
daughter 82:22
DAVID 37:6
day 38:10 101:25 107:13
days 42:11 49:12,16 89:13 94:3
day-to-day 56:9
deadline 48:23
deal 23:9 43:13 66:21 67:22 93:7
dealing 23:11 66:13 86:14
deals 86:3
dealt 49:21 76:9 77:5

59:8 107:22 108:3
dollar 82:15
dollars 63:14
donate 75:5
double 47:24
downtown 15:17,20 39:23 84:13
dozens 68:1
draft 6:10 8:9 52:3,17 100:8
drafted 55:10
drafting 90:24
drag 93:2
drain 102:9
draining 102:5
drawings 69:20,25 85:21 86:11 99:13
dry 46:10 102:13,14 102:22
duct 18:25 19:17
due 69:17 92:6 94:12
duly 80:2
dumb 63:13
D.C 15:24

E

E 48:8,17 98:21
EARHMAN 76:7,17 81:14,18 83:9 91:5 93:10 102:19 104:17 104:21 105:6,14 105:24 106:3
earlier 60:13 87:16 89:18 92:4,19,23
early 43:13 74:5 102:21 105:20
easier 46:11 59:7
east 17:8 19:1 40:13 50:21 68:3 69:12 70:11
Eastern 78:16
east-side 48:5 57:21
east-west 15:8,12 16:25 17:3 20:21,24 24:19,20 32:10 32:14 54:5 70:9
easy 50:8
edge 18:17 19:12,13 28:22 35:23
effect 7:4 40:24 65:9
effective 7:20
effectively 48:4
effects 59:13,19 65:12
effort 46:19
efforts 53:6
eight 33:4 75:24 94:18
either 30:1 52:9 91:18
electric 19:1,17
electrical 16:3
element 14:23 15:1,4,6 16:18 18:17 20:18 42:14
elements 4:24 25:18 35:15 42:24 43:13 72:13,14,20 88:1 100:5
elevation 16:11,12 24:25 36:18 53:23
eligibility 44:9
eliminate 90:13
emergency 10:1 80:14,15
empty 25:2
encounter 83:2
encroach 15:13 16:24
encroaching 20:22
encroachment 66:6
encroachments 15:11
end-of-the-day 34:25
engineer 58:12
engineering 15:17 21:21,22 51:16 80:13 84:25
ensure 42:1
entire 15:16 17:7 51:12 68:3
entirely 3:15
entirety 96:22
entrance 48:5,7,8 57:22 106:7
equal 82:20
equipped 56:9
escalators 5:5 15:11 25:20 25:23 26:5,13,15 30:2
escort 103:10
especially 28:21 95:14 102:7
essentially 41:10 60:23 61:10 96:9
estate 60:4
estimates 35:9 38:24
et 38:25 78:16
Europeans 78:16
evaluate 87:7
evaluation 31:5
event 22:25
eventually 39:24
everybody 7:11 8:15 46:18 47:12
everybody's 13:23 42:18 44:24 82:19 94:5
evidence 23:17
exactly 36:4 62:11 74:20 88:14 100:1
examination 83:21
example 53:11 54:3 58:12 64:9 83:24 88:15 90:6 93:19
exceed 53:23 54:1
excellent 47:6 56:8 86:11
excited 44:25
excluded 67:12
excuse 6:20 79:24
executed 42:19
execution 6:25
exerts 7:2
exhibit 76:3
existed 13:15
existing 36:3 55:1 60:22
expanded 58:14,15
expanding 4:12
expanse 37:10
expect 107:2
expectation 63:23
expectations 91:24
expecting 63:21
expediency 106:9
expend 82:4
experience 28:9 33:24 34:20 57:11 80:12
experienced 70:19
expertise 43:12 58:1
explain 24:4
explanation 60:16
explicit 5:20
explicitly 62:7
explore 98:9
expose 18:2
exposed 20:8 39:6 67:20 103:15

18:6 24:10 33:5 34:7,8,13,19 39:9 40:13,14 41:11 49:20 50:7 51:12,19 52:14 53:23,24 54:2 59:24 103:20
footprints 5:3 19:22 21:12 25:5 31:1,6 33:23 39:3,6,8 40:20,24 41:1,5 41:6 42:2 51:24 59:4,17 60:1,24 68:25 97:13 100:21,24 101:1 101:24 103:15 107:12
forced 70:21 94:19
foreign 81:10
foreseeable 54:25
forever 47:3
forgot 104:5
form 24:12
formal 22:11 38:18
formalizing 58:5
Forst 9:21,21 34:22
forth 70:21 87:1,20 98:22
forthright 22:13
forward 4:2 31:6 35:9 46:23 81:11 95:25 96:5
forwarded 105:3
found 3:5
four 27:2,7
fourth 31:24
four-minute 28:1
frame 107:2
frankly 41:24 59:24 95:12
free 19:2
Friday 3:9 7:18 45:25 102:1,16,21 105:20,22
friend 76:19
front 23:10 93:4 103:1
frustrated 101:7
frustrating 95:18
FTA 2:18 11:11,12 82:15 88:18 89:2 90:19 91:12 97:21
full 15:2 18:2 79:18 80:21
fullest 26:10 27:17
fully 67:1
Fund 10:1
funds 82:4
further 16:23 17:2 35:1 100:15 101:11 105:12
future 4:25 14:19 66:24 68:9 87:14 106:13

G

Gardner 8:25 9:1 30:19 40:9 41:9 54:16 58:19 94:12 96:12 97:10 100:16 107:10 108:2
gate 102:24 103:3,3 106:5
gated 106:7
gays 78:16
gears 84:19
general 67:14 76:18 78:3 85:13
generation 78:14
Germans 78:14
Germany 77:15 78:13 79:9
Gerson 9:22
getting 45:4 63:18 82:11 104:6 105:11
girders 31:22
give 40:6 43:21 52:25 88:8 101:13
given 7:16 37:11 42:11 49:12,13 53:13 55:17 60:16 75:23 97:3
gives 60:23 75:14
giving 21:8 93:18 101:8
glass 17:22 19:25 20:6 28:20 29:4
Glenn 2:13 11:17,17
go 4:17 8:13 12:11 14:20 18:7 20:24 21:22 23:6 24:24 25:23 26:3 31:14 31:19 32:5 33:22 33:23,25 39:10 47:23 49:8 50:1 53:1,16 62:8 65:3 70:21 72:11 74:3 80:19 83:7 87:13 91:19 98:24 101:9,15 102:25 103:3
goal 83:4
God 46:10
Goelz 2:19 7:10,24 11:19 12:8,11 22:3 27:18 34:21 37:3 41:8 43:15 43:19 61:21 65:3 81:16,19 84:17 92:6 93:25 98:17 98:23 101:20 108:4
goes 17:18 28:19 29:3 75:7 86:23 89:6 91:12
going 4:2 7:4,15 8:2,3,5 8:8,11 11:22,22 12:14,18,19 13:2 13:9,14 19:9 26:3,16,18 27:20 27:20,22 28:1,5 28:7 29:10 30:2 30:15 31:8,11 33:17 34:6,6,16 35:9 36:9,13 37:14,21 38:9,10 39:21,24 41:15 41:16,22 43:16 45:22 47:2,13,16 47:23 48:1,6,7 49:25 51:1,1,3 51:18 52:6 54:4 55:12 57:22 59:13,16,22 60:8 60:24 62:10,19 62:25 63:16,23 64:4,18,20,23 66:2 67:20 68:16 68:16 69:7,15,16 75:17 77:24 80:16,16 81:6 82:3 83:5 84:18 86:25 87:1,9,13 92:9,10 94:1 95:9 96:5 101:13 101:21 103:19
going-forward 66:10
good 4:3 7:10 12:8,10 12:12 14:15 18:2 21:10 22:13 23:3 39:18 44:11 47:9 54:15 58:17 59:15,16,24 76:16 78:2,3 83:23 85:20 100:9
gotten 100:8
grandparents 79:9
gravel 103:24 104:3
great 35:11 38:8,11,19 42:6 79:9 84:10 85:12 107:9
greater 51:17 55:2 83:23
greatest 84:8
Greenberg 86:12
grief 71:19
ground 35:20 37:20,25
group 30:7 42:21,23 43:4,5 76:11 79:10 84:6 85:5 92:20,25 93:16
groups 80:3,9 85:24 90:11 97:15
growth 39:21,23
guess 71:9
guys 22:9 60:6
Guzi 2:13 11:17,17

58:10,17 65:5,16 67:2 68:15 69:5 69:23 70:7 73:10 73:24 75:5 76:1 76:16 84:18 85:19 86:18,22 88:4 91:25 92:8 93:9 94:1 98:20 99:1,3,7,22 100:2 101:12,19 107:21,25
hours 80:14
houses 71:10
Howe 10:21,21
Hub 1:1
Hudson 46:2 54:8 84:19 86:6,7
hug 16:18 19:1
huge 34:4 104:22
hugged 20:18
hundreds 102:8
hurry 42:18
HVAC 16:3 19:18

I

idea 92:25
identified 44:19 52:8
identifying 75:12
ignore 47:14
illustrates 40:16
imagine 47:10,13
impact 12:19 13:25 17:3 40:23 47:1 50:13 54:7 55:2 59:3 66:16 68:22 69:12 87:21
impacted 12:20 18:1 21:13 52:10 67:25 73:12 86:23
impacting 24:21 31:10,12
impacts 13:5 26:18 40:17 50:16 58:13,25 69:11 82:6 86:14
importance 35:22
important 15:2 46:23 81:3 81:22,22 91:22 92:14 100:18 104:22
impossible 54:13
improve 12:18 13:6,7
improves 16:5 20:12
inappropriate 73:5
inaudible 29:19 86:1,13,22 107:16
incalculable 84:3,3
include 57:15 100:19,21
included 17:14 75:7
includes 42:3
including 6:4 73:20 84:9 86:11
incoming 105:11
incorporate 94:9
incorporated 36:5 101:10
incredible 80:20
incrementally 65:25
indefinite 68:9
indefinitely 78:18
independent 43:5
indicating 55:3
indication 88:25 102:17
individual 41:4,5 100:23 107:17
industry 4:14
informally 58:8
information 23:2 52:16 53:13 69:2 76:4 85:21 85:23 87:7 92:11 94:8 101:18
infrastructure 31:11
initial 22:12
initially 14:4 18:1
input 15:25 44:11 45:16 48:4
insatiable 79:14
insert 90:20
instance 21:16 77:9 78:9 79:17 93:13
Institute 11:14
intact 68:16
integrate 38:4 82:14
intended 49:25
intent 73:5 89:20,20 98:14
interacts 50:1
interest 49:4 82:19 83:3 84:6 95:4 96:11
interested 5:10 70:24 99:19 99:24
interesting 71:6
interests 46:22
Interior 57:16
internally 98:3
interpret 67:13
interpreted 57:22 60:25
introduce 8:14
intuitively 36:16
inventory 75:7,15 100:19
invited 5:23
invoked 94:16 95:2
involved 47:2,7,16 51:17 64:18,22 65:20 86:6 87:24 92:14 92:23 94:23
involvement 65:23 97:22
inward 20:1
iota 84:7
irrespective 40:1
irrevocably 79:7,10
issue 18:22 30:1,12,13 34:2 35:21 50:25 51:8 54:22,23 57:9,25 66:18 74:5,13 79:16 81:2,22 86:24 91:17,18 94:23 97:1,7,11
issues 23:10 35:17,19 36:7 44:18 49:24 57:21 82:9,19 93:5 94:22 105:12
item 72:19 75:17 76:12 76:14 99:5
items 8:1 52:4 74:18,22 74:25 75:3
iteration 100:14
iterations 92:4 106:13

J

Jane 1:25
January 95:8
jeans 80:15
Jersey 1:6 2:1 39:24
Jews 78:16
JFK 15:23 72:6
jive 70:1
job 8:16 47:6,10 56:9 59:6 93:20
Joel 9:2,2 22:7 48:21 49:1 51:15 60:11 63:25 64:16 75:9 86:4,20 99:2,5,8 100:1
John 8:9 9:2 11:4,4 37:4 43:20,25 45:14 48:25 50:5 50:24 51:25 52:3 52:23 53:2 54:15 55:5,9 58:10,17 65:3,5,7,16 67:2 68:15 69:5,23 70:7 73:10,24 75:5 76:1,16 81:16 84:17,18 85:19 86:18,22

Lebrun
2:19
left
25:16,21 75:17
legal
6:23 62:16 90:24 90:25 96:25 97:7
legally
62:13
Lejda
10:14,14
Lenahan
2:6 10:23,23
length
4:16 13:18
Lester
9:16,16
letter
94:20 96:24 97:5
letting
7:19 36:17
let's
8:13,17 46:13 65:11 105:14 108:4
level
15:9 16:12 20:15 20:15 24:6,16,24 25:1,7,10,10,11 25:14,22,24 29:21,22 37:16 37:20 42:10 50:1 51:6 68:13 96:20
Levine
11:6,6
Levitt
2:8 10:8,8
Liberty
102:25 106:6
life
38:7
line
17:7 20:22 50:22 53:25
lines
59:9
linger
18:20
list
73:21 75:22,25
listened
12:24 15:14
lists
67:5
lit
25:3
literally
21:7
litigation
94:23
little
16:23 20:20 24:2 29:16 33:1,20 43:24 44:4 45:7 46:10 47:19 48:9 48:10 56:15 63:13 75:11 85:17 101:25 102:14 104:12 107:18
live
63:19
lived
79:1
lives
79:19 82:22
LMDC
5:14 6:2,6,9 11:9 36:11 40:21 41:20 43:4 47:11 57:9 58:25 59:8 59:20 60:8,14,22 60:23 61:11,13 61:16,20 62:5,10 62:13,20 63:4 76:11 87:16 89:21 91:1 97:24
LMDC's
40:19 64:6,8 94:17 101:7
LMPF
85:25
LO
54:21 55:7,16 56:1,20,23 57:2 62:22 63:6 84:15 91:3
local
71:15
location
5:5 13:10,15,19 25:20 54:6 72:7
locked
21:7
long
30:14 33:4 39:17 39:17
longer
46:10
longtime
77:2
long-term
97:23
look
5:4 17:21 19:4,8 19:21 20:2,4,6 21:9 25:4,7 26:16 28:18 29:11 33:4,20,21 34:1,7 36:9 40:2 51:8 66:15 82:6 85:20 89:23 91:17 92:12 104:7
looked
14:2,16 16:2
looking
3:13 5:9 14:22 17:15 20:14,16 21:15,20 23:13 23:18 25:13 26:8 26:20 27:14 33:1 33:11,13,19 34:12,14 105:5
looks
23:3
lost
37:10,19 38:3 63:17 71:16 84:4
lot
6:16 12:17,25 16:1 34:6 39:3 39:10,11 41:14 43:1 45:23,23 48:4 49:23 50:13 66:2 68:15,19 70:17 71:22 74:13,18,21 75:2 76:1,21 77:16 85:20,23 87:4 88:24 92:3 93:2 93:7 95:13 100:9 100:9,15 101:6 102:10 103:19 104:19
Lou
2:3 10:6,6 11:22 12:11,12 16:8,10 22:3 24:8,17 25:9 26:8 27:1 27:13 28:11,16 28:25 29:10 31:13 32:11,13 36:9,24 56:16 98:18 101:14
Louise
54:21 55:7,16 56:1,12,20,23 57:1,2 62:22 63:6 84:15 91:3
Love
10:4,4 52:24 53:3 70:4,8 73:19 85:4 88:3,8
low
102:10
Lower
2:18 8:21 10:1
lowest
24:24
Luis
2:14
lungs
80:21
Lustbader
9:25,25 11:25 24:13 32:5,12 35:13 36:15 57:8 79:21 85:24 101:15
Lustbader's
58:23
luxury
23:13

M

main
62:11 69:10
maintain
18:16 75:25
maintained
32:20 61:11 75:22
major
33:18,24 52:21
majority
37:12
making
12:6 58:20 68:22
manage
29:25
management
17:14 57:17
manager
71:15
managing
32:21
mandate
56:6
Manhattan
2:18 8:21 10:1 48:11 60:4
manner
83:3
Margie
105:13
Mark
2:7 10:10,10
marked
37:22
material
14:13
matter
91:15
matters
85:10
Matthews
10:15,15
maximum
23:21 30:24 53:12
McClellan
85:12
McNeely
2:5 10:12,13 25:12 30:8 52:3 55:21
mean
50:19 68:1 69:10 77:2 89:9,9 97:17
meaning
33:14 85:16
meaningful
33:25 38:14 81:6 81:12
means
24:14 56:6 82:19
measures
14:3,4 21:16 23:14 55:20
mechanically

65:17 71:20 102:16,17
move 14:23 22:5 42:12 71:20 95:25 98:18
moved 16:18,20,22 20:17 20:19 21:1 71:11 92:1
movement 28:6 29:7
movements 84:2
moving 17:10 29:15 30:17 31:5 60:6 70:5 107:3
mud 45:23 46:8
muddle 89:4
muddled 89:13
muddy 103:14,20
museum 15:24 88:7
museums 74:15

N

Nancy 2:15 9:7,7 10:25 10:25
narrow 28:24 29:1
narrowed 19:16,16
narrowest 19:11
nation 81:3
national 4:9 12:3 60:2 94:14
Native 78:10
nature 66:3 91:22
near 77:17
necessarily 37:15 70:20 99:18
necessary 39:5
necessity 35:7
need 7:1 15:4 22:5,18 22:24 23:22 26:14 27:11 29:14 39:6 41:2 43:2 54:11,22 55:3 63:9 66:22 67:7,16,22 69:14 69:19 78:1,4 96:20 98:2,6
needed 80:18
needs 4:25 42:21 43:8 44:24 46:22 47:14 51:20 57:11 58:8 73:22 77:8,8 83:22 92:19 95:22 98:12 108:6
neighborhood 66:16 71:10 83:17
neighborhoods 66:6 83:16
never 66:17 95:10 96:12
new 1:6,6,8,8 2:1,1 8:5 9:17 11:23 13:11 60:4 78:19 83:15 84:2,10 95:7
nice 55:16,19 64:3 86:18
non-peak 30:14
normal 38:7 56:6
normally 55:10,14
north 5:6 15:3 16:24 17:3,13 20:20 21:1 24:19 26:11 32:9 33:2 35:24 40:14 52:2 53:8 53:22,24 68:2 78:8
northeast 12:22 13:25 18:7 21:4 27:3 64:21
northern 21:17,17
northernmost 15:1
northwest 65:1
north-south 27:5 28:19
noted 6:10
noticed 71:3
notification 3:10
November 1:5 3:1 4:6 71:5
no-brainer 107:22 108:1
number 4:21 19:23 67:7 67:16 74:10
numbers 67:5,23
nuts 87:24

O

object 48:21 72:7
objection 86:1
Objections 88:16
objector 89:9
objects 74:2
obligation 82:6
obliterate 31:8
obscure 27:16
obscured 51:4
obscures 34:9
obviously 31:2 51:18 96:25
occupied 31:17
occur 39:22,24 52:6
occurring 65:19
offer 55:22
office 2:18 8:21 9:15,18 10:3,22 15:19 39:25 80:12,17 105:3
off-site 74:6
okay 11:19 25:25,25 27:18 34:21 52:23 58:16 67:2 79:24 80:7 81:18 91:25 93:9,25 101:12 106:24 106:25 108:4
old 38:6,6
once 13:15 14:7,8 29:12,12 67:10 99:22 100:19
ones 21:17 26:24 27:6 49:4
one-acre 37:15
ongoing 43:1 77:11 98:14
on-site 37:15
open 17:17 25:16 29:13 37:24
opening 33:7,10 36:6
operating 69:17
operation 14:22
operational 29:11 30:16 58:12
opinions 79:25
opportunities 98:7
opportunity 6:21 40:7 64:16
opposed 28:10 54:17
opposition 73:2
oppressed 79:1
oppression 79:5
option 6:11 105:8
options 5:2 14:5
organization 9:20 79:24
orientation 11:23
original 31:18 51:5
originally 31:16,17
outcome 6:8
outline 41:5 100:23 104:12
outlined 51:4
outlines 101:1 107:12,19
outside 5:24 93:17
overarching 83:4
overlooks 78:7
oversight 82:5
overture 6:23
owe 100:6
owner 47:3 61:4 64:18 65:18
owners 66:14
ownership

10:17,17 11:19 12:8,11 22:3 27:18 34:21 37:3 41:8 43:15,19 61:21 65:3 81:16 81:19 84:17 92:6 93:25 98:17,23 101:20,20,22,23 102:20 104:9,15 105:22 106:1,5 108:4
philosophical 81:22
phone 12:1 106:23
photographs 69:25
phrase 48:22 90:20
physical 30:25 41:17 42:3
physically 14:5 18:24 19:21 20:5 69:20 89:23
pick 3:20 45:12 105:14 108:4,7
picked 35:22
piece 28:20
pieces 38:4 92:3
Pierpont 10:2,2 96:23 97:16
place 26:6,10 29:12 33:8 38:12 53:14 58:2 71:5 76:5 95:15 96:2 106:2
plan 31:20 38:18 44:24 94:4 99:4 107:4
plane 71:4,9
planning 23:20 65:24
plans 31:9 40:19 88:16
platform 3:20 4:12 8:4 11:23 12:16,21 13:11,21,25 14:6 14:12 16:11,13 17:1 18:1,9,14 19:2,11,15,16 21:14 22:18,24 23:7,17 25:8,10 25:11,24 26:24 28:3,4 29:22 31:24 35:6,16 39:20 45:12 50:22 52:8,13 56:16 77:22
platforms 5:3 13:17 52:13 68:22
play 66:7
please 65:3 84:17 105:12
pleased 13:3 44:5
plenum 19:19
plus 67:25
poignant 38:13
point 6:19 7:14 16:3 18:19 22:17 23:3 23:3,15,19 29:2 29:12 30:9,10 34:17 36:8,23 37:9 40:15 46:24 49:7 54:15,18 58:18 62:12 63:22 65:17 66:2 66:8 68:9 86:4 87:25 89:18 94:7 96:14,15
pointed 13:24 14:25 31:20 45:5 61:4
pointing 24:4
ponded 102:7
population 39:22,23,25
Port 1:6 2:1 4:11,23 5:8,17 7:15 8:5 8:19 9:8 10:7,9 10:11,13,18,20 10:24 11:1,2,16 11:18 12:5 22:22 30:5 34:23 42:23 44:21 46:20 47:1 47:6,10 53:10 56:4 58:5 60:17 61:3,6,9,18,19 62:3,15 63:4,9 64:3,17 65:18,20 66:20 68:20 72:8 74:12 75:6,10,14 75:16 77:4,7 87:23 89:8,12 90:20 91:11
portion 28:17,19 32:3 51:19 67:18 69:12,17 70:11 74:4
portions 68:4 107:15
portraying 80:24
position 94:13
possible 12:6 23:1 26:10 26:21 27:10,17 31:4 75:25 79:11 105:16 107:14
possibly 29:25
posted 99:23
posting 99:10
post-MOA 98:16
potential 40:23 99:12
potentiality 65:25
potentially 72:14
power 7:3
powerful 44:12,18
practical 21:23
practices 4:15
pragmatic 36:8
prefer 23:8
preferences 105:19
preliminary 21:10,21
premise 22:16
preparatory 45:15
presence 98:15
present 5:11 8:5 16:4
presentation 11:21 27:25 43:21 44:1 64:3
presented 4:11 14:4 48:4
preservation 4:9 5:19 9:13,15 10:1,3,22 23:9 30:23 43:12 57:12,16 58:23 79:15,18,22 80:9 81:2,5 82:7,11 82:17 84:7 92:22 93:19 95:6
preservationist 58:6 77:14 82:25 83:16,20,24 84:14 85:8,17 86:16 92:22 93:16,24
preservationists 43:11
preservation-re... 66:18
preserve 26:9 53:7,14 64:4 73:14 78:8,12 81:12 85:5
preserved 26:6 42:2 51:2 68:17
preserving 54:20 85:7,14
president 79:18
PRESTI 54:21 55:7,16 56:1,20,23 57:2 62:22 63:6 84:15 91:3
pretty 44:25 55:6 87:13 100:3,10
prevailing 83:4
prevails 82:21
prevent 32:22 96:5
previous 26:3 34:5 48:24 88:15
pre-9/11 13:16
prime 60:4 80:13
print 99:14
prior 74:11 88:16
priority 98:25
privileges 63:10
proactive 75:11
probably 37:1 44:22 51:14 53:2 58:7 80:20 80:21 84:23 97:22 100:13 104:10
problem 3:14 22:14 34:24 40:16 48:12 61:12 105:1,11
problems 4:2 99:12
proceed 96:18
process 4:2,8 6:7,14 35:11 43:6 45:5 47:8 47:13,17 51:22 52:6 64:19 66:12

41:13 42:23 43:9 44:18 46:19 47:20 49:3,4,21 50:16 51:8 60:7 67:7 68:1 85:22 86:12 90:22 93:23 99:15,20 99:24
reason 50:11 86:15 90:25
rebuilt 71:10
recall 25:19 97:6
recap 100:4
receive 3:11
received 105:7,8 106:12
receiving 107:5
reclaim 83:7
recognition 53:15
recognize 23:1 31:9 32:2 37:19 54:11
recognized 14:14
recognizing 66:23
recommendations 12:25
record 23:6,17 30:22 49:8 54:17 70:3 80:5 85:3 86:1 95:17 97:20
recordation 52:6 84:23 100:20 107:23
Recovery 2:18 8:21
recuse 94:14 95:9
redevelopment 63:14 97:12
refer 90:4
referred 24:23 41:6 91:15
referring 90:11
refers 53:11
refining 41:2
refused 61:8
refusing 94:24
Register 74:2
regret 83:5
regularly 77:20,21
regulation 61:5
regulations 5:22
reiterate 35:4
relate 3:19 52:4,18,21 55:22
related 42:5 72:1 82:9 91:8
relates 89:17
relating 53:4 60:12
release 82:15
relevant 4:13
religion 73:3
religious 73:3
relinquished 61:10
relocate 18:25
relocated 72:6,16
relocation 72:12 87:25
remain 72:7
remains 30:25 31:10,12 40:12,24 42:2 59:4,17 60:1 97:13 100:20
remember 32:20 44:8 58:22 74:1
reminded 70:20
reminder 38:14
remiss 82:1
remnants 41:4 49:20 52:9 53:4,7 67:6,17 79:2 100:25 107:18
removal 21:18 27:16
removed 26:6 27:12 74:11 75:3,12 100:5 102:7
render 94:6
rendering 22:21
reopen 61:17
repeat 89:3
report 44:9 91:18
Reporting 1:25
reports 88:16
represent 18:9 79:25 80:1,3
representation 15:19 20:9
representations 14:6 50:18
representative 42:22
represented 21:5 26:23,25 27:2,8
request 99:17
requested 99:20
require 37:16 54:6
required 5:24
requirements 53:14
requires 83:21 106:17
reresurrect 83:7
reschedule 46:8
resident 78:25 82:24
residential 35:5 39:22
residents 70:17,23 71:22 77:3 80:24 81:10 81:11 82:22 84:13
resolution 88:11,23 94:16 95:1,23 96:3,16
resolve 54:22 91:12
resolved 88:14
resource 85:8,11 86:21 87:8
resources 12:20 13:6 16:6 20:13 22:1 57:17 69:22 87:3
respect 56:3 70:24 85:25 94:13
respects 84:5
respond 81:14 83:10 89:12
response 8:7 64:7 84:12 94:18
responsibilities 5:21 60:19
responsibility 5:25 6:2 40:22
rest 14:12 18:13 68:24 68:25
restaurant 71:15
result 44:13 61:9
retail 70:25
retreat 98:1
return 88:6
returned 74:12
returning 72:19,22 73:2
reverse 60:8
review 13:23 22:12 44:11 49:10 93:7 98:4
reviewed 97:2
reviewing 6:10
reviews 98:16
revised 73:6 106:21
revisionism 77:24
revisions 106:15
revisit 8:3
rewrite 100:7
Richard 9:23,23
right 15:9 18:21 24:10 24:11 25:13 27:3 27:6 28:25 32:11 32:14 41:11 43:16,18 51:22 52:1 57:24 60:7 61:6 65:5 68:24 83:5 88:3 97:8 100:22 102:3,9 103:1 107:24,25
rights 63:10
right-of-way

105:2
sentence
89:3
separate
59:2 78:1,4
separated
24:20
separates
16:19
separation
17:11
separations
37:1
serious
46:19
server
3:15,23
set
42:8 45:18 73:19 95:17
setback
101:25
seven
18:5 19:6 81:7
shame
60:5
share
106:12
Shawn
2:6 10:23,23
shed
36:20
sheet
33:6
Sheldon
9:17
shift
14:24 84:18
shifted
5:7
shocked
81:9
short
29:21
show
13:10 14:5,17,18 17:6 18:3 20:9 21:3 31:25 40:11 67:7 103:11
showed
32:1
showing
18:10 21:25 41:15
SHPO
5:18 49:9 90:19 91:11 94:5,13,15 94:21,24 95:7,13 98:4
shunted
84:10
side
19:1 23:10,12 25:13,16 32:9
sides
40:5
sign
6:7,9,24 59:1 61:8
signatories
5:23,24 88:17 90:2,9,13
signatory
5:14,16 6:5 60:15 61:3,7,18 62:13 63:1 89:19,21
signed
63:5 101:8
significance
68:13
significant
39:25 59:18 74:4 74:22 75:3
signing
6:11 60:10 62:17 89:25
silent
51:23 83:10
Silver's
9:18
similar
31:25 43:7 54:10
single
33:8
sit
95:14
site
7:13 8:12 23:8,21 32:20,21,23 33:15,18 34:6 38:6,13,17 47:2 55:17 63:11 64:18 65:18,20 67:9,20 68:10,12 68:15,25 70:2 72:20 73:4,12,22 74:3,4,11 75:3 75:12,19 76:10 80:14 81:7 83:1 83:22 88:6 99:10 99:21,23 102:4,6 102:10,14 103:2 103:5,6
sites
81:3
site's
107:23
situation
27:10 28:9 54:13 62:16,16 96:6
situations
62:14
size
40:1
skills
56:8
slab
20:9 103:23,25 104:2
slaughtered
78:9
sleeves
43:10
slide
13:10 16:9,11 18:24 19:10 20:14 24:2 26:3 28:18 32:1,6,6 101:16
slides
31:14
slinking
33:19
slow
47:25
slurry
70:9,12,22 72:1
small
29:24
smaller
27:5 92:20,25
society
82:13
soil
78:21 103:20,24 104:2
solicit
52:18
solution
20:11 21:24 34:24 34:25 39:18 51:9 51:14 58:2
solutions
37:2 58:1
solve
90:10
someplace
33:2
somewhat
88:12
son
79:8 82:22
sore
64:11
sorry
63:4 90:17 101:19
sort
32:25 33:13,14 38:22 40:11 53:20 77:6 89:4
soup
87:24
south
31:8,10,12 32:3 35:24 41:12 51:13,17,24 52:5 52:14,21 53:8 54:1 68:3 78:8
southerly
26:14
southern
17:1,16
space
19:5,20 24:9,22 25:3,4 31:2 39:5 39:11
spaces
37:24
speak
39:19 94:21,25 97:9
Speaker
9:17
speaks
44:18 52:4
special
84:6
specific
51:21 54:19 55:6 55:8,22 60:18 67:5,10 97:7
specifically
12:21 29:8 59:3 61:2 64:5 67:12 86:2
speed
47:25
spell
54:19
spelled
58:11
spend
8:8 43:23
spending
86:17
spent
79:13 80:14
spin
78:18
split
94:11
spoke
14:3 97:10
staff
91:18
stage
43:1
stages
92:23
stair
15:11 17:14 25:20
stairs
5:6 25:23 26:5,13 26:15 64:2 65:1
stairway
16:25
stakeholders
82:9
standard
87:3
standards
57:16 84:24
standing
6:23 40:12
stands
45:3
STANKE
37:6
start
4:18 8:13,17 23:4 23:20 41:2 46:13
started

47:20 49:7 57:20
talking
27:24 49:5 64:21 65:2,23,24 73:11 73:17 76:2 88:17 90:23 97:18 99:12 100:4 106:17
talks
70:9 72:13,19,22 72:23 90:7
tall
37:23
team
15:16 56:4 57:18 58:7
tears
77:1
technical
35:15 56:4 58:1
telephone
12:7
tell
45:20 65:14 102:3 103:6,18
temporarily
52:9 72:16 100:5
temporary
29:19 72:12 87:25
ten
13:18 23:11 42:1 83:6
tends
79:17
terminal
1:2 4:7,25 6:3 70:11
terms
93:11 103:9
terribly
87:10,12
terrific
39:16
test
84:21 85:2
testing
87:6
thank
7:6 12:13 22:2,8 67:2 73:10 91:25 93:9 101:12,22
thanks
12:5 26:1
theme
4:23 5:1
themes
4:21
thing
17:15 33:13 38:20 44:16 45:18,20 50:2 61:22 63:7 67:6,14 71:13 81:25 100:3
things
16:2 17:10 29:11 32:17 38:3 39:1 45:8 49:1 52:19 52:21 58:20 65:25 68:6,17,23 74:14 85:22 88:6 93:21 99:10,23
think
11:21 13:2 24:13 28:5 29:7 31:19 32:19 33:12,13 33:16,21 34:3,23 35:10 37:8,11 38:15,19 39:2,16 39:18,21 40:3,5 40:16 41:1,2,6 42:4,6,7,13,21 43:2,7,15 44:6 44:21 45:3,17 47:5,9,16 49:6 49:11,23 50:3,11 50:15 51:4,7,15 51:20,23 52:1,20 53:10 55:12 57:14 58:4,7,8 58:10,14,21 59:6 62:8 63:9 65:8 65:12,22,24 66:22,22 67:6,16 67:22 68:5,12,14 68:18 69:14,19 73:4 75:9 76:1 77:3,10,23 82:1 87:22 89:2 90:10 91:7,12,22 93:6 93:17,22 95:17 95:21 96:10,19 97:20 98:12,18 100:18 106:18 106:19
thinking
13:1 16:1 76:20
third
5:4 16:10 52:11
thirty
89:13
thought
4:22 41:14 43:23 43:25 46:19 47:18 49:12 71:21
thoughts
40:10
thousands
32:24
three
8:1 13:17 15:2 16:9 17:13 26:24 52:4,8,19,20 59:23 105:1
three-minute
28:1
throughs
19:17
ticket
28:15
tile
18:10
tilted
20:1
Tim
8:17,18 54:24 56:2,11,22 57:3 65:16 97:3,18 106:8
time
4:16,18 8:8 13:13 14:3 16:22 23:19 35:8 43:24 44:3 44:4 46:20 47:24 49:10 60:9 66:8 76:22,24 77:13 79:5 86:17 91:20 105:15 107:2 108:5
times
58:22 105:1
timing
28:2
Timothy
2:2 8:18 12:2 16:8 24:15 49:15
56:12,25 64:14 75:13 101:17 104:25 106:25 107:6
tiny
84:6
today
5:10 8:2 13:3 35:21 44:6 45:2 45:21 47:18 60:13 102:11 104:10 105:15 105:19
today's
4:19
told
44:3
tonight
83:13
top
51:18
topic
4:19
total
53:22 67:7,16
totally
47:16
touching
21:18 26:19
tour
6:18 7:13,16,17 7:25 8:12 40:1 43:20 45:21 81:20 98:24 101:21 104:6,23
tourist
38:10
tourists
32:24 38:9
towel
33:7
tower
5:6 31:9,10,12 32:3 35:25 40:14 41:12 46:17 49:20 51:13,17 51:24 52:2,5,15 52:21 53:8,8,22 53:24 54:1
towers
27:7 50:9
track
16:16 18:18 19:9 19:10,14 31:20 40:6,8 50:22
tracks
13:10,14 67:19 69:12,18
Trade
4:7 12:22 13:11 14:1,8 16:14 17:6 18:8 19:22 21:4 24:19 33:5 34:7,13,19 35:24 38:6 48:9 49:22 51:10 67:15,21 69:13 71:16 72:20 75:18 103:22
traffic
17:12
tragic
79:11
train
15:7 31:8 48:8,17 77:15,21 98:21
trains
15:3 27:23 28:3 29:9
Transcription
1:25
transfer
31:21
Transit
5:18 8:22
translucent
28:20 40:11
transmittals
3:6
transparent
19:25 29:4
transportation
1:1 4:24 11:7 13:5 31:3
trauma
70:19
traumatized
71:23
treasures
84:3,4
treat
48:6
treatment
18:12,13 20:7

victimizers
77:12 78:5,10,15 78:20,21,22 79:4
victims
77:12 78:5,11,17 78:20 79:3
view
16:3 18:19 27:21 28:7 29:12 36:8 36:20,21 104:8 107:11
views
70:22
virtually
13:14,19 14:11
visibility
13:7 16:5 20:12 21:12 30:22 41:16 70:10
visible
14:17 18:5 36:17 51:1 59:9 86:21
visual
5:2 104:5
voice
73:1
volume
19:4 24:9,22 25:2 25:4 35:23 37:17 37:18,20 39:7
voyeuristic
33:12
Vyrem
79:20

W

walk
47:4 71:19
walking
20:23
wall
16:19,19 17:8,22 19:25 20:3,19,19 24:19 26:15 27:5 28:17 34:16 36:3 36:18 40:11 70:12,22 72:1
walls
70:9
wandering
32:25
want
16:4 22:8,10,19 30:21 31:4 32:6 33:14,15 34:18 34:22 37:4 41:25 43:20 45:8,10 46:8 47:22 56:13 57:18 62:6,24 70:20 71:18,20 71:23 76:17 78:8 78:12 79:17 80:4 81:20 90:14 94:8 94:22 97:9 98:24 99:18 108:2
wanted
35:12 40:15 49:17 58:19 68:10
wants
33:22 64:15
Washington
15:24 106:6
wasn't
4:17 14:15 75:21 85:12
water
40:5 45:23 46:3 102:4,7,8 103:10 103:13
way
7:20 12:18 17:18 24:25 29:4 31:19 31:25 32:21 33:19,25 36:1,2 37:13,16 38:17 39:18 41:18,19 42:8 47:12,17 59:14 64:25 67:21 68:7 77:4 77:6 81:6 83:18 87:18 90:10,13 93:10 96:2 101:7 104:5,7 106:10 107:8
ways
12:18 51:7
weather
102:1
Web
76:10 99:10,21,23
week
3:5 7:20 11:24 21:7 33:6 46:21 54:24 56:3,18 94:6 98:10 102:12 104:13
weekend
71:4 94:20 102:5
weeks
48:3 94:18
week's
44:1 102:13
weight
82:20
Weintraub
15:22 21:8 57:13
went
13:21 16:1 37:21 47:24 56:16 61:1 71:8,9 74:19 76:14
west
10:5 16:21 33:3 40:13 70:12
western
16:19 20:19
western-most
20:3
we'll
3:25 22:20 83:1 101:21
we're
3:13 8:8 13:14 18:15,20 21:15 21:20,20 23:18 24:21 26:8,16,17 26:18,20 27:13 30:9,10 35:1 36:9 43:1 44:15 45:6 48:16 59:13 61:12 63:21 92:9 92:15
we've
17:13 22:11 38:20 38:22 44:6 45:7 47:5,9,11,21 48:13 50:3,14,16 50:17 55:5 58:21 61:13 68:23 76:2 83:8 84:20 85:16 87:6 92:1,21 97:4 98:18 100:7 100:8 101:23 102:5,7 103:12 103:16 107:15
whole-heartily
58:4
width
18:16
wife
76:23
wiggle-room
54:20
William
11:8,8 39:15
willing
22:17 29:20 81:23 98:9
window
104:7
wish
6:14
wonder
34:5
wonderful
57:6 93:19
wondering
34:3 53:19 74:16
Wong
2:9 3:4 7:22 10:19 10:19 45:11 50:17 51:3 105:9 105:17 108:6
word
90:13
words
34:11 67:13 68:7 90:4,12
work
3:21 11:24 18:25 19:18 22:9 30:5 40:5 44:13 45:7 45:9,19 46:20 47:12 55:1 59:11 60:9 63:16 70:1 70:17 83:8 92:25 93:5 98:4,8 99:14
worked
44:23 47:11 74:20
working
8:6 23:4 36:11 46:2 54:4 59:15 92:15,20 100:10 101:24
works
42:23 44:25
world
4:7 12:22 13:11 14:1,8 16:14 17:6 18:8 19:22 20:24 21:4 24:19 33:5 34:7,13,19 35:24 38:6 48:9 49:21 51:10 57:5 67:15,21 69:13 70:18 71:16 72:20
worms
36:7
wouldn't
17:3 34:18 97:6
wreckage
81:8
write
99:25
written
49:11 98:13
wrong
105:4
wrote
44:10
WTC
1:1,2 9:9

X

X
62:25
x-amount
42:11

Y

Y
62:25
yards
102:8
yeah
55:5,19 63:8
year
23:20 77:6
years
23:11 42:1 44:23 79:13 83:6,25 84:11
York
1:6,8,8 2:1 9:17 60:4 83:15 84:2 84:11 95:7
Yorkers
78:19

9

9
53:19
9A
86:2
9/11
9:1,3 30:24 70:19
71:18,23

Appendix H-5: Written Comments from Section 106 Consulting Parties

WRITTEN COMMENTS ON THE OCTOBER 20, 2004 DRAFT MEMORANDUM OF AGREEMENT

- Gardner, Anthony, Coalition of 9/11 Families. Letter dated November 18, 2004.
- Gaull Howard, Dr. Marilyn. E-mail (not dated).
- Kornfeld Jr., Robert, The Historic Districts Council. Letter dated November 12, 2004.
- Kornfeld Jr., Robert, The Historic Districts Council. Letter dated November 19, 2004.
- Love, William C., Jr., Coalition to Save West Street. E-mail dated November 19, 2004.
- Lustbader, Ken, Lower Manhattan Emergency Preservation Fund. Facsimile dated November 19, 2004.
- Martine, David, Shinnecock Nation Cultural Center and Museum. E-mail (not dated).
- Merritt, Elizabeth S., National Trust for Historic Preservation. Letter dated November 22, 2004.
- Sutphin, Amanda, New York City Landmarks Preservation Commission. Memorandum dated November 19, 2004.
- Weisbrod, Carl, Alliance for Downtown New York, Inc. Letter dated November 19, 2004.

WRITTEN COMMENTS ON THE DECEMBER 16, 2004 DRAFT MEMORANDUM OF AGREEMENT

- Gardner, Anthony, Coalition of 9/11 Families. E-mail dated December 22, 2004.
- Kornfeld Jr., Robert, The Historic Districts Council. Letter dated December 23, 2004.
- Love, William C., Jr., Coalition to Save West Street. E-mail (not dated).
- Lustbader, Ken, Lower Manhattan Emergency Preservation Fund. Facsimile dated January 3, 2005.
- Merritt, Elizabeth S., National Trust for Historic Preservation. Letter dated December 31, 2004.
- Yaro, Robert D., Regional Plan Association. Letter dated December 22, 2004.

WRITTEN COMMENTS ON THE MARCH 22, 2005 DRAFT MEMORANDUM OF AGREEMENT

- Hall, Craig. A, World Trade Center Residents Coalition. Facsimile dated March 31, 2005.

- Kornfeld Jr., Robert, The Historic Districts Council. Letter dated March 30, 2005.
- Love, William C., Jr., Coalition to Save West Street. Letter dated March 26, 2005.
- Lustbader, Ken, Lower Manhattan Emergency Preservation Fund. E-mail dated April 1, 2005.
- Merritt, Elizabeth S., National Trust for Historic Preservation. E-mail dated March 30, 2005.
- Stanke, David, BPC United. Letter dated March 31, 2005.

NOV 19 2004

Coalition OF 9/11 FAMILIES

November 18, 2004

Mr. Bernard Cohen
Director
Lower Manhattan Recovery Office
Federal Transit Administration
One Bowling Green, Suite 436
New York, New York 10004

RE: WORLD TRADE CENTER TRANSPORTATION HUB
(PERMANENT WTC PATH TERMINAL)
OCTOBER 20, 2004 DRAFT MEMORANDUM OF AGREEMENT

Dear Mr. Cohen:

The Coalition of 9/11 Families (the Coalition) has prepared the following comments on the draft Memorandum of Agreement (MOA) between the Federal Transit Administration (FTA), the New York State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (ACHP) and the Port Authority of New York and New Jersey (Port Authority). Although we have been directed to send comments to the Port Authority, we are addressing them to you as the representative of the responsible lead federal agency under the Section 106 process. A copy of these comments is being sent to the Port Authority.

Detailed comments are attached. However, there are several major points and concerns that are of such overriding importance to the Coalition. These items go to the heart of how the proposed MOA is structured.

- The Coalition believes that the SHPO should recuse itself from further proceedings and should not be a party to the MOA. The Coalition has come to this conclusion based on the following:

    1. The New York SHPO, Commissioner Bernadette Castro, indicated in an interview with the *New York Times* that she was considering recusing herself from the process because of potential conflicts associated with her dual roles as both SHPO and Vice Chair of the ACHP.

    2. The SHPO has demonstrated an inability to respond in a timely manner to the Coalition's invoking of the dispute resolution clause of the Programmatic Agreement for the Lower Manhattan Development Corporation's World Trade Center Memorial and Redevelopment Plan project. The failure of the SHPO to respond within a reasonable period of time to the Coalition's concerns has forced the Coalition to initiate legal proceedings which are being reviewed in Federal District Court.

3. On November 15, 2004 the Coalition received a letter from the SHPO's counsel indicating that the SHPO would not communicate with the Coalition on any of the matters relating to the lawsuit. At least some of the issues in contention relate directly to some of the provisions in the Draft MOA.

4. The Coalition believes that throughout the Section 106 processes for the various downtown Manhattan redevelopment projects, the SHPO has abdicated its role as defined in ACHP regulations, and in the National Historic Preservation Act, and instead has been acting to further the development goals of its sister New York State agencies including the LMDC, the Port Authority and the New York State Department of Transportation without regard to the effects of those undertakings on the World Trade Center Site.

- The Draft MOA contains wording referring to the EIS for the Project. The Final EIS for the Project has not yet been issued. The Draft MOA has assumed that a particular Project alternative, specifically the Alternative calling for a 5-track, 4-platform system will be the final design alternative. Stipulation IB, in particular, contains detailed language based on the assumption that 5-track, 4-platform alternative will, in fact, be what is constructed. The Coalition is reviewing the back-up data provided to the Consulting Parties on November 15 which purports to justify the selection of the 5-track, 4-platform alternative. However, based on a very preliminary examination of that data it appears that the Port Authority's own analysis indicates that Project objectives can be met with a 5-track, 3-platform system that would meet the criteria and standards for platform clearance and crowding set forth in the *Transit Capacity and Quality of Service Manual*. Given the requirements of Section 4(f) of the Department of Transportation Act we believe that there is a strong likelihood that the FTA will not be able to support the Port Authority's selected alternative. The proposed language in Stipulation IB cannot be finalized until this matter is settled.

- The Draft MOA fails to adequately address the issue of cumulative effects. At the November 15, 2004 meeting of Consulting Parties you advised us that our informal suggestion that the LMDC be a signatory to the Draft MOA was not acceptable. Unfortunately, in the absence of a legally binding commitment from LMDC to honor the preservation commitments and mitigation measures set forth in the Draft MOA, there is no basis for assuming that any of the FTA/Port Authority commitments will be meaningful, since LMDC will be free engage in actions that would render them moot.

We look forward to continuing to work with you, the FTA and the Port Authority in resolving our concerns. We firmly believe that a mutually acceptable solution(s) are possible. To date there have been at least two cases—the Vesey Street Stairs and the E-train subway entrance—where Port Authority engineers have, after urging by the Consulting Parties, found mutually acceptable solutions to problems that those same engineers initially termed unsolvable.

Sincerely,

Anthony Gardner, Executive Board Member, Coalition of 9/11 Families

cc: A. Cracchiolo (Port Authority)
M. Morera (Port Authority) *via email*
J. Nau (ACHP)
R. Pierpont (OPRHP)
R. Lippes, Esq.

WORLD TRADE CENTER TRANSPORTATION HUB (PERMANENT WTC PATH TERMINAL), OCTOBER 20, 2004 DRAFT MEMORANDUM OF AGREEMENT PURSUANT TO SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

ADDITIONAL COMMENTS OF THE COALITION OF 9/11 FAMILIES

Page 1. The WHEREAS clauses should include mention of the fact that a temporary PATHWTC Station was constructed and is operating, and that the proposed undertaking is a replacement for that temporary station.

Page 1. The fourth WHEREAS clause refers to the "EIS." No Final EIS presently exists. This clause should refer to the "Draft EIS."

Page 2. The first WHEREAS clause should describe the nature of the consultation between the SHPO and the ACHP.

Page 2. The second WHEREAS clause states that the Project "may" have an adverse effect on certain historic properties. It is our understanding that FTA has already determined that the Project *will* have an adverse effect. This language should be changed accordingly.

Page 3. As worded, the first WHEREAS clause, while strictly correct, incorrectly conveys the impression that all the Consulting Parties are satisfied with the final Coordinated Determination of Eligibility.

Page 4. The second WHEREAS clause should be revised to reflect the fact that certain WTC artifacts under the Port Authority's control are in locations other than Hanger 17.

Page 4. The fourth WHEREAS clause should acknowledge that protecting and preserving historic properties in the Project area is apparently not a key goal or objective of the Project, even though virtually the entire project area is located within the limits of a nationally significant historic site.

Page 4. The fifth WHEREAS clause should refer to the *Draft* EIS.

Page 5. The second WHEREAS clause should identify what office or division of the National Park Service will be asked to review design plans. It should also identify by date or by milestone when this will take place.

Page 5. The third WHEREAS clause lists the Final EIS as one of the documents the public was provided an opportunity to comment on. No Final EIS has yet been issued. The Port Authority has suggested that the MOA will be finalized relatively soon. As the Final EIS has not been issued and the comment period has not begun, the impression has been conveyed that the MOA will be finalized before the Final EIS is issued.

Page 7. Stipulation I, introduction. How the Port Authority will coordinate treatment of historic properties with LMDC must be described in detail. The Port Authority has previously stated at Consulting Party meetings that it did not know how LMDC activities would affect certain historic resources that the Port Authority was committed to preserving. This goes to the heart of the Coalition's concerns about how cumulative impacts will be addressed.

Page 7, Stipulation IA1, line 1. The use of the word "resolve" is curious. Adverse effects will not be resolved by anything proposed in the draft MOA. They will be addressed and/or mitigated.

Page 7, Stipulation IA1, line 4. The Coalition continues to maintain that Level I standards for HABS/HAER recording should be applied, as is appropriate for a historic property that is being considered for, and will certainly receive, National Historic Landmark status.

Page 7, Stipulation IA1, line 6. Reference is made to photographs of historic features "as they currently exist." This is very unclear. Based upon our November 15, 2004 site visit, the Coalition believes that some features, notably the Twin Tower footprints, have been altered by Port Authority activities subsequent to the end of the recovery period on ~~June~~ May 30, 2002. The WTC site continues to undergo change on a daily basis. For these reasons the term "currently" is meaningless. Any photographs of the Twin Tower footprints must be taken only after the footprints have been restored to their appearance on ~~June~~ May 30, 2002.

Page 7, Stipulation IA1, line 7. The word "or" should replaced with "and." To the best of our knowledge there are no "existing drawings of current conditions." The Coalition has maintained that such drawings should be prepared as part of the HABS/HAER recording of the WTC Site. Any such drawings will clearly be very different from drawings of "pre-9/11 conditions." As worded, Stipulation IA1 implies that one type of drawing can substitute for the other. This is clearly not the case.

Page 7, Stipulation IA1, last sentence. It is unclear what is meant by the phrase "coordinate the photographic effort" with the photographic efforts of LMDC. It is the understanding of the Coalition that LMDC has essentially completed their photographic program at the WTC Site. Does the Port Authority intend to merely adopt those photos as a means of satisfying the requirements of the MOA? If so, this is not acceptable to the Coalition.

Page 7, Stipulation IA2. As noted in our cover letter, the Coalition believes that the SHPO should not be involved. The Port Authority should consult with HABS/HAER. This stipulation needs to be clarified to note which office(s) of HABS/HAER will be consulted.

Page 8, Stipulation IA3. It is unclear whether completed documentation is being "submitted to SHPO" or being "submitted to SHPO for consideration." If the latter, consideration for what? Presumably, HABS/HAER will consider whether or not to accept the documentation based on whether or not it satisfies HABS/HAER standards. HABS/HAER has previously refused to accept documentation of the World Trade Center Site submitted by the Port Authority on behalf of LMDC because it did not conform to their standards. This could have been avoided had LMDC properly consulted with HABS/HAER prior to compiling the documentation.

Page 8, Stipulation IB1. The statement that the Port Authority will implement this stipulation (which relates to the Twin Tower footprints) "in a manner consistent with the 'Memorial Access Commitments' contained in the LMDC Programmatic Agreement" is unacceptable. This statement presumably trumps all commitments made in other stipulations in the draft MOA rendering them meaningless. If it is not intended to do so this must be made very clear. This goes to the heart of the Coalition's continued concern over how cumulative effects are being treated. As the property owner, the Port Authority should have final say over this matter and should not be relinquishing its right to make binding commitments over how the Twin Tower footprints will be dealt with to the LMDC.

Page 8, Stipulations IB2a and b. Reference is made to "temporarily or permanently" removing tower perimeter column remnants. Either would constitute an adverse effect that has not been previously addressed. If permanently removed what would happen to these features?

Page 8, Stipulation IB2. As worded, this Stipulation does not reflect the most recent proposal of the Port Authority to allow some tower perimeter column remnants to remain visible from the proposed Platform D. Should the Platform D alternative, as proposed by the Port Authority, become the final selected alternative, this Stipulation will have to be revised to reflect newly proposed mitigation measures.

Page 9, Stipulation IB2b. The phrase "potentially accessible" must be defined or the modifying adjective "potentially" deleted. The wording could just as easily have been "potentially not accessible." Both phrases have exactly the same meaning and both are irrelevant as the Stipulation leaves the final decision to the LMDC.

Page 9, Stipulation IB3. As noted above, the MOA must discuss what will happen to any column bases that may be permanently removed.

Page 9, Stipulation IB5. The draft MOA does not adequately describe how the footprints will be protected while covered by the temporary PATH track. A detailed resource protection plan specifying how protective covering will be placed and removed from affected areas is needed. This plan need not be part of the MOA, but the MOA should call for its preparation and review for comment by Consulting Parties.

Page 9, Stipulation IB6. The MOA needs to clarify the relationship between elevation 242 and the elevation of "bedrock."

Page 10, Stipulation IB7. The *removal* of the fill that covered the Twin Tower footprints can in no way be categorized as a mitigative measure. The Coalition notes that as of November 15, 2004 this fill has already been removed. The Coalition has serious concerns about how the placement and removal of this fill has already affected the Twin Tower footprints. The Coalition went on record months ago as recommending that a construction protection plan be developed for the WTC Site. The MOA must include provisions for the preparation and implementation of such a plan. It should also provide the Consulting Parties an opportunity to review and comment on such a plan before it is adopted.

Page 10, Stipulation IB8. Much of the discussion in the introductory paragraph has been rendered moot by the Port Authority's November 15, 2004 presentation to the Consulting Parties. While platform architectural treatment remains a possible mitigation measure if combined with other measures, the Coalition notes that this will be required only if a project alternative including Platform D is selected as the final alternative.

Page 10, Stipulation IB8a. Consulting Parties who request to be involved should be included in consultations related to the development of design plans. [This comment also applies to Stipulations IC1b and 1D1b].

Page 10, Stipulation IB8b. Making design plans available to the Consulting Parties only via the Project website is unacceptable. Downloading large-scale drawings from the Internet can be time consuming and will be impossible for some users. Downloading full-scale copies of oversize drawings will also be impossible for some Consulting Parties. The Port Authority must make

available full size hard copies of these drawings to at least those Consulting Parties that request them. [This comment also applies to Stipulations IC1b and 1D1b].

Page 10, Stipulation IB8b. The language in this section should be reworded to make clear "design plans" refers to both preliminary (35%) and pre-final (75%) design plans. [This comment also applies to Stipulations IC1b and 1D1b].

Page 10, Stipulation IB8b. Fourteen calendar days is two short a period to allow for meaningful comment. It is our understanding that the Port Authority has already proposed changing this to 21 days.

Page 10, Stipulation IB8c. It is unclear why the limitation on review comments is included. The FTA and Port Authority should welcome any constructive comments on any matter relating to the project no matter when the comment is made. [This comment also applies to Stipulations IC1b and 1D1b].

Page 10, Stipulation ID1. This stipulation should be reworded so that the prerequisites for making a portion of the slurry wall visible from within the Terminal become obligations of the Port Authority. This stipulation should commit the Port Authority to making a portion of the slurry wall visible and each of the prerequisites should become requirements that the Port Authority agrees to abide by.

Page 10, Stipulation ID1. The last sentence should be eliminated or revised. It seems likely that the corridor enhancement proposed by the Port Authority will be designed long before the LMDC can make available the design information on their project needed for meaning coordination. As the potential exists that the Memorial will never be built or will not be built in the manner presently conceived, the Port Authority should not make any of its proposed treatment of historic properties at the WTC Site contingent upon LMDC activities. Once again this goes to the Coalition's concerns about how cumulative impacts have been addressed.

Page 10, Stipulation IF. This Stipulation should include a commitment by the Port Authority to actively attempt to identify those artifacts that were removed form the site so that a comprehensive inventory can be made. The Coalition notes that at least one instance is known where artifacts not presently in Port Authority custody have been identified as having been donated by the Port Authority Police Department to the current "owner."

Page 10, Stipulation IF. Last sentence. Quarterly, not semi-annual, reports should be issued.

Page 19, Stipulation VIA1. The Consulting Parties, as well as FTA and SHPO should be notified.

Page 19, Stipulation VIA2. The Consulting parties should be involved in developing the plans for removing historic elements, safeguarding them, and returning them to the WTC Site. The Consulting Parties should be permitted to observe the removal of these elements if they wish.

Page 19, Stipulation VIA2, 3 and 4. As noted in our cover letter, we believe that the SHPO should recuse itself from review responsibilities called for by the MOA. The SHPO's role should be assumed by the ACHP and/or the FTA.

Page 19, Stipulation VIA5. Those Consulting Parties who request to be notified should be notified when temporarily removed elements will be returned to the WTC Site. Those Consulting

Parties requesting it should be afforded the opportunity to observe the replacement of these elements to insure that the work is done properly and in a respectful manner.

Page 19, Stipulation VIA6. Keeping the Consulting Parties informed about the implementation of Stipulation VI should be done via e-mail. Relying on the Project website places an unfair burden on the Consulting Parties requiring them to constantly check the website for updates. This comment is not meant to imply that information should not be posted on the website, only that the Consulting Parties should be notified via e-mail when updates become available.

Page 19, Stipulation VIA2, 3 and 4. The Coalition believes that the SHPO cannot be relied upon to monitor the activities carried out pursuant to the MOA. The Coalition recommends that an outside party, acceptable to the FTA, the Port Authority and the Consulting Parties be identified to carry out this function and that the costs of such an outside monitor be paid for by the Port Authority. The monitor should be responsible to both the Port Authority and the Consulting Parties.

Page 21, Stipulation IXC. Reporting should be on a quarterly, not semi-annual basis. The draft MOA is unclear about how the Port Authority will "make this report available" to the Consulting Parties. This must be clarified.

Page 21, Stipulation XA. It should be made clear that signatories (as distinct from parties to the MOA) may include Consulting Parties. The ACHP or FTA should be substituted for the SHPO in the dispute resolution process.

Page 21, Stipulation XB1. The phrase "timely and substantive" is highly subjective to varying interpretations. It should be precisely defined.

Page 25. It is unclear what is meant by LMDC's "concurrence." LMDC is not a party to the MOA. LMDC should have the role of signatory (as distinct from party) to the MOA along with all other Consulting Parties requesting that status.

Exhibit A. The shading is confusing.

Exhibit D. This exhibit is presumably intended to list the HABS/HAER photography proposed. One or more vertical (non-oblique) overhead shots should be included. Additional non-HABS/HAER photography should include photographs of each individual box beam support beam and each other feature identified within the footprint perimeters. These will provide baseline photographs which can be used to determine if features are damaged during construction, can provide a basis for restoring damaged features, and will be necessary to insure that box beam column remnants that are temporarily removed for PATH construction will be replaced to as close as their original appearance as possible.

Exhibit D. The Exhibit calls for six typical views of Tower Footprints. As no photos of individual box beam column remnants are proposed we assume that this is what is being referred to. HABS/HAER photographic documentation must include photographs of the footprints in their entirety.

106 comments
Marilyn Gaull Howard
mg49@nyu.edu

Representing the Coalition to Save West Street, we are, in fact, the only group representing Battery Park City South, about 10,000 residents many of whom also lost relatives in 9/11 or are actually survivors who remained in the neighborhood. The families in our neighborhood are not affiliated with the group which has assumed the voice of the victims for obvious reasons. Our neighborhood includes children, the elderly, and a huge population of people who go to work, all of whom need transportation out of Battery Park City. We all used the WTC before 9/11.

Now nearly all transportation is inaccessible—the proposed tunnel, in any design, would make it less accessible. So, first, we need access. The proposed memorial would cut us off from your transportation center and we would be limited to the alleys which now exist, with more construction, more pollution and danger.

Secondly, we need safety, no tunnels, alleys, or temporary bridges. We need to restore the safe access we had with two permanent bridges over the West Side Highway, wide, covered, with escalators that work.

Third, we need community, to have the sheltered center we enjoyed in the WTC restored with underground retail and all the amenities that made the neighborhood work. This does not make us economic opportunists. Rather, we simply want to restore our community.

Fourth, we need to recover. For the past three years we have born witness, daily, two or three times a day to this tragedy that many of us will never recover from, either because we lost family or barely survived ourselves. To those of us who lived it, to re-live it by going into the pit or worshipping the slurry wall and smoke-streaked remains, is gruesome and pointless, emotional self-indulgence. We need access which is emotionally as well as physically safe, not through the memorial or past the gruesome and incidental remains. We have our own remains; no one wanted them.

Fifth, we do not believe that the words "sacred" or "hallowed" are appropriate. To those of us who survived, it is a crime scene, where our neighbors were murdered or injured and which has altered our lives forever. It is sacred only to the religious fanatics who found martyrdom there or to the "dirt-worshippers," godless and emotionally warped people who believe that their loved ones are in the dirt, the foot-prints as they call them, or at Fresh Kills, and not in their hearts or in heaven or in some other appropriate spiritual state. They do a disservice to their loved ones and are implicating all of us in it. We don't know how or why anyone decided that the footprints were sacred, but they are not and are of no more interest to us than the damaged property we discard, the ashes and dust we inhaled, the human remains we found in our living rooms and on our window sills.

Finally, we need to recover our neighborhood from the politicians, bureaucrats, architects, lawyers, the LMDC, and these so-called "families," everyone who has a made a business of our tragedy, who would not exist were it not for the deaths of our neighbors and the destruction of our neighborhoods.

The only agency that has so far been able to offer any vision of recovery is PANYNJ. Your plans are stunning—however many platforms you propose. There cannot be enough as far as we are concerned. The terminal itself is a far better memorial than anything that has been planned at the site. From the very first presentation at CB1, I was convinced that this agency is the only one capable of directing the rebuilding, and I have said it often. The level of professionalism along with your patience is inspiring. But, we need access from BPC south; we do not need a memorial.

What the LMDC and "families" decided was historical is arbitrary, decisions by people who weren't there, either before or after, and have no understanding of what matters. Please get on with your work and do the right thing. I don't know anyone else who can.

Marilyn Gaull Howard
350 Albany Street 3Q
NY, NY 10280

HISTORIC DISTRICTS COUNCIL

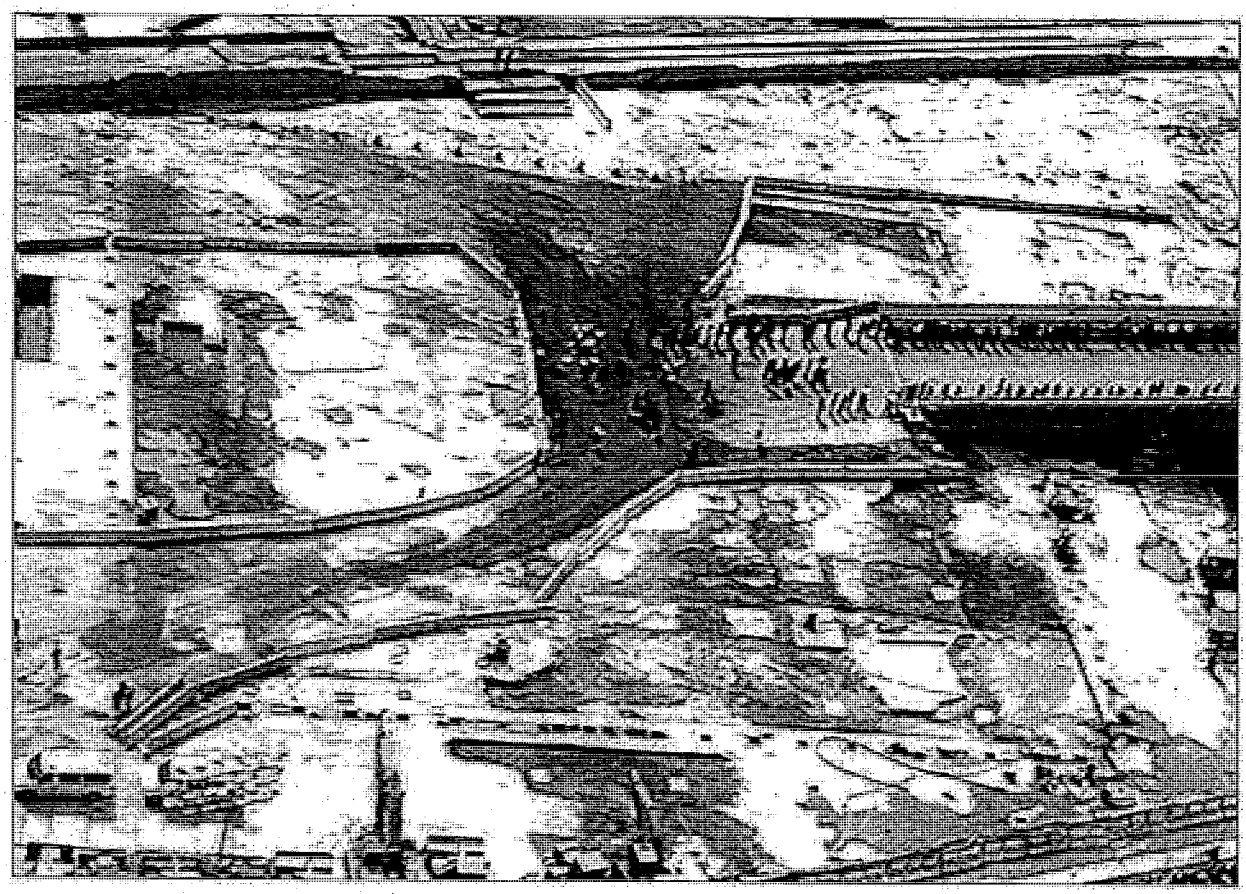
THE ADVOCATE FOR NEW YORK CITY'S HISTORIC NEIGHBORHOODS

232 East 11th Street New York NY 10003
tel 212-614-9107 fax 212-614-9127 e-mail hdc@hdc.org

NOVEMBER 12, 2004 COMMENTS REGARDING THE SECTION 106 REVIEW FOR THE PERMANENT WTC PATH STATION (Revised November 19) NOT FOR RELEASE

Daniel Libeskind has described the preservation of the "BEDROCK FOOTPRINTS," the heart and soul of his original scheme, as, "REVEALING THE HEROIC FOUNDATIONS OF DEMOCRACY FOR ALL TO SEE." The attacks of September 11, 2001 sent the towers crashing to earth, but in the profound depth of the World Trade Center site these foundations remained, embodied in the steel column bases, concrete and bedrock of the tower footprints, a monument to the endurance of our nation and a national shrine for ages to come.

Partially uncovered ruin of 1 WTC in June 2002, showing perimeter column bases, core column bases, concrete slab features and areas where falling steel damaged the concrete, opening the foundation to bedrock beneath. The barricaded hole near the bridge apron is the elevator pit of car #50, the freight car that served every floor.



Partially uncovered footprint of 1 WTC during the closing ceremony on May 30, 2002. Note concrete slab features such as column bases, equipment pads, condensate return trenches and pits, and of particular significance, concrete elements damaged by the falling structural steel of the tower.

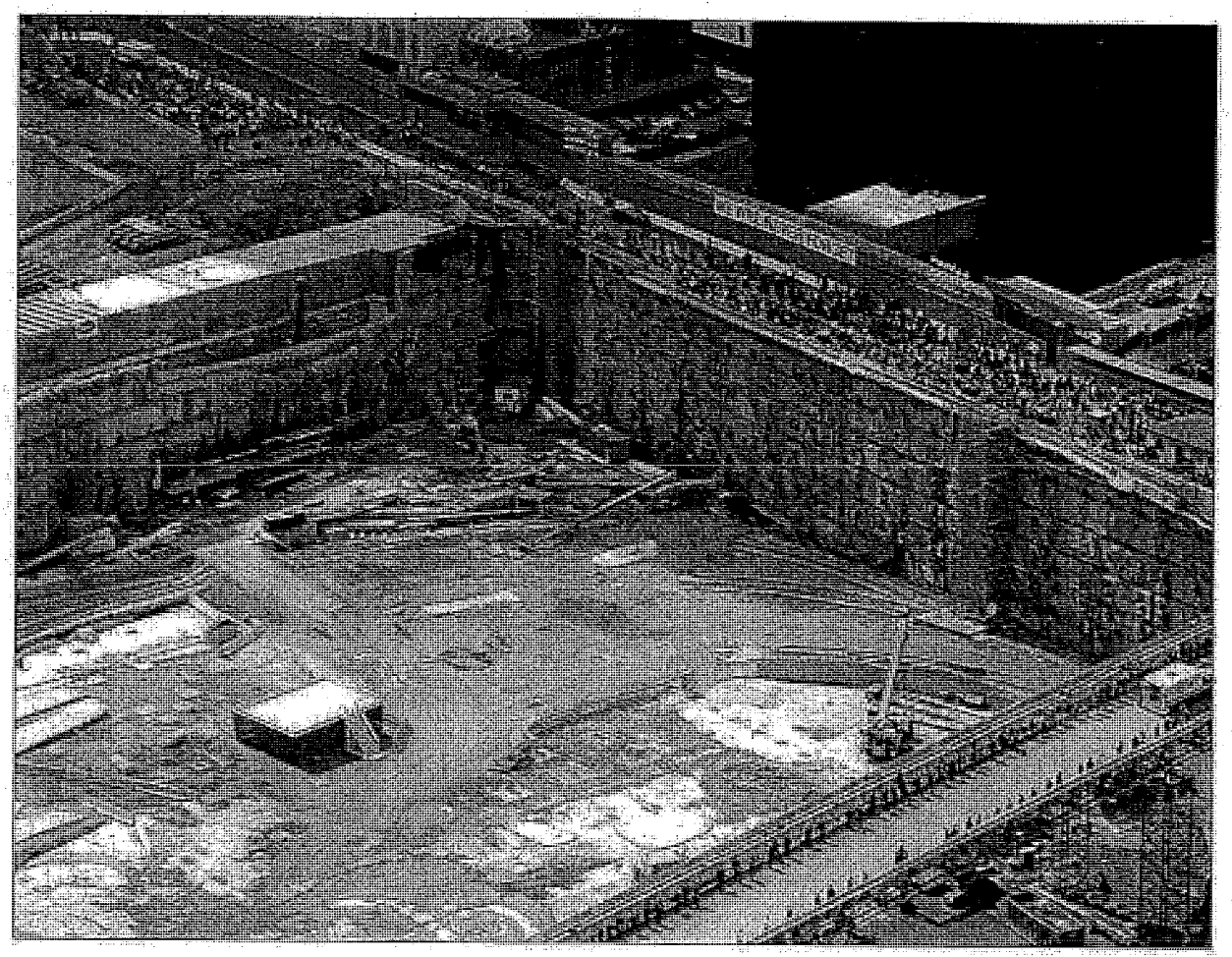
For more than two years the tower footprints have been hidden beneath fill while temporary construction projects progressed. There was an initial focus on the tower footprints; the Libeskind design was organized around the footprints, and the temporary PATH station did not encroach. Governor George Pataki said that where the towers stood was sacred ground and pledged that we would never build where the towers stood.

The features of the footprints were only partially revealed by the gross demolition methods of the WTC Emergency Operation, as shown in the photos herein, which were taken around the time of the closing ceremony in the spring of 2002. Documentation should have begun at that time. I urged it strongly starting more than one year ago in documents furnished to the PANYNJ, SHPO and NPS. Now that the formal documentation of the footprints has finally started it should be performed properly and not rushed through in a perfunctory manner.

Site preparation for HABS/HEAR recordation should accomplish the following:

1. Clean materials sufficiently that size, color, texture and material of each component is apparent, i.e. steel, concrete, bedrock. It is feared that machine brushing alone may leave components covered with dust or residue that will mask their character.

2. Remove fill, new concrete rat slabs and other foreign materials sufficiently to permit the ruin to be seen in full relief, i.e. revealing various levels of concrete slabs, edges



Partially uncovered footprint of 2 WTC during closing ceremony, May 30, 2002. The column bases are most apparent at the southwest corner of the perimeter and core, and at the northeast corner of the perimeter, where the columns have an atypical configuration due to accommodation of the PATH tracks. The darkened area to the right of the podium is where the Flag Column (aka Final Column) had been cut down two days prior.

of column bases and damaged slabs, recesses within column bases, and areas where stone of the underlying bedrock is revealed. It is feared that the methods employed may leave the footprints looking flat and featureless which would be entirely misleading.

3. Identify adverse effects that have already taken place since the end of the period of significance.

4. All of the 2 WTC footprint should be documented in drawings, even if the portion over which the tracks pass cannot reasonably be uncovered at this time. The east portion of this footprint is still full of features that contribute to the significance of the site. Their preservation is still a relevant part of the long-term stewardship of the resource, even if they are not physically accessible. Their inaccessibility, and particularly the proposed demolition of any of these features, would be adverse effects that must be addressed by the mitigation plan.

An acceptable protection plan should be established prior to backfilling, circulated to the consulting parties for comment and evaluated by SHPO and the Advisory Council. The

tower footprints should be properly protected. The methodology used to date seems more geared to protecting truck tires than historic materials. The fill that has been in place for the last two years has looked persistently moist over the footprints, potentially accelerating steel corrosion and deterioration of concrete. There has been too much construction activity and heavy equipment traffic even for these rugged materials.

A great deal of construction is slated for this site in coming years. Traffic over the footprints should be limited. There should be no storage and staging of materials and equipment on the footprints. These measures would not put an extraordinary burden on construction logistics. Few projects in the city have a large staging area beyond the building lot itself and adjacent streets, and the footprints take up only about ten percent of the WTC site. Contractors should be required to behave respectfully – for example, not disposing of refuse or spillage, or washing out concrete mixers where the slurry will wash into the footprints (perhaps such a policy already exists). A coordinator should be responsible for maintaining and monitoring protection of historic site features, setting up sump pumps if areas are persistently wet, and submitting weekly reports.

WTC bathtub during closing ceremony, May 30, 2002.

The construction plans should include measures for actively preserving the features of 1 WTC and 2 WTC. Offering to spare something from demolition is not the same as preserving it. Despite the Port Authority and LMDC's insistence at Section 106 meetings that they have a genuine appreciation for the historic significance of resources at the site, the billions of dollars being lavished on the site do not seem to include any funding for preservation of the footprints or construction of the memorial, and no plan to create a National Memorial on this hallowed ground. It seems that

substantial portions of the site's historically significant features are slated to be demolished and the rest abandoned to an uncertain future.

Based on the site visit of November 15 it appears that the site preparation for HABS/HEAR documentation is far from complete and that there have been significant adverse effects that are unknowns until a more thorough examination of the site has been performed. For example, it is not clear if core columns of 1 WTC have been cut down lower than they were during the period of significance or if some have been removed entirely. Also, it is clear that there not been an effective protection plan and the site has not been treated as an historic resource. The PANYNJ should develop a temporary protection plan immediately until a long-term plan can be finalized.

Most of our comments on the Draft Memorandum of Agreement have been voiced at the November 4th and 15th meetings. In addition we recommend that Level I standards for HABS/HAER recordation be adopted for this site consistent with its level of national significance.

HISTORIC DISTRICTS COUNCIL

Robert J. Kornfeld, Jr., R.A.
Board of Directors

North perimeter column bases of 1 WTC (right) at closing ceremony, May 30, 2002. Left are FDNY and PAPD vehicles participating in the ceremony. Top left is the Flag Column laid on a flatbed truck, wrapped in black bunting, and adorned with a flag and a wreath of red, white and blue flowers. The floor of the bathtub was so clean at this time that the concrete joints were visible. Right from the truck are a pit for elevators serving the garage and a condensate return pit within the 1 WTC tube perimeter.

HISTORIC DISTRICTS COUNCIL

THE ADVOCATE FOR NEW YORK CITY'S HISTORIC NEIGHBORHOODS

232 East 11th Street New York NY 10003
tel 212-614-9107 fax 212-614-9127 e-mail hdc@hdc.org

ADDITIONAL NOVEMBER 19, 2004 COMMENTS REGARDING THE SECTION 106 REVIEW FOR THE PERMANENT WTC PATH STATION

Having participated in the November 19th site visit I would like to commend the PANYNJ for the additional work performed since the visit on the 15th. The perimeter columns have been more clearly delineated. I was very surprised, however, to hear that photographic recordation has started, including aerial photography. The 1 WTC and 2 WTC footprints are nowhere near ready. The entire area within the perimeter is still an amorphous, undulating field of mud. The core columns and concrete features are not discernable. How can they be said to have been officially recorded when they are not visible. The character of the ruin depends to a great extent on the crisp edge of the slab around the perimeter and the delineation of the interior features. Complete photographic recordation should be performed after the site preparation is complete.

Also, an additional site visit should be arranged when the site has been prepared in a satisfactory manner for HABS/HAER recordation, particularly as the Consulting Parties were not notified with reasonable time to arrange to come, particularly out-of-town attendees. It was inexcusable that there was no notification for the first visit. I even sent an email stating that I had not received notice and requesting information on the time and location. This email was not responded to. I was fortunate that I learned of it from another Consulting Party.

HISTORIC DISTRICTS COUNCIL

Robert J. Kornfeld, Jr. R.A.
Board of Directors

333 Rector Place, # 11-B
New York, NY 10280
November 19, 2004

Executive Director
Port Authority of New York and New Jersey
225 Park Avenue South
New York, NY 10003

Via E-mail

Re: WTC Transportation Hub Project
Comments of Section 106 Consulting Party

Dear Sir:

On behalf of the Coalition to Save West Street (the "Coalition"), a Consulting Party for the WTC Transportation Hub Project, I offer these comments in connection with matters related to the proposed Memorandum of Agreement for this project. I have attended most of the Section 106 meetings, including the one earlier this week that dealt specifically with the Memorandum of Agreement and related issues. I hereby incorporate into this letter my previous verbal comments on these issues as reflected in the written transcripts of the Section 106 meetings. The purpose of this letter is to add a few additional general comments reiterating key points that I have made at the meetings and that I particularly want to emphasize at this stage of the decision process.

1. The Port Authority has provided compelling evidence of the need for a fourth platform (Platform D) for PATH service at the World Trade Center ("WTC") site. On behalf of the Coalition, I have reviewed all of the materials provided by the Port Authority and have listened to all of its presentations regarding its rationale for recommending the preferred 5-track, 4-platform alternative for the WTC PATH Terminal. The Coalition hereby joins other residents, downtown organizations and elected officials in recognizing that the Port Authority has proven the case for this alternative beyond any reasonable doubt. We fully support this alternative with the wide version of Platform D. The highest possible priority must be given to increasing platform capacity in order to meet PATH system operating requirements.

It is critical for the economic redevelopment of Lower Manhattan that PATH service be able to accommodate peak period ridership for many years into the future, and to do so with an adequate and conservative margin of safety. Any sacrifice of this goal to preserve a few more box beam columns at bedrock level at the behest of a narrow band of zealots would be ludicrous.

2. The Port Authority should focus its efforts on retail development in the proposed East-West Pedestrian Connector rather than emphasizing views of the slurry wall that many local residents and workers would rather avoid. Many of the people who

live and work in Lower Manhattan were driven from their homes and offices on 9/11 and were traumatized by the events of that day. Consequently, most of those who have returned to their neighborhood do not wish to be forced to revisit the tragedy by continually having to confront a major symbol of the destruction (the slurry wall) on a daily basis as they traverse the site.

On the other hand, one of the things that most local residents and workers fondly remember about the pre-9/11 WTC site was the excellent indoor retail concourse that existed and that was tied so seamlessly into Battery Park City by the pedestrian North Bridge to the World Financial Center. The concourse felt like an integral part of the neighborhood and has even been described by some as serving the role of a "town square," in spite of those critics (most of whom live and work elsewhere) who have claimed that West Street was a major "barrier" isolating Battery Park City. No one knows better than the Port Authority how successful that indoor concourse was as a commercial retail development, and we are confident that local residents and workers will once again embrace and support upscale retail establishments on the redeveloped WTC site. "If you build them (quality retail stores) they will come."

3. The extreme and narrow demands of a few family members and their preservationist allies cannot be allowed to effectively veto the economic redevelopment of Lower Manhattan. It is now an absolute certainty that there will be at the WTC site a significant and meaningful memorial and related reminders of the tragedy of 9/11. That experience will be there for those people, whether locals or tourists or family members, who choose to avail themselves of it. Both the documented history of that terrible day and a significant amount of related artifacts will be preserved at the site for future generations. It is "baked in the cake" as the saying goes. Consequently, whether 0%, 5% or even 10% of the North Tower "footprint" is encroached upon by necessary infrastructure development at the WTC site will make no material difference in the quality of the memorial experience. The emphasis by a small group of family members on fighting tooth and nail to preserve every last box beam column at bedrock level at the expense of the site's timely and adequate redevelopment and the resultant overshadowing of the interests of those who live and work in the area is a bizarre bit of posturing that should not be allowed to dictate developments on the site any more than it already has. Rationality, not emotion, has to carry the day as we make decisions that will have far reaching consequences for the long-term future of Lower Manhattan.

4. The preservation of the E subway entrance is a positive example of historic preservation, and the Port Authority is to be commended for its work with the Consulting Parties in arriving at a creative solution that preserves this section of the site. Unlike the slurry wall, which most residents had never seen or even heard of prior to 9/11 and which conjures up images of destruction, the E train entrance is a very familiar piece of infrastructure that survived 9/11 relatively unscathed and serves as a positive reminder of what existed on the site prior to 9/11. The Port Authority's solution for preserving this entrance to the WTC site, as approved by the Consulting Parties, makes the preserved structure an integral part of the new PATH terminal at minimal cost and with no disruption to subway riders. This is a wonderful outcome.

Thank you for the opportunity to offer these comments and to participate in the Section 106 process.

Yours truly,

/s/ William C. Love, Jr.

William C. Love, Jr.
Vice Chair, Coalition to Save West Street
W: (212) 306-1789
H: (212) 786-4897
blove93@earthlink.net

LOWER MANHATTAN EMERGENCY PRESERVATION FUND

Municipal Art Society | National Trust for Historic Preservation | New York Landmarks Conservancy | Preservation League of New York State | World Monuments Fund

November 19, 2004

Bernard Cohen
Director
Lower Manhattan Recovery Office
Federal Transportation Administration
One Bowling Green, Suite 436
New York, NY 10004

Re: Comments on Draft Memorandum of Agreement on the Permanent World Trade Center PATH Terminal and Transportation Connections

Dear Mr. Cohen:

On behalf of the Lower Manhattan Emergency Preservation Fund (LMEPF), the following are our written comments on the Draft Memorandum of Agreement (MOA) dated October 20, 2004 for the Permanent World Trade Center PATH Terminal and Transportation Connections. Each of the five organizations that make up the LMEPF support the building of the Terminal as part of the revitalization of Lower Manhattan and welcomes the opportunity to contribute to the rebuilding process. The LMEPF also appreciates the Port Authority of New York and New Jersey's (PANYNJ) responsiveness to the comments from historic preservation groups and other consulting parties during the past months concerning the importance of integrating the existing on-site historic elements into the new Terminal.

Most broadly, the LMEPF recommends the following:

Develop a Process to Evaluate and Mitigate the Cumulative Impact of all Projects
The LMEPF is concerned about the cumulative impact that all projects will have on the National Register-eligible World Trade Center Site (WTCS) in conjunction with the numerous other projects soon to be underway (Route 9A, Freedom Tower, Memorial, Memorial Center, etc.). Each project is being reviewed separately under Section 106 with little or no ability for the consulting parties to address effects and alternatives holistically. As owner of the site, the PANYNJ needs to establish a review and approval process for all projects (whether implemented by the PANYNJ, Lower Manhattan Development Corporation, and/or others) that identifies, evaluates, and mitigates historic preservation concerns. This process should also include the established consulting party process to ensure that comments from stakeholders are discussed and evaluated. The protocol should also include guidelines for a Resource Protection Plan addressing the care and protection of on-site historic elements during all construction projects.

Establish a Cultural Resources Management Team
As owner of the World Trade Center Site, the PANYNJ should establish a Cultural Resources Management Team (CRMT) with members meeting the Secretary of the Interior's Professional Qualification Standards (36 CFR 61 Appendix A). Members of the team should have appropriate experience and background in the evaluation, preservation, and interpretation of historic properties and artifacts. The MOA should require the inclusion of the CRMT which would help mitigate adverse effects on historic resources and promote sensitive and creative design solutions for the effective interpretation of on-site elements.

Salvage and Preserve Elements from the Slab Remnants in the Northwest Corner
Although not part of this specific project, we are requesting a written commitment from the PANYNJ to salvage and preserve the two smoke scarred columns, one wall section with sign, and one stairwell wall section with heart from the deconstructed slab remnants in the northwest corner of the WTCS.

The LMEPF's specific comments about the MOA are as follows:

Page 2. The third WHEREAS clause should include St. Paul's Chapel and Graveyard that we believe may be adversely affected by the Project. It is directly across from the site and could be damaged by vibrations.

Page 3. Letter "J" St. Paul's Chapel and Graveyard should be deleted.

Page 8. Stipulation IA3. We suggest that the Memorial Center also receive completed documentation for this and any other project that requires historic documentation.

Page 8. Stipulation IB2a & b. In general, the MOA needs to address the care and preservation of any on-site elements that are to be removed and not returned to the site.

Page 9. Stipulation IB3. As previously noted, the MOA must address the care and preservation of elements removed and not returned to the site.

Page 9. Stipulation IB5. As previously stated, the PANYNJ should establish a separate Resource Protection Plan to protect historic elements during all construction projects.

Page 9. Stipulation IB6. Since this addresses the PATH Project, it should be stated that no other projects (whether PANYNJ, LMDC, and/or others) will violate these commitments.

Page 10. Stipulation IB7. As previously stated, the PANYNJ should establish a separate Resource Protection Plan to protect historic elements during all construction projects.

Page 10. Stipulation IB8. As previously stated, the LMEPF recommends the creation of a CRMT to ensure for sensitive and creative interpretation of all historic elements through architectural treatments and other media.

Page 10. Stipulation IB8b. It is our understanding that the 14 day period has been changed to 21 days. The stipulation should also specify when the period begins and ends. In addition, Consulting Parties should be sent affirmative notification from the PANYNJ rather than checking the website. These comments apply to Stipulations IC1b and ID1b.

Page 10. Stipulation IB8f. Should the SHPO fail to comment within 30 calendar days, we are requesting language that the PANYNJ respond directly to any Consulting Party comments. This request applies to Stipulations IC1f and ID1f.

Page 11. Stipulation IC1. In order to not limit the interpretive possibilities of the E Subway Entrance, the CRMT should be involved in all decisions affecting the development of how historic elements will be marked and identified. We are requesting that the last sentence be modified as follows: "This design, at a minimum, will include a plaque identifying the historic features of the E subway entrance." This concern about architectural treatments and interpretation applies to Stipulation ID1.

Page 14. Stipulation IIA. Although extensive documentation exists on the existing conditions of the Hudson River Bulkhead, we are requesting that Consulting Parties have the ability to comment.

Page 15. Stipulation III. St. Paul's Chapel and Graveyard should be added to the list of buildings.

Page 15. Stipulation IIIA. The issue of coordination goes back to our concerns about the cumulative impact and construction coordination affecting historic resources.

Page 16. Stipulation IIIB3. The specific vibration criteria and any other related standards should be explicitly stated or included as an appendix to the MOA. More detailed qualifications should be included concerning the selection of a firm or individual to oversee the Construction Protection Plan (CPP). An engineering firm with extensive experience in historic preservation projects and vibration monitoring may be a more appropriate entity to oversee the CPP than an historic architect.

Page 17. Stipulation IVB. This addresses Project-related disturbances but does not address concerns that we have about how non-Project-related disturbances will be addressed and the cumulative impact that other projects will have on the site.

Page 18. Stipulation VC. This is a typographical error indicating VC and should be changed to read VB.

Page 19. Stipulation VI2. This fails to address the possibility that elements may not be able to be returned to the WTCS.

Thank you for the opportunity to present our concerns, and we look forward to our continued participation.

Sincerely,

Ken Lustbader
Preservation Consultant
Lower Manhattan Emergency Preservation Fund
37 West 12th Street, 2E
New York, NY 10011
Phone: 917-848-1776
Email: klustbader@aol.com

cc: Kevin Rampe, Lower Manhattan Development Corporation
Carol Bruegelmann, Federal Transit Administration
Paul Lebrun, Federal Transit Administration
Timothy Stickelman, Port Authority of New York and New Jersey
Don L. Klima, Advisory Council on Historic Preservation
Ruth Pierpont, New York State Office of Parks, Recreation, and Historic Preservation

In pertaining to the EIS (Environmental Impact Statement) regarding the WTC Path Terminal and Pedestrian Connections; as has been stated in previous commentary relevant to the reconstruction of the World Trade Center Site:

The southern tip of Manhattan had been an extremely important neutral meeting and trading ground for the Algonquian and Iroquoian tribal nations thousands of years before contact with European powers; and since the area has been irrevocably altered from its original ecology after more than three hundred years of architectural construction; very little of anything relating to the original occupation and archaeology of the indigenous inhabitants has remained. In previous consultation with the LMDC, the Shinnecock Nation Cultural Center and Museum has advocated that a portion of the memorial and the museum contain something which will call to mind the presence of the original inhabitants of the area, something that will communicate the environmental and philosophical ethic which the traditional elders continue to espouse. That ethic says that the indigenous people of the area have been for thousands of years and continue to be the spiritual guardians of the earth according to the original instructions of the Creator. So great a tragedy as the 9/11 situation only intensified the feeling of the transgression of the original instructions of living in harmony with each other and the natural world.

Therefore, in consideration of the construction of the WTC Path Terminal and Pedestrian Connections, we believe it is fitting that some architectural, environmental or artistic statement be included within this area as well as the other areas to bring to the attention of the passersby the ancient presence and history of the indigenous civilization that once flourished under all the steel and concrete for thousands of years ands still lives on today through the some 20,000 native people in the City and throughout the Western Hemisphere. This primordial ethic underscores the idea of a spiritual guardianship that exists, that was never broken, and that the traditional elders feel a connection with the area despite the enormous physical changes to the landscape of the last three-hundred years. They feel this connection even more so after the 9/11 tragedy. Some such tangible statement in this construction project signifying the continuing presence of the Shinnecock, Montauk, Mohawk, Delaware, and Unquechaug (Poospatuck) Tuscarora, Onondaga, Oneida, Seneca, and Cayuga would further serve to help consecrate this land anew for the memories of the thousands who lost their lives in the tragedy and the hopefully bright future ahead.

Finally, in regard to the concerns expressed by the representatives of the 9/11 families and the exposure of the footprints of the buildings, we recommend that appropriate portions of the footprints remain visible much in the manner of the Battleship Arizona in the Pearl Harbor Memorial in the Hawaiian Islands. Sections of the footprint or artifacts of the site should remain visible where appropriate behind some kind of transparent window so that proper respects could be paid.

We sincerely hope these recommendations can be implemented. We at the Shinnecock Nation Cultural Center and Museum appreciate being a part of the consultative process for this very important project.

David Martine
Director/Curator
Shinnecock Nation Cultural Center and Museum

CC. Shinnecock Nation Cultural Center and Museum Board of Directors
Port Authority of New York and New Jersey (PANYNJ)

November 22, 2004

Bernard Cohen, Director
Lower Manhattan Recovery Office
Federal Transit Administration
One Bowling Green, Suite 436
New York, NY 10004

Re: Comments on Draft Memorandum of Agreement (MOA) for
Permanent World Trade Center PATH Terminal and Transportation Connections

Dear Mr. Cohen:

On behalf of the National Trust for Historic Preservation, I am writing to summarize the Trust's comments on the draft Memorandum of Agreement (MOA) under Section 106 of the National Historic Preservation Act (NHPA) for the construction of the permanent PATH Terminal at the World Trade Center.

In preparing these comments, the Trust has also reviewed the comments submitted by the Coalition of 9/11 Families and the Lower Manhattan Emergency Preservation Fund. We agree with the vast majority of these other comments, but rather than repeat each one in detail, we look forward to seeing the revised draft of the MOA and the responses to all comments received.

The MOA Should Include the Port Authority's Mitigation Commitments to Salvage and Preserve Significant Elements from The Remains of the WTC Parking Garage.

The Port Authority has made a number of commitments to salvage and preserve significant elements from the remains of the WTC parking garage. These include the three elements proposed by the Port Authority during the consultation meeting on April 29, 2004 (a smoke-scarred column, a blistered paint column, and a wall section from level B2 with a painted locational sign). In addition, responding to requests from the consulting parties, the Port Authority has made a commitment to salvage and preserve the wall section with a graffiti painted heart and a cross, located in a stairwell between level B3 and B4. This item was identified by the consulting parties from the photos circulated by the Port Authority, in Photo # 24. While these commitments were loosely based on Stipulation 5 in the LMDC's Programmatic Agreement (PA), the Port Authority was not a party to that agreement, and in any event, the PA is not sufficiently specific to reflect the Port Authority's mitigation plans. In our view, it is important for these mitigation commitments to be incorporated into a formal Section 106 agreement, rather than being treated as an informal side-bar understanding. Because of the overlap and physical

1785 Massachusetts Avenue, NW · Washington, DC 20036
202-588-6000 · FAX: 202-588-6038 · TTY: 202-588-6200 · www.nationaltrust.org

relationship between the PATH Terminal and the WTC Subgrade Remnants (see Exhibit A to the Draft MOA), this agreement (specifically, Stipulation I) would be the most appropriate place for that commitment to be reflected.

The MOA Should Include a Process for the Port Authority, as Owner of the WTC Site, to Take Into Account Cumulative Effects Through an Approval and Consultation Process.

The consulting parties have repeatedly raised the importance of addressing cumulative effects on historic properties as a result of the variety of undertakings going forward within and around the World Trade Center site. The Port Authority is in the best position to take into account cumulative effects, and to coordinate mitigation of those effects, because of the Port Authority's ownership and control of the WTC site, and because of the agency's leadership to date in responding to the concerns raised by consulting parties. In our view, the best way to ensure that cumulative effects are taken into account would be to spell out a specific procedure in the MOA (in Stipulation VIII?) whereby the Port Authority would require that all activities being carried out by other agencies within the WTC site must go through a prior review and approval process, which would include consultation led by the Port Authority.

For example, through the use of such a process, long-term effects to the Vesey Street stairway and escalator could be taken into account, even though the PATH Terminal itself has been reconfigured to avoid directly affecting this element of the site.

St. Paul's Chapel and Graveyard Should be Included on the List of Historic Properties Subject to Potential Adverse Effects.

Presumably, St. Paul's Chapel and Graveyard is included on the No Adverse Effect list because the chapel structure itself may be located more than 90 feet from the expected construction site. However, the historic property as a whole appears to extend within the 90-foot buffer zone, including the cemetery. The National Historic Landmark Chapel was built in the 1760s, and is Manhattan's oldest surviving church. Given the age and significance of the chapel building, combined with the fragility of the cemetery, we are especially concerned about the risk of vibration impacts to this property, which is right across the street from the project site. We urge the FTA to include this property among the group that will be given special monitoring through the Construction Protection Plan in Stipulation III.

Specific Comments on the MOA:

WHEREAS CLAUSES

It might be helpful to add a Whereas Clause confirming that the Port Authority owns the World Trade Center Site, and that all activities within the WTC site must be approved by the Port Authority.

Clauses 7-8 (pages 2-3): St. Paul's Chapel and Graveyard should be included with the Adverse Effect list in Clause 7, rather than the No Adverse Effect List.

Clauses 20-23 (pages 5-6): The two Whereas Clauses on the bottom of Page 5 relate to tribal consultation and public input through the NEPA process. These appear substantively redundant with the next two Whereas Clauses at the top of page 6. We recommend deleting the two clauses on page 6 in favor of the two on page 5, which provide more detailed summaries. In addition, the cross-reference to Stipulation IX at the end of Clause 21 (bottom of page 5) needs to be revised. We assume the intended reference is to Stipulation X.B. (Public Comments and Dispute Resolution).

I. WORLD TRADE CENTER SITE (pages 7-13)

Clarify Consulting Party Review Process (Stipulations I.B.8, I.C.1, and I.D.1, pages 10-13)

Several aspects of the consulting party review process need clarification. This process is described in the draft MOA as applicable to the tower perimeter column remnants, the E Subway entrance, and the slurry walls. We hope the process will be extended to other elements as well, such as the treatment plan for the Hudson River Bulkhead, the Construction Protection Plan, etc. Needed clarifications include the following:

We appreciate the decision to extend the consulting party comment period from 14 days to 21 days. The MOA should explain more clearly that this comment opportunity will begin at the same time as the SHPO's 30-day review period, and that the consulting parties will be directly notified by e-mail, rather than placing the burden on the consulting parties to check the website continually. In addition, subparagraph "F" should provide that, if the SHPO fails to comment, but one or more consulting parties has commented, the Port Authority and/or FTA will address and respond to the consulting party comments directly. This approach mirrors the Section 106 regulations (36 C.F.R. § 800.5(c)(2)(i)).

A. Documentation (pages 7-8)

Although we were unable to participate in the site visit last week, we are extremely disturbed to learn from the other consulting parties that many of the box beam column remnants have been filled and/or covered with concrete. This concrete must be removed in order to properly document the footprints of the twin towers.

B. Tower Perimeter Column Remnants (pages 8-10)

The Port Authority has been extremely responsive to consulting party concerns by modifying the project over the course of the past six weeks to reduce and mitigate the adverse effect on the tower perimeter column remnants. The draft of this entire stipulation needs to be

revised to reflect those improvements in the project design. At the same time, however, the alarming current condition of the column remnants suggests that additional steps need to be taken to ensure that the integrity of these elements is not inadvertently damaged as a result of negligence or poor communication. It would be a tragic waste if the Port Authority's commendable efforts to provide visual access to the column bases within the PATH Terminal were to be lavished on column bases that end up being filled with concrete.

In Stipulations B.2 and B.3 (pages 8-9), a more specific process needs to be spelled out for deciding whether "practical engineering design" will permit returning the column bases to their original locations, and if not, where the column bases will be placed if permanent removal is ultimately required.

In Stipulation B.7 (page 10), we are very concerned about the proposal to replace the construction fill in order to "protect" the footprints and column remnants. This stipulation should be developed in more detail, and should explicitly prohibit the use of concrete or any similar material that would be difficult to remove. It should also require the ultimate removal of the fill once construction is complete.

C. E Subway Entrance (pages 11-12)

This stipulation includes a commitment to install a "plaque identifying the historic features of the E subway entrance." We commend the Port Authority for modifying the project to preserve and integrate this area into the redevelopment of the terminal. In our view, this preservation effort warrants a more creative approach to interpretation.

D. Penetration of East and West Slurry Walls (pages 12-13)

This stipulation includes a commitment to install a "plaque and photograph of the west slurry wall," in addition to providing visibility to a portion of the slurry wall itself. As we discussed at the consultation meeting, the reference to a plaque and a photograph is reminiscent of Penn Station, which is certainly not an ideal example. We strongly encourage reference to a more creative approach to interpretation, which has been discussed during the consultation process.

E. Steel Beams in Cross Form (page 13)

The draft stipulation refers to "final disposition of these artifacts in accordance with the rights of the respective owners thereof." This cryptic reference, which does not appear in Stipulation VI, needs to be clarified. The language suggests that the steel beams in cross form are not owned by the Port Authority, but by more than one other owner. If so, this information should be disclosed to the consulting parties.

F. Off-Site Artifacts (page 13)

This stipulation should be explicit about the Port Authority's ongoing commitment to involve a Conservator or Curator meeting the Secretary of the Interior's Historic Preservation Professional Qualification Standards (62 Fed. Reg. 33,707 (June 20, 1997)), in the preservation and management of off-site artifacts. The Port Authority's responsible stewardship of these artifacts should be reflected in the MOA.

II. HUDSON RIVER BULKHEAD (page 14)

A. Coordination (page 14)

You should be aware that the Federal Highway Administration (FHWA) has issued a determination of No Adverse Effect on the Hudson River Bulkhead in connection with the proposed reconstruction of Route 9A, notwithstanding the anticipated physical alteration and/or damage to the Bulkhead. (36 C.F.R. § 800.5(a)(2)(i)-(ii).) The Lower Manhattan Emergency Preservation Fund has objected to that determination, pursuant to 36 C.F.R. § 800.5(c)(2)(i). This disagreement with FHWA has not yet been resolved. We would recommend additional detail in this stipulation setting out a procedure for coordination, and clarification as to which agency has jurisdiction and authority to approve activities affecting the Hudson River Bulkhead.

C. Treatment (page 14)

We would like to include an opportunity for the consulting parties to comment on the proposed treatment plan, within the SHPO's 30-day comment period, as provided in Stipulations I.B.8.b, I.C.1.b, and I.D.1.b. Though this treatment plan may generate fewer comments than others, the consulting parties could still have valuable input, without delaying the overall timetable for SHPO review of the plan.

III. [HISTORIC BUILDINGS SUBJECT TO POTENTIAL ADVERSE EFFECTS] (pages 15-16)

As mentioned above, St. Paul's Chapel and Graveyard should be added to this section, because it is within the 90-foot zone of potential vibration impact.

A. Coordination (page 15)

The procedures for coordination with LMDC and MTA/NYCT need to be spelled out in more detail. One approach could be to cross-reference to a standard procedure for Port Authority review and approval of work within the WTC Site in Stipulation VIII. However, since the Former East River Savings Bank is not within the ownership or control of the Port Authority, the procedure for coordination with MTA/NYCT would need to be addressed separately.

B. Construction Protection Plan (pages 15-16)

In general, this draft stipulation designed to address potential vibration impacts is a good one. However, we recommend several minor modifications.

1. The Construction Protection Plan should explicitly address the potential for cumulative vibration impacts to historic properties.

2. Although the procedures in the City's Policy and Procedure Notice (PPN) #10/88 are important, that policy is based on a maximum peak particle velocity (PPV) of 0.5 inches/second (ips). In contrast, the FTA and Bureau of Mines criteria call for a maximum PPV of 0.12 ips for fragile historic buildings. We request that the MOA specifically commit to using 0.12 ips as a limit, rather than 0.5 ips. This more conservative standard will help to account for cumulative impacts as well.

3. This stipulation should specifically identify the 0.12 ips standard, rather than simply referring generally to the FTA vibration criteria. In addition, the general reference to the Secretary of the Interior's Standards should be expanded to include the full citation to the Secretary of the Interior's Historic Preservation Professional Qualification Standards, 62 Fed. Reg. 33,707 (June 20, 1997).

5. We recommend a stronger role for the consulting parties in this stipulation by including a 21-day opportunity to comment on the Construction Protection Plan, prior to the end of the SHPO comment period, as provided in Stipulations I.B.8.b, I.C.1.b, and I.D.1.b.

IV. ARCHAEOLOGICAL RESOURCES (pages 16-17)

A. Coordination (pages 16-17)

This provision should cross-reference to Stipulation VIII, which in turn should spell out a more specific procedure for the Port Authority to review and approve all undertakings by other agencies within the WTC site, to ensure that cumulative effects are adequately considered. In addition, it would be important to clarify that, prior to approving other undertakings within the area of archaeological sensitivity, the Port Authority will require the other agencies to prepare Treatment Plans that conform to Stipulation IV.

B. Location and Identification (page 17)

It may make sense to combine Stipulations B and C, since the Treatment Plan in IV.C is actually introduced and defined in IV.B.

C. Treatment Plan (page 17)

1. The end of the first sentence refers to development and implementation of a "data recovery plan," which creates confusion about the relationship between the data recovery plan and the Treatment Plan already described in Stipulation IV.B.

This stipulation should also include a commitment to involve an Archaeologist meeting the Secretary of the Interior's Historic Preservation Professional Qualification Standards, 62 Fed. Reg. 33,707 (June 20, 1997), in developing and implementing the Treatment Plan.

V. UNANTICIPATED DISCOVERIES AND EFFECTS (page 18)

A. Unanticipated Discovery of Archaeological Resources (page 18)

Exhibit F, paragraph B, which defines a "Qualified Archaeologist," should specifically refer to the Secretary of the Interior's Historic Preservation Professional Qualification Standards, 62 Fed. Reg. 33,707 (June 20, 1997).

C. Unanticipated Effects to Historic Properties (page 18)

This heading needs to be labeled as "B" rather than "C." More importantly, the relationship between this stipulation and Stipulation VIII.A needs to be clarified. In addition, the 21-day deadline for initiating implementation of the treatment or mitigation plan appears inconsistent with the 30-day deadline for SHPO comments on the plan. If the plan is to be developed in consultation with the SHPO, these two time periods need to be coordinated.

VI. TEMPORARY RELOCATION OF HISTORIC ELEMENTS OF THE WTC SITE (pages 18-19)

This stipulation includes a Section A, but no Section B. The Section A heading appears unnecessary.

This stipulation should be explicit about the Port Authority's commitment to involve a Conservator or Curator meeting the Secretary of the Interior's Historic Preservation Professional Qualification Standards (62 Fed. Reg. 33,707 (June 20, 1997)), in all phases of developing and implementing the plan for temporary relocation of historic elements.

2. The plan called for in subparagraph 2 also needs to address the long-term preservation of these historic elements if for some reason they cannot be returned to the World Trade Center site as originally intended.

6. We recommend a stronger role for the consulting parties in this stipulation than merely having them check the project website for updates about the status of these historic elements. This should include a 21-day opportunity to comment on the plan, prior to the end of the SHPO comment period, as provided in Stipulations I.B.8.b, I.C.1.b, and I.D.1.b, and affirmative notifications by e-mail as the stages of the plan are implemented.

VIII. ADDITIONAL COORDINATION WITH UNDERTAKINGS OF OTHER AGENCIES (pages 19-20)

This stipulation includes a Section A, but no Section B. In addition, the title of the heading (relating to inter-agency coordination) does not correspond with the content of the stipulation, which relates to unexpected impacts on historic properties.

A. Newly Affected Historic Properties (pages 19-20)

Both Sections A.1 and A.2 include a cross-reference to Stipulation V.B (page 18), which is apparently intended to be the section labeled in this draft as V.C.

More substantively, the relationship between Stipulation V.B and Stipulation VIII.A is very confusing. The former appears to cover unanticipated effects on all historic properties other than archaeological resources, (which are addressed by Stipulation V.A), while the latter apparently covers effects on two smaller categories of historic properties: those identified but assumed to be subject to No Adverse Effect (listed in Whereas Clause 8 on pages 2-3), and non-archaeological resources that were not previously identified. Since the broad language of Stipulation V.B overlaps with the scope of Stipulation VIII.A, we recommend combining the two provisions under Stipulation V to avoid confusion.

Stipulation VIII should then be used to address the issue in its title – interagency coordination – which will help to take into account cumulative effects on the World Trade Center site. We strongly recommend developing a specific procedure under which the Port Authority will: (1) require other agencies conducting work within the WTC site to obtain formal approval for all work, and (2) commit to engaging in a consultation process to take into account effects on historic properties prior to approving the undertakings of other agencies within the WTC site.

X. DISPUTE RESOLUTION (pages 21-22)

B. Public Comments and Dispute Resolution (page 22)

While the dispute resolution provision for members of the public is generally a good one, additional language needs to be added at the end providing a mechanism for ultimately resolving the disputed issue. Typically this would call for the FTA making the final decision, after

referring the issue to the ACHP for comment. The ACHP should be able to provide standard language for this kind of stipulation.

Conclusion

The National Trust would especially like to commend the Port Authority for its conduct of the Section 106 consultation process for the PATH Terminal. The Port Authority has been extremely responsive to comments from the consulting parties, repeatedly modifying the plans for the PATH Terminal to accommodate a number of unexpected ideas and suggestions that have emerged from consultation. The FTA has clearly encouraged and supported this approach, which we greatly appreciate. We hope that the Port Authority's good faith responsiveness to the consulting parties will serve as a model for other participating agencies to emulate as the World Trade Center redevelopment goes forward.

Sincerely,

Elizabeth Merritt

Elizabeth S. Merritt
Deputy General Counsel

cc: Charlene Dwin Vaughn, ACHP
Carol Braegelmann, Federal Preservation Officer, FTA
Paul Lebrun, Federal Transit Administration
Ruth Pierpont, NY State Office of Parks, Recreation & Historic Preservation
Timothy Stickelman, Port Authority of New York and New Jersey
Ken Lustbader, Lower Manhattan Emergency Preservation Fund
Frank Sanchis, Municipal Art Society
Peg Breen, New York Landmarks Conservancy
Alex Herrera, New York Landmarks Conservancy
John Stubbs, World Monuments Fund
Robert Kornfeld, Historic Districts Council
Joel Klein, Coalition of 9/11 Families
Anthony Gardner, Coalition of 9/11 Families

The New York City Landmarks Preservation Commission
1 Centre Street, 9th Floor North New York NY 10007 TEL: 212-669-7922 FAX: 212-669-7797
http://www.nyc.gov/landmarks

To: Anthony Cracchiolo, Director of Priority Capital Projects
From: Amanda Sutphin, Director of Archaeology
Date: November 19, 2004
Re: Archaeological Issues/ Draft MOA dated October 20, 2004 and attachments

The Landmarks Preservation Commission is in receipt of the Draft October 20, 2004 Memorandum of Agreement and attachments.

The Commission notes that the identified potential impacts to potentially significant archaeological resources, as shown in Exhibit E, reflects the findings of the Phase 1A Archaeological Assessment for the Permanent World Trade Center PATH Terminal for the South Pedestrian Passageway, prepared by Historical Perspectives and dated April 2004. On June 17, 2004, we noted that we could not concur with that study and recommended that additional research be completed to substantiate the finding that Liberty St, Liberty Place, and Temple Street do not contain potentially significant archaeological resources. We also noted that additional research should be completed to determine whether these streets were widened. Until this work has been completed, we cannot be certain that the areas identified in Exhibit E are theonly areas with potential archaeological sensitivity. In addition, Exhibit F should be titled "Unanticipated Discovery Plan."

As for historic architectural resources the text is appropriate, but we would like to be consulted about all work relating to New York City landmarks and about the construction protection plans as they are developed.

cc: Margarita Morera, PANYNJ
Bernard Cohen, Federal Transit Authority
Charlene Vaughn, ACHP
Robert Kuhn, NY SHPO
Mary Beth Betts, LPC
Kate Daly, LPC

Alliance for Downtown New York, Inc.
120 Broadway, Suite 3340
New York, NY 10271
212 566-6700 Fax 212 566-6707
www.DowntownNY.com

Carl Weisbrod
President

November 19, 2004

Margarita Morera
Port Authority of New York and New Jersey
115 Broadway, 10th Fl.
New York, NY 10006

Dear Ms. Morera:

Re: S106 Draft Memorandum of Agreement

The Alliance for Downtown New York, Inc. (the "Downtown Alliance") manages the Lower Manhattan business improvement district on behalf of more than 600 commercial property owners, 15,000 businesses and 300,000 workers. On behalf of this business community – the third largest in the nation – I am submitting the following comments in relation to the S 106 process and the Draft Memorandum of Understanding for the World Trade Center Transportation Hub.

Before I get into any details I want to take this opportunity to commend the Port Authority for its willingness to listen and compromise throughout this difficult process. Although it is impossible to satisfy all the wishes of all the disparate parties, and also address the critical transportation needs of Lower Manhattan, the Port Authority has worked closely with all parties and has made every effort to address all issues that have been raised in the fairest and most objective fashion.

With respect to the specific issues, the Alliance firmly and fully supports the building of a full platform D that provides for maximum future growth in ridership. The Port Authority has analyzed and provided 20-year ridership projections using an extremely conservative formula. We need to plan AND build now for the longer term: for 50 or more years. Those who suggest making changes only after they are needed, as ridership actually does grow, are unrealistic. Such an approach would put a brake on desperately needed economic growth. Moreover, the cost, engineering complexities and disruption to service make such an approach impractical at best and often impossible.

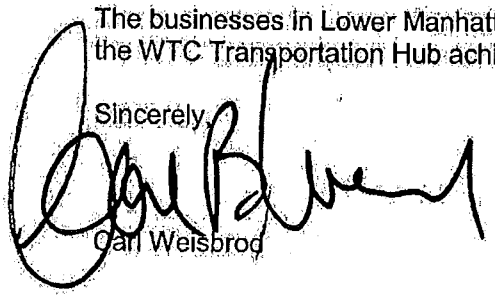
The approach that the Port Authority has proposed – to provide visibility to the tower footprint below the platform by relocating services --is an excellent solution that we wholeheartedly support.

Along with our constituents, I lived through the horrible events of September 11th and lost many friends and colleagues. We must always remember and respect the loss of lives that tragic day. But we must also move forward. Lower Manhattan needs to grow and prosper. An appropriate balance has been reached between the preservation of

artifacts on the site and the need to provide modern transportation services that will take Lower Manhattan into the future.

The businesses in Lower Manhattan believe the Draft Memorandum of Agreement for the WTC Transportation Hub achieves that balance. We strongly urge its adoption.

Sincerely,



Carl Weisbrod

Stickelman, Timothy

From: Morera, Margarita
Sent: Thursday, December 23, 2004 9:31 AM
To: Stickelman, Timothy; Wong, Bill; Lenahan, Shawn; McNeilly, Bernie
Subject: FW: Coalition of 9 11 Families Comments on Draft MOA

Importance: High

-----Original Message-----
From: Anthony Gardner [mailto:amg@wtcufg.org]
Sent: Wednesday, December 22, 2004 9:35 PM
To: Morera, Margarita
Subject: Coalition of 9 11 Families Comments on Draft MOA
Importance: High

December 22, 2004

Via Fax, Email and Surface Mail

Mr. Bernard Cohen
Director
Lower Manhattan Recovery Office
Federal Transit Administration
One Bowling Green, Suite 436
New York, New York 10004

RE: WORLD TRADE CENTER TRANSPORTATION HUB
(PERMANENT WTC PATH TERMINAL)
DECEMBER 16, 2004 REVISED DRAFT MEMORANDUM OF AGREEMENT

Dear Mr. Cohen:

Thank you inviting the Coalition of 9 11 Families (the Coalition) to provide comments on the revised draft of the Memorandum of Agreement (MOA) between the Federal Transit Administration (FTA), the New York State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (ACHP) and the Port Authority of New York and New Jersey (Port Authority). Although we have been directed to send comments to the Port Authority, we are addressing them to you as the representative of the responsible lead federal agency under the Section 106 process. A copy of these comments is being sent to the Port Authority.

The Coalition is pleased to note that many of our comments on the initial October 20th draft MOA have been addressed in this version of the MOA. However, many of our more substantive comments do not appear to have been addressed and no explanation for why they have not has been provided.

Unfortunately, in the course of revising the October 20th draft, numerous new issues have been introduced. Additionally, the revised document suffers from abundant internal inconsistencies and ambiguities that we believe render it unworkable in its present form. However we wish to especially draw your attention to one of the more serious problems. The revised draft refers to parties, and signatories. Additionally, it provides for others the ability to concur with the MOA. You have previously referred to these others as concurring parties. Not only is the use of these terms inconsistent throughout the documents, but their usage appears to be inconsistent with definitions contained in 36 CFR 800 the NHPA Section 106 implementing regulations. As a result, it is unclear exactly what obligations, rights, and responsibilities are being assigned to each of

these groups. Until this is clarified it is impossible for anyone to understand either the intent of the MOA s authors concerning many of the provisions, or exactly how the MOA will function. For this reason we believe it essential that at least one additional draft of the MOA

which addresses this (as well as the other issues raised by the consulting parties about the revised draft) be circulated for comment before it is finalized.

A second major concern is that the revised draft, as did the October 20th draft, continues to provide for the April 22, 2004 MOA for the LMDC s WTC Memorial and Redevelopment Plan to supersede the commitments of FTA and the Port Authority relating to access to the WTC footprints. This effectively renders meaningless the most significant changes in the revised draft MOA (those in the section headed Tower Perimeter Column Remnants) and continues to be unacceptable to the Coalition. As the owner of the site, the Port Authority is in a position to require LMDC to implement the Programmatic Agreement for their project in a manner consistent with the MOA for WTC Transportation Hub Project. The Port Authority s commitments to preservation should take precedence over those of LMDC not the other way around.

A third major concern to the Coalition is that the Project s effects on the World Trade Center footprints are not fully addressed. Although the revised draft is considerably improved in how it treats the exterior box beam column remnants that define the footprints, it is virtually silent on the footprints themselves. As we have noted on numerous occasions over the past year the existing Determination of Eligibility (DOE) for the World Trade Center Site does not clearly distinguish between contributing and non-contributing elements, and is silent in regard to the footprints as a whole and the discreet remains within the footprints as delineated by the exterior box beam columns. Further, the section on the footprints within the draft MOA is titled: Tower Perimeter Column Remnants. We ask you to rename this section--WTC Footprints and Perimeter Column Remnants-- to acknowledge the full breath of these historic resources.

Finally, the revised draft, as we noted about the October 20th draft, starts from the assumption that a particular alternative has already been selected. Based upon our review of the data provided in the Port Authority FTA Platform and Track Planning Requirements study, we believe that there are at least two alternatives to the presumed selected alternative which will not only satisfy the Project s performance criteria, but which would also have a significantly reduced impact on historic properties at the World Trade Center site. Given this fact, as we noted in our comments on the October 20th draft MOA, we do not believe that the Project as described in the revised draft MOA will comply with the requirements of Section 4(f) of the Department of Transportation Act.

The Coalition s detailed comments on the revised draft MOA are attached.

The Coalition is encouraged by many of the revisions in this revised draft. Additionally, we are optimistic that a compromise concerning the final design of track and platform configurations in a manner consistent with the requirements of Section 4(f) can be achieved. We look forward to seeing the next draft of the MOA and the opportunity to continue discussions regarding modifications in track and platform design that reduce impacts to historic properties and still satisfy Project transportation objectives.

Finally, we would be remiss if we did not encourage you to continue to strive to meet FTA s legally mandated responsibilities under the National Historic Preservation Act. Undue weight should not be given to the comments of those who believe the Coalition of 9 11 Families and any person or organization, (presumably including Governor Pataki, as well as the National Trust for Historic Preservation, the Historic Districts Council, and the Municipal Arts Society) who recognizes and advocates for the importance of the ability to view and touch and the slurry wall and bedrock footprints at the WTC Site is a religious zealot, godless and emotionally warped, and a dirt worshiper.

We look forward to continuing to work with you to arrive at mutually acceptable solutions to the issues raised here.

Sincerely,

Anthony Gardner, Executive Board Member, Coalition of 9 11 Families

cc: A. Cracchiolo (Port Authority) via overnight mail and fax
M. Morera (Port Authority) via email
J. Nau (ACHP) via fax
R. Pierpont (OPRHP) via fax
R. Lippes, Esq. via fax

WORLD TRADE CENTER TRANSPORTATION HUB (PERMANENT WTC PATH TERMINAL), DECEMBER 16, 2004 REVISED DRAFT MEMORANDUM OF AGREEMENT PURSUANT TO SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

ADDITIONAL COMMENTS OF THE COALITION OF 9 11 FAMILIES

Page 2, first WHEREAS clause. The Coordinated Determination of Eligibility does not identify elements of the WTC that will be impacted. The DOE is an evaluation of the historic significance of the WTC site and properly does not address the effects of any project.

Page 2, first WHEREAS clause. The DOE does not contain a comprehensive list of contributing and non-contributing elements. If a list of contributing elements is included it should refer to the WTC footprints as defined by the tower perimeter column remnants . We also note that elements is used without a modifier and can be read to include non-contributing elements. This is clearly incorrect.

Page 3, first WHEREAS clause. The Environmental Performance Commitments (EPC s) should be attached as an Exhibit. The EPC s have not been specifically provided to the consulting parties in connection with the Section 106 review of the project.

Page 3, second WHEREAS clause. The Environmental Analysis Framework (EAF) should be attached as an Exhibit. The EAF has not been specifically

provided to the consulting parties in connection with the Section 106 review of the project.

Page 3, fifth WHEREAS clause. While strictly correct, this sentence should be revised to indicate that the DOE identified some, but not all, of the elements that contribute to the significance of the WTC Site.

Page 4, first WHEREAS clause. It is unclear what is meant by review. Will the Port Authority also comment on construction plans? Will the Port Authority have to approve them as the owner of the site? This WHEREAS clause should specifically say whether or not the Port Authority has the right to approve or reject construction plans prepared by other entities.

Page 4, third and fourth WHEREAS clauses. These clauses should changed to stipulations to insure that they are binding commitments. No mention is made of the day-glow handrails, which the Port Authority has verbally committed to preserving. The three enumerated items should be more specifically identified (e.g. which smoke scarred-column?).

Page 4, fifth WHEREAS clause. What mitigation plan is being referred to? The graffiti heart was identified in August 2004, after the cited May 24th SHPO concurrence.

Page 6, first WHEREAS clause. The senior representative of the National Park Service is the Director, not the Executive Director. As noted in our earlier comments, should identify a specific office or division of the National Park Service that will review design plans. Our past experience with the NPS indicates that whenever a specific office within NPS refers a matter to the Director, responses are delayed for months, and sometimes are never finalized. Referring anything to the NPS director is likely to result in extensive delays that can be avoided by identifying a subordinate office that will have the review responsibility.

Page 6, first WHEREAS clause. It is unclear what design plans are being referred to. To our knowledge there will be no design plans that assess effect. This must be clarified.

Page 6, first WHEREAS clause. The revised version of this WHEREAS clause addressing the above comments should be made a stipulation.

Page 6, second WHEREAS clause. The public has not, contrary to this clause been provided with an opportunity to comment on the Final EIS, since the FEIS has not been issued.

Page 6, fourth WHEREAS clause. The phrase though the NEPA process should be eliminated. The NEPA process is independent of the Section 106 process. The invitation to participate in the Section 106 process for the Project was independent of invitations relating to NEPA review.

Page 7, Stipulation IA1, P2. The use of clean rounded gravel as a temporary protective cover to protect the footprints and column remnants from ongoing construction may not be the best approach and may in itself result in harm to the footprints. The Coalition s consultants has discussed this with Port Authority engineers and suggested the use of sterile sand or Solite in combination with Geoweb and geotextile coverings to provide a soft buffer, covered by a combination of gravel and construction matting would be a much more effective protective measure. The eventual removal of this type of protective cover will be much less likely to result in damage to the protected resources than removal of gravel placed directly on the footprints.

Page 8, Stipulation IA1, last line. It is unclear whether all is meant to include LMDC prepared documentation. As LMDC s documentation has already been submitted, it is not possible for a single submission to be made. If the intent is to submit all Port Authority-generated documentation in a single submission the MOA should say so.

Page 8, Stipulation IA3. Submission of completed documentation to the NYS Archives is appropriate. However, the Archives are not a signatory to the agreement. The FTA Port Authority should obtain a commitment form the Archives to provide the permanent curation called for in the stipulation, and the Archives should be a signatory to the MOA.

Page 8, Section IA3. Reference is made to Exhibit D. No exhibit D (or any other exhibits) accompanied the revised draft MOA. Assuming that Exhibit D remains unchanged from the October version, our original comments still pertain. This exhibit is presumably intended to list the HABS HAER photography proposed. One or more vertical (non-oblique) overhead shots should be included. Additional non-HABS HAER photography should include photographs of each individual box beam support beam and each other feature identified within the footprint perimeters. These will provide baseline photographs which can be used to determine if features are damaged during construction, can provide a basis for restoring damaged features, and will be necessary to insure that box beam column remnants that are temporarily removed for PATH construction will be replaced to as close as their original appearance as possible. Exhibit D. The Exhibit calls for six typical views of Tower Footprints. As no photos of individual box beam column remnants are proposed we assume that this is what is being referred to. HABS HAER photographic documentation must include photographs of the footprints in their entirety.

Page 8, Stipulation IB, section heading. This should be changed to read Tower Footprints and Perimeter Column Remnants.

Page 8, Stipulation IB1. The project implementation requirements should be enumerated. In the absence of further explanation it is unclear exactly what the meaning of this qualifying phrase is.

Page 8, Stipulation IB1. We repeat our comment on the October 20th draft, which has not been addressed in this revision. The statement that the Port Authority will implement this stipulation (which relates to the Twin Tower footprints) in a manner consistent with the Memorial Access Commitments contained in the LMDC Programmatic Agreement is unacceptable. This statement presumably trumps all commitments made in other stipulations in the draft MOA rendering them meaningless. If it is not intended to do so this must be made very clear. This goes to the heart of the Coalition s continued concern over how cumulative effects are being treated. As the property owner, the Port Authority should have final say over this matter and should not be relinquishing its right to make binding commitments over how the Twin Tower footprints will be dealt with to the LMDC.

Page 8, Stipulation IB2. The Coalition appreciates the efforts of the Port Authority to reduce and mitigate impacts associated with the proposed Platform D. However, the measures described are contingent upon the described alternative being the final alternative. As noted in our cover letter, the Coalition believes that there may at least two alternatives that satisfy Project requirements and also result in a reduced taking of historic properties. The obligation is on FTA and the Port Authority to demonstrate that neither of these alternatives is prudent and feasible as required by Section 4(f).

Page 9, Stipulation IB2b. A discussion of the South Tower footprint, box beam column remnants and the core column remnants of both tower footprints needs to be added and provided to the consulting parties for comment.

Page 9, Stipulation IB3, line 2. The word all which appeared in the October 20th draft has been eliminated. It should be replaced.

Page 9, Stipulation IB5. It is unclear if the temporary PATH tracks will affect the South Tower footprint. If they will be affected, a description

of mitigative measures should be included.

Page 10, Stipulation IB7. It is the Coalition s understanding that the gravel fill on the footprints has already been removed. The wording of this paragraph should reflect that fact. What is a perimeter footprint ? Clarify whether what is being referred to is the footprints or the footprint perimeters. It is the Coalition s understanding that a commitment has been made to document the footprints in their entirety, not just their perimeters.

Page 10, Stipulation IB8. To be consistent with the WHEREAS clause on page 6, the NPS should be added to the list of those receiving design plans.

Page 10, Stipulation IB8f. As worded this paragraph is inconsistent with 36 CFR 800.5(c)(2)(i) and denies the consulting parties privileges to which they are entitled. This paragraph must be made consistent with the Section 106 regulations. Additionally, the Port Authority should be obligated to respond to as well as merely consider comments.

Page 11, Stipulation IC1. What does the phrase at a minimum mean. Surely after considering this issue for more than five months the FTA and Port Authority and their consultants must have some ideas beyond just a plaque.

Page 11, Stipulation IC1f. As worded this paragraph is inconsistent with 36 CFR 800.5(c)(2)(i) and denies the consulting parties privileges to which they are entitled. This paragraph must be made consistent with the Section 106 regulations. Additionally, the Port Authority should be obligated to respond to as well as merely consider comments.

Page 12, Stipulation ID1f. As worded this paragraph is inconsistent with 36 CFR 800.5(c)(2)(i) and denies the consulting parties privileges to which they are entitled. This paragraph must be made consistent with the Section 106 regulations. Additionally, the Port Authority should be obligated to respond to as well as merely consider comments.

Page 13, Stipulation IF, P1. This paragraph should be revised to include a provision allowing any consulting party, at their own expense, to have their own preservation professional monitor construction (without stop work authority).

Page 13, Stipulation IF, P2. What does the phrase significantly qualified mean in reference to the historic architect. The historic architect should at a minimum satisfy the professional qualifications standards established by the Secretary of the Interior as published in the Federal Register.

Page 13, Stipulation IF, P3. The fourth sentence should be revised to call for FTA and the Port Authority to consider and respond to comments.

Page 13, Stipulation IF, P3. The last sentence should be deleted. This sentence gives the Port Authority the ability to disregard the entire stipulation at its sole discretion. Paragraph four details specific timeframes that provide for timely reviews and responses. The vague consideration of the Project s schedule condition is not necessary. We would note that a properly crafted RPP should be able to accommodate any concerns the Port Authority may have about possible Project delays.

Page 16, Stipulation IIIB3, last sentence. It is unclear why this change has been made. The language in the October 20th draft, calling for a Historic Architect who meets the Secretary of the Interior s professional qualification standards, should be restored.

Page 18, Stipulation IVB, first sentence. If the Port Authority can determine that the Project will or may affect a Historic Property then the effect is not unanticipated. The wording of this sentence should be changed to has affected or is affecting a Historic Property.

Page 19, Stipulation VII. This stipulation should include a provision to allow any consulting party (alternatively, any concurring party) the right to monitor, at their own expense, activities carried out pursuant to the MOA.

Page 20, Stipulation IXC. Semiannual reporting should be changed to quarterly reporting during the period when construction activities have the potential to affect Historic Properties or the first three years of the Project (whichever is shorter), and reduced to semiannual reporting thereafter.

Pages 21-22, Stipulations XB1-4. As worded these stipulations would limit rights given to consulting parties under 36 CFR 800. This issue may best be addressed by providing dispute resolution clause for consulting parties distinct from the one for the general public.

Page 21, Stipulation XB1. What is the FTA Port Authority definition of substantive ? The phrase within 30 days of posting on the Project website should be changed to read within 30 days of posting on the Project website or, if an objection originates with a consulting party, within thirty days of e-mail notification to the consulting parties to review the Project website."

Page 21, Stipulation XB2. The phrase or the matter is such that PANYNJ believes SHPO involvement is appropriate should be eliminated. It is difficult to imagine a situation SHPO involvement is not appropriate when an unresolved issue concerning historic properties affected by a federal undertaking is involved. This stipulation should be revised to indicate that stipulation XB4 would also be followed.

Page 21, Stipulation XB3. The phrase and SHPO determines that, in the absence of such resolution there would be an adverse effect should be eliminated. There may be situations where the SHPO cannot determine if an adverse effect will occur if there is no resolution

HISTORIC DISTRICTS COUNCIL

THE ADVOCATE FOR NEW YORK CITY'S HISTORIC NEIGHBORHOODS

232 East 11th Street New York NY 10003
tel 212-614-9107 fax 212-614-9127 e-mail hdc@hdc.org

DECEMBER 23, 2004 COMMENTS ON WORLD TRADE CENTER TRANSPORTATION HUB AND PERMANENT WTC PATH TERMINAL DECEMBER 16, 2004 REVISED DRAFT MEMORANDUM OF AGREEMENT

The Revised Draft MOA reflects a number of changes recommended by Consulting Parties, but leaves some open issues, and creates some new questions. These issues have been addressed clearly in the comments of the Coalition of 9/11 Families statement submitted to Mr. Bernard Cohen on December 22, 2004, and we endorse the Coalition's comments.

There are still outstanding issues that are should be resolved prior to the finalizing of this document and we believe that a meeting and an additional draft are required. In the overall scope of the project another week or two would not be a significant delay, and could resolve issues that have the potential to lead to lengthy disputes in the future.

It has been commented at numerous meetings, and is identified on the National Historic Landmark application, that the there are numerous features that contribute to the site's significance, including steel column bases and concrete slab features within the 1 WTC and 2 WTC footprints. When LMDC was preparing the DOE they responded to these comments by saying that it is not intended to be an exhaustively detailed document and is not a complete inventory of significant features. Moving forward, however, it is necessary to base the design and mitigation concepts, and an accurate assessment of potential adverse effects, on a complete inventory of significant features.

The current process is skewed because those adverse effects that have already been accepted are being left unmentioned as if they have no bearing on decisions concerning the site. For example, it is an adverse effect to reduce the size of the historic site from sixteen acres to one-and-a-half acres. It is an adverse effect to demolish the ruins of the garage beneath 6 WTC. It is an adverse effect to cover the vast majority of the slurry wall. It is an adverse effect to cover the footprints with a plaza deck rather than leaving them open to the sky. It is an adverse effect to demolish remaining portions of the H&M terminal and tunnels.

Given all of this, it is a bare minimum mitigation proposal to preserve and provide access to all of the features of the 1 WTC and 2 WTC footprints, outside of the portion within the PATH track and platform zone. It is also necessary to endeavor to protect those features that are covered within the track and platform area. Themed floor finishes alone

are not an acceptable mitigation measure because they are ephemeral and may be replaced with something else in ten years.

Since the PANYNJ is the owner of the entire property and the entire WTC complex is integrated with the PATH system, this MOA should take precedence. It seems disingenuous for the PANYNJ to agree to preserve historically significant features that their tenants or lessees retain the discretion to demolish. The WTC Consulting Parties have not had opportunities to comment on developing plans for the memorial and memorial center, as well as other portions of the site. Control of the site's redevelopment is being delegated to a number of bodies that are effectively shielded from independent review, and whose adverse effects are unknown and uncoordinated. We do not believe that this satisfies the intent of the Section 106 process, nor is it in the public interest.

We look forward to continuing to work with you and we would like to assure you that we appreciate the efforts that PANYNJ personnel have made in resolving a number of issues that have arisen during the Section 106 process.

HISTORIC DISTRICTS COUNCIL

Robert J. Kornfeld, Jr. R.A.
Board of Directors

333 Rector Place, # 11-B
New York, NY 10280
December 22, 2004

Executive Director
Port Authority of New York and New Jersey
225 Park Avenue South
New York, NY 10003

Via E-mail

Re: WTC Transportation Hub Project
Comments of Section 106 Consulting Party

Dear Sir:

On behalf of the Coalition to Save West Street (the "Coalition"), a Consulting Party for the WTC Transportation Hub Project, I offer these additional comments in connection with matters related to the revised draft (dated December 16) of the proposed Memorandum of Agreement (MOA) for this project.

1. My first additional comment on the new draft of the MOA is a followup to a drafting point that I made at the last meeting of the Section 106 Consulting Parties for the WTC Transportation Hub Project. I pointed out at the meeting that the interchangeable use of the words "parties" and "signatories" to describe FTA, SHPO, ACHP and PANYNJ collectively introduces a source of potential confusion or ambiguity into the document. It could arguably suggest that the two words represent different groups and could be used to assert that signatories is a broader term that could include the LMDC and even the Consulting Parties that choose to formally concur with the MOA with a signature. I suggested a simple "fix" (which received a favorable reaction from the other Consulting Parties), which was to define the term "parties" and then substitute that term in place of "signatories" (including the singular version of each word) each place that the latter word appears. This was done in part, but not completely. The word "parties" was correctly defined on page 6 (just before the paragraph on STIPULATIONS) and was substituted for "signatories" in at least two places (the last paragraph in section IX.C under SEMIANNUAL STATUS REPORTING and the heading of section X.A. under DISPUTE RESOLUTION). However, there are several other places in the document where the same substitution needs to be made. I believe that the following constitutes a comprehensive list of those substitutions:

- Page 12, paragraph I.G. on OFF-SITE ARTIFACTS: substitute "parties" for "Signatories" in the last sentence;

- Page 17, paragraph X.A. under DISPUTE RESOLUTION: substitute "party" for "signatory" in the first sentence of the first paragraph;

- Page 17, paragraph X.A. under DISPUTE RESOLUTION: substitute "parties" for "signatories" in the last sentence of the second paragraph;

- Page 18, paragraph XI.A. on AMENDMENT: substitute "party" for "signatory" and "parties" for "signatories" in the first sentence of the paragraph; and

- Page 18, paragraph XI.B. on TERMINATION: substitute "parties" for "signatories" twice in the first sentence of the second paragraph.

2. In paragraph 6 under section I.B. (TOWER PERIMETER COLUMN REMNANTS), I had counseled at the last meeting against making an absolute commitment that the Project would not occupy more than 4% of the North Tower "footprint" area and 53% of the South Tower footprint area. I would like to strongly repeat that recommendation once again. I think it is a fine objective if tempered with conditional language such as "shall to the maximum extent feasible" (see paragraph 1 under the same section) or "[e]very effort will be made to avoid" (see paragraph 2a under the same section) or "if practical engineering design permits" (see paragraph 3 under the same section). Another phrase that might be used is "to the maximum degree practicable." The objective here is to avoid a situation where, due to unforeseen circumstances, the plans for the Project might need to be changed, with the result that the future development of Lower Manhattan would be held hostage by an absolute commitment to avoid encroachment on these so-called "footprints."

While it is important that the memorial preserve in some way the outline of the space occupied by the twin towers, this is adequately done at the surface by the winning memorial design, and the contribution of the outline of the box beam columns (which are quite unremarkable remnants in and of themselves) is supplemental at best. Based on my recent personal visit with the other Consulting Parties to bedrock level, it is quite clear to me that enough of these box beam columns are going to remain in place under any conceivable set of circumstances to adequately delineate the outline of the twin towers at that level.

I do approve of the additional language "at the lowest level, at approximately" in this paragraph 6 under section I.B. to limit the percentage commitment somewhat. This at least makes it clear that upward projections of these footprints cannot be further used to limit the rebuilding effort. I hope that this will give some flexibility to cantilever structures over these areas if the necessity arises.

3. The final comment I would like to make at this time concerns paragraph 4 under section I.B. (TOWER PERIMETER COLUMN REMNANTS) relating to the proposed east-west pedestrian corridor. At a meeting last week of the WTC Redevelopment Committee of Community Board No. 1 (CB1), the Port Authority unveiled drawings of the aforementioned corridor. Concern was expressed by some Community Board members that the corridor may not be wide enough to accommodate the heavy volume of foot traffic during the morning and afternoon rush hours, particularly with a heavy dose of tourists mixed in. One member of CB1 recounted how

he used to avoid the expansive WTC indoor concourse during those periods because of the large fast-moving crowds. It was a nightmare for people in wheelchairs or who were otherwise physically incapacitated or limited. While I personally did not avoid the WTC concourse during those hours, I have described the experience to others many times as feeling like a salmon must feel as it is swimming upstream. Presumably the new east-west pedestrian corridor will not be as expansive as the former WTC indoor concourse and rush hour crowding could be a very serious problem. Particularly if upscale retail stores are also included in this space (which I believe is desirable to avoid the kind of long, sterile pedestrian corridor that currently exists in numerous locations in our subway system), walking space could be at a premium. Tens of thousands of people should not be seriously inconvenienced every day because of this commitment to a few box beam columns and the space that they enclose.

Consequently, I urge that the width of the east-west corridor be considered very carefully with these issues in mind and that the language of paragraph 4 under section I.B. be revised by (1) removing the commitment to a five (5) foot distance between the pedestrian corridor and the North Tower "footprint" and (2) adding conditional language (as I have suggested in the second item above) regarding the possibility of the corridor breaching this "footprint." In addition to residents and workers, an east-west corridor of sufficient width to incorporate retail stores and comfortably handle rush hour foot traffic will benefit visitors to the WTC site as well. Any rational weighing of the priorities should recognize that a few additional square feet added to the east-west pedestrian corridor will result in a much greater qualitative impact on the experience of people traversing that corridor than the loss of a small percentage of the North Tower "footprint" at bedrock level will have on the "footprint" viewing experience.

Thank you for the opportunity to offer these comments and to participate in the Section 106 process.

Yours truly,

/s/ William C. Love, Jr.

William C. Love, Jr.
Vice Chair, Coalition to Save West Street
W: (212) 306-1789
H: (212) 786-4897
blove93@earthlink.net

LOWER MANHATTAN EMERGENCY PRESERVATION FUND

Municipal Art Society | National Trust for Historic Preservation | New York Landmarks Conservancy | Preservation League of New York State | World Monuments Fund

January 3, 2005

Bernard Cohen
Director
Lower Manhattan Recovery Office
Federal Transportation Administration
One Bowling Green, Suite 436
New York, NY 10004

Re: Comments on Revised Draft Memorandum of Agreement (MOA) for Permanent World Trade Center PATH Terminal and Transportation Connections

Dear Mr. Cohen:

On behalf of the Lower Manhattan Emergency Preservation Fund (LMEPF), the following are written comments on the revised Draft Memorandum of Agreement (MOA) dated December 16, 2004 for the Permanent World Trade Center PATH Terminal and Transportation Connections. In preparing these comments, the LMEPF has reviewed and agrees with the comments submitted by the National Trust for Historic Preservation.

The LMEPF is appreciative that the Port Authority (PA) has incorporated many of the comments submitted by Consulting Parties into the revised draft. It also thanks the PA for working with the Consulting Parties to achieve substantial improvements in the overall design, treatment, and interpretation of the historic resources, particularly the box-beam columns.

Rather than repeating all the comments submitted by the National Trust, the LMEPF is highlighting a few issues that need clarification:

Cumulative Effects of All Projects
Consulting Parties have repeatedly raised concerns about the cumulative effects of all projects on the historic resources located within the World Trade Center Site. It has already been proven difficult to evaluate the current PATH Terminal's effects since Consulting Parties cannot evaluate all WTC Site projects holistically (for example, the Memorial and Memorial Center). In addressing these concerns, the current draft includes two new Whereas Clauses on pages 3 and 4 which acknowledge the need for the PA as owner of the site to be able to review, coordinate, and hopefully mitigate the impact on the historic resources. The LMEPF recommends that this language be clarified and expanded to include a mechanism and procedure for such review.

Resource Protection Plan
The LMEPF is pleased that the revised draft includes a Resources Protection Plan (RPP); however, there is a need to define its relationship to the Construction Protection Plan. In addition, there are stipulations in the revised draft MOA, such as B5 on page 9, that should cross reference the protection measures that will be addressed in the RPP.

Cultural Resources Management Team
Given the historic magnitude of the resource and the complexity of interpreting the site, the LMEPF was disappointed that the MOA did not include a stipulation for a Cultural Resources Management Team. While the MOA does include references to the interpretation of historic resources, the importance of the site warrants a more thoughtful and creative approach than detailed in some of the stipulations.

The LMEPF is encouraged and pleased with the results of the PATH Terminal Section 106 process and looks forward to its continued participation as other World Trade Center Site projects move forward.

Sincerely,

Ken Lustbader
Preservation Consultant
Lower Manhattan Emergency Preservation Fund
37 West 12th Street, 2E
New York, NY 10011
Phone: 917-848-1776
Email: klustbader@aol.com

cc: Kevin Rampe, Lower Manhattan Development Corporation
Carol Braegelmann, Federal Transit Administration
Paul Lebrun, Federal Transit Administration
Timothy Stickelman, Port Authority of New York and New Jersey
Don L. Klima, Advisory Council on Historic Preservation
Ruth Pierpont, New York State Office of Parks, Recreation, and Historic Preservation

December 31, 2004

Bernard Cohen, Director
Lower Manhattan Recovery Office
Federal Transit Administration
One Bowling Green, Suite 436
New York, NY 10004

Re: Comments on Revised Draft Memorandum of Agreement (MOA) for Permanent World Trade Center PATH Terminal and Transportation Connections

Dear Mr. Cohen:

On behalf of the National Trust for Historic Preservation, this letter will summarize the Trust's comments on the Revised Draft Memorandum of Agreement (MOA), received on December 16, 2004, pursuant to Section 106 of the National Historic Preservation Act (NHPA), for the new PATH Terminal at the World Trade Center. We apologize for not being able to get these comments to you within one week as requested, in light of holiday schedules, but we appreciate having the opportunity during the comment period to discuss our suggestions by telephone with staff from the FTA and the Port Authority.

As you know, the Trust has coordinated closely with the Lower Manhattan Emergency Preservation Fund in preparing these comments, and we have also reviewed the comments submitted by the Coalition of 9/11 Families and the Historic Districts Council, which we support.

Specific Comments on the MOA

All references in these comments are to the red-line/strike-out version of the December 16, 2004 Revised Draft MOA.

WHEREAS CLAUSES

Clause 8 (page 2): In subparagraph a., the list of "elements" of the WTC site should be expanded to include "other column bases . . . inside the perimeter of the Twin Towers," mentioned on p.13 of the Coordinated Determination of Eligibility (DOE), and the "footprints" themselves, mentioned on p.15 of the CDOE. In addition, the word "that" in line 2 should be changed to ", which" in order to reflect the fact that the CDOE is not the document that identifies which elements will be "impacted." The CDOE only identifies the elements; it is the MOA that includes the determination of which elements will be affected. We also recommend using the

1785 Massachusetts Avenue, NW · Washington, DC 20036
202.588.6000 · FAX: 202.588.6038 · TTY: 202.588.6200 · www.nationaltrust.org

term "affected" rather than "impacted," to be consistent with the terminology in the Section 106 regulations. The result would read: "the Coordinated Determination of Eligibility identifies the following elements of the WTC site, which ~~that~~ will be ~~impacted~~ affected . . . ."

Clause 9 (page 2): We recommend the following revision to subparagraph a., for clarification and consistency with the Section 106 regulations, as discussed above under Clause 8: "the Coordinated Determination of Eligibility identifies the following elements of the WTC site, which ~~that~~ may be ~~impacted~~ affected . . . ."

Clauses 11-12 (page 3): The Environmental Performance Commitments (EPC's) and Environmental Analysis Framework (EAF) should be attached to the MOA as an exhibit, so that these commitments will be clearly understood. Even those of us who have been actively involved in the Section 106 review process do not know what these documents say or where to find them. They will provide a useful reference point for addressing the specific issues that may arise during implementation of the MOA regarding noise, vibration, cultural and historic resources, etc.

Clause 17 (page 4): This clause should clarify that the Port Authority must "review and approve all construction plans" prior to the commencement of any construction within the WTC site. In addition, the Stipulations portion of the MOA needs to include a specific procedure for involving consulting parties in this review, and clarifying the relationship between this review and the Construction Protection Plan and WTC Resource Protection Plan. The Stipulations should ensure that the Port Authority will: (1) require other agencies conducting work within the WTC Site to obtain formal approval in advance for all work, and (2) commit to engaging in a consultation process to consider effects on historic properties prior to approving the undertakings of other agencies within the WTC Site. In our view, this will be the most effective way to ensure that cumulative effects on all historic properties are taken into account. For example, through the use of such a process, long-term effects to the Vesey Street stairway and escalator could be taken into account, even though the PATH Project itself has been reconfigured to avoid directly affecting this element of the site.

Clauses 19-21 (page 4): We appreciate the reference to plans for salvaging and preserving elements from the northwest slab remnants (i.e., parking garage remnants). However, these also need to be incorporated into the stipulation or commitment portion of a Section 106 agreement – either this MOA or a separate MOA applicable to the parking garage. For example, the commitment referenced in Clause 20, regarding the heart and cross graffiti, is solely a verbal commitment by the Port Authority. We believe this verbal commitment should be reflected explicitly in an MOA stipulation. (This is not because we don't trust the Port Authority, which has repeatedly demonstrated its good faith throughout the consultation process, but rather, because we simply believe as a matter of practice that mitigation commitments should be incorporated into an MOA; the whole purpose of an MOA is to formalize and reflect those commitments.)

Clause 19 refers to three elements proposed for removal from the parking garage remnants, which were discussed in a consultation meeting on April 29, 2004. These three elements (a smoke-scarred column, a column with blistered paint, and a wall section from Level B2) are only identified in a power-point presentation shown to the consulting parties at that meeting. Their location is not specifically identified in this MOA, and their salvage and preservation is not specifically reflected in a written commitment or Section 106 agreement by any agency. (Indeed, we noticed the absence of the word "commitment" even in the Whereas Clause regarding these three elements.) While the salvage plans for the three elements were developed in response to Stipulation 5 in the LMDC's Programmatic Agreement (PA), the Port Authority is not a party to that PA, and in any event, the PA is not sufficiently specific to reflect the actual mitigation plans.

Clause 21 refers to the SHPO's concurrence with the "above mitigation plan" on May 24, 2004. This concurrence letter was not shared with the consulting parties. The reference suggests that the concurrence applied to the heart and cross graffiti as well as the original three elements. However, the heart and cross graffiti were first brought to the Port Authority's attention on August 5, 2004 – more than two months after the SHPO's concurrence – and thus could not be included within the scope of the May 24 concurrence.

Finally, the Coalition of 9/11 Families has also mentioned the day-glow handrails, which we recall was the subject of a verbal commitment by the Port Authority, and should be included with the other salvaged elements in a Section 106 commitment.

Clause 30 (page 6): The Clause regarding National Park Service review needs clarification. Since design plans do not usually assess effects, this Clause does not indicate which design plans are intended for NPS review, and whether the NPS review would also apply to the Construction Protection Plan and the WTC Resource Protection Plan. We understand that the apparent intention is to invite the Park Service to comment at all points when the SHPO and Consulting Parties will comment. Accordingly, we recommend adding a specific reference to the NPS in each of those Stipulations. In addition, the NPS should be added to the Contact List in Exhibit G.

Finally, as a technical correction, the National Park Service is led by a Director rather than an Executive Director. In any event, specific reference to the Director would suggest that this review should not be delegated. Instead, we would prefer that delegation of the review to NPS staff with appropriate expertise should be encouraged, rather than discouraged. (This could also be accomplished through selection of an appropriate agency contact to be included in Exhibit G.)

Clause 32 (page 6): The cross-reference at the end of the first tribal consultation clause should be to Stipulation X.B. (Public Comments and Dispute Resolution), not Stipulation IX (Administration of this Agreement).

Clause 33 (page 6): In the second tribal consultation clause, the reference to "~~through the NEPA process~~" should be deleted, because the FTA has not invoked the NEPA substitution provisions of the Section 106 regulations, 36 C.F.R. § 800.8(c). In our view, the NEPA process is not an adequate substitute for tribal consultation. In any event, the relationship between Clause 32 and 33 is still confusing, as they appear largely redundant.

NOW THEREFORE Clause (page 7): The term "parties" should be changed to "signatories" to be consistent with the Section 106 regulations, 36 C.F.R. § 800.6(c)(1).

I. WORLD TRADE CENTER SITE (pages 7-13)

A. Documentation (pages 7-8)

1. We agree with the comments of the Coalition of 9/11 Families regarding the best way to protect and minimize harm to the box beam column remnants and other contributing elements within the footprints. This is extremely important, in light of the apparent miscommunication that led to the introduction of concrete that recently had to be removed from the column bases.

3. Since the New York State Archives is designated as having a specific responsibility in this Stipulation, the Archives should be included as an Invited Signatory to the MOA, pursuant to 36 C.F.R. § 800.6(c)(2)(ii), or at the very least, a Concurring Party. In addition, the Archives should be added to the contact list in Exhibit G.

B. Tower Perimeter Column Remnants (pages 8-10)

The title of this section should be broadened to include reference to the Footprints as a whole.

1. This Stipulation articulates the Port Authority's basic commitment to preserve in place a total of 123 column base remnants "to the maximum extent feasible." We commend the Port Authority for this commitment. However, this Stipulation also includes the cryptic statement that the Port Authority "will implement this stipulation in a manner consistent with" Stipulation 3 of the LMDC Programmatic Agreement (PA). It is completely unclear what this statement is supposed to mean. Stipulation 3 of the PA includes such statements as "LMDC shall not be required to consider modifications to any other portion of the Plan," and "plans shall not be subject to further review . . . ." Thus, the cross-reference to the PA appears intended to cut back on the scope of the commitment that is otherwise reflected in Stipulation I.B.1. of the PATH MOA. We strongly urge you to delete or clarify this cross-reference.

7. In line 3 of Stipulation B.7 (page 10), the word "perimeter" should be deleted. In

addition, the MOA should also require the ultimate removal of the fill once construction is complete.

8. In Stipulation I.B.8., the process for review and comment on design plans should be revised as follows:

   a. Design plans should be submitted "for SHPO, NPS, and Consulting Parties' comment."

   e. "SHPO and NPS will respond within 30 calendar days or earlier . . . ."

   f. "Should SHPO or NPS fail to comment within 30 calendar days after receipt of plans and specifications, the submitted plans and specifications shall be deemed approved by that agency. In any event, however, PANYNJ will consider and respond to all comments received from Consulting Parties prior to approval of submitted plans and specifications."

C. E Subway Entrance (pages 11-12)

The revisions described above under Stipulation I.B.8. should also be incorporated into Stipulation I.C.1.a., e., and f.

D. Penetration of East and West Slurry Walls (pages 12-13)

The revisions described above under Stipulation I.B.8. should also be incorporated into Stipulation I.D.1.a., e., and f. In addition, the following sentence should be added to D.1.b. (taken from I.B.8.b. and I.C.1.b.): "The Consulting Parties will be informed of the availability of the plans by e-mail as the plans are posted at the Project website."

F. Resource Protection Plan for WTC Site (page 13)

In the second paragraph of Stipulation I.F., we recommend that the qualifications for the Historical Architect be based on the Secretary of the Interior's Historic Preservation Professional Qualification Standards, at 62 Fed. Reg. 33,707, 33,719-20 (June 20, 1997). We understand that there may be advantages to using a more flexible qualifications standard for the other reference to hiring a Historical Architect, in Stipulation III.B.3. (for the Construction Protection Plan), in order to find someone with experience more directly related to vibration, but whose qualifications may not fit the model of the Secretary of the Interior's professional qualifications. With respect to the WTC Resource Protection Plan, however, the Secretary of the Interior's qualifications should be used as the standard.

The fourth paragraph of Stipulation I.F. should be revised as follows:

"PANYNJ shall furnish copies of the WTCRPP to SHPO, ACHP, NPS, and Consulting Parties for review and comment. Consulting parties shall have 21 days in which to comment. SHPO, NPS, and ACHP shall respond within 30 calendar days of the request for review and comment on the WTCRPP. Should SHPO, NPS, ~~and~~ or ACHP fail to respond within the 30 calendar day period, the WTCRPP shall be deemed approved by that agency. In any event, however, FTA and PANYNJ shall consider and respond to all comments received within this review period in preparing the final WTCRPP. PANYNJ shall ~~implement~~ adopt the approved WTCRPP prior to the commencement of Project construction, and shall implement ~~in consideration of~~ [1] ~~the~~ Project~~'s schedule~~ in accordance with the WTCRPP."

G. Off-Site Artifacts (page 13)

The Port Authority's responsible stewardship of these off-site artifacts, through a professional Conservator or Curator, should be reflected in the MOA.

II. HUDSON RIVER BULKHEAD (pages 14-15)

A. Coordination (page 14)

As mentioned in our previous comments, the Federal Highway Administration (FHWA) has issued a determination of No Adverse Effect on the Hudson River Bulkhead in connection with the proposed reconstruction of Route 9A, notwithstanding the anticipated physical alteration and/or damage to the Bulkhead. This finding is inconsistent with the Section 106 regulations, 36 C.F.R. § 800.5(a)(2)(i)-(ii). The Lower Manhattan Emergency Preservation Fund objected to that determination, pursuant to 36 C.F.R. § 800.5(c)(2)(i), but the disagreement with FHWA has not yet been resolved. This Stipulation should spell out a specific procedure for coordination, and clarify which agency has jurisdiction and authority to approve activities affecting the Hudson River Bulkhead.

C. Treatment (page 14)

Why delete the sentence ensuring that the Treatment Plan will be implemented to the satisfaction of the SHPO prior to any Project-related demolition or construction involving the Hudson River Bulkhead? This sentence should be added back into the MOA.

---

[1] The phrase "*in consideration of* the Project's schedule" is too vague. It also differs from the phrase "*in accordance with* the Project's schedule," used in Stipulation III.B.5. (p.16), which suggests a different intended meaning.

D. Treatment Plan (pages 14-15)

The revisions described above under Stipulation I.B.8. should also be incorporated into Stipulation II.D.a., e., and f. In addition, the following sentence should be added to II.D.1.b. (taken from I.B.8.b. and I.C.1.b.): "The Consulting Parties will be informed of the availability of the plans by e-mail as the plans are posted at the Project website."

III. [LISTED HISTORIC BUILDINGS SUBJECT TO POTENTIAL ADVERSE EFFECTS] (pages 15-16)

A. Coordination (page 15)

The second paragraph needs to be corrected as follows: "The Former East River Savings bank and St. Paul's Chapel and Graveyard ~~is~~ are also located within the APE of the Fulton Street Transit Center. PANYNJ shall therefore coordinate treatment of ~~this~~ these Historic Propert~~y~~ies with MTA/NYCT." In addition, the procedures for coordination with LMDC and MTA/NYCT should be spelled out in more detail, especially since these historic properties are not within the ownership or control of the Port Authority.

B. Construction Protection Plan (CPP) (pages 15-16)

1. As we understand it, the Construction Protection Plan applies to off-site effects, while the WTC Resource Protection Plan applies to on-site effects within the WTC Site itself. The MOA should clarify the Port Authority's commitment to ensure compliance with both plans when reviewing and approving proposed construction activities within the WTC Site. In addition, a clear timetable should be indicated, including a commitment that no Project-related construction activities will commence until the CPP is final. It would also be helpful to confirm that the Port Authority will follow the CPP when considering requests from other parties to engage in construction activities within the WTC Site.

3. We appreciate the Port Authority's commitment to the most conservative standard for protecting adjacent historic properties from vibration damage. In order to clarify *which* buildings are to be treated as the "extremely fragile buildings," i.e., all buildings listed in the heading for Stipulation III, we suggest revising the second-to-last sentence as follows: "For these extremely fragile buildings, ~~these~~ vibration protection measures shall reduce vibration levels . . . ."

5. Stipulation III.B.5. should be revised as follows:

   "PANYNJ shall furnish copies of the CPP to SHPO, ACHP, NPS, and other Consulting Parties for review and comment. The Co~~u~~nsulting parties shall have 21

days in which to comment on the CPP. SHPO, NPS, and ACHP shall respond within 30 calendar days of the request for review and comment on the CPP. Should SHPO, NPS, ~~and~~ or ACHP fail to respond within the 30 calendar day period, the CPP will be deemed approved by that agency. In any event, however, FTA and PANYNJ shall consider and respond to all comments received within this review period in preparing the final CPP. PANYNJ shall ~~implement~~ adopt the approved CPP prior to the commencement of Project construction, and shall implement the Project in accordance with the ~~Project's schedule~~ CPP."

IV. ARCHAEOLOGICAL RESOURCES (pages 16-18)

C. Treatment Plan (pages 17-18)

2. This provision states that the Consulting Parties will have 21 days to comment on the proposed Treatment Plan, but doesn't spell out the procedure for distributing the proposed plan and advising the parties of the comment opportunity. We recommend expanding this provision to incorporate a more detailed stipulation comparable to I.B.8.b. It may be appropriate to include the NPS in this comment opportunity as well.

3. Why delete the sentence ensuring that the Treatment Plan will be implemented to the satisfaction of the SHPO prior to any Project-related demolition or construction involving the affected Historic Property? This sentence should be added back into the MOA.

V. UNANTICIPATED DISCOVERIES AND EFFECTS (page 18)

B. Unanticipated Effects to Historic Properties (page 18)

The relationship between this Stipulation and Stipulation V.A (Unanticipated Discovery of Archaeological Resources) needs to be clarified. Is this intended to cover both archaeological and non-archaeological historic properties? In addition, the MOA should clarify the relationship between this Stipulation and the Construction Protection Plan and the WTC Resource Protection Plan, since those two plans are designed to address certain types of unanticipated effects to historic properties. Finally, the terms of the Stipulation are limited to circumstances in which the Port Authority "determines" that the Project "will or may" in the future affect a historic property in an unanticipated manner. Since unanticipated effects, by their very nature, are difficult to predict or determine in advance, the language of this Stipulation should be expanded to include circumstances in which the unanticipated effect has already occurred or is in the process of occurring.

It might be a useful exercise to consider whether and how this Stipulation would apply to

the newly identified feature mentioned in yesterday's New York Times article by David Dunlap – the recently exposed section of travertine floor with contrasting dark bands in angular patterns, located just outside the PATH station concourse – which was characterized as an "evocative vestige" of the trade center shopping mall. This feature (and others that may be exposed or revealed as the redevelopment moves forward) would presumably be evaluated as a newly identified contributing element or feature of the WTC Site, rather than an archaeological resource. The existing language of Stipulation V.B. may not be flexible enough or broad enough to encompass these circumstances. Would 14 days be sufficient for the Port Authority to implement a treatment and mitigation plan? Revisions to this draft Stipulation may be warranted in order to address this and other features of the site that may be newly revealed or identified.

VI. TEMPORARY RELOCATION OF HISTORIC ELEMENTS OF THE WTC SITE (pages 18-19)

2. This Stipulation should be explicit about the Port Authority's commitment to involve a Conservator or Curator meeting the Secretary of the Interior's Historic Preservation Professional Qualification Standards (62 Fed. Reg. 33,707 (June 20, 1997)), in all phases of developing and implementing the plan for temporary relocation of historic elements. We also recommend a stronger role for the consulting parties in this stipulation. This should include a 21-day opportunity to comment on the plan, prior to the end of the SHPO comment period, as provided in Stipulations I.B.8.b., I.C.1.b., I.D.1.b., and II.D.b.

VIII. ADDITIONAL COORDINATION REGARDING NEWLY AFFECTED HISTORIC PROPERTIES (pages 19-20)

Stipulation VIII is closely related to Stipulation V (p.18); for example, both Stipulations VIII.1 and VIII.2 include a cross-reference to Stipulation V.B). However, the relationship between the two provisions remains very confusing. We strongly recommend integrating this provision into Stipulation V as V.C., so that all the related stipulations will be combined together under one section. In addition, it would be useful to clarify whether this provision applies to newly identified historic properties that will be affected (presumably these will be archaeological resources), or already known historic properties that are affected in unanticipated ways, or both.

IX. ADMINISTRATION OF THIS AGREEMENT (page 20)

This Stipulation would be an appropriate place to refer to Exhibit G (Agency Contact Information), which is not yet referenced anywhere within the MOA itself.

B. Submittals to SHPO (page 20)

This Stipulation would also be a good place to provide for any special procedures needed

for submittals to the NPS.

C. Semiannual Status Reporting (page 20)

In the third-to-last line of this stipulation, the term "parties" should be changed back to "signatories" in order to be consistent with the Section 106 regulations. Since the Consulting Parties are one sub-category of the broader term "parties," it creates confusion to say "make the report available to the parties . . . *and to the Consulting Parties* . . . ."

X. DISPUTE RESOLUTION (pages 21-22)

A. Objections to Plans or Reports by Parties to This Agreement (page 21)

This Stipulation creates a process that looks fine on paper, but is unlikely ever to apply to any real-world situation. Since the four signatories to the MOA are all involved in the process of addressing and resolving the objections, it is difficult to imagine who would be left to serve as the objecting party. In the unlikely event that one of the signatories were to raise an objection (e.g., SHPO, FTA, or ACHP), they would be the very agencies called upon to referee or comment on their own objections.

B. Public Comments and Dispute Resolution (pages 21-22)

The National Trust strongly supports this Stipulation as a good model for facilitating public participation in the project through Section 106. Public comments are acknowledged as legitimate and deserving of a response. However, when considered together with the review process for consulting parties to comment on design plans at various stages of the project, it reflects a discrepancy. Although the Port Authority has committed to "respond" to all substantive comments from the public at large, it has only agreed to "consider" comments from consulting parties on specific design plans. This discrepancy could create an incentive for the consulting parties to use the public objection process, rather than the consulting party commenting process, as the mechanism for influencing the design and plans for the Project. Perhaps the best solution to this discrepancy would be to ensure that the stipulations describing the consulting party comment process include a specific commitment to respond to consulting party comments and to attempt to resolve disagreements with consulting parties.

XI. AMENDMENT AND TERMINATION (page 22)

B. Termination (page 22)

In line 2 of the second paragraph, the word "even" needs to be corrected to "event" ("In the event the Agreement is terminated . . . .")

Concluding Paragraph (page 23)

In line 2 on page 23, the word "undertaking" should be replaced by "Project," since the Project is defined in the First Whereas Clause. Using the term "undertaking" introduces an ambiguity, because the redevelopment of the WTC site involves many overlapping undertakings, and the scope of this particular undertaking has not been defined in the MOA.

Signatures (page 24)

As discussed above, the New York State Archives should be added as an invited signatory, or at least a concurring party, because of their commitment to permanent curation of documentation in Stipulation I.A.3 (p.8).

Exhibit F (Plan for Unanticipated Discovery of Archaeological Features or Materials)

In our previous comments, we suggested that Exhibit F, paragraph B, which defines a "Qualified Archaeologist," should specifically refer to the Secretary of the Interior's Historic Preservation Professional Qualification Standards, 62 Fed. Reg. 33,707 (June 20, 1997). This comment is reiterated simply because revised drafts of the Exhibits were not provided.

Exhibit G (Contact Information)

The contact list should include a point of contact for the National Park Service and the New York State Archives.

Conclusion

We wish to reiterate our thanks to the Port Authority for the agency's continued good faith in the Section 106 consultation process for the PATH Terminal. It was gratifying to see this view echoed in the New York Times article on December 30, 2004. We look forward to reviewing a revised draft of the MOA.

Sincerely,

Elizabeth Merritt

Elizabeth S. Merritt
Deputy General Counsel

cc: Charlene Dwin Vaughn, ACHP
Carol Braegelmann, Federal Preservation Officer, FTA
Paul Lebrun, Federal Transit Administration

Ruth Pierpont, NY State Office of Parks, Recreation & Historic Preservation
Timothy Stickelman, PANYNJ
Anthony Cracchiolo, PANYNJ
John Hotapp, Louis Berger Group
Ken Lustbader, Lower Manhattan Emergency Preservation Fund
Frank Sanchis, Municipal Art Society
Peg Breen, New York Landmarks Conservancy
Alex Herrera, New York Landmarks Conservancy
John Stubbs, World Monuments Fund
Robert Kornfeld, Historic Districts Council
Joel Klein, Coalition of 9/11 Families
Anthony Gardner, Coalition of 9/11 Families
Marilyn Fenollosa, Northeast Office, National Trust

NJ CT NY
Regional Plan Association

December 22, 2004

Anthony Cracchiolo
Director
Priority Capital Programs
The Port Authority of NY & NJ
233 Park Avenue South, 4th Floor
New York, NY 10003

Bernard Cohen
Federal Transit Administration, Lower Manhattan Recovery Office
One Bowling Green, Room 436
New York, NY 10004

Dear Mr. Cracchiolo and Mr. Cohen:

Thank you for the opportunity to submit comments on the Draft Memorandum of Agreement (MOU) among the Federal Transportation Authority, New York State Historic Preservation Office, Advisory Council on Historic Preservation, and Port Authority of New York New Jersey regarding the Permanent World Trade Center PATH terminal, dated December 16, 2004.

Regional Plan Association (RPA) strongly supports the construction of the World Trade Center Transportation Hub to restore long-term access to Lower Manhattan and connectivity to the NYC Subway system, contributing to the revitalization and economic recovery of Lower Manhattan. RPA has reviewed the PATH ridership estimates provided by the Port Authority and concurs with the conclusion that a fourth platform is needed to provide sufficient capacity within the station for the safe loading and unloading of passengers between the train cars and the platform in an efficient manner.

RPA also recognizes the unique importance of the historic resources that exist at the World Trade Center site. Every effort should be made to preserve these resources *in situ* at the site, and to maintain visual and physical access to the resources wherever possible. We realize that preserving access to the World Trade Center tower footprints while accommodating the physical space needs of the PATH tracks and platforms has been a challenge, and we appreciate the Port Authority's willingness in trying to find a solution that reconciles the physical space needs of both the infrastructure and the artifacts.

The preservation of historic remnants of the World Trade Center can play an important role in conveying the importance of this place to New York City and the nation's history, while not impeding the goal of providing a modern, safe and efficient transportation hub. To achieve this goal, the historic elements should be seamlessly integrated with the design of the site, so that users of the station may encounter historic elements on a daily basis, without the presence of these artifacts inconveniencing them or the operation of the station. However, we are concerned that the cumulative impact of multiple construction projects taking place at the World Trade Center site and managed by separate agencies has the potential to cause adverse impacts to the historic resources at the site. Therefore, RPA supports two recommendations made by the Lower Manhattan Emergency Preservation Fund (LMEPF) to mitigate this negative impact.

One, RPA agrees that the Port Authority should develop a process to evaluate and mitigate the cumulative impact of all relevant projects impacting the historic resources located at the World Trade Center site. This process should include a review and approval process for all projects managed by the separate agencies, and should include a resource protection plan for protecting the on-site historic elements during construction.

Two, we support the creation of a Cultural Resources Management Team by the Port Authority that will review plans for mitigating impacts to historic resources and for designing solutions to integrating visual and physical access to these elements in new projects built on the site.

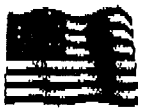
Regarding the WTC Transportation Hub, the specific architectural treatments proposed for the platforms over the Tower Perimeter Column Remnants, the E Subway entrance, the East and West Slurry Walls and the steel beams in cross form outlined in the December 16 Draft MOU provide an outline of how to achieve integration of the historic elements and the station. We look forward to commenting on the more specific design plans for incorporating these historic elements into the station design as they progress. In the absence of a coordinated process for evaluating the cumulative impacts to historic resources, we offer the following comment on the proposed treatment of the Slurry Wall, as outlined in the MOU.

- The MOU specifies several conditions which must be met in order for portions of the slurry wall to be visible from the terminal or East-West pedestrian connector. We hope that the Port Authority will make every effort to meet these conditions, as actual visual and physical access to the slurry wall is preferable to a photograph or plaque marking the wall's presence. We understand that access to the slurry wall will also be provided under LMDC's jurisdiction through the design of the memorial center, but these plans have not yet been presented to the consulting parties. Therefore, we urge the Port Authority to provide visual and physical access to the wall, in addition to what the LMDC will provide.

Thank you again for your diligence in finding solutions to integrate historic elements with the World Trade Center transportation hub. We look forward to offering further comments as the project progresses.

Sincerely,

Robert D. Yaro
President



WTCRC
C/O 200 Rector Place APT#38A
NY,
NY, 10280
Tel: 212 9454332

Section 106 MOA
Attn: Timothy Stickelman, Esq.
PANYNJ Law Department
225 Park Avenue South - 14th Floor
New York
NY 10003

March 31, 2005

Members of the Port Authority and Interested Parties,

Please find enclosed the WTCRC (World Trade Center Residents Coalition) endorsement of the Section 106 Memorandum of Agreement (MOA), prepared by the Port Authority for the WTC Transportation Hub Project.

After 3.5 years the represented downtown residents believe that it is now time to begin the rebuild process. The Port Authority has done its utmost to preserve historic artifacts at the WTC site. Many residents believe too many compromises were made to preserve remnants of the structure in situ, that have only very minor significance from a historical view point, which could have been better viewed in a museum. We remain concerned that project constraints around the percentage of the two footprints that maybe occupied severely limits the sites potential. The concession will undoubtedly generate increased costs, build times and potentially impact greatly our local communities due to required facility relocations.

Despite our concerns, we believe that the commercial and retail redevelopment of the World Trade Center site is critical to the future of Lower Manhattan for both businesses and local residents. For these reasons, we have decided to endorse.

We look forward to working with you in the future.

Yours faithfully,

Craig A. Hall
WTCRC - President

HISTORIC DISTRICTS COUNCIL

THE ADVOCATE FOR NEW YORK CITY'S HISTORIC NEIGHBORHOODS

232 East 11th Street New York NY 10003
tel 212-614-9107 fax 212-614-9127 e-mail hdc@hdc.org

March 30, 2005 VIA FAX

Mr. John L. Nau, III
Chairman
Advisory Council on Historic Preservation Old Post Office Building 1100 Pennsylvania Avenue, NW, Suite 809 Washington, DC 20004

Re: WTC Transportation Hub Memorandum of Agreement

Dear Mr. Nau:

The Historic Districts Council would like to express serious concerns about the current draft of the Memorandum of Agreement (MOA) of the Port Authority of New York and New Jersey (PANYNJ) concerning the Section 106 Review of the World Trade Center site that make it unacceptable in its present form. While the document is close to completion, there are several areas where it is weak and unenforceable, and unlikely to accomplish its apparent intent, to minimize adverse effects to the contributing historic features, and to clearly define those features that will be protected. We request the Advisory Council to refrain from signing the document until the issues are satisfactorily resolved, and we do not feel that we can concur at this point. We previously requested another consulting parties meeting, but at least an additional draft is in order to address substantive comments by consulting parties. We endorse the comments by the Coalition of 9/11 Families concerning cumulative effects and dispute resolution.

PANYNJ is the owner of the site and has control of the site, and yet the terms of their MOA do not appear to be enforceable on the other tenants or agencies that plan to build on the site, particularly the Lower Manhattan Development Corporation (LMDC), nor

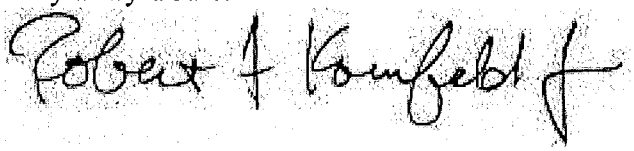
does it give PANYNJ the authority to require LMDC to submit plans for review, nor the authority to require modifications to reduce adverse effects. For example, while PANYNJ identifies numbers of column bases in the tower footprints and percentages of the tower footprint areas that they intend to "preserve", it is apparent from LMDC's preliminary design presentation that they intend to obliterate almost all of the contributing resources, and leave token remnants stripped of their sense of place.

This is a critical moment in the history of the World Trade Center site, and the future of this historic resource may hinge on a few text changes. We sincerely hope that the reviewing agencies fulfill their mission to protect our nation's historic resources. The WTC footprints and other contributing features comprise an extraordinary resource which still possesses a high degree of integrity. If it is lost, there will be repercussions that are felt in the preservation community for generations, like the loss of Penn Station, because this is a resource of such profound historic significance, and a site that Americans will continue to consider as hallowed ground on a par with any existing national memorial.

Penn Station was destroyed under the fateful slogan, "You can't stop progress." The World Trade Center preservation, just like the rescue and recovery effort, must continue under the banner, "We will never forget."

We look forward to continue working as a consulting party with you on this important undertaking.

Very Truly Yours:



Robert J. Kornfeld, Jr., RA
Board of Directors, Historic Districts Council

cc: Carol Braegelmann
Timothy G. Stickelman
Elizabeth Merritt
Ruth Pierpont
Consulting Parties (selected)

333 Rector Place, # 11-B
New York, NY 10280
March 26, 2005

Section 106 MOA
Attn: Timothy Stickelman, Esq.
PANYNJ Law Department
225 Park Avenue South – 14th Floor
New York, NY 10003

Ladies and Gentlemen:

On behalf of the Coalition to Save West Street (Coalition), a Consulting Party, I enclose herewith an executed signature page to the Memorandum of Agreement (MOA) for the WTC Transportation Hub Project (Project) in order to formally indicate the Coalition's concurrence with this MOA. We are endorsing the document despite very serious reservations about some of its provisions. There are parts of the MOA that we enthusiastically support, such as the decision to incorporate the historic features of the surviving E subway entrance into the new design. However, we are concerned that far too many compromises were made to preserve remnants of the structure that have only marginal significance from a historical or any other perspective and which could have been either represented or incorporated into the museum. Moreover, we believe that the commitment to preserve a large number of the box beam columns at bedrock level (the so-called "footprints") and to place strict limits on the percentage of the two footprints to be permanently occupied by any portion of the Project constrains development on the site in a very severe way and limits its potential. We would certainly never have negotiated such concessions had we been the primary negotiators in this process.

On balance, however, we feel that any further delay in redeveloping the site is unwise and that construction should not be held back any longer. The commercial and retail redevelopment of the World Trade Center site is critical to the future of Lower Manhattan for both businesses and local residents. We have stared at this huge hole in the ground daily for 3.5 years now, and it is time to move forward. For these reasons, we have decided to concur with the agreement.

Sincerely,

William C. Love, Jr.

William C. Love, Jr.
Vice Chair
Coalition to Save West Street

Stickelman, Timothy

From: KLustbader@aol.com

Sent: Friday, April 01, 2005 1:34 PM

To: cvaughn@achp.gov

Cc: Stickelman, Timothy; ruth.pierpont@oprhp.state.ny.us; Beth.Cumming@oprhp.state.ny.us; carol.braegelmann@fta.gov; FSanchis@mas.org; betsy_merritt@nthp.org; marilyn_fenollosa@nthp.org; avaningen@nysca.org; pegbreen@nylandmarks.org; jdilorenzo@preservenys.org; Opmacw@aol.com; bburnham@wmf.org; hng@wmf.org

Subject: Final PATH MOA

Dear Charlene,

The Lower Manhattan Emergency Preservation Fund (LMEPF) has been working with Elizabeth Merritt and Marilyn Fenollosa of the National Trust in reviewing the MOA for the PATH project. The LMEPF endorses the Trust's comments on the MOA which were distributed on March 31.

It is unfortunate that the Consulting Parties were not given one final opportunity to comment on the MOA considering how much work has already been committed to this process. We know that the Port Authority and its staff have been receptive to many of our prior recommendations and hope that the Trust's comments can be incorporated into a revised Final MOA.

Ken Lustbader
Preservation Consultant
Lower Manhattan Emergency Preservation Fund
c/o 37 West 12th Street, 2E
New York, NY 10011
phone: 917 848-1776
fax: 212 633-1087

----- Message from "Betsy Merritt" <Betsy_Merritt@nthp.org> on Wed, 30 Mar 2005 23:22:31 -0400 -----

To: <cvaughn@achp.gov>
cc: "Stickelman, Timothy" <tstickel@panynj.gov>, <ruth.pierpont@oprhp.state.ny.us>, <carol.braegelmann@fta.gov>, "Marilyn Fenollosa" <Marilyn_Fenollosa@nthp.org>, <klustbader@aol.com>, <rkornfeld@lzatechnology.com>, <jklein@johnmilnerassociates.com>, <fsanchis@mas.org>, <alexherrera@nylandmarks.org>, "Anthony Gardner" <amg@wtcufg.org>
Subject: Comments on PATH MOA

Attached are comments from the National Trust on the MOA for the PATH Project.

We were disappointed that the Port Authority did not circulate this document once more for comment prior to finalizing it and executing it. We have learned to expect more from the Port Authority than the take-it-or-leave-it approach reminiscent of the LMDC. Nonetheless, we hope this will remain an aberration, rather than a trend, in an otherwise commendable record of consultation by the Port Authority. We would appreciate the Council's review of our comments on the MOA, and we would be happy to discuss them with any of the parties.

NATIONAL TRUST
for HISTORIC PRESERVATION

Comments on Final PATH MOA

Cumulative Effects (pp.12-13)

This new section of the MOA represents a good effort to address cumulative effects. However, it is unfortunate that the Port Authority chose to introduce this stipulation only in the final MOA, without any opportunity for consulting parties to comment on it in draft form. In our view, a number of refinements are needed to clarify and improve this provision, which remains confusing and vague.

1. The Port Authority plans to consider cumulative effects for the first six months of "full operation" of the project, but no longer. This time-limit is arbitrary and insufficient. Since the Port Authority will continue to own the WTC Site, there is no reason why the Port Authority's leadership role in coordination and oversight could not continue for more than six months.

2. The Port Authority is only proposing to "request," not "require," "documents" for construction projects within the WTC Site, and only from "agencies" that are constructing projects. We assume that the other construction projects include the Memorial (LMDC), the Fulton Street Transit Center (FTA), and Route 9A (FHWA), as well as the Freedom Tower and office and retail development within the WTC Site. Would the Freedom Tower be excluded from this provision because it is not being constructed by an "agency"?

4. If the Port Authority and SHPO agree that cumulative adverse effects are likely, then the Port Authority will "consider" mitigation measures, including project design modifications. However, this stipulation fails to address what will happen if the SHPO and/or LMEPF believe that cumulative effects will be adverse, but the Port Authority does not agree. Normally, the Section 106 regulations would require the FTA to consult with the SHPO or LMEPF to resolve such a disagreement about whether the cumulative effects would be adverse. 36 C.F.R. § 800.5(c)(2)(i). That procedural right appears to be short-circuited here.

5. The Port Authority commits to make all appropriate Port Authority documentation available to consulting parties, but not documentation prepared by any other party (i.e., the agency constructing the project within the WTC Site). While we recognize that this restriction is based on an effort to accommodate security concerns, we are concerned that, without adequate documentation, it will be difficult for LMEPF (or any other consulting party) to provide meaningful input under stipulation G.3 on the potential for adverse cumulative effects.

1785 MASSACHUSETTS AVENUE, NW · WASHINGTON, DC 20036
202.588.6000 · FAX: 202.588.6038 · TTY: 202.588.6200 · WWW.NATIONALTRUST.ORG

7. The Port Authority's commitment to "consider and respond" to comments on cumulative effects from consulting parties, and to "attempt to resolve" those concerns, helps to address in part the inadequacies of stipulation G.4 discussed above. However, G.4 makes no cross-reference to G.7. More importantly, recourse to the ACHP and the dispute resolution procedure would only be triggered if the Port Authority is unable to reach resolution "*with SHPO*," which would be highly unlikely. This stipulation fails to address what happens if concerns are not resolved with other consulting parties.

8. In the third line from the end, the reference to the "WTC Resource [Protection] Plan for Construction" is missing the word "Protection."

Dispute Resolution (pp.19-20). Stipulation X.B.3. (p.20) appears to create a process in which objections raised by consulting parties could not be brought to the FTA or ACHP for review unless the SHPO "considers the issue of sufficient importance." We strongly disagree with putting the SHPO in this role. It is likely to exacerbate, rather than resolve, conflicts between the consulting parties and the SHPO, and would place inappropriate and disproportionate power and pressure on the SHPO. The federal agencies should take responsibility themselves for addressing disputes that are brought to them by consulting parties, rather than relying on the SHPO to block or screen issues in order to keep disputes away from the federal agencies.

Role of National Park Service. Although specific reference to NPS has been added in the review process for plans that will affect the various contributing elements of the WTC Site, elsewhere that reference to NPS has been omitted, which creates ambiguity and confusion about the process. For example:

- The consulting parties have 21 days to comment on various plans, while SHPO (and ACHP, where applicable) have 30 days. The MOA fails to indicate whether the NPS would have 21 days or 30 days.
- The MOA commits that the Port Authority will consider and respond to all timely comments from SHPO and consulting parties, but not those from NPS.
- The consulting parties will be notified electronically that plans are available, but the Port Authority is not required to notify NPS.

These clarifications need to be made throughout the MOA.

Column bases *inside* the perimeter of the footprints. Although this element of the WTC Site is specifically mentioned on page 13 of the Coordinated Determination of Eligibility, it is not mentioned in the MOA. Even though this historic element will apparently be affected, the MOA does not take into account those effects.

Corrections

Historic Properties vs. Historic Resources. Although Whereas Clause 7 on p.1 defines the term "Historic Properties" as National Register-listed or -eligible properties, the MOA later slips into the use of the term "Historic Resource[s]," which is not defined. See, e.g.:

- I.F.2, end of paragraph (p.11). (Compare end of I.F.3.)
- I.G.1, line 2 (p.12).

- V., Title (p.17).
- V.B., Title and throughout paragraph (p.17).
- Page 21, line 3.

These references to Historic "Resource[s]" need to be changed to Historic "Properties."

Professional Qualifications. The Secretary of the Interior's Historic Preservation Professional Qualification Standards are incorrectly cited to 36 CFR 61. Although this was previously the citation for the Standards, they are no longer located within that section of the National Park Service regulations. The following references need to be corrected:

- I.F.2, fourth line from the end (p.11)
- III.B.3, third line from the end (p.15)

Final Paragraph. The verbiage at the top of page 21 and the other signature pages is redundant of the paragraph at the bottom of page 20. It also contains an error – the reference to "historic resource."

March 31, 2005

David Stanke
Helene Seeman
BPC United
114 Liberty Street, Apt. 7
New York, NY 10006

Section 106 MOA
Attn: Timothy Stickelman, Esq.
PANYNJ Law Department
225 Park Avenue South – 14th Floor
New York, NY 10003

Members of the Port Authority and Interested Parties:

BPC United would like to express our concurrence with the MOA prepared by the Port Authority for the WTC Transportation Hub Project. We feel that the Port Authority has gone far beyond reasonable expectations to preserve the historic artifacts at the WTC site. We have significant reservations that the tradeoffs already made and the commitments going forward go beyond reasonable levels to preserve artifacts that are of secondary importance. But we also feel that it is critical that work on the WTC site move forward quickly: critical for the surrounding neighborhoods, for Downtown New York, and, symbolically, for our country.

It has been an honor and a pleasure to be involved in these hearings. The presentations of artifacts and the site by Port Authority employees have been enlightening and moving. Presentations of proposed projects and detailed descriptions of impact on historic elements have been clear and well articulated. Feedback from each meeting was addressed in succeeding meetings. While at times, the hearings mired down with repetitious demands, the Port Authority made every effort to hear all views and to treat everyone with respect. The modifications made to plans demonstrated creativity and flexibility in adjusting to comments from the Consulting Parties.

Unfortunately, we must also express our reservations in supporting this MOA. Our concerns are not with the process, but with the lengths taken to preserve artifacts of disputed value. Consulting Parties who demanded expanded preservation failed to establish a consistent method to establish an artifact's historic value. In these discussions, it was simply stated that every item on the site was historic and should be saved with little regard for the costs. Items that had no pre-9/11visibility to the public, that are of no architectural significance, and that evoke limited resonance to the memory of the WTC or the events of 9/11 have been treated with a "preserve at all costs" mentality. Our primary concerns are with the column footings from the WTC embedded in cement on the floor of the WTC bathtub, although many items with little resonance were also discussed.

In particular, we believe that the cost of rebuilding at the WTC has been increased dramatically due to actions taken as a result of these meetings. The dislocation of all functional, infrastructure elements of the old WTC to surrounding areas will require extensive excavation and re-building. Only in the future will the full cost of these decisions will be realized. Movement of facilities to surrounding areas will extensively impact impair our local communities; impacts which cannot be mitigated. We are also concerned that the functionality of the Path Station, transportation facilities, walkways, retail, and office space will be compromised.

The Port Authority took steps to preserve the historic artifacts from the WTC long before the public took interest. In those earliest days of national morning, they engaged experts to identify, remove, and protect items of significant value. The results of these efforts are an impressive collection of deeply moving artifacts stored in a hanger at JFK. Presentations by these experts were among the most well reasoned and moving aspects of the hearings. The Port Authority treated the site with the respect that someone would treat his/her own home after a historic disaster. The results are evidence of their feelings for the old WTC, and the personal losses they all experienced. As knowledgeable caretakers of the site, their selection of artifacts demonstrated a clear understanding of relative importance of specific items. Unfortunately, most of the 106 hearings focused on items of far lesser importance and far greater cost than those already identified and preserved.

The Port Authority has established pattern of respecting the historic nature of the WTC and demonstrated their understanding of the form and function of the WTC. Based on these qualifications, we concur with the MOA and fully support the Port Authority proceeding immediately with construction of the Path Station and associated infrastructure. We also look forward to further hearings on other areas of the site as this historic rebuilding continues.

Sincerely,

David E. Stanke
BPC United

Appendix I

Construction Analysis and Management Framework

Appendix I-1: Environmental Analysis Framework and Environmental Performance Commitments

Metropolitan Transportation Authority
State of New York

NEW YORK STATE
DEPARTMENT OF TRANSPORTATION

THE PORT AUTHORITY OF NY & NJ

September 3, 2003

Susan E. Schruth
Director
Lower Manhattan Recovery Office
Federal Transit Administration
One Bowling Green
New York, NY 10004

Re: Lower Manhattan Transportation Recovery Projects

Dear Ms. Schruth:

In the aftermath of the September 11th attacks and the destruction visited on the transportation infrastructure of Lower Manhattan, we appreciate the Federal Transit Administration's ("FTA") commitment of funding and other resources to the transportation recovery projects in Lower Manhattan described by Governor George E. Pataki in his letter dated February 6, 2003. As these projects advance in development, the Metropolitan Transportation Authority ("MTA"), the Port Authority of New York and New Jersey, and the New York State Department of Transportation are working together with the FTA's Lower Manhattan Recovery Office to demonstrate their commitment to the environment and communities of Lower Manhattan. The attached Environmental Analysis Framework represents the fruits of that collective commitment.

We also acknowledge the opportunity to proceed with these important projects provided by the temporary waiver of transportation conformity requirements as enacted by Public Law 107-230. It is important to meet the commitments made by the State in order to obtain the waiver and we recognize the benefits of an enhanced interagency consultation process as we go forward with these transportation recovery projects.

As the first of these priority projects – MTA's Fulton Street Transit Center and the Permanent WTC PATH Terminal – have begun the environmental process incorporating this Framework, we mark the beginning of the environmentally-conscious contribution that the transportation recovery projects will make to the revitalization of Lower Manhattan. We look forward to working together with you as each of the other projects progresses in development and look

forward to the state-of-the-art restoration and enhancement of the transportation systems to and from Lower Manhattan.

Sincerely,

Katherine N. Lapp
Executive Director and
Chief Executive Officer
Metropolitan Transportation Authority
347 Madison Avenue
New York, New York 10017

Paul T. Wells, P.E.
Chief Engineer
New York State Department of Transportation
1220 Washington Avenue,
State Campus, Bldg 5, Room 504
Albany, New York 12232

Joseph J. Seymour
Executive Director
Port Authority of New York and New Jersey
225 Park Avenue South
New York, New York 10003

ENVIRONMENTAL ANALYSIS FRAMEWORK FOR FEDERAL TRANSPORTATION RECOVERY PROJECTS IN LOWER MANHATTAN

In the aftermath of the September 11, 2001 attacks, a common framework of environmental analysis for reconstruction and redevelopment projects in Lower Manhattan can produce substantial benefits for each project, including the avoidance or minimization of environmental impacts and an increase in public understanding. The initiation of transportation recovery projects that are to be undertaken with the $4.55 billion in federal funding to restore and enhance functionality of the infrastructure and support the recovery of the area ("Federal Transportation Recovery Projects") will likely precede non-infrastructure projects. These projects therefore present an early opportunity for implementing a framework for evaluating and minimizing potentially adverse environmental effects, particularly cumulative effects, from other projects in Lower Manhattan that are constructed and put into operation during similar time frames and may affect the same resources (the "Framework"). As such, this Framework, which features a coordinated cumulative effects analysis approach, is offered to assist sponsors of Federal Transportation Recovery Projects ("Project Sponsors") in their environmental analyses.

The Framework for the Federal Transportation Recovery Projects was developed by a group of governmental entities involved with recovery in Lower Manhattan: the Metropolitan Transportation Authority ("MTA"), the Port Authority of New York and New Jersey ("Port Authority"), the New York State Department of Transportation ("NYSDOT"), and the Lower Manhattan Development Corporation ("LMDC"), in cooperation with the Federal Transit Administration ("FTA") and interested federal agencies. It is anticipated that at a minimum, this Framework, as applicable and where appropriate, will be used by the MTA, the Port Authority, and NYSDOT in connection with each of their proposed Federal Transportation Recovery Projects. This Framework will be introduced to additional local Project Sponsors, as appropriate, as additional Federal Transportation Recovery Projects are identified and prioritized. It is intended that, when completed, each Federal Transportation Recovery Project will result in an overall positive impact on the environment.

The temporary waiver of most transportation conformity requirements provided by Public Law 107-230 allows for these projects to proceed with out the need for a full conformity determination. To meet obligations set forth with the conformity waiver, the framework recognizes the need and value of interagency consultation and is consistent with the enhanced interagency consultation procedures during the transportation conformity waiver period.

In light of other reasonably foreseeable transportation and non-transportation actions in Lower Manhattan, this Framework for analyzing Federal Transportation Recovery Projects will establish a consistent set of information and commitments to be fulfilled in each Project Sponsor's project-specific environmental review and documentation. The Framework considers the regulations set forth by the Council on Environmental Quality ("CEQ") and takes into account the guidance in State Environmental Quality Review Act ("SEQRA") regulations, the City Environmental Quality Review ("CEQR") Technical Manual, industry best practices, and public input.

This ***Environmental Analysis Framework*** consists of the following components:

1. ***Green Design, Green Construction, and Sustainability Principles;***
2. ***Construction Environmental Protection Plan;***
3. ***Public Involvement and Governmental Entities Coordination Plan; and***
4. ***Baseline Assessment of Resources & Coordinated Cumulative Effects Analysis Approach***

1. Green Design, Green Construction, and Sustainability Principles

Each Project Sponsor cooperating with the FTA, and other interested federal agencies, recognizes the importance of avoiding and minimizing adverse impacts. Project Sponsors will address their advance commitment to undertake such avoidance efforts. In this regard, Project Sponsors have agreed to develop a common set of Environmental Performance Commitments ("EPCs") that they will each undertake. EPCs are items such as design elements, construction techniques, or operating procedures that will be implemented to lower the potential for adverse environmental impacts. This proactive approach is incorporated into this Framework and will diminish the likelihood of adverse cumulative effects. In addition, each Project Sponsor will undertake additional EPCs appropriate to its project based on the project's particular nature, timing, and scope.

Each Project Sponsor will describe the green practices that will be followed during construction for the following resources/areas of potential impact:

- Air Quality
- Pedestrian and Vehicular Access and Circulation
- Historic and Cultural Resources
- Noise and Vibration
- Business/Economic Interests

Project Sponsors will also set forth the green practices, high performance, and sustainable design features to be evaluated during design of the structures and facilities that will avoid or minimize adverse impacts and enhance overall environmental performance during operation.

2. Construction Environmental Protection Plan

Each Project Sponsor will provide a detailed outline of the EPCs and any other procedures to be implemented during the construction phase to protect sensitive resources that may be affected during construction. This plan will discuss how the initial condition of the resource will be assessed, where applicable; how the construction work will actually be implemented to avoid or minimize impacts; and how the environmental performance of the project will be monitored during construction. This plan will be based on the best available information and the ongoing construction coordination process in Lower Manhattan and a shared Lower Manhattan projects inventory being developed by LMDC. The plan will also provide an effective means for disseminating appropriate current information to the public and other developers.

3. Public Involvement and Governmental Entities Coordination Plan

Each Project Sponsor will describe how the environmental community, relevant governmental entities, and the general public will be involved as the Project Sponsor proceeds with its Federal

Transportation Recovery Project. Each Project Sponsor will develop a public and governmental entity involvement plan that will be coordinated with the public and governmental entity involvement plans for other Lower Manhattan projects. A key goal of the coordination will be to avoid or at least minimize adverse effects on the environment, particularly during construction. In addition, this plan will identify a protocol by which comments received during the construction phase will be addressed; appropriate current information will be provided to the public, including Project Sponsors' project implementation schedules; and coordination with other projects will occur. The process will build on an existing construction coordination protocol among parties already involved in rebuilding Lower Manhattan.

4. ***Baseline Assessment & Coordinated Cumulative Effects Analysis Approach.***
The components of the baseline assessment and coordinated cumulative effects analysis approach to be used by the Project Sponsors in Federal Transportation Recovery Projects are as follows:

- Each Project Sponsor will address cumulative effects, as applicable, as part of its independent project-specific environmental review process.
- The "baseline" to be used for the "No Build" comparison required under NEPA will be pre-September 11, 2001 conditions.
- The "baseline" for environmental review of construction-related impacts for each project will be adjusted to reflect, where appropriate, conditions anticipated to be in effect at the time of construction.
- Project Sponsors will share appropriate information, databases and documentation of the baseline and forecasted conditions.
- Each Project Sponsor will apply a consistent approach for the evaluation of cumulative effects focused on the five following "resources":
  - -- Air Quality (including the Enhanced Procedures during the Transportation Conformity Waiver Period);
  - -- Pedestrian and Vehicular Access and Circulation;
  - -- Historic and Cultural Resources
  - -- Noise and Vibration; and
  - -- Business/Economic interests
- The geographic area for analysis will be the area of Lower Manhattan south of Canal Street, but where appropriate, the geographic area may be adjusted for the specific resources.
- Each Project Sponsor will adhere, at a minimum, to the attached set of common EPCs to lower the potential for adverse environmental impacts as listed in Section 1 and above, thereby lessening the potential for each project to contribute to overall adverse cumulative effects.
- As each project matures through the NEPA process, the findings of the project will be incorporated into the cumulative effects analyses for the projects that follow it. As such, the project on which findings have been issued will constitute an "existing condition" for the cumulative effects analysis of the next project.

LOWER MANHATTAN FEDERAL TRANSPORTATION RECOVERY PROJECTS
COMMON ENVIRONMENTAL PERFORMANCE COMMITMENTS

These common environmental performance commitments are made by the Project Sponsors accepting the Environmental Analysis Framework for Federal Transportation Recovery Projects in Lower Manhattan. As noted in the Environmental Analysis Framework, actual requirements and specifications implementing the commitments will be set forth in each Project Sponsor's public involvement and governmental entities coordination plan, construction environmental protection plan, design documents and contracts.

Air Quality:

Proposed Commitments
Use ultra low sulfur diesel fuel in off-road construction equipment with engine horsepower (HP) rating of 60 HP and above.
Where practicable, use diesel engine retrofit technology in off-road equipment to further reduce emissions. Such technology may include Diesel Oxidation Catalyst / Diesel Particulate Filters, engine upgrades, engine replacements, or combinations of these strategies.
Limit unnecessary idling times on diesel powered engines to 3 minutes.
Locate diesel powered exhausts away from fresh air intakes.
Control dust related to construction site through a Soil Erosion Sediment Control Plan that includes, among other things: a. spraying of a suppressing agent on dust pile (non-hazardous, biodegradable); b. containment of fugitive dust; and c. adjustment for meteorological conditions as appropriate.

Noise and Vibration:

Proposed Commitments
Where practicable, schedule individual project construction activities to avoid or minimize adverse impacts.
Coordinate construction activities with projects under construction in adjacent and nearby locations to avoid or minimize impacts.
Consider condition of surrounding buildings, structures, infrastructure, and utilities where appropriate.
Prepare contingency measures in the event established limits are exceeded.

Cultural and Historic Resources:

Proposed Commitments
Establish coordination among projects to avoid or minimize interruption in access to cultural and historic sites.
Initiate public information and involvement outreach with sensitivity to local cultural resources.
Identify public information outlets that will receive and provide current information about access during construction.
Consult with the New York State Office of Historic Preservation and the New York City Landmarks Preservation Commission regarding potentially impacted, culturally significant sites. Monitor noise and vibration during construction at such sites as appropriate.

Access and Circulation:

Proposed Commitments
Establish a project-specific pedestrian and vehicular maintenance and protection plan.
Promote public awareness through mechanisms such as: a. signage; b. telephone hotline; and c. Web site updates.
Ensure sufficient alternate street, building, and station access during construction period.
Regular communication with New York City Department of Transportation and participation in its construction coordination efforts.

Economic Effects:

Proposed Commitments
Coordinate with LMDC, Downtown Alliance or other entities to minimize residential and retail impacts as required through: a. relocation assistance, as applicable, to persons or businesses physically displaced by the project; and b. focus on essential businesses and amenities to remain in Lower Manhattan.
Add appropriate signage for affected businesses and amenities.

Design for the Environment:

Proposed Commitments
Energy Efficiency/Renewable Energy
Enhanced Indoor Environmental Quality (IEQ)
Conserving Materials and Resources
Environmentally-friendly Operations & Maintenance
Water Conservation and Site Management
Waste Management and Recycling (including during construction)

Executive Order Establishing the Lower Manhattan Construction Command Center

State of New York

Executive Chamber

No. 133

EXECUTIVE ORDER

ESTABLISHING THE LOWER MANHATTAN CONSTRUCTION COMMAND CENTER

WHEREAS, the terrorist attacks of September 11, 2001 resulted in the deaths of 2,749 people, the loss of more than 65,000 jobs, the destruction and damage of 30 million square feet of commercial office space, and the dislocation of more than 65,000 commuters;

WHEREAS, a permanent Memorial is being planned for the World Trade Center site to ensure that future generations never forget the people who died on September 11, 2001 in New York City, in Pennsylvania and at the Pentagon, as well as those who died in the terrorist bombing of the World Trade Center on February 26, 1993;

WHEREAS, an extensive rebuilding and revitalization effort is being undertaken in response to the damage to the World Trade Center and surrounding properties, and the broader impacts to area businesses and the transportation infrastructure of Lower Manhattan, caused by the terrorist attacks of September 11, 2001;

WHEREAS, the rebuilding and revitalization of Lower Manhattan will involve billions of dollars in public and private construction projects over the next decade conducted by multiple State, multi-State, and City agencies, as well as private developers;

WHEREAS, the rebuilding must occur in a compact timeline to preserve and improve the quality of life downtown, to retain Lower Manhattan's place as the financial capital of the world, and to reenergize the entire regional economy;

WHEREAS, it is critical that construction be coordinated to ensure that projects move forward expeditiously and with the utmost integrity, while minimizing the impact of such construction on residents, businesses, workers, commuters, pedestrians, and vehicles;

WHEREAS, the lead construction personnel from the key agencies involved in the rebuilding have been meeting regularly as the Lower Manhattan Construction Coordination Group;

WHEREAS, the inspectors general and law enforcement personnel from the key agencies involved in the rebuilding process have been meeting regularly as the Lower Manhattan Construction Integrity Team;

WHEREAS, all parties involved in the rebuilding recognize the need for an entity to coordinate the construction projects in Lower Manhattan;

WHEREAS, all parties involved in the rebuilding recognize the need for an entity to ensure equal employment opportunities, and meaningful opportunities for minority and women-owned businesses to participate in contracting and subcontracting opportunities to minority and women owned businesses;

WHEREAS, all agencies involved in the rebuilding must maintain the ability to manage their own projects and an entity coordinating the projects improves their ability to successfully manage their own projects; and

WHEREAS, a Lower Manhattan Construction Command Center, working with the public and private partners involved in the rebuilding, charged with coordination of construction projects in Lower Manhattan can best achieve the goal of meeting the ambitious timeline while minimizing the impact of such construction on the community.

NOW, THEREFORE, I, GEORGE E. PATAKI, Governor of the State of New York, by virtue of the authority vested in me by the Constitution and Laws of the State of New York, do hereby order as follows:

1. Establishment of the Lower Manhattan Construction Command Center. There is hereby established a Lower Manhattan Construction Command Center ("the Command Center"). The Command Center will coordinate between all construction located in Lower Manhattan. Lower Manhattan is defined as the area on the island of Manhattan south of Canal Street and southwest of Rutgers Street from the Hudson River to the East River. Construction includes all construction beginning from 2004 to 2010 valued at over $25 million, work requiring governmental action or permit, and any construction requiring work directly in City or State streets or highways.

2. Lower Manhattan Construction Command Center Executive Director. The Command Center will be managed by the Lower Manhattan Construction Command Center Executive Director ("the Executive Director"). Such Executive Director shall be appointed in a manner to be determined jointly by, and shall report directly to, the Governor and the Mayor of the City of New York.

3. Management of the Command Center. The Command Center will be managed by the Executive Director, and one or more deputies, including a communications director and fraud prevention director, charged with responsibility for coordinating the scheduling and staging per the overall plan and with day-to-day responsibility for coordinating construction work in Lower Manhattan with a focus on mitigating impacts on mobility, maintaining and improving access, and alleviating congestion of any kind related to construction.

4. City Operations. A Director of City Operations will be appointed by the Mayor, after consultation with the Command Center Executive Director, to ensure the quality of life of residents and businesses of Lower Manhattan, to coordinate the various municipal services as they interface with the construction projects and to ensure that the various logistics and traffic management plans are appropriately enforced. The Director of City Operations will serve as the liaison between the Executive Director of the Command Center and all City agencies and will be located at the Command Center.

5. Participation by Public and Private Partners. The Command Center will coordinate between high level construction personnel from the key participants in the rebuilding process including the New York City Department of Transportation, the New York City Department of Design and Construction, the New York City Economic Development Corporation, the New York City Department of Sanitation, the New York City Police Department("NYPD"), the New York City Fire Department, the New York City Office of Emergency Management, the Port Authority of New York and New Jersey, the Metropolitan Transportation Authority, the New York State Department of Transportation, the Lower Manhattan Development Corporation, Silverstein Properties, Verizon and

ConEdison, the Alliance for Downtown New York, Community Board 1, the Battery Park City Authority, the Real Estate Board of New York, and representatives of such other entities as the Executive Director shall determine appropriate in carrying out the duties and responsibilities of the Command Center.

6. Lower Manhattan Construction Executive Committee. The Lower Manhattan Construction Executive Committee, which includes senior managers designated by the heads of the New York City Department of Transportation, the New York City Economic Development Corporation, the Port Authority of New York and New Jersey, the Metropolitan Transportation Authority, the New York State Department of Transportation, and the Lower Manhattan Development Corporation (each in a number to be determined by the Command Center Executive Director) will advise and consult with the Command Center Executive Director on the establishment and management of the Command Center. This group will meet as determined by the Command Center Executive Director (in any event no less than monthly) and will be chaired by the Command Center Executive Director.

7. Traffic Coordination. The New York State Department of Transportation will work in consultation with the New York City Department of Transportation and New York City Police Department, in a manner consistent with law, in the coordination of traffic management, street permitting, and enforcement.

8. Fraud Prevention. In order to provide a coordinating mechanism for the State and City to receive information on potential corruption relating to any construction in Lower Manhattan, a Lower Manhattan Fraud Prevention Hotline will be created under the direction and control of the Command Center. The Lower Manhattan Construction Command Center will help ensure that all construction projects proceed with the utmost integrity, free of corruption and wrongdoing, by reporting to the Lower Manhattan Fraud Prevention Hotline, any allegations of corruption or criminal activity by or on behalf of any agency employee, public official, contractor employee, agent, subcontractor, vendor, or labor official. The Command Center shall work in coordination with each agency's Office of Inspector General, and the New York City Department of Investigations, as appropriate, and shall coordinate all efforts on federally-funded projects with the United States Department of Transportation Office of Inspector General, and other appropriate federal agencies.

9. Functions of the Command Center. The Command Center will coordinate community information, construction logistics, utility coordination, environmental compliance, safety, diversity, and equal opportunity. The functions of the Command Center shall include:

A. Coordinating the work of the participants in the rebuilding process and ensuring that the construction in Lower Manhattan proceeds as scheduled by mediating conflicts in schedules and street and site access between construction projects, agencies, and the Lower Manhattan community through the following:

(1) Expanding the on-going standard coordination efforts from pre-planning through construction currently managed by NYC DOT and its consultant for all projects in Lower Manhattan;
(2) Working with each of the project sponsors to establish a master schedule of all Lower Manhattan construction projects;
(3) Working with New York City and the Port Authority to set guidelines for street and site access priorities;
(4) Providing a forum for agencies, contractors, utilities and the community to be heard when conflicts arise; and
(5) Coordinating expeditious and consistent decision-making on conflicts that can not be resolved between agencies.

B. Coordinating protocols, contract requirements and activities outside of individual project limits through planning and on a daily basis throughout construction for government agencies, developers, construction managers, general contractors, and contractors to follow, including, but not limited to, the following items:

(1) Environmental protection;
(2) Maintenance and protection of traffic;
(3) Site fences, barricades, and signage;
(4) Construction site cleanliness, dust control and clean up

between sites coordinated between the New York City Department of Sanitation and the Downtown Alliance;
(5) Rodent control;
(6) Pedestrian access outside of site area;
(7) Deliveries and staging requirements for incoming and outgoing materials and/or debris;
(8) Utility coordination;
(9) Site safety and access;
(10) Maintenance and protection of traffic;
(11) Routing, dispatching, and scheduling;
(12) Material deliveries;
(13) Equipment movement;
(14) Crane positioning;
(15) Excavation, demolition, and debris removal;
(16) Concrete deliveries;
(17) Truck access;
(18) Material handling facilities, yard storage, and staging areas; and
(19) Construction worker access and screening.

C. Coordinating construction projects to minimize inconvenience for residents, workers, businesses, pedestrians, vehicles, and commuters by focusing on the following:
(1) Access to City tunnels and bridges;
(2) Traffic control;
(3) Express buses;
(4) Access to residential areas;
(5) Access to businesses;
(6) Access for local workers;
(7) Pedestrian access; and
(8) Tourist access to World Trade Center site and surrounding areas.

D. Ensuring that the Lower Manhattan area remains neat, clean and orderly throughout construction by coordinating the following:
(1) Area clean up between sites with the New York City Department of Sanitation and the local Business Improvement District;
(2) Construction barricades, fences, and signage;
(3) Construction vehicle cleaning; and
(4) Construction trailer space.

E. Communicating with residents, businesses, and the general public through a communications director working with each agency's communications and public outreach personnel; providing a central focus on issues critical to the local community and the construction industry, by coordinating initiatives, public outreach, and information on the following:
(1) Environmental performance commitments;
(2) Site safety;
(3) Programs for local businesses during construction;
(4) Minority and women business and worker participation in the rebuilding efforts;
(5) Job opportunities during the rebuilding;
(6) Utilization of the City coordinated information line (311), as practicable, as the uniform access number for residents and businesses; and
(7) Expansion and use of the LowerManhattan.info website for construction information.

F. Utilizing technology to facilitate coordination of projects including:
(1) Computerized GIS mapping and scheduling of all projects, site access, and street access;
(2) Radio technology for 24-hour communication between the Command Center, critical project sites, essential supplies and materials, concrete plants, NYPD, and others; and
(3) Internet site and e-updates for communication with public concerning status of construction projects and street closures.

10. Agency Assistance and Cooperation. All public authorities, or departments, divisions, boards, bureaus, commissions or agencies of the state or any political subdivision thereof shall cooperate fully with the Command Center Executive Director and to provide such assistance as may be required in fulfilling its obligations. Such

assignment may include the assignment of staff and the provision of support services.

11. Project Responsibility. The creation of the Command Center does not abrogate any agency or public or private entity from its responsibility for full management of its construction project or projects in Lower Manhattan. All aspects of each project will be the responsibility of the entity building that project. The Command Center provides a means to enable each entity to better coordinate its project or projects with the surrounding projects and for a central body to provide coordinated initiatives and communication with the public on issues important to the public. The Executive Director is hereby given authority to review and comment on project budget items critical to overall coordination. Each project budget must be provided to the Executive Director at least 60 days prior to final adoption by the agency or authority. Each agency and authority is hereby directed to incorporate such comments as appropriate to further the purposes of the Command Center.

12. Liberty Bonds. All projects funded by Liberty Bonds in Lower Manhattan will be required to coordinate all work with the Command Center. Projects valued at over $50 million will require the participation at the Command Center of a high level coordination specialist by the private entity responsible for the building pursuant to Part 5 of this Order. Consistent with law, all agencies with authority to issue Liberty Bonds will include this requirement in the Bond issuance.

13. Powers and duties of agencies. Nothing in this Order shall serve as a limitation on the powers and duties of any State or City agency.

14. Effective Date. This Order shall take effect immediately and shall expire on December 31, 2010.

G I V E N under my hand and the Privy Seal of the State in the City of Albany this twenty-second day of November in the year two thousand four.

/s/ George E. Pataki

BY THE GOVERNOR

/s/ John P. Cahill

Secretary to the Governor