

RFP# C-26503:

**Design-Build for the
Excavation of Running
Tunnels, Borough of
Manhattan**

Project Overview Meeting

November 18, 2004

No.  Subway Line Extension

Opening Remarks

Mysore L. Nagaraja

President MTA Capital Construction

No.  **Subway Line Extension**

Procurement

Lloyd Lampell

Senior Director

No.  **Subway Line Extension**

Pertinent Dates

- Issue RFP – Step 1 October 27th
- Project Overview Conference November 18th
- Request for Clarification December 3rd
- Step 1 Proposal Due December 17
- Issue Request for Proposal December 2004
- Proposal Due February 2005
- BAFO Due March 2005
- Anticipated Contract Award April 2005

Introduction

Joseph F. Trainor, P.E.,
Vice President & Program Executive

No.  **Subway Line Extension**

Far West Midtown Manhattan Rezoning Hudson Yards Development Area

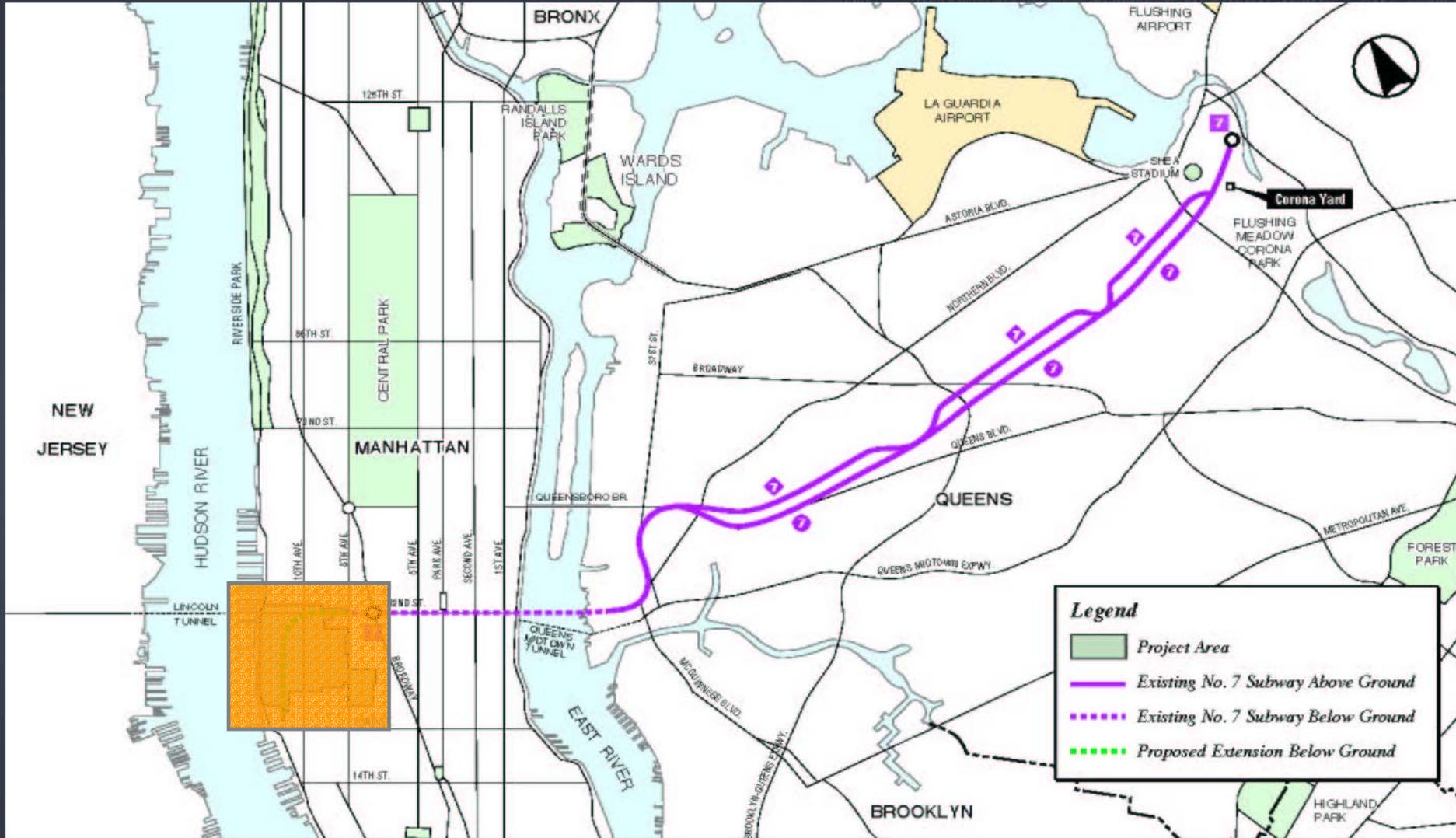




Preferred Direction



No. 7 Project Context



No. 7 Proposed Alignment



**10th Avenue
Station**

**34th Street
Station**

Jacob Javits Convention Center Expansion



Existing Hudson Yard



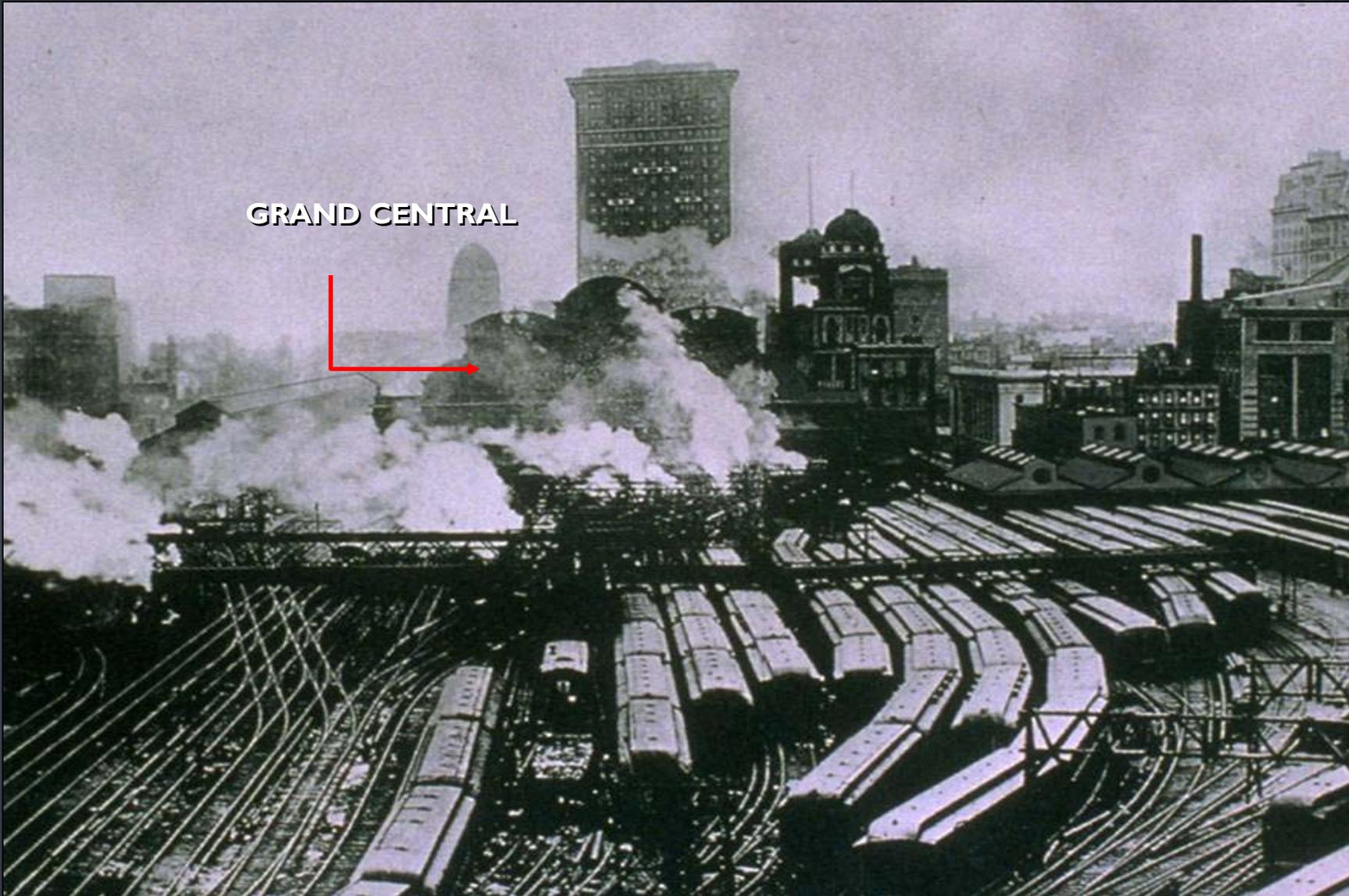
Far West Midtown Manhattan Rezoning and Multi-Use Facility



Proposed Multi-Use Facility







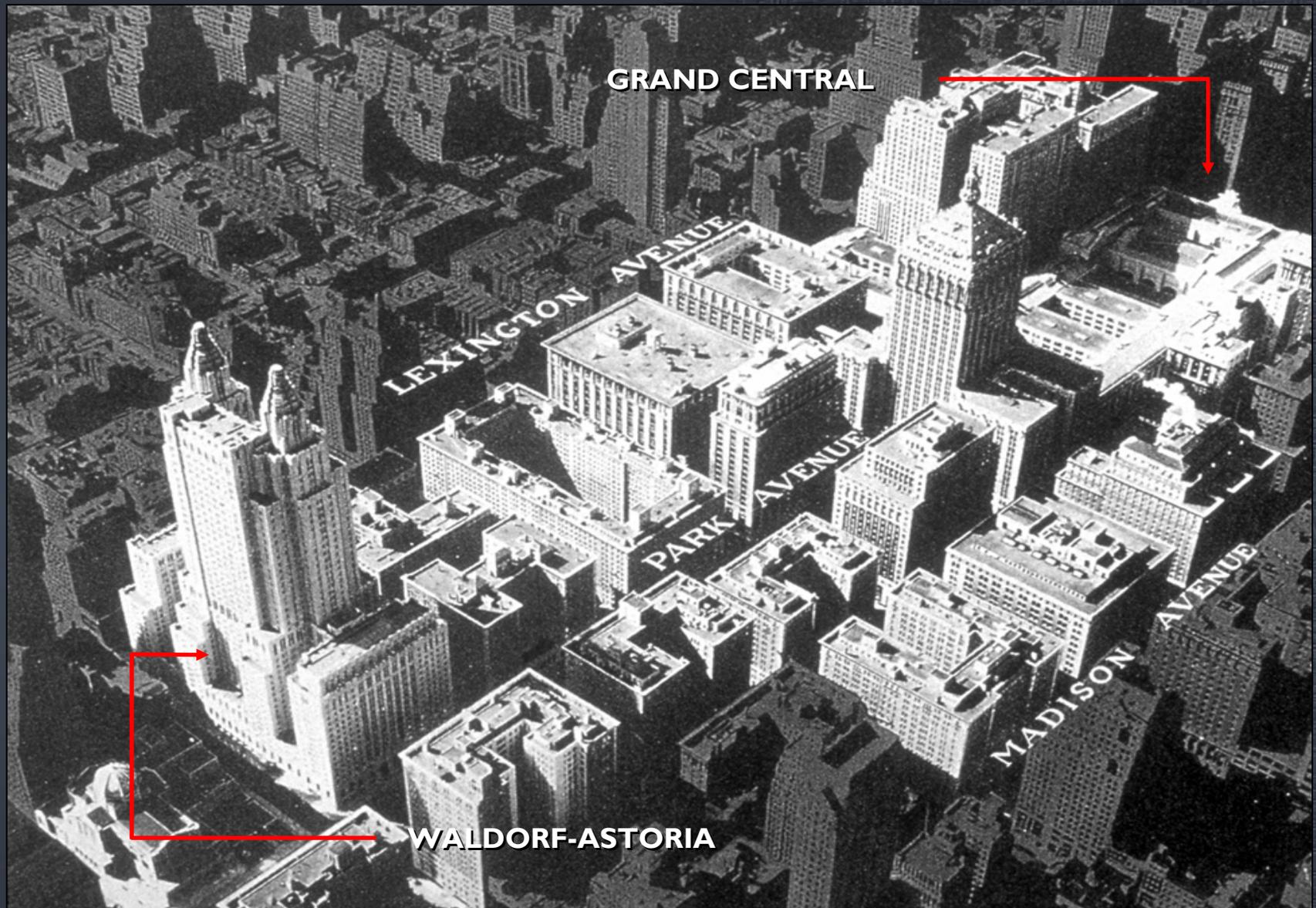
GRAND CENTRAL

Looking south, circa 1900



GRAND CENTRAL

Looking south, circa 1913



Aerial photo, circa 1935



Looking South, circa Today

2025 Projected Development



\$ Funding \$



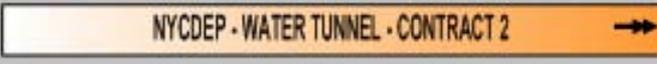
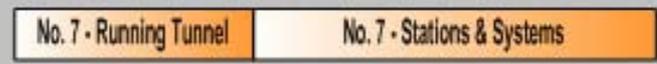
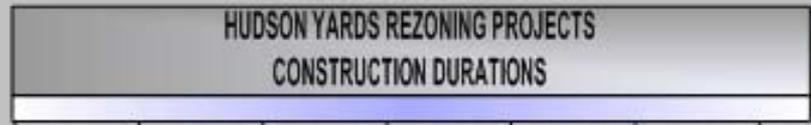
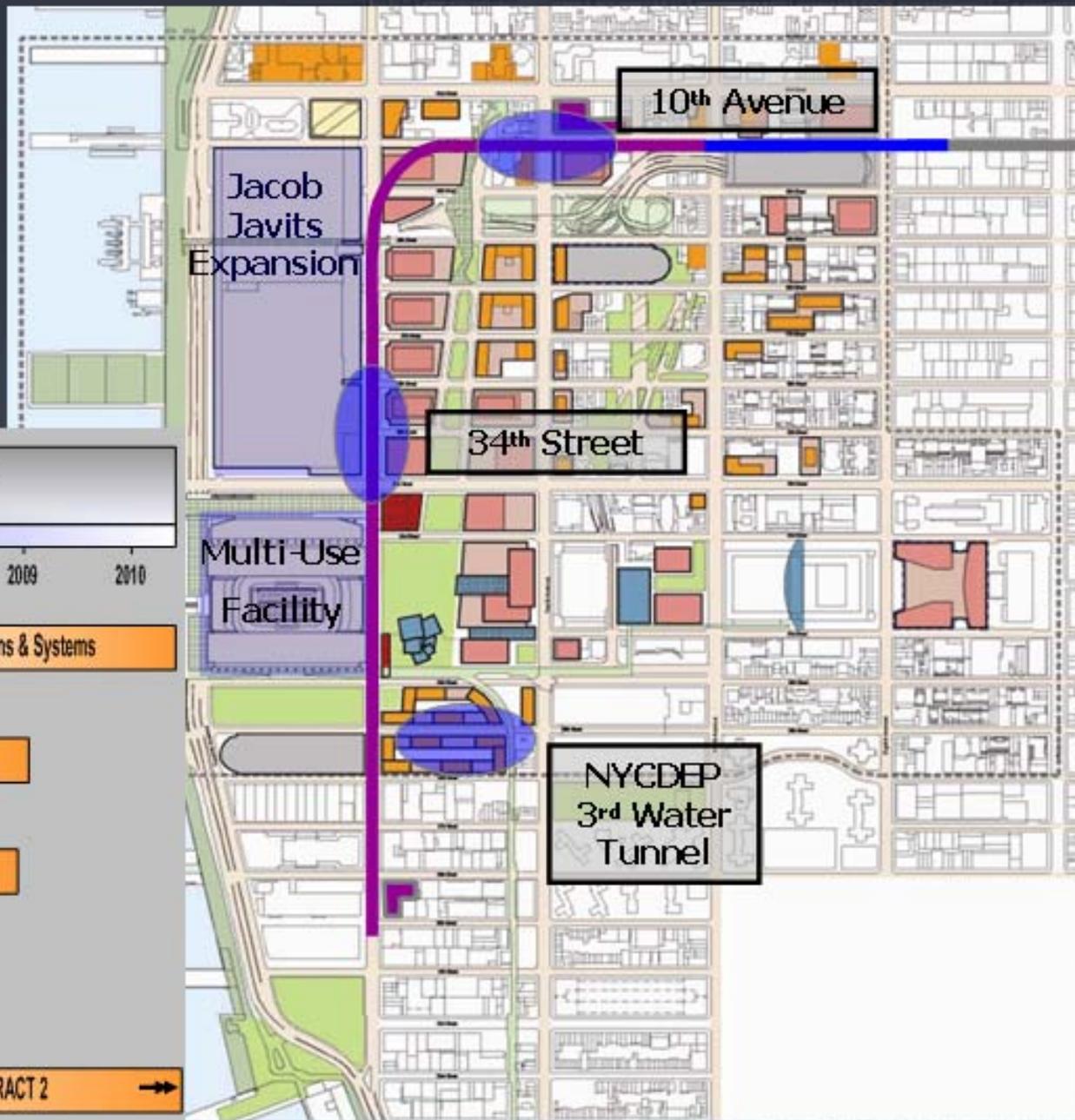
Key Details of the Project

David Donatelli, P.E.,

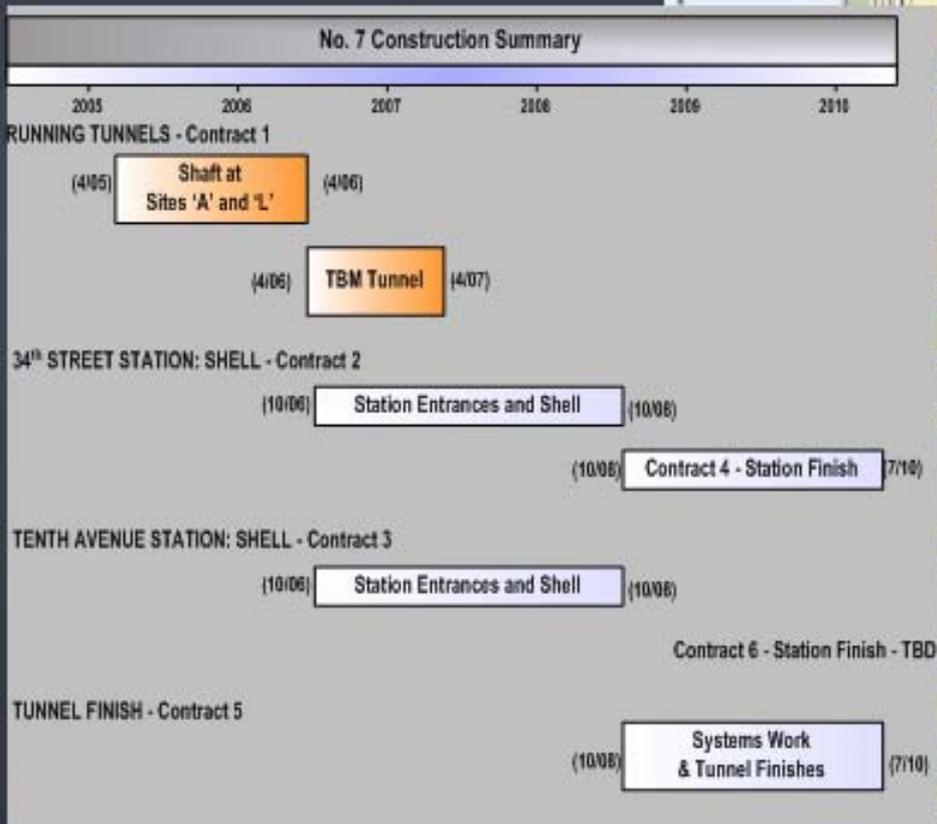
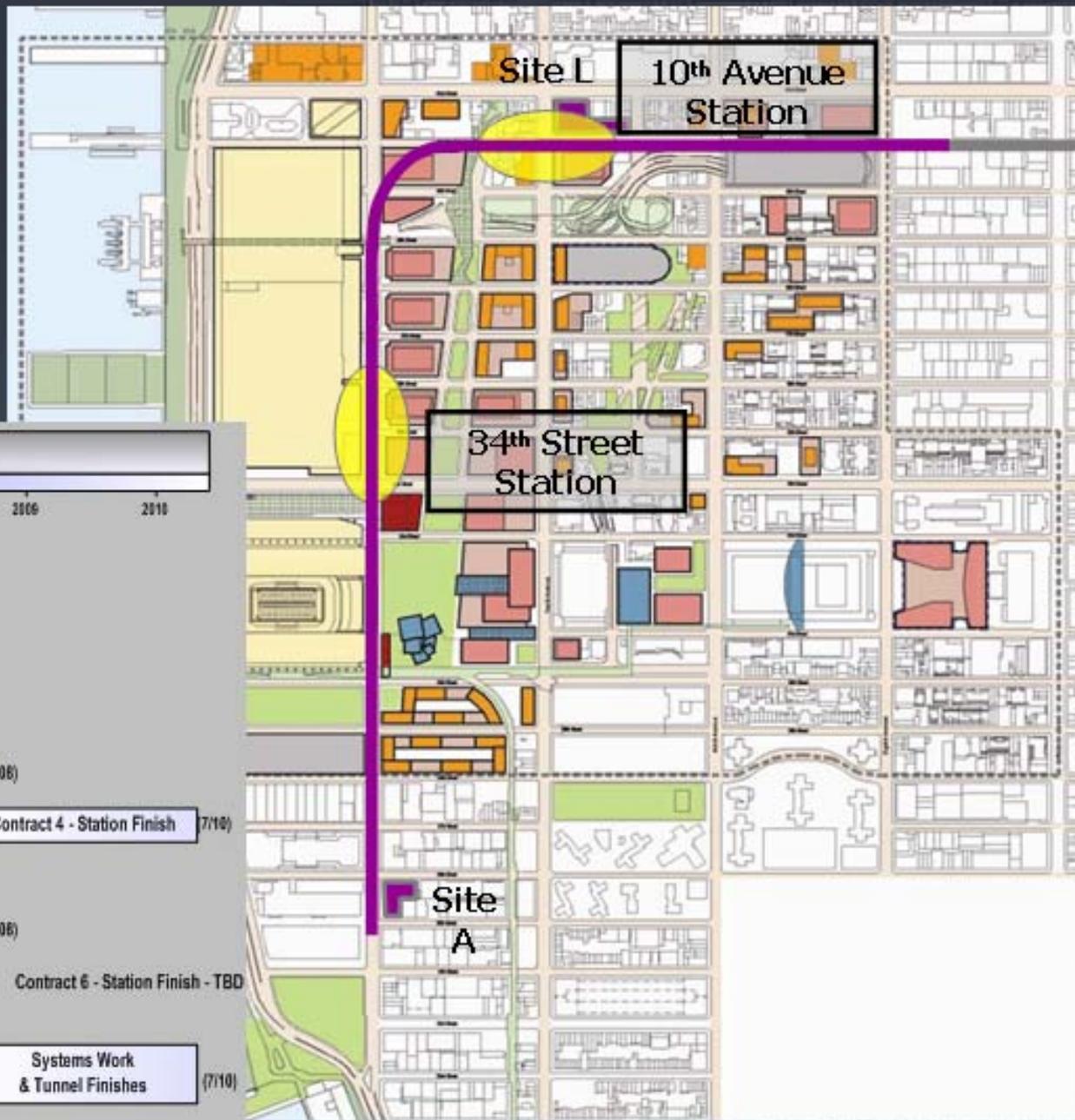
PB Team Program Manager

No.  **Subway Line Extension**

Hudson Yards Projects And Schedules



No. 7 Schedule

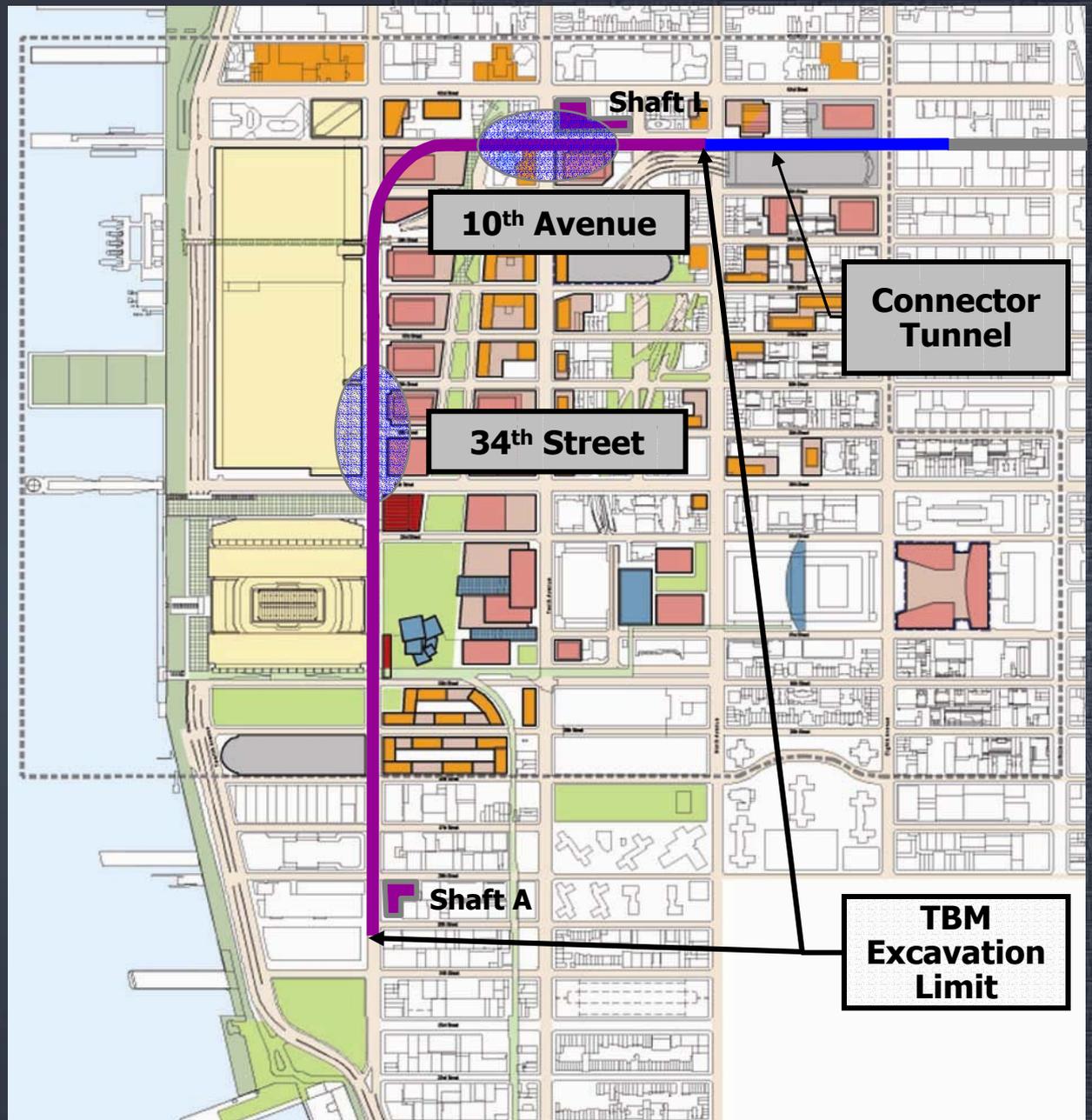


Running Tunnel

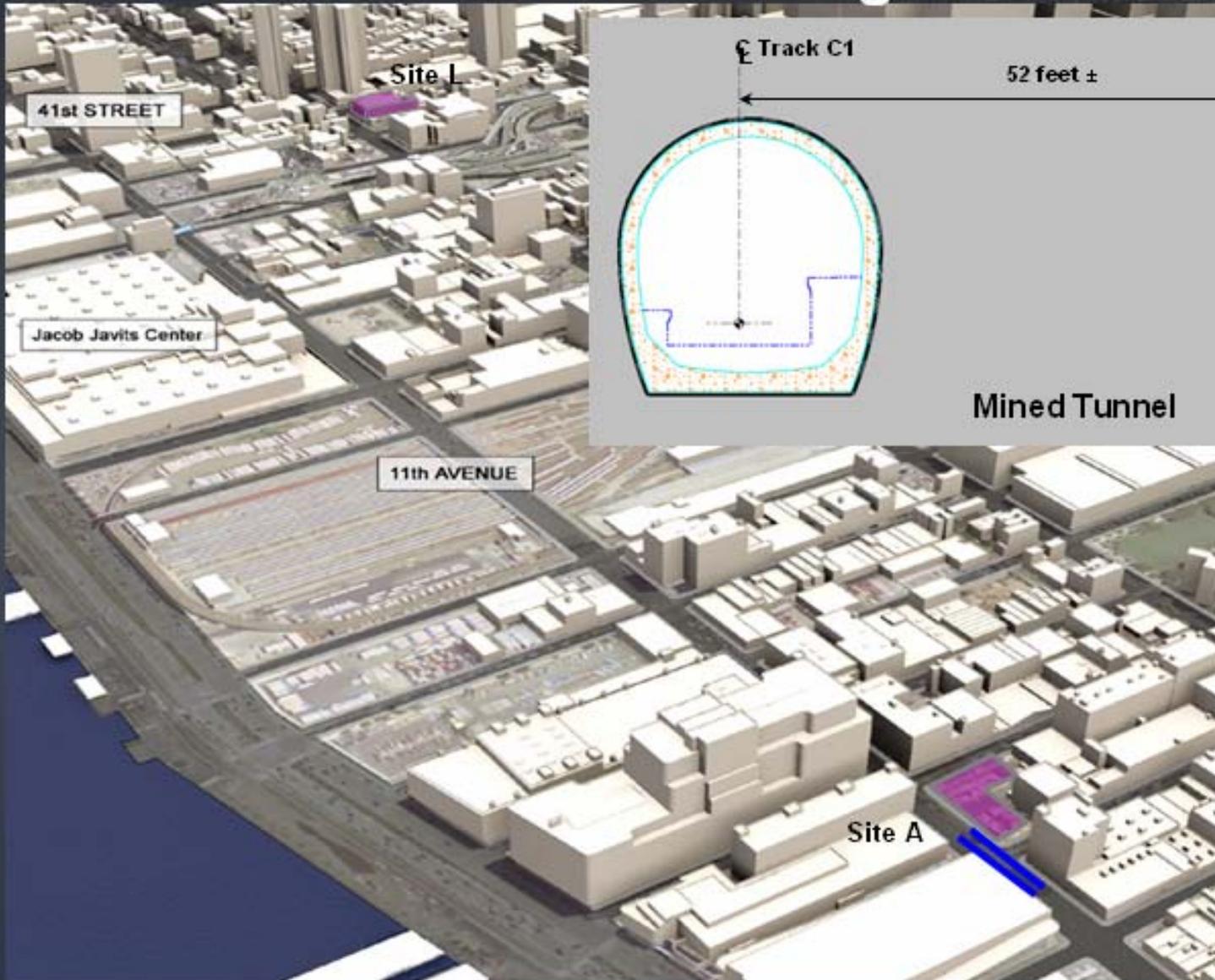
- **Horizontal Alignment**
- **Shaft Sites and Laydown Areas**
 - ◆ **Shaft Sites**
 - Site A
 - Site L
- **Geotechnical Data Collection Program**
- **Alignment Profile and Rock Line**
- **Proximity to Adjacent Structures**
- **Lining Options & Waterproofing Requirements**

Number 7

Subway Line Extension Proposed Alignment

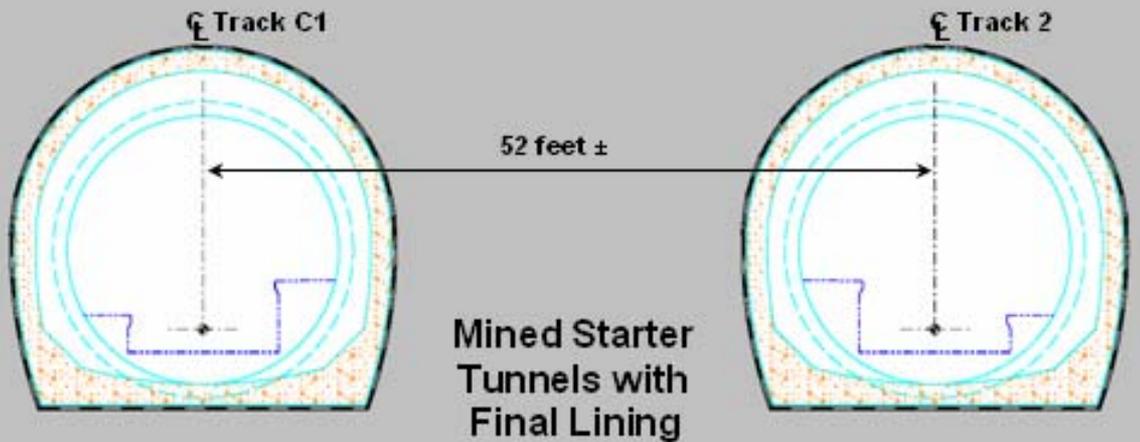
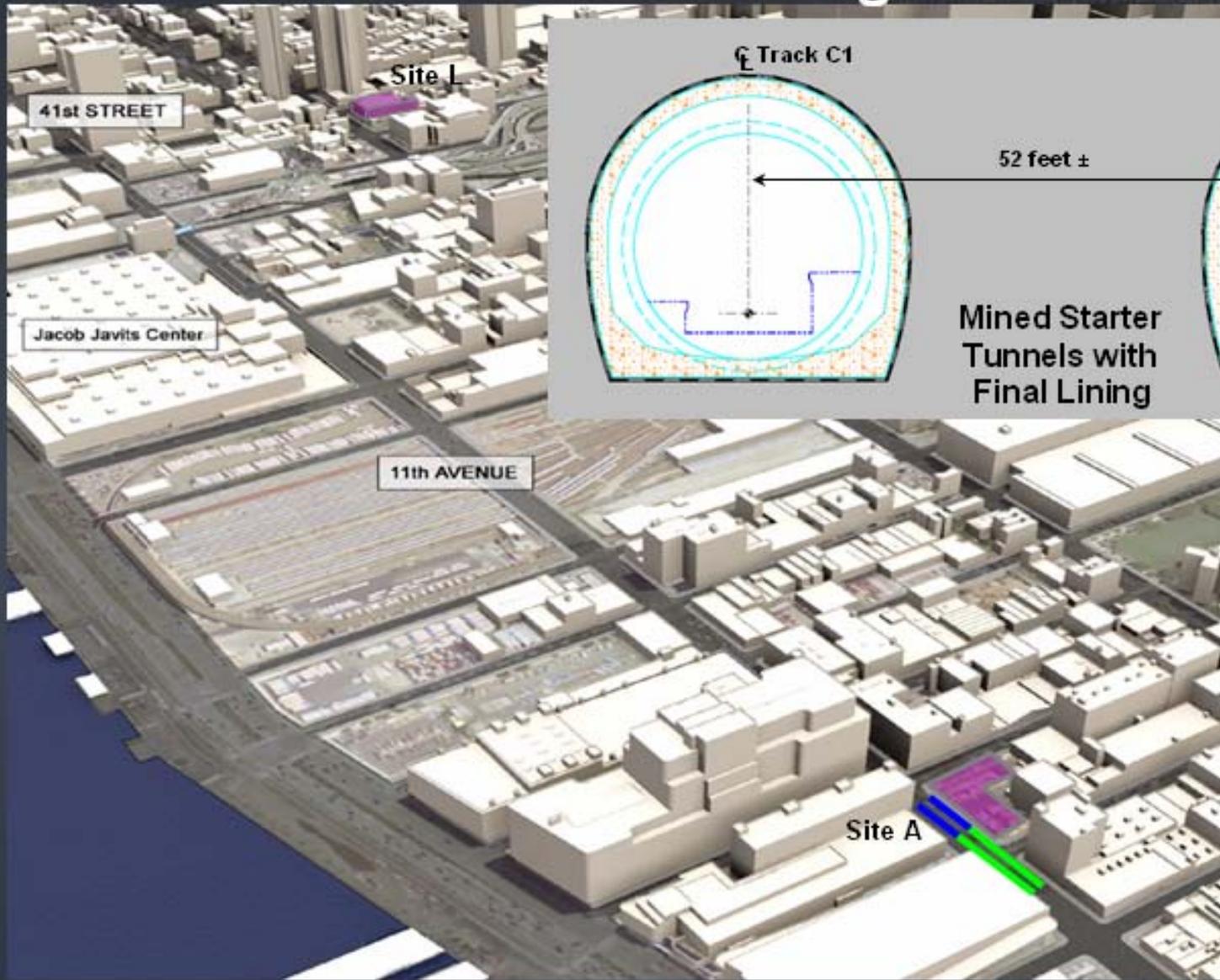


Horizontal Alignment



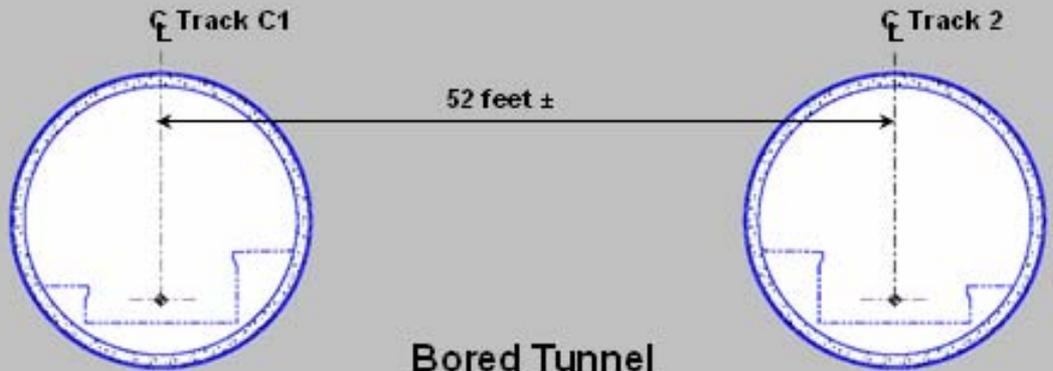
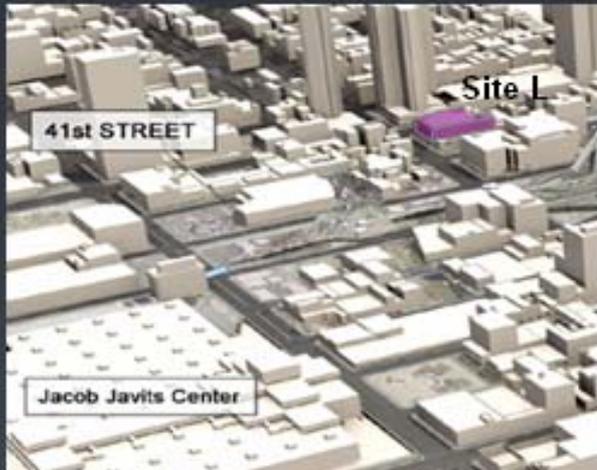
Finished Tunnel
Width = 17'

Horizontal Alignment

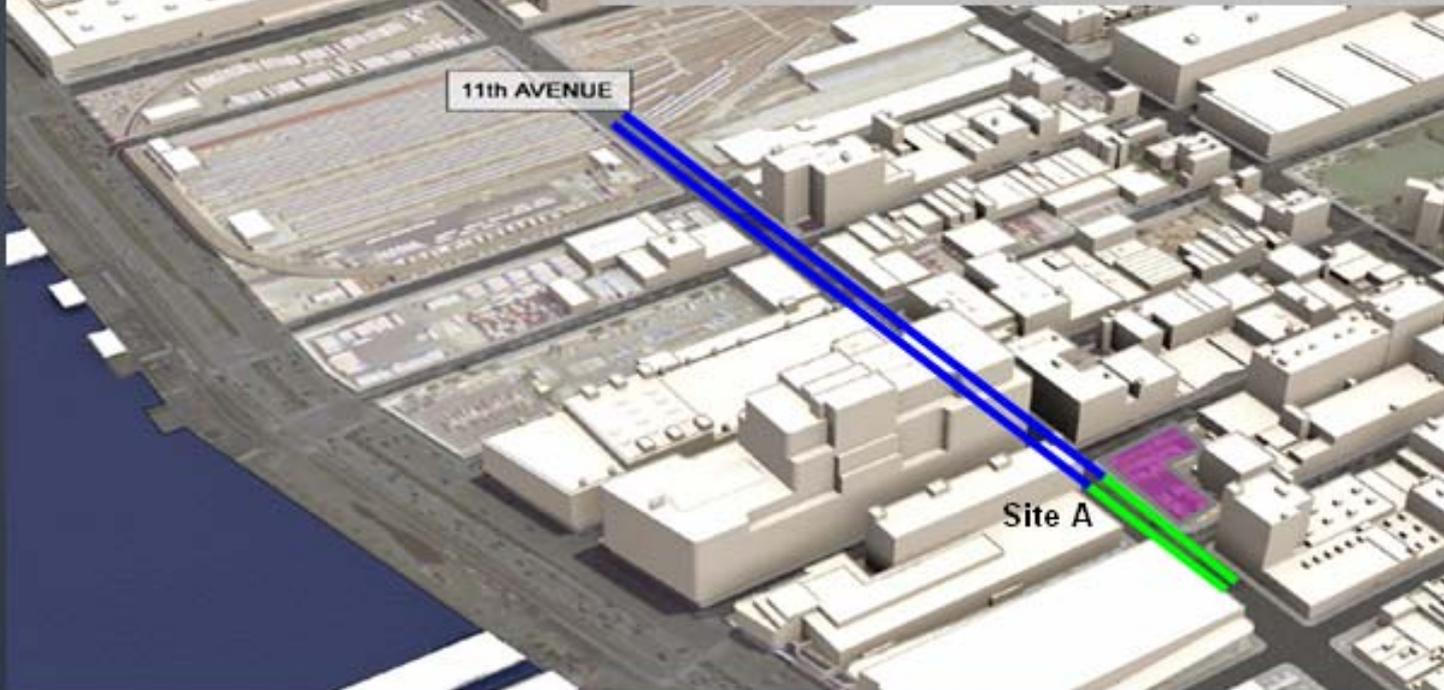


**Finished Tunnel
Width =**
24' (max)
19'-6" (min)

Horizontal Alignment



Bored Tunnel
With Final Lining

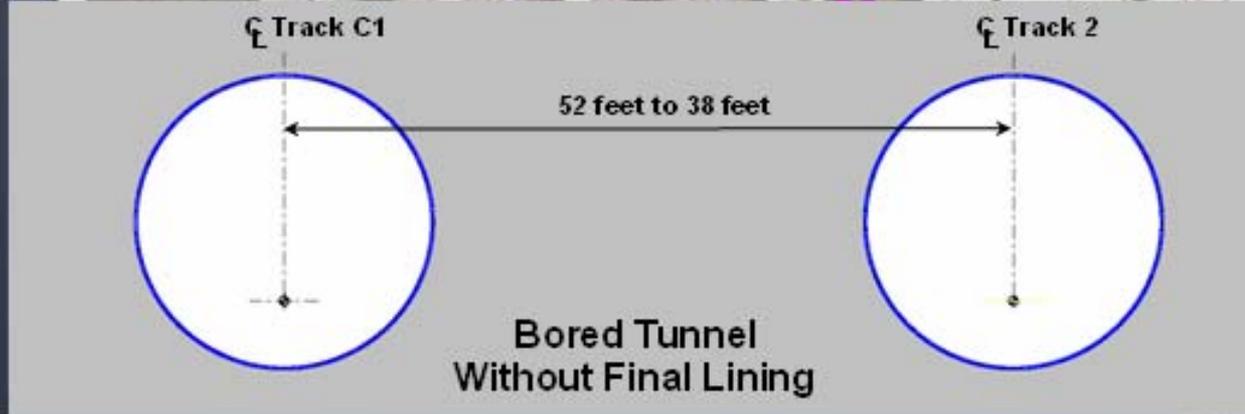


Finished Tunnel
Diameter
= 19'-6"
(min)

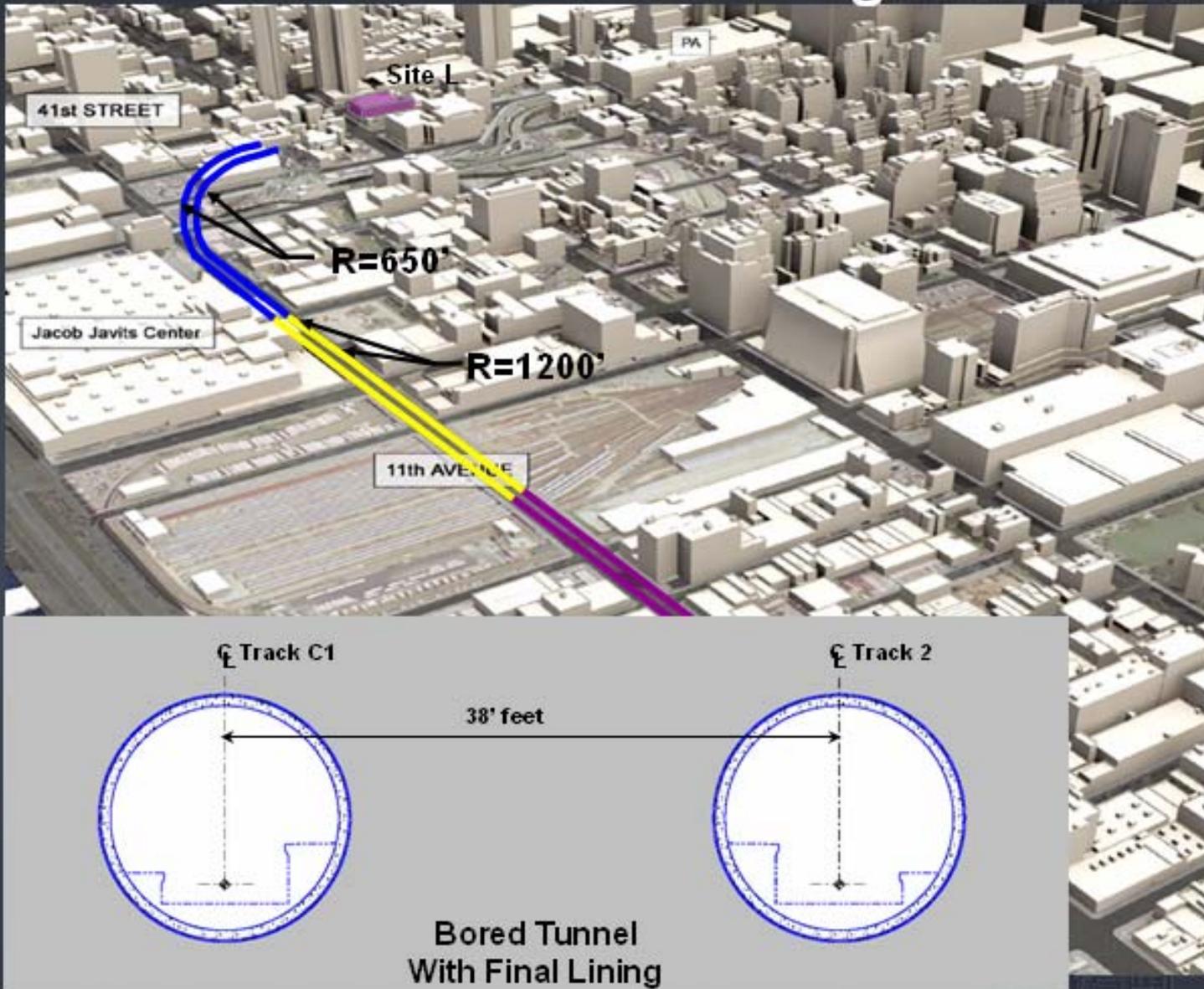
Horizontal Alignment



Finished Tunnel
Diameter
= 19'-6"
(min)

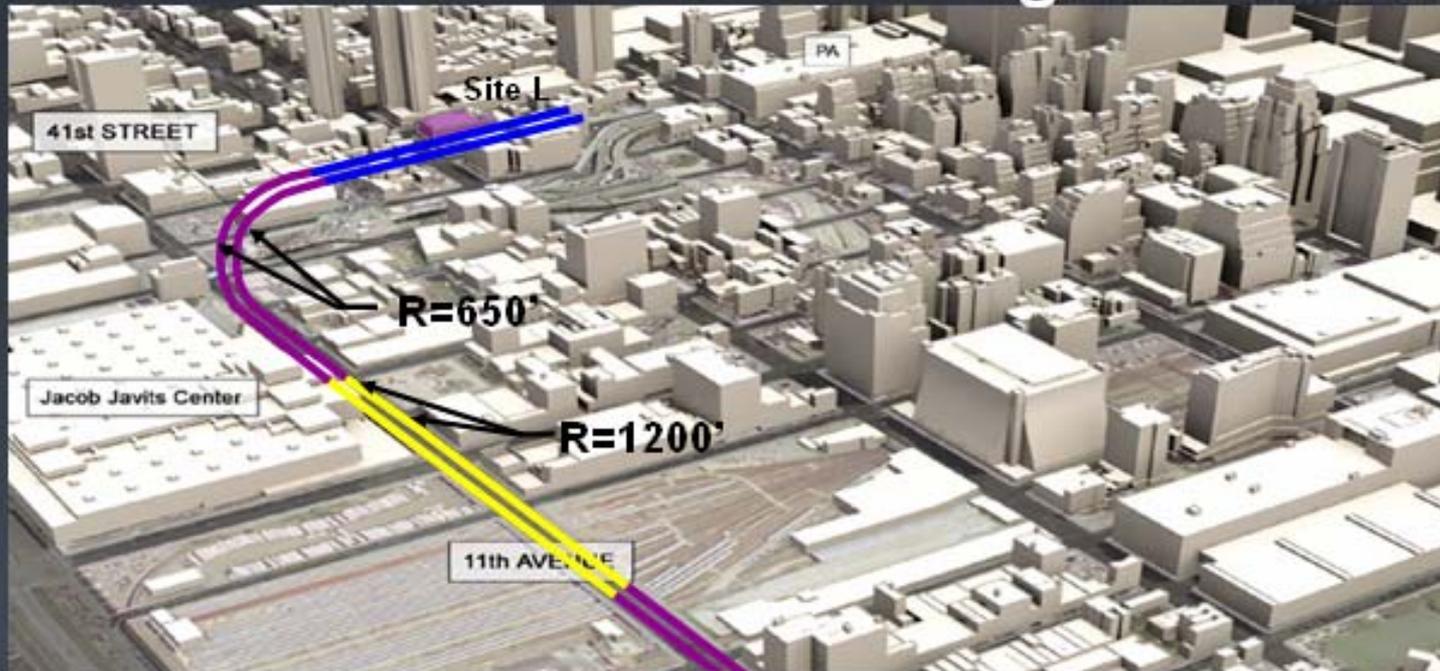


Horizontal Alignment



Finished Tunnel
Diameter
= 19'-6"
(min)

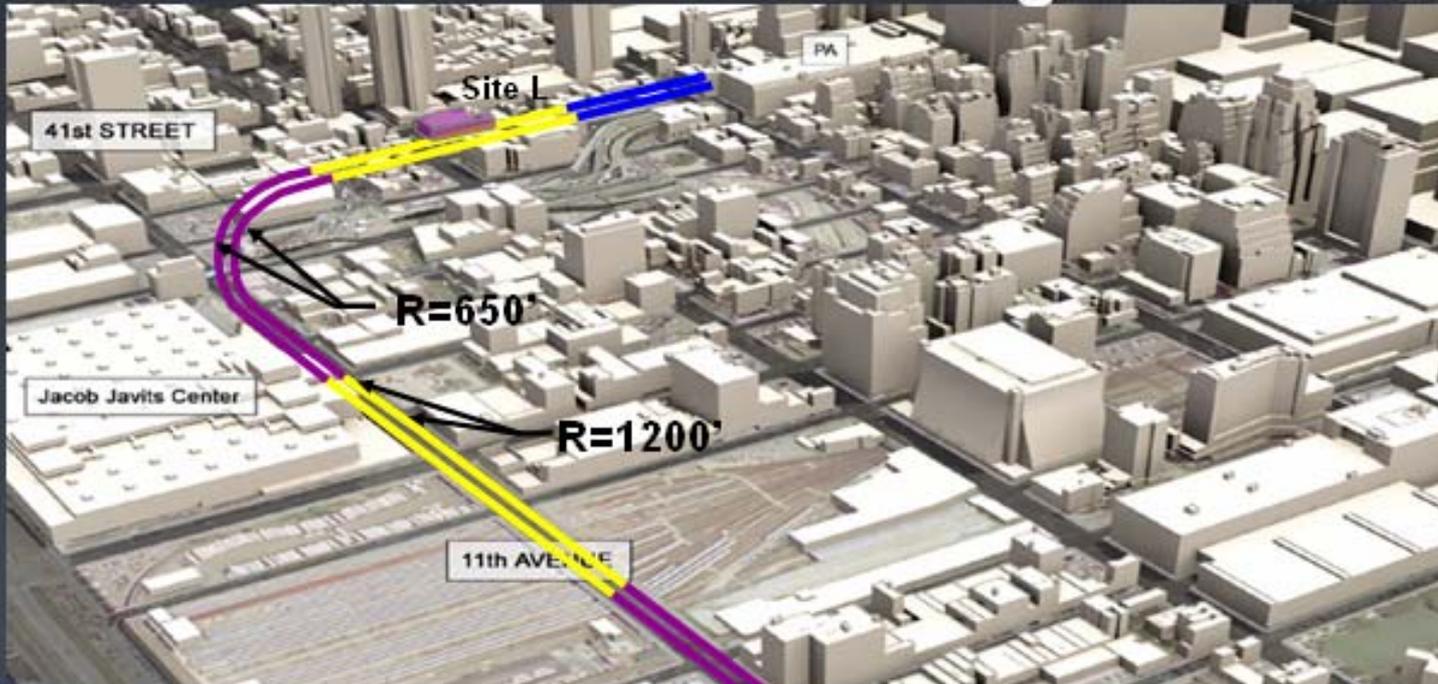
Horizontal Alignment



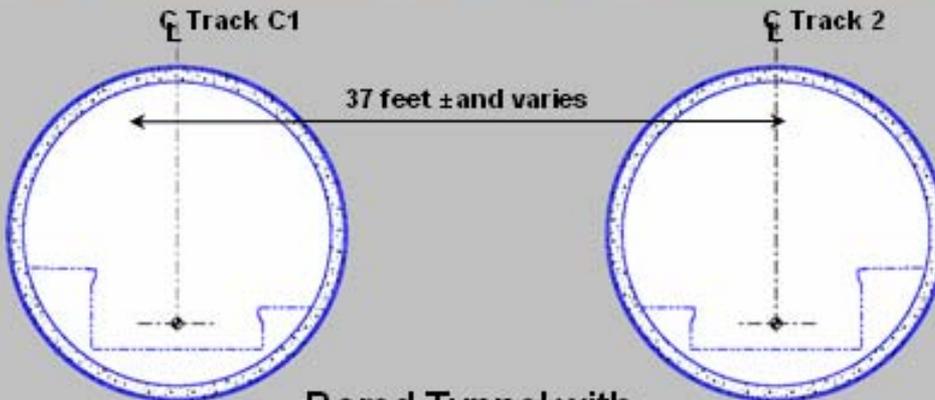
Finished Tunnel
Diameter
= 19'-6"
(min)



Horizontal Alignment

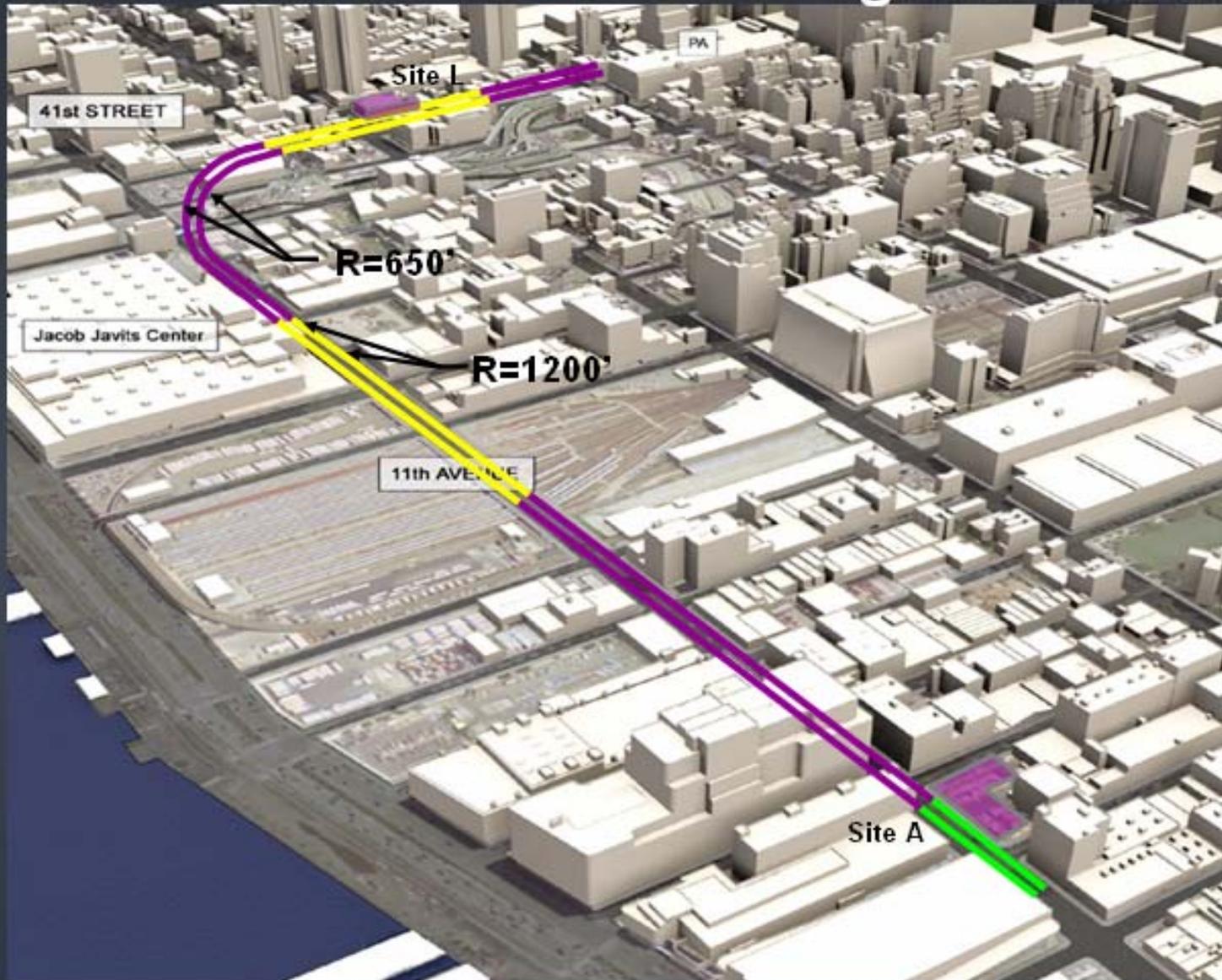


Finished Tunnel
Diameter
= 19'-6"
(min)



Bored Tunnel with
Final Lining

Horizontal Alignment

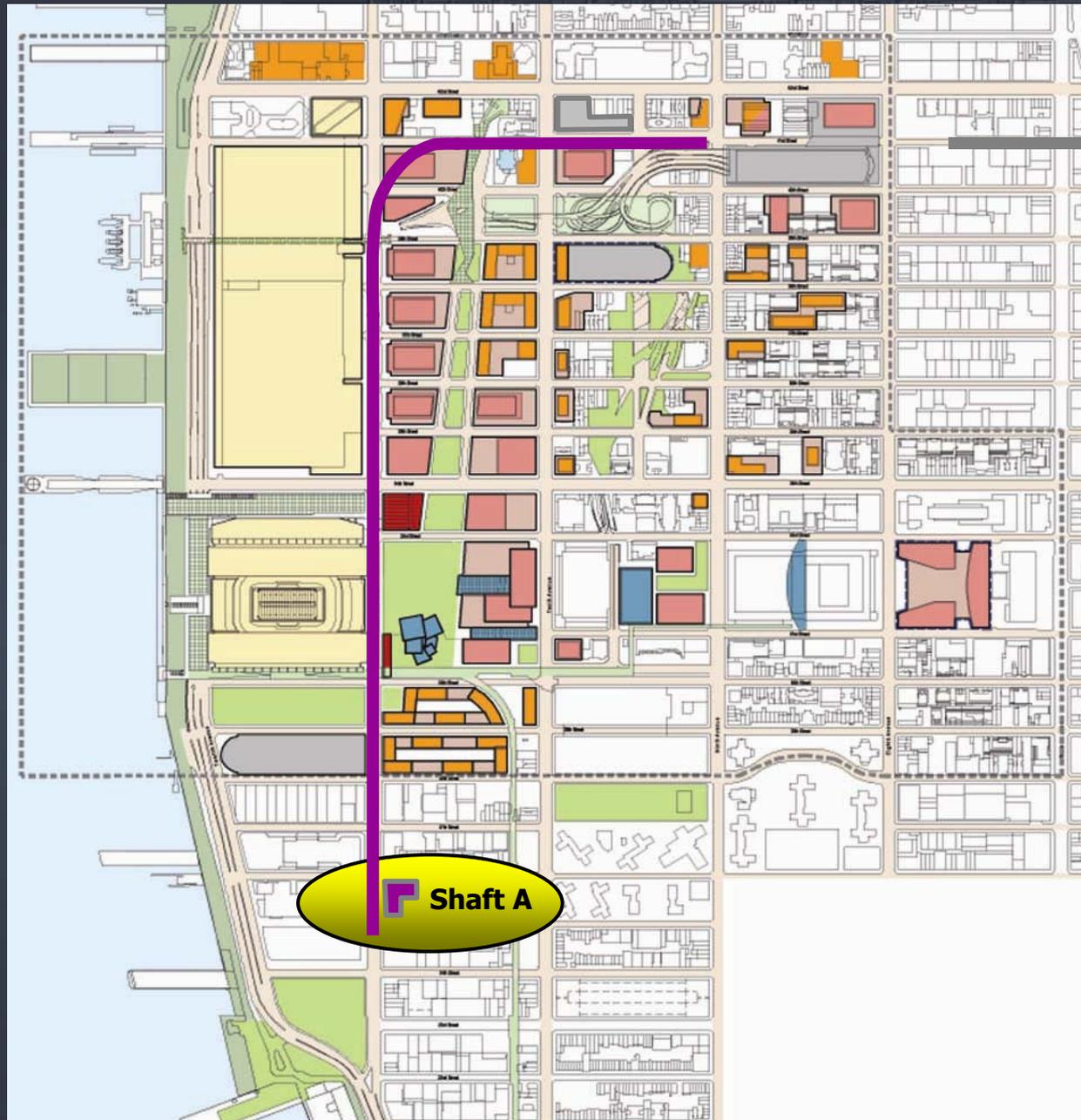


Running Tunnel

- Horizontal Alignment
- Shaft Sites and Laydown Areas
 - ◆ Shaft Sites
 - Site A
 - Site L
- Geotechnical Data Collection Program
- Alignment Profile and Rock Line
- Proximity to Adjacent Structures
- Lining Options & Waterproofing Requirements

Number 7

Site A Shaft



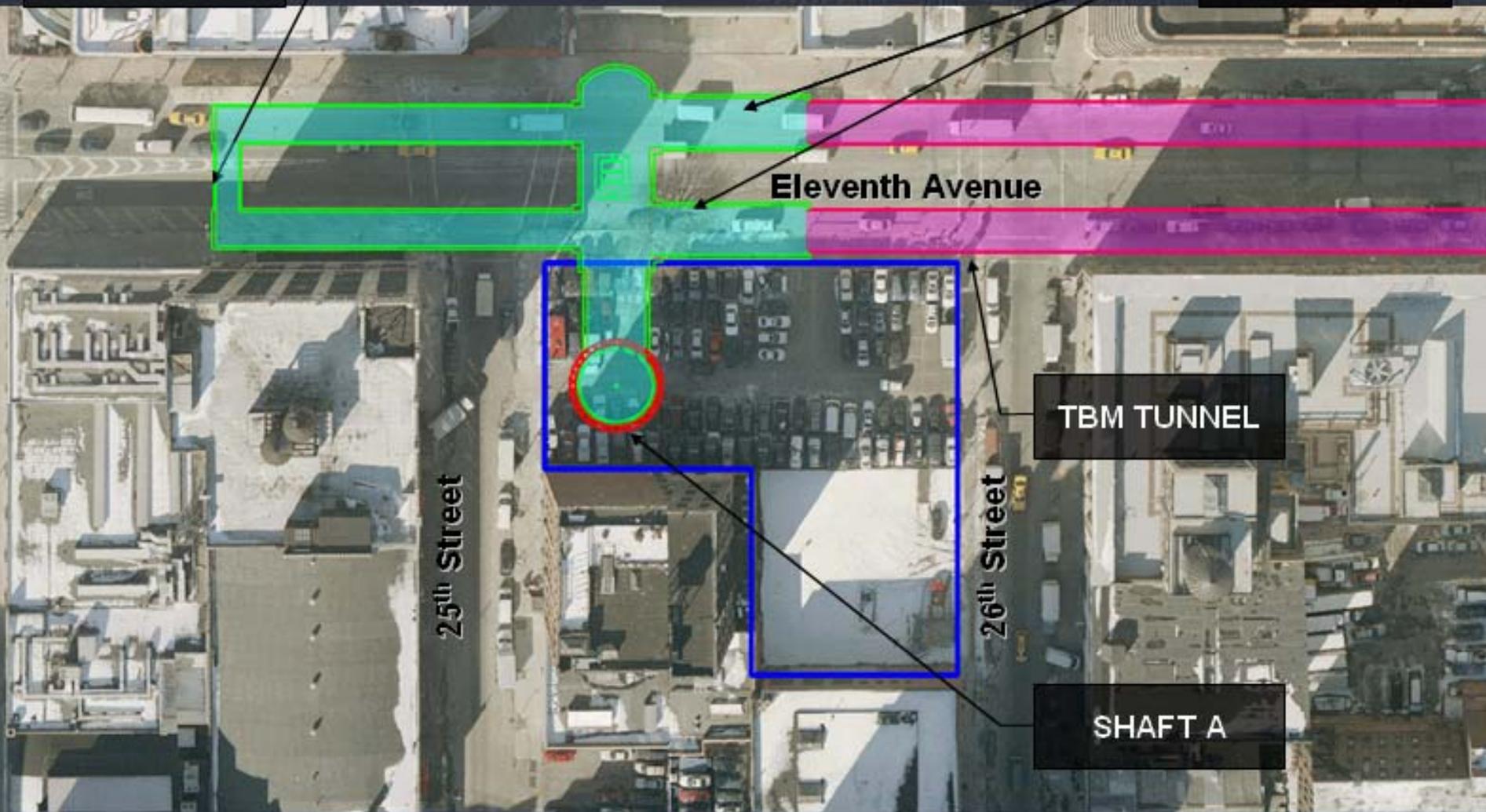
Site A



Site A Construction Activities

CONSTRUCTION
LIMIT

TBM STARTER
TUNNELS



Eleventh Avenue

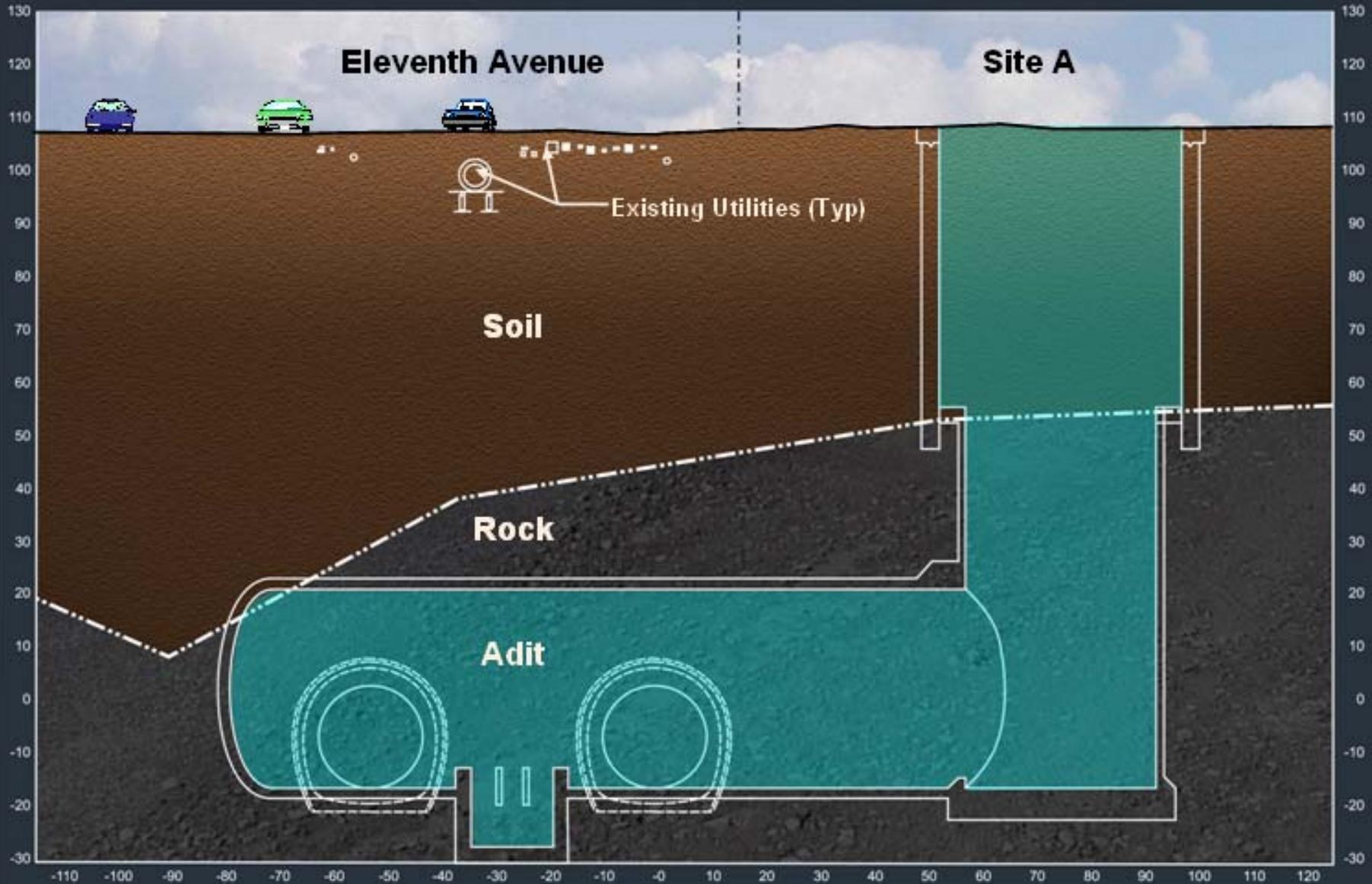
25th Street

26th Street

TBM TUNNEL

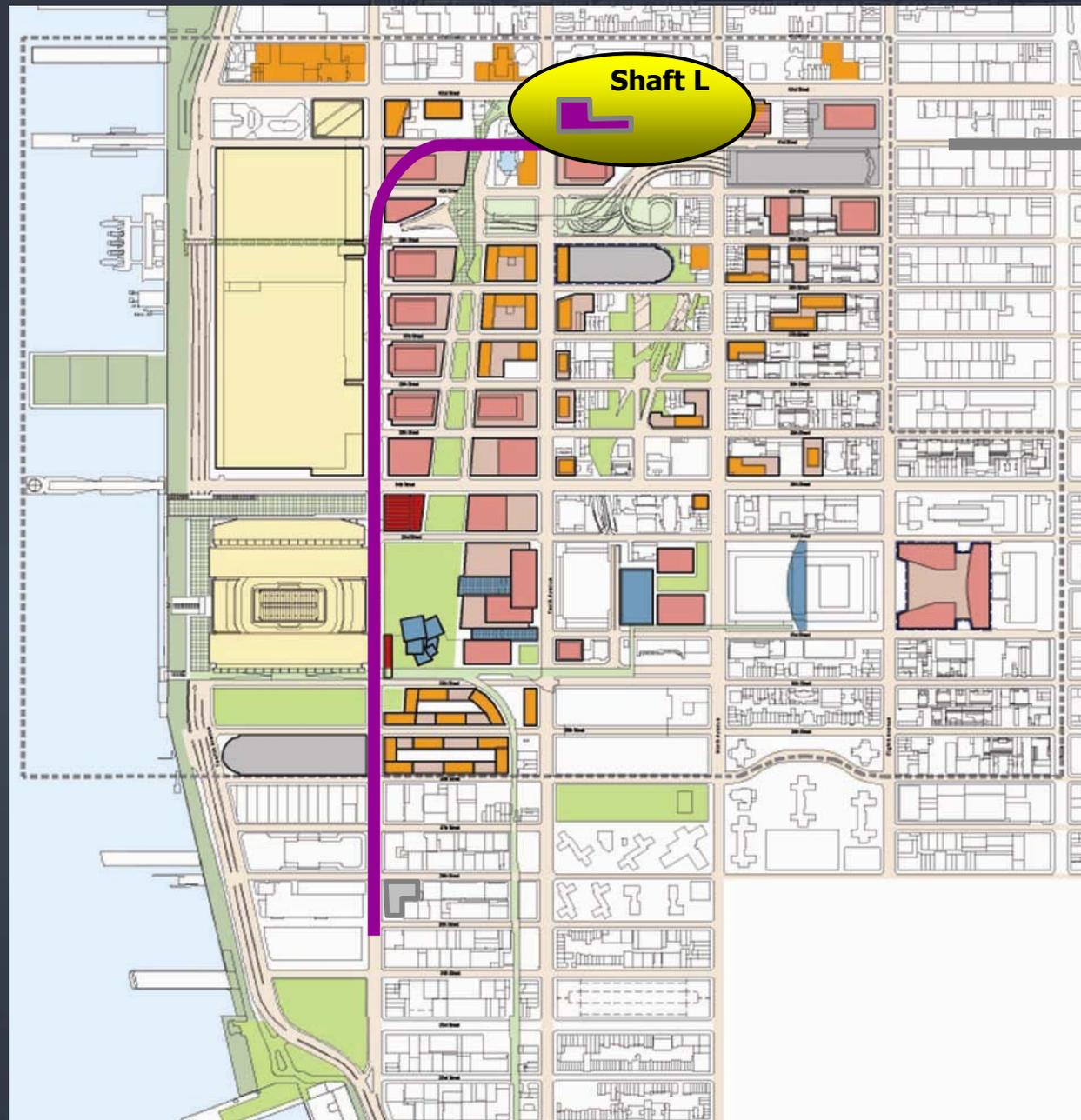
SHAFT A

Site A Shaft and Adit



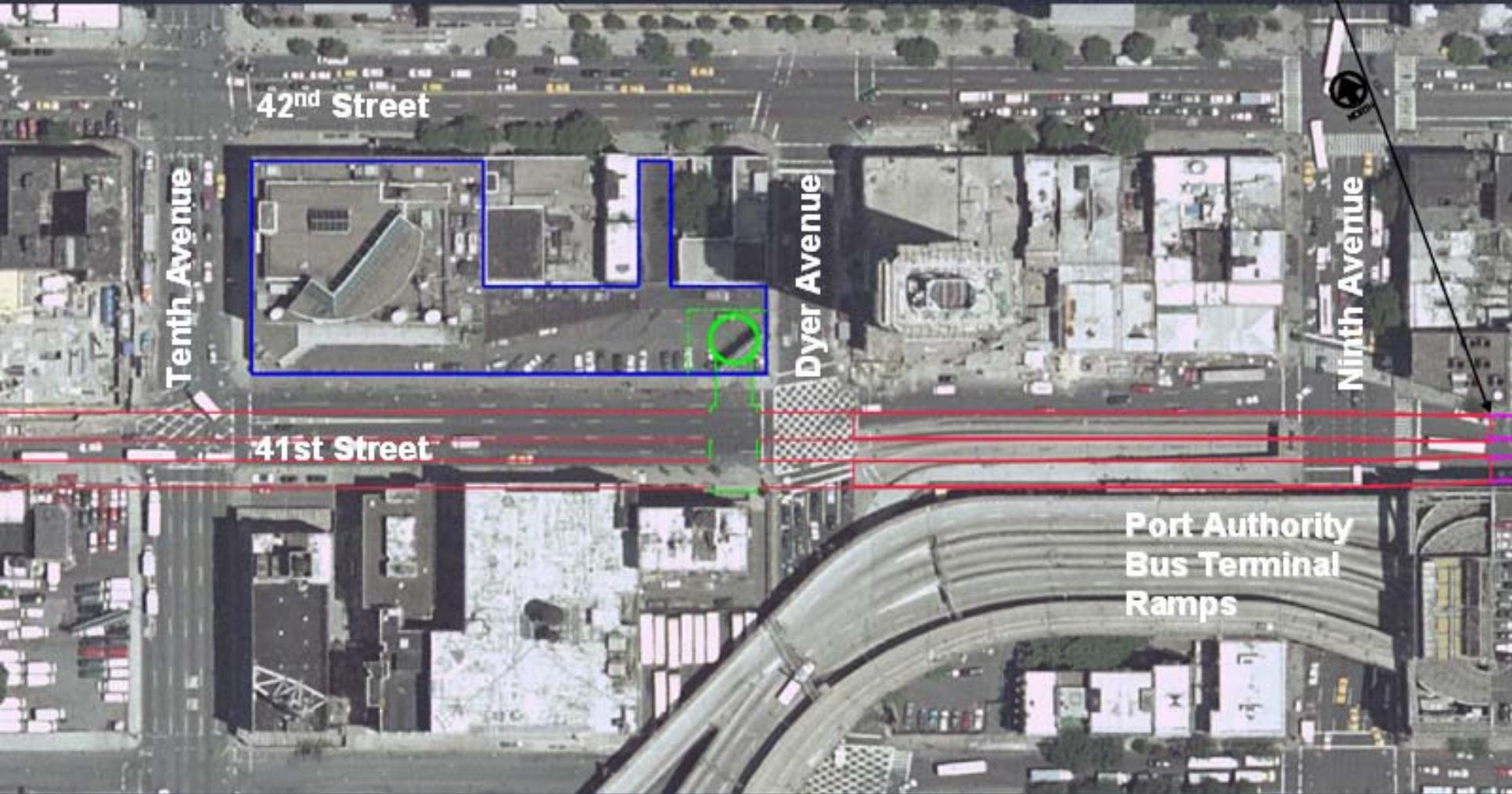
Number 7

Site L Shaft



Site L

CONSTRUCTION
LIMIT

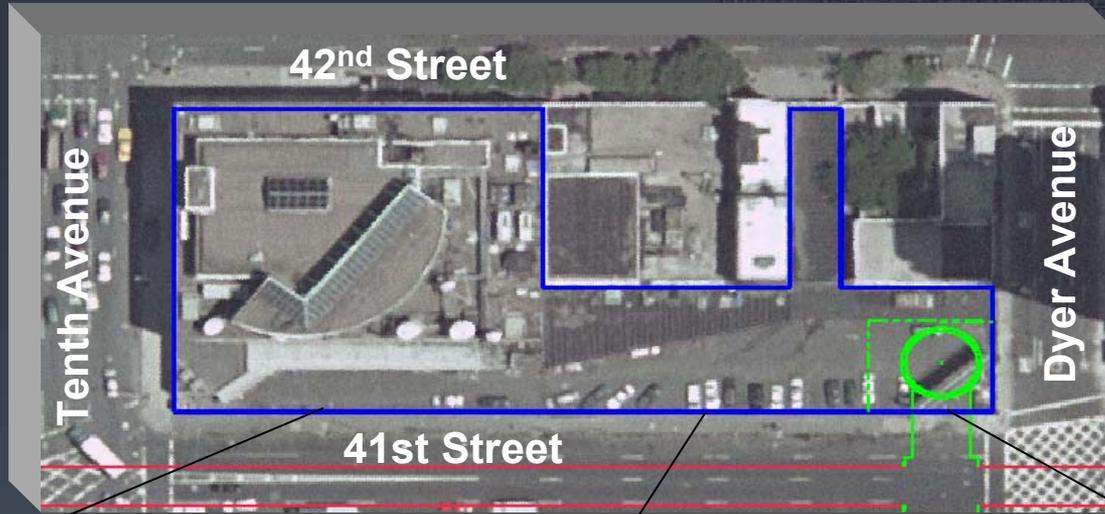


Site L

**CONSTRUCTION
LIMIT**

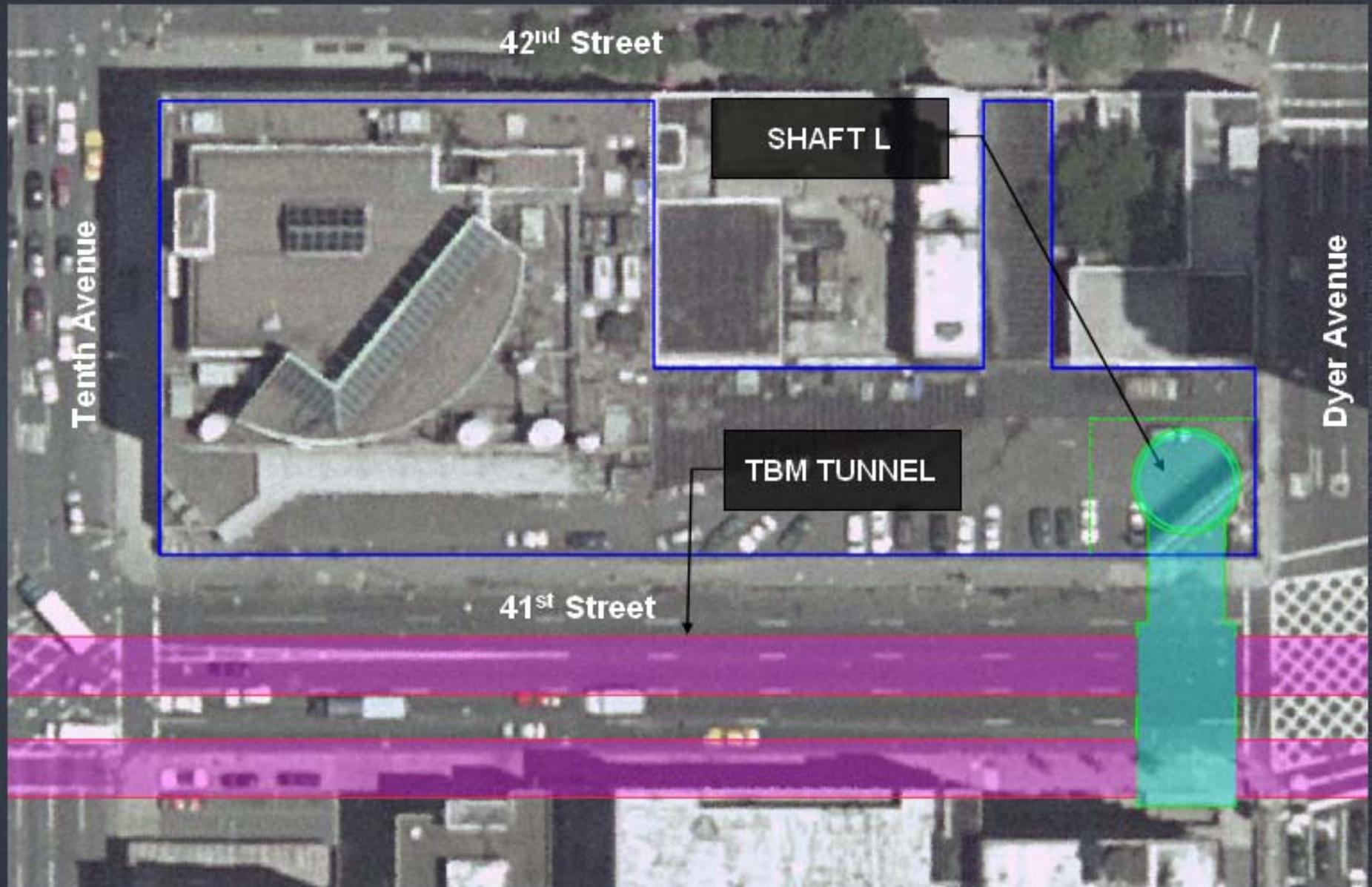


Site L

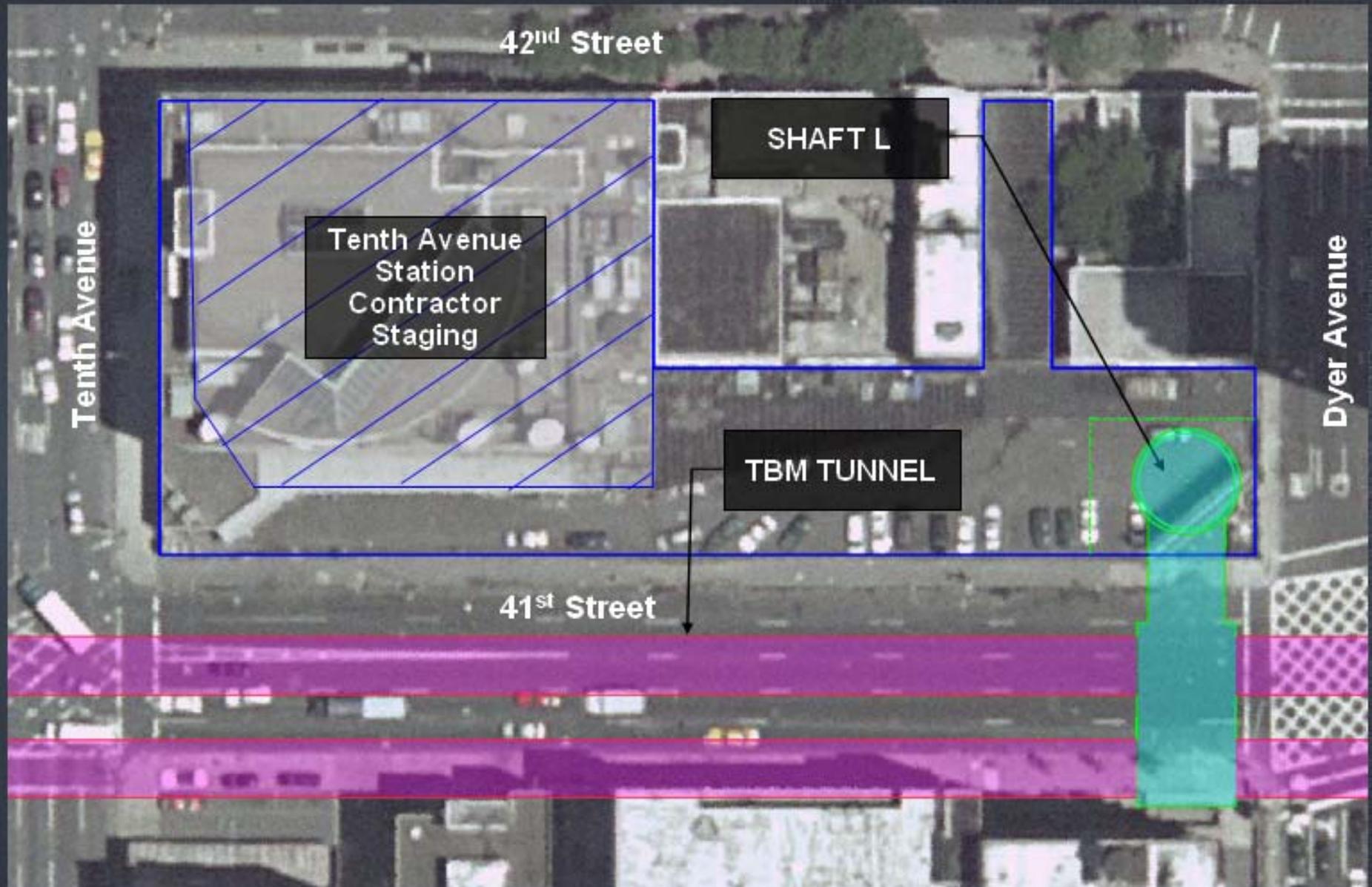


Looking North along 41st Street

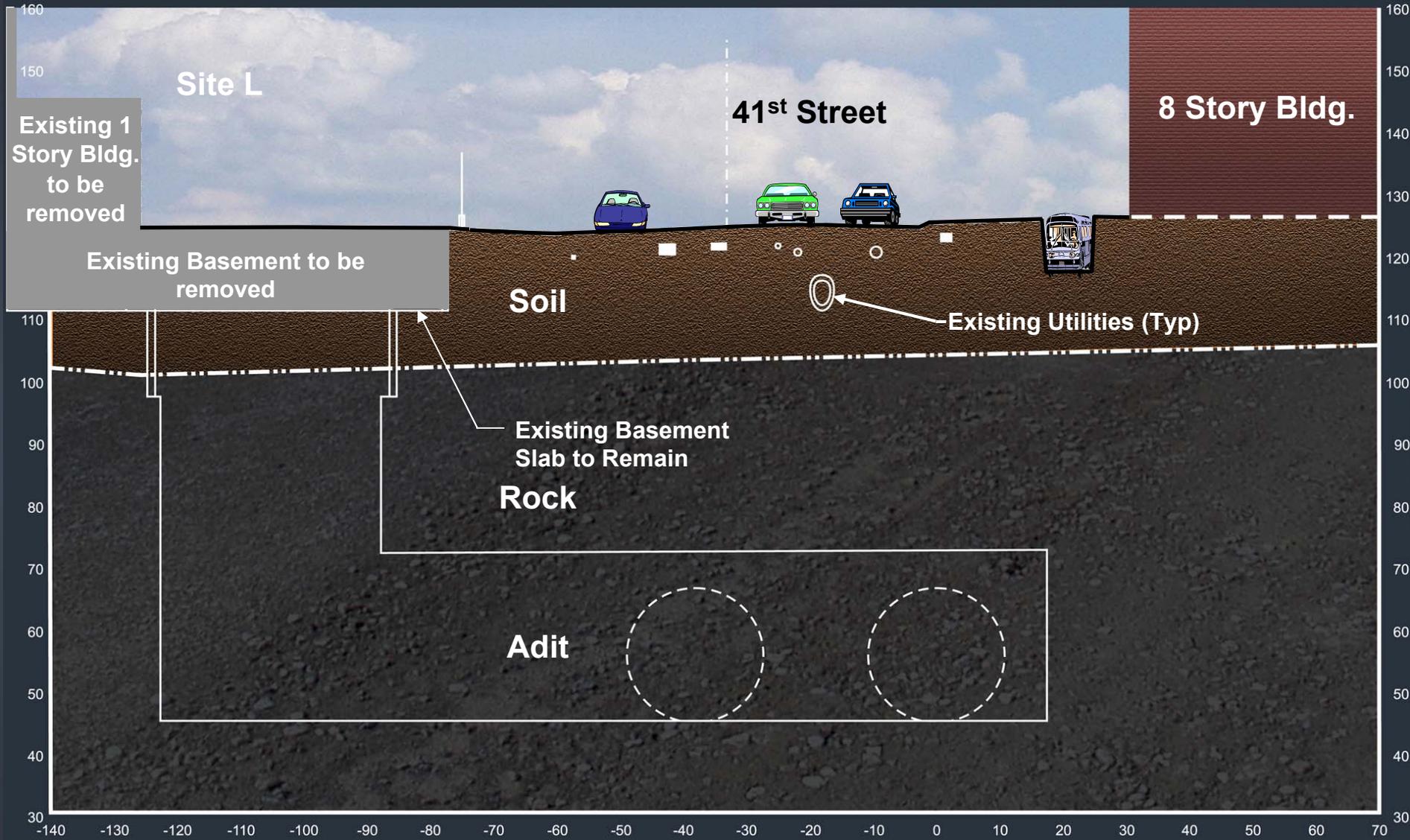
Site L Construction Activities



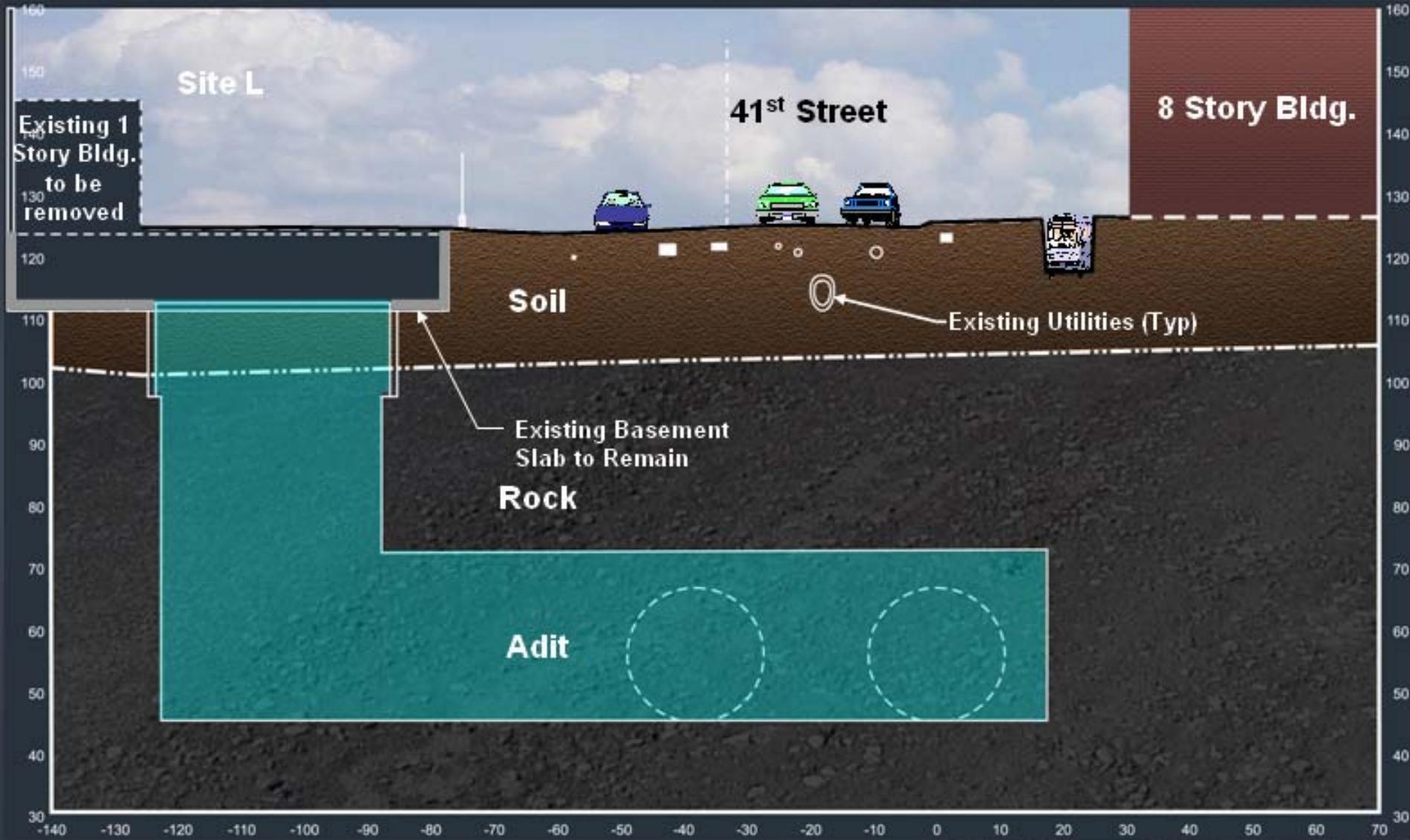
Site L Construction Activities



Site L Shaft and Adit



Site L Shaft and Adit



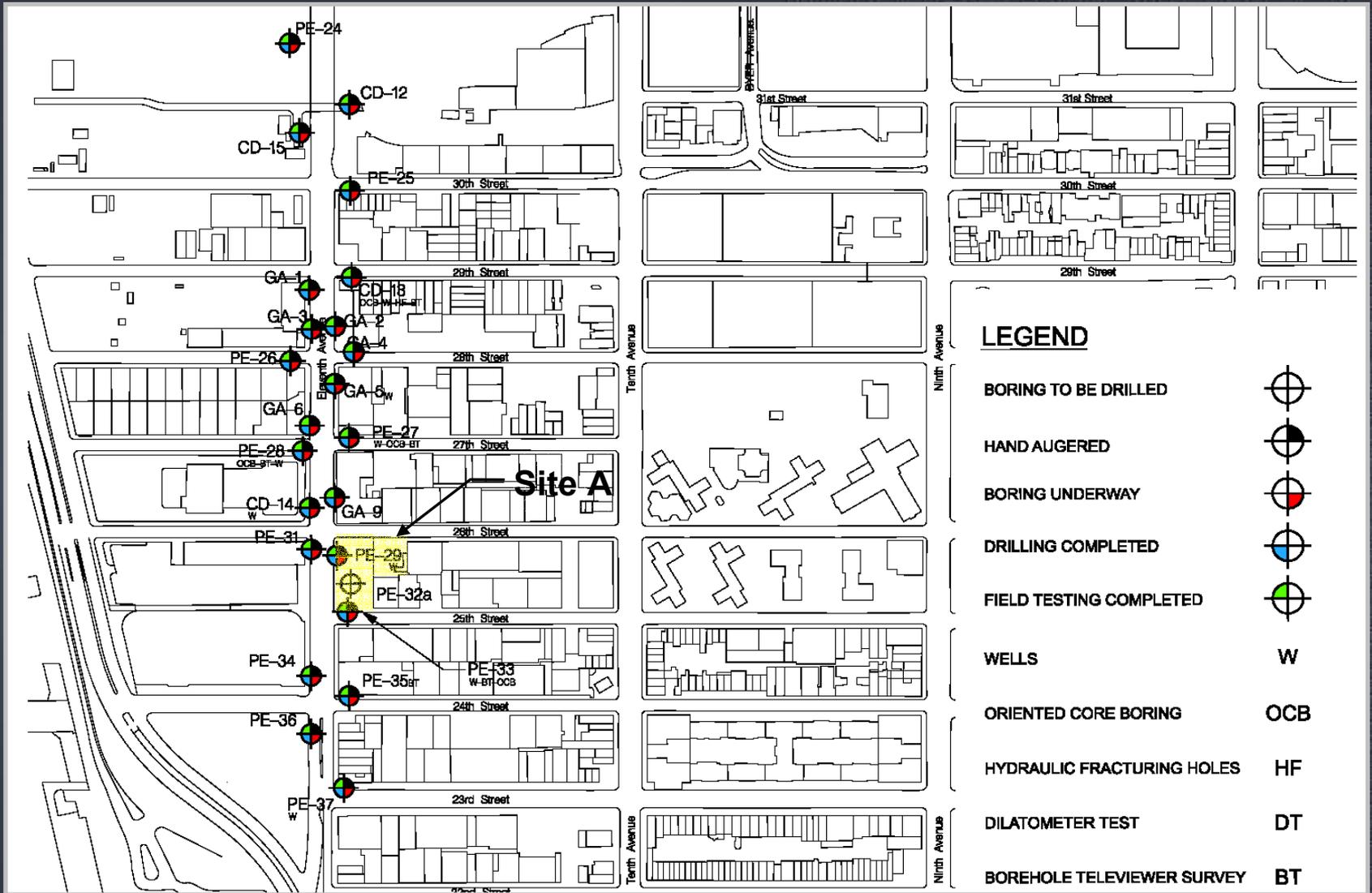
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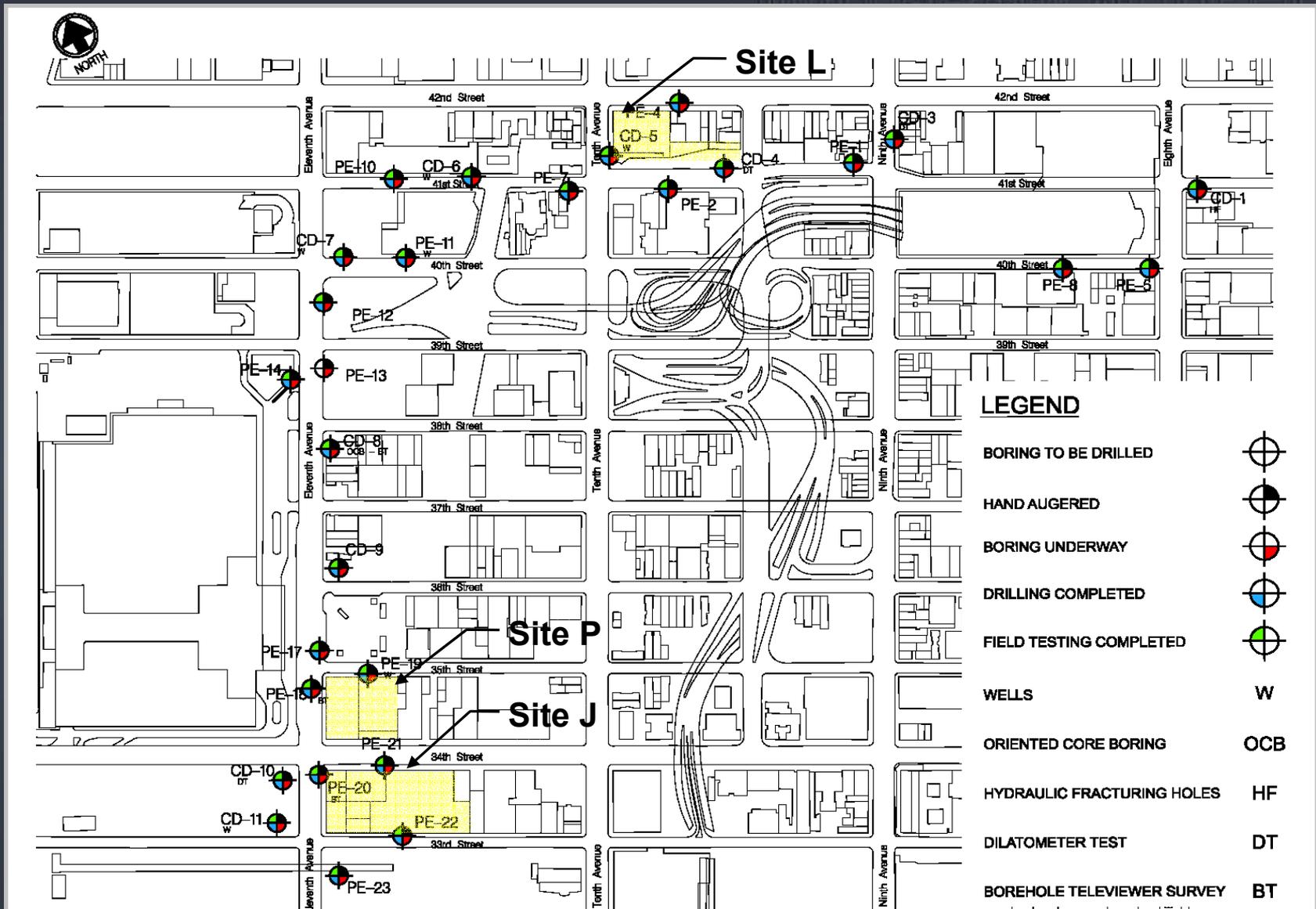
Geotechnical Data Collection

- 80 Boreholes & 40 probe holes were completed to date
- Information from 680 existing Boreholes was compiled from:
 - ◆ Port Authority of NY & NJ
 - ◆ Amtrak
 - ◆ MTA Long Island Railroad
 - ◆ NYC Department of Design and Construction
 - ◆ NYC Department of Transportation
 - ◆ US Postal Service
- Packer Permeability Tests
- Oriented Core Boring
- Hydraulic Fracturing
- Dilatometer
- Televiwer Survey
- Laboratory Tests

No. 7 Boring Data Collection



No. 7 Boring Data Collection



Geotechnical Reports

- ◆ Geotechnical Baseline Report
- ◆ Geotechnical Data Report
- ◆ Existing Building Inventory

Running Tunnel

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Profile and Rock Line - 1

Site A Adit

Approximate
Rock Line

Top of Ground

25th St.

30th St.

11th Avenue Viaduct

33rd St.

Amtrak North
River Tunnels

Amtrak North
Access Tunnel

40'

Jacob
Javits
Convention
Center

Future 34th
Street
Station

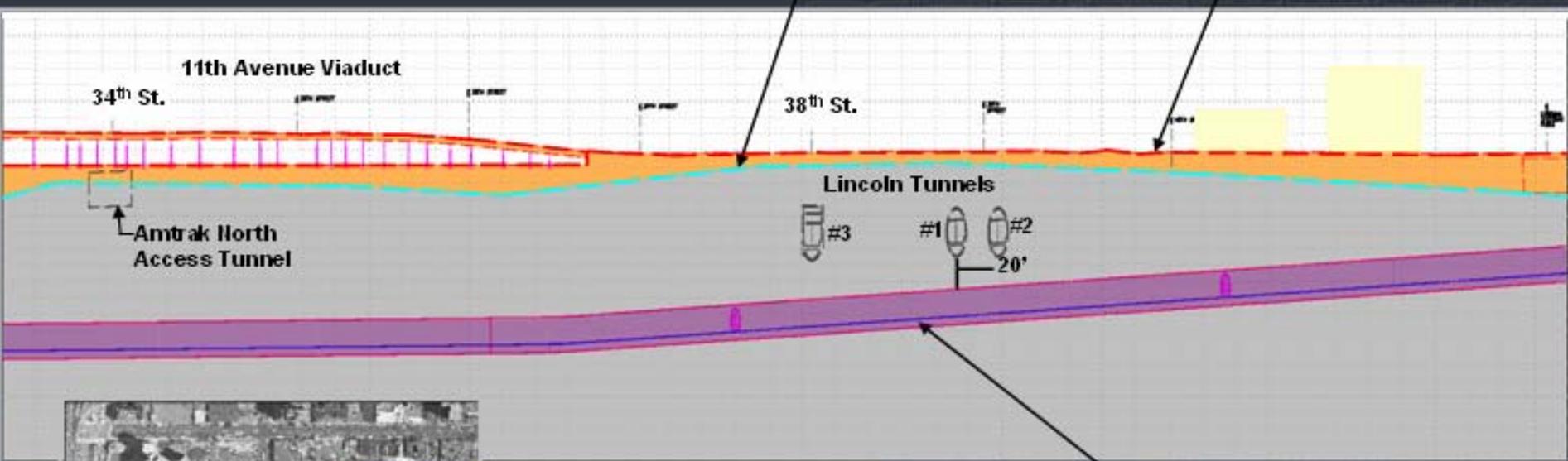
Site A

No. 7 Tunnel

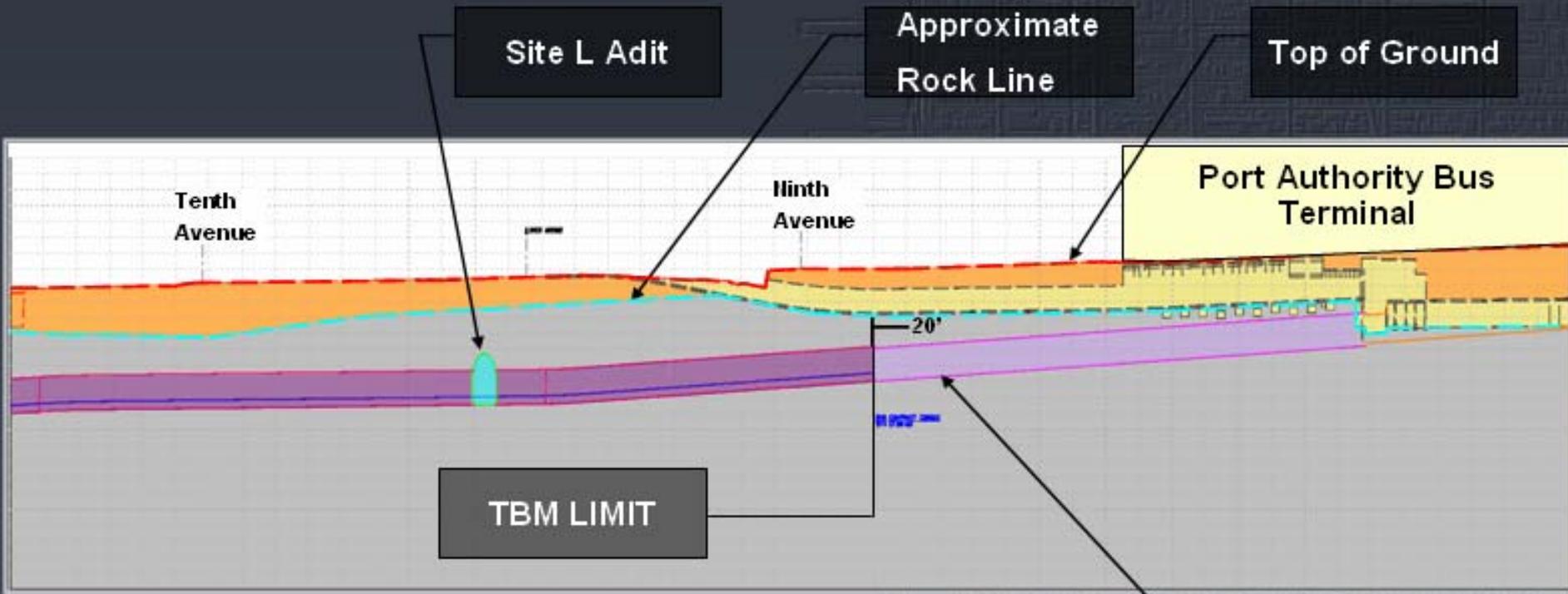
Profile and Rock Line - 2

Approximate
Rock Line

Top of Ground



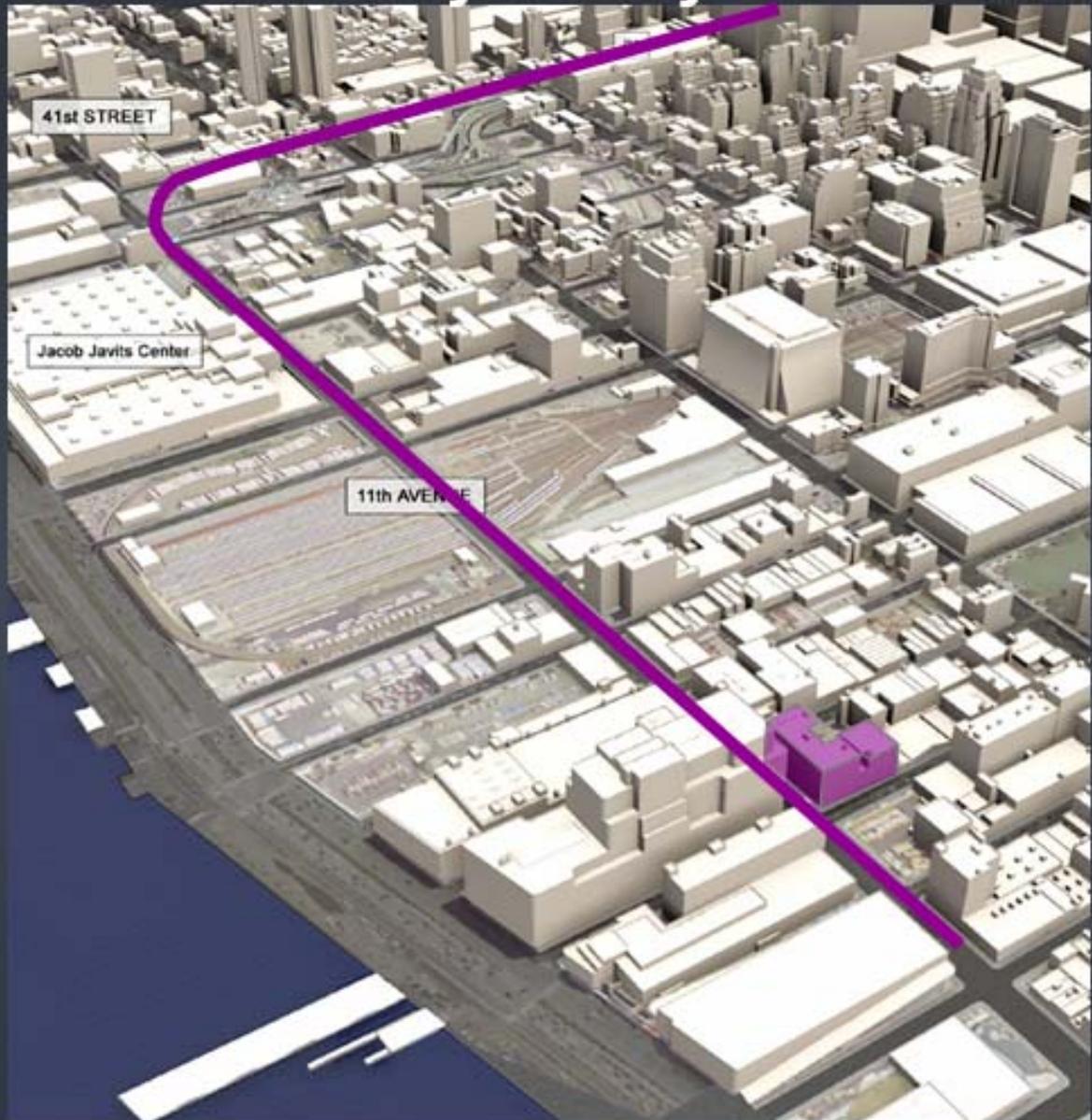
Profile and Rock Line - 3



Running Tunnel

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Proximity to Adjacent Surface Structures



Proximity to Adjacent Surface Structures

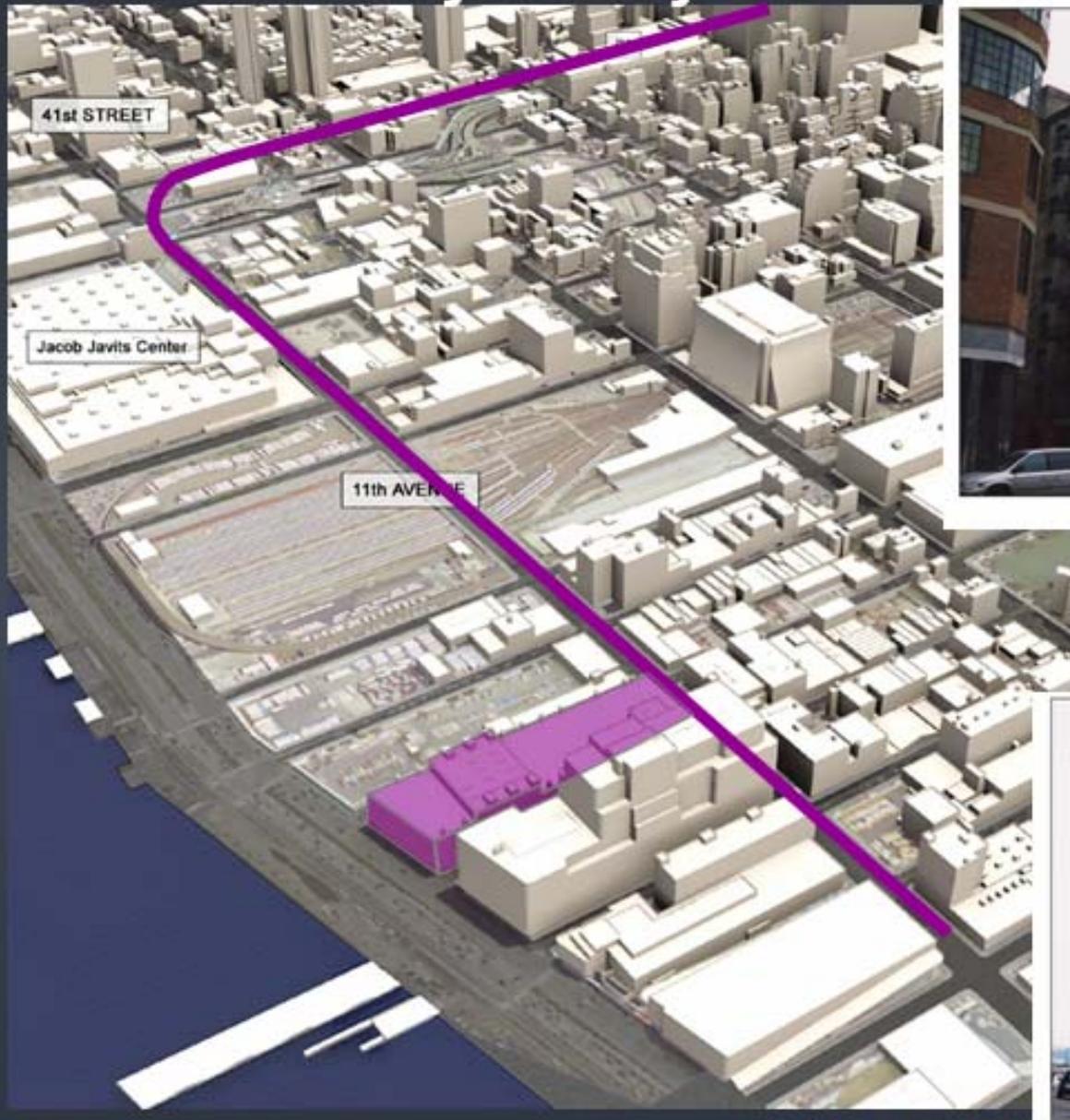


Starrett-Lehigh Building. View northeast from West 24th Street and Twelfth Avenue 10a



Starrett-Lehigh Building. Eleventh Avenue facade, view north 10b

Proximity to Adjacent Surface Structures



New York Terminal Warehouse Company. Eleventh Avenue facade, view north 99



New York Terminal Warehouse Company. View west on West 27th Street 90

Proximity to Adjacent Surface Structures



Former W&J Sloane Warehouse, 541-561 West 29th Street. View northeast from Eleventh Avenue 70

Proximity to Adjacent Surface Structures



Proximity to Adjacent Surface Structures



Proximity to Adjacent Surface Structures



Proximity to Adjacent Surface Structures

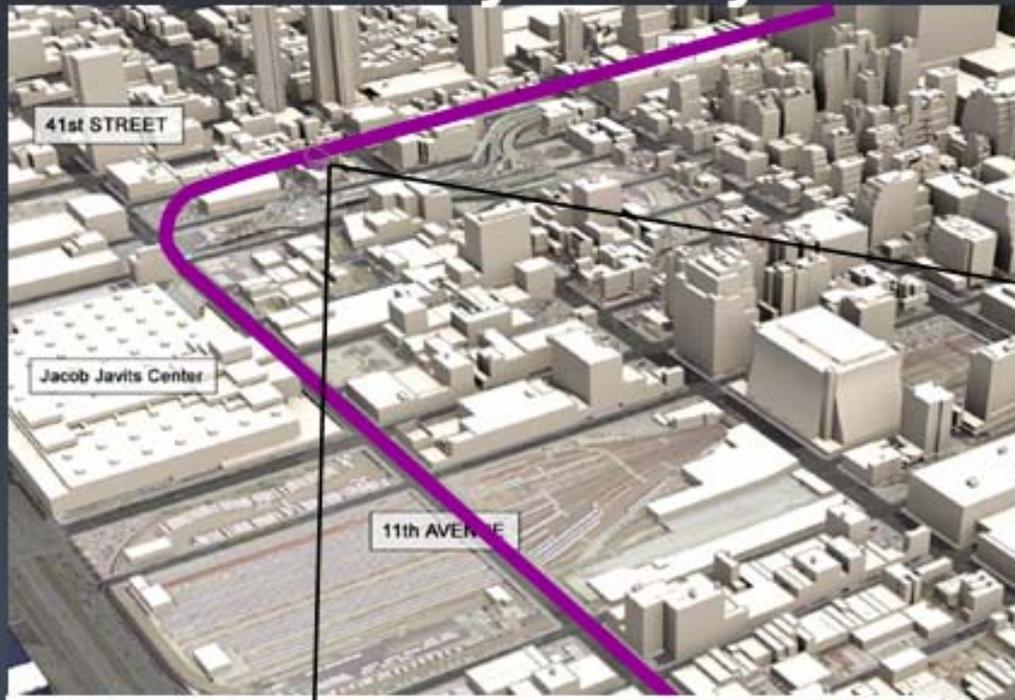


Proximity to Adjacent Surface Structures



Lincoln Tunnel entrance. View north of wall along West 39th Street 21

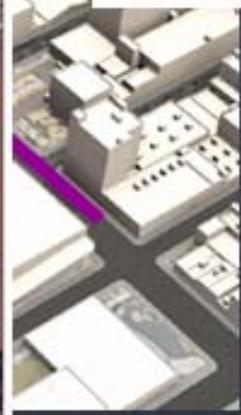
Proximity to Adjacent Surface Structures



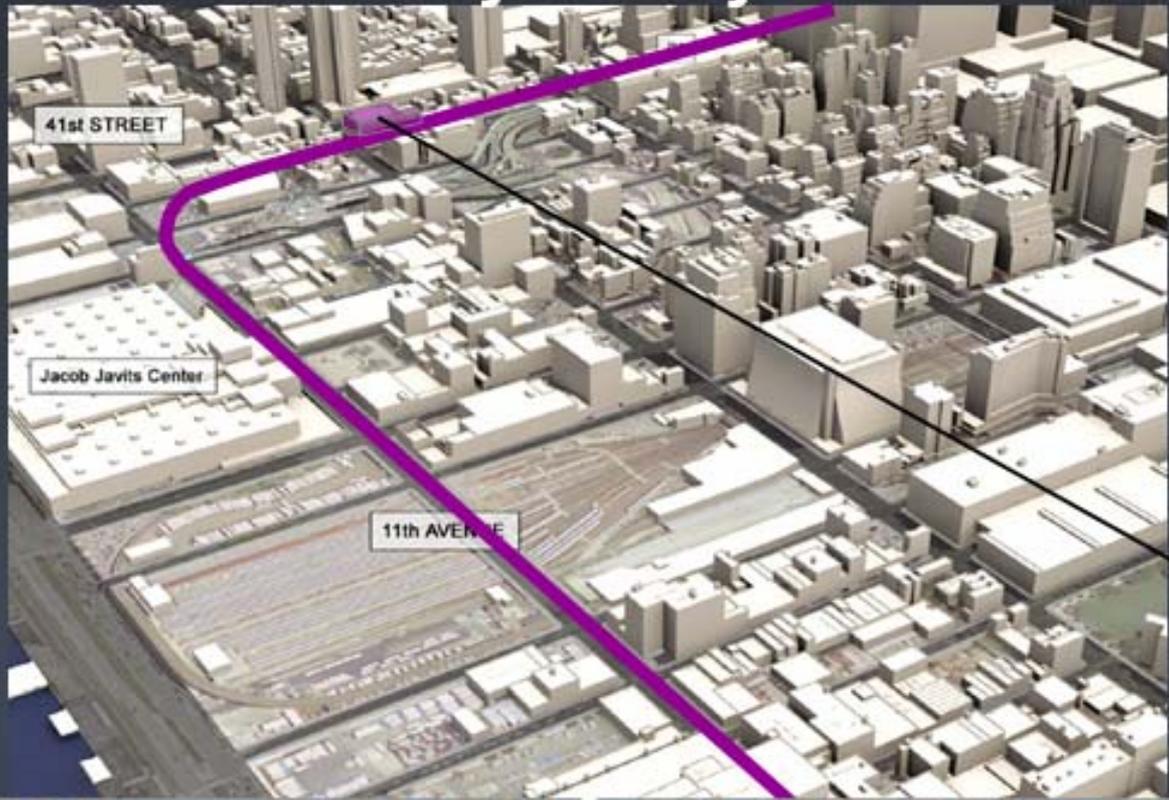
St. Raphael Roman Catholic Church and Rectory, 502-504 West 41st Street. View west 99a



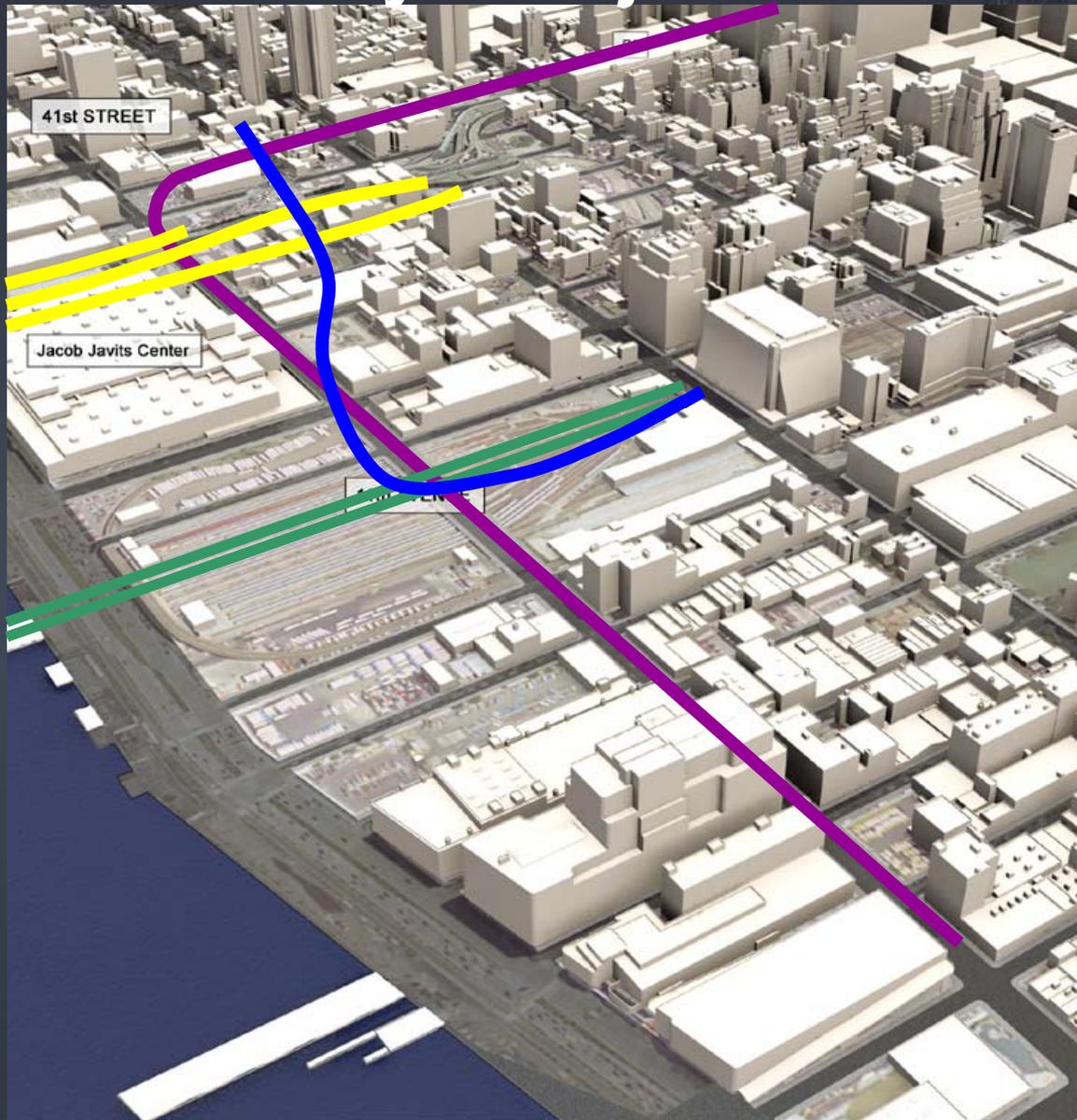
St. Raphael Roman Catholic Church and Rectory, 502-504 west 41st Street. View north from West 40th Street 99b



Proximity to Adjacent Surface



Proximity to Adjacent Subsurface Structures



— No. 7 Subway

— Hudson North River
Tunnels (Amtrak &
NJ Transit)

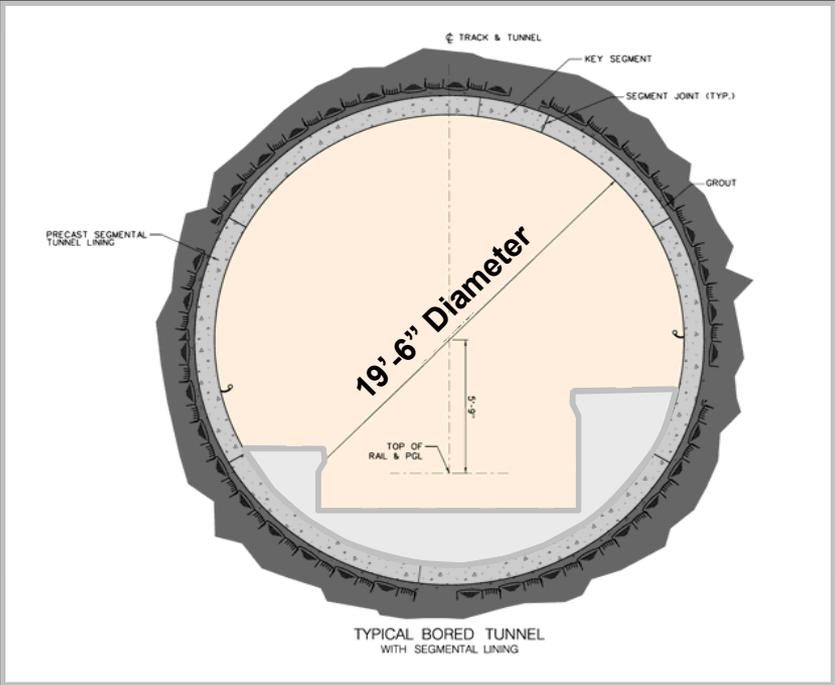
— Lincoln Tunnel
Tubes (1, 2, 3)

— Hudson North
Access Tunnel
(Empire Line)

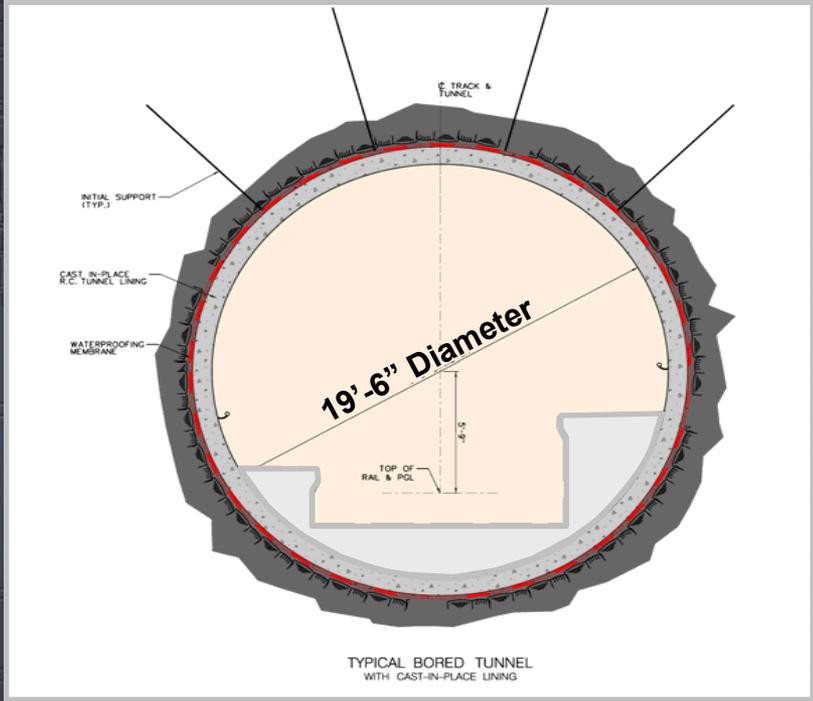
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Lining Options



Pre-Cast Segmental Lining



Cast-in-Place Lining

Agenda

- Overall Project Description
- Running Tunnel
- TBM performance requirements
- Schedule

TBM Performance Requirements

- **Tunnel ID = minimum 19 feet 6 inches + construction tolerances**
- **650 ft minimum horizontal radius**
- **Full-face hard rock TBM with capability to negotiate short reaches of mixed face and possible soft ground conditions.**
- **Capable of negotiating very strong & very/extremely abrasive rock (Manhattan Schist & Pegmatites)**
- **Option to utilize:**
 - ◆ **pre-cast segmental or cast-in-place permanent lining systems- both to be watertight undrained systems.**
 - ◆ **Gripper, Shield or Double-shield type TBMs**

TBM Performance Requirements cont'd

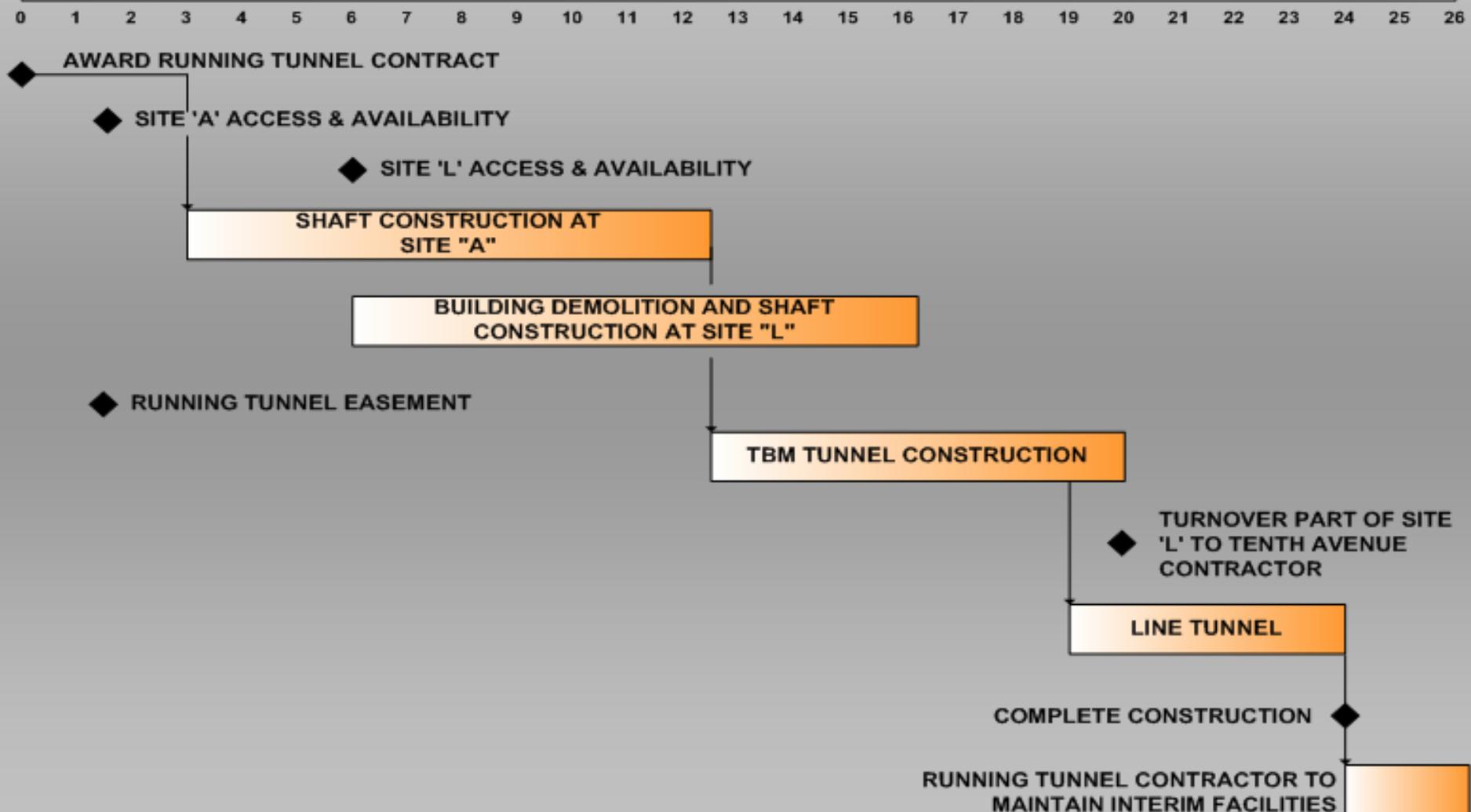
- **Equipped with:**
 - ◆ **provisions for drilling probe holes and grout holes.**
 - ◆ **17 inch or larger disc cutters**
- **Back-loaded cutter mountings**
- **Automated guidance system**
- **New or refurbished TBM's**
- **Gripper-type TBMs to be equipped with roof shield (finger-shield)**

Agenda

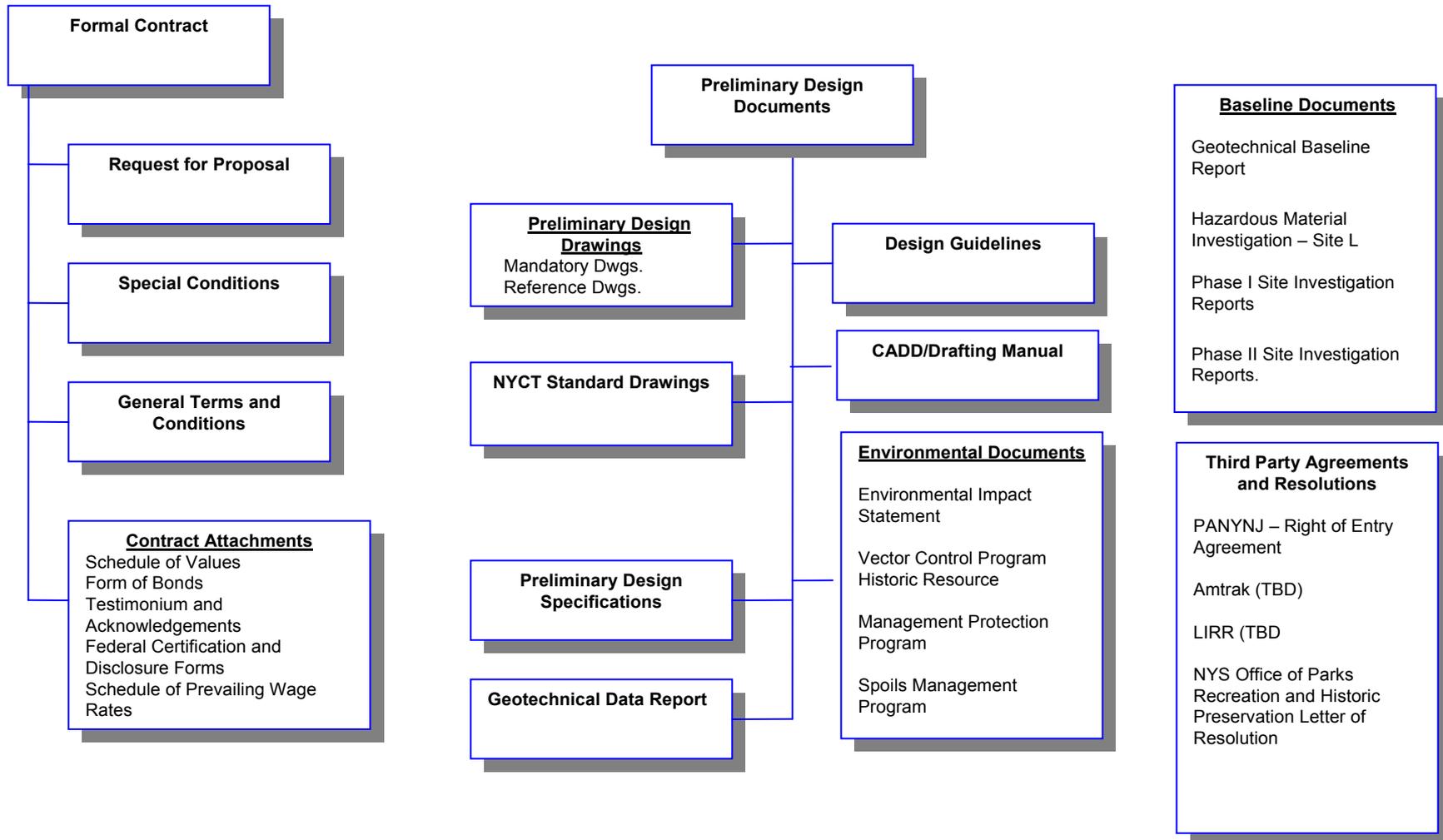
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Construction Schedule TBM with CIP Liner

DESIGN BUILD RUNNING TUNNEL - CONSTRUCTION SCHEDULE (Months)



Contract Documents



Mandatory / Reference Documents

Mandatory Documents & Drawings

- *Design cannot be altered without agency approval.*

Reference Documents & Drawings

- *Design changes are allowed via written notification to agency.*

Supplementary Drawings and Documents

Published Geotechnical Information from Past TBM Tunneling Projects in New York City

Published information on tunnel boring machine excavation experiences on the above projects

Geotechnical Information Instrumentation Report

Other Available Geotechnical Reports

Structures Inventory/Preliminary Assessment of Ground Movement Report

Informational Drawings

PE Reference Drawings for Cavern Excavation Contracts

Infrastructure Drawings

Amtrak North Access Tunnel Plans

Amtrak North River Tunnel Plans

Lincoln Tunnel Plans

Record Utility Drawings

Survey Control Reports

Agency/Owner Coordination Drawings and Documents

DEP – Concept Approval Drawings

Modified Con Edison Specification EO-2022

Modified Con Edison Specification EO-4035

Final Documents (Contractor Produced, Partial Listing)

Design Build Proposal

Technical Proposal
Price Proposal

Drawings

CADD Test Drawings
In-Progress Drawings
Final Design Drawings
Final Drawings

Geotechnical Design Summary Report

Specifications

Final Design Specifications
Final Specifications

Shop Drawings

CPM Schedule

Record and As-Built Drawings

Baseline Building Condition Survey

Construction Environmental Protection Plan

Procurement

Lloyd Lampell

Senior Director

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- Request for Clarification December 3rd
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Questions and Answers

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