Appendix B.7 Construction

B.7.1 INTRODUCTION

This appendix assesses the potential impacts associated with the construction of the Proposed Project. The Port Authority of New York and New Jersey (PANYNJ) proposes to replace the existing Midtown Bus Terminal (also known as the Port Authority Bus Terminal, "PABT") in Manhattan, New York, with a new Main Terminal, Storage and Staging Facility (SSF), and associated ramp infrastructure (the Replacement Facility), accompanied by the development of two private commercial towers (the private development) to assist in funding the project. Two decks over below-grade portions of Dyer Avenue and the Lincoln Tunnel Expressway would also be constructed to facilitate construction-period bus operations. These Dyer Deck-Overs would be converted to publicly accessible open space by 2040. The Replacement Facility, private development, and Dyer Deck-Overs are collectively referred to as the Proposed Project. The construction assessment covered in this appendix includes all components of the Proposed Project, including the private development and conversion of the Dyer Deck-Overs into publicly accessible open space.

This appendix provides a discussion of a representative construction schedule, the activities likely to occur during construction of the Proposed Project, the types of equipment that are likely to be used, and the anticipated construction logistics (*e.g.,* equipment, operation and staging area locations). Based on this information, potential impacts on transportation, air quality, noise and vibration, land use, neighborhood character, socioeconomic conditions, community facilities, open space, historic and cultural resources, natural resources, and hazardous materials from construction activities are analyzed.

A full description of the Proposed Project is provided in **Chapter 1**, **"Introduction"** of the FEIS.

B.7.2 REGULATORY PARAMETERS & COORDINATION

Construction coordination may involve several federal, state, and City agencies. While PANYNJ is not directly subject to New York City or New York State building or fire codes, PANYNJ has its own set of design and construction standards, which are based on nationally recognized building codes and engineering practices. In addition, PANYNJ reviews and approves all construction plans within its jurisdiction to ensure they meet or exceed these standards, and works in close consultation with local building departments, including the New York City Department of Buildings (DOB). During construction, PANYNJ oversees construction contracts and ensures compliance with approved design documents, and codes, fire protection systems, and vertical transportation systems are also monitored to ensure conformity.

Table B.7-1 lists the primary related agencies and their general areas of responsibility. For projects in New York City, DOB is generally responsible for ensuring that construction projects meet the requirements of the New York City Building Code and that buildings are structurally, electrically, and mechanically safe. DOB would be consulted on the enforcement of safety regulations to protect workers and the public during construction. The areas of consultation would include installation and operation of equipment such as cranes, sidewalk sheds, safety netting and scaffolding. The New York City Department of Environmental Protection (DEP) is generally responsible for ensuring compliance with the New York City Noise Code; it reviews and approves Remedial Action Work Plans and Construction Health and Safety Plans (CHASPs), and regulates water disposal into the sewer system as well as abatement of hazardous materials. The City of New York Department of Sanitation (DSNY) is generally responsible for ensuring the regulatory compliance of the storage, transport, and disposal of asbestos waste. The New York City Fire Department (FDNY) would be consulted to ensure consistency with the New York City Fire Code and the proper installation of tanks containing flammable materials. The New York City Department of Transportation (NYC DOT) reviews and approves any traffic lane and sidewalk modification or closures. Construction Protection Plans (CPP) would be developed in consultation with the New York City Landmarks Preservation Commission (LPC) to address potential construction-related impacts including ground-borne vibration and accidental damage from heavy machinery. A CPP must be developed for construction work taking place within 90 feet of historic properties.

Table B.7-1. Construction in New York City

Agency		Areas of Responsibility
New York City	Department of Buildings	Consultation and concurrence on conformance with NYC Building Code, crane and site safety (as applicable to the PANYNJ)
	Department of Environmental Protection	Consultation on service, sewer utility connection, relocations, noise, soil Remedial Action Permit, site-specific Construction Health and Safety Plan (CHASP), dewatering, hazardous materials abatement and ambient air quality
	Fire Department	Consultation on conformance with NYC Fire Code
	Department of Transportation	Consultation and concurrence related to traffic management plans, lane and sidewalk closures, and operational roadway changes
	Landmarks Preservation Commission	Cultural and architectural resources consultation; consultation on Construction Protection Plans
New York State	Department of Labor	Worker safety
	Department of Environmental Conservation	Possible consultation regarding contaminated and hazardous materials management and petroleum/chemical bulk storage
	Office of Parks, Recreation, and Historic Preservation (NYSHPO)	Cultural and architectural resources consultation
	Department of Health	Environmental Health Exposure Investigation, Assessment and Response and laboratory analytical testing procedures

Agency		Areas of Responsibility
United States	Environmental Protection Agency	Air emissions, noise, contaminated and hazardous waste management
	Federal Transit Administration	Construction oversight, regulatory compliance Standard Operating Procedure 19: Consideration of Contaminated Properties (including brownfields)
	Occupational Safety and Health Administration	Worker safety

At the state level, the New York State Department of Labor (DOL) licenses asbestos workers and oversees other worker safety regulations. The New York State Department of Environmental Conservation (DEC) regulates disposal of hazardous materials, and construction and operation of bulk petroleum and chemical storage tanks. At the federal level, the U.S. Environmental Protection Agency (EPA) has wide-ranging jurisdiction over environmental matters, including air emissions, noise, and hazardous materials—although much of the responsibility is delegated to the state level. The Occupational Safety and Health Administration (OSHA) sets standards for work site safety and construction equipment. As the Proposed Project may receive federal funding from the Federal Transit Administration (FTA), the FTA would be involved in overseeing construction activities and ensuring the PANYNJ complies with all applicable federal regulations.

B.7.3 CONSTRUCTION PHASING AND SCHEDULE

Construction of the Proposed Project is anticipated to begin in 2024 and be completed in three phases: Phase 1: construction of the ramps, SSF, supporting ramp structures, and Dyer Deck-Overs, Phase 2: construction of the new Main Terminal, and Phase 3: construction of the private development and conversion of the Dyer Deck-Overs to publicly accessible open space. These phases of construction would occur sequentially and are planned to minimize disruption to existing bus services. During Phase 1 of construction, which is anticipated to take four years to complete, the Dyer Deck-Overs, ramps, and SSF would be constructed while bus service would continue at the existing PABT using West 39th Street and a temporary vehicle ramp structure on West 40th Street.

Once completed, the Dyer Deck-Overs and SSF begin operations as interim sites for bus operations while demolition and construction of the new Main Terminal would commence. Phase 2 of construction is anticipated to take four years to complete. After construction of the new Main Terminal is completed, bus service would be redirected from the SSF and the Dyer Deck-Overs to the new Main Terminal, while the SSF would be retrofitted to provide storage and staging for bus service at the new Main Terminal. The Main Terminal is anticipated to be in operation by 2032. Following completion of the Main Terminal, the Dyer Deck-Overs would be converted to publicly accessible open space. The detailed description of the construction activities and interim bus operations in these two phases are described below.

Following an initial two years of operation of the Main Terminal, construction of the private development would occur (assumed for analysis purposes to begin in 2035 and complete construction by 2037). The two private commercial towers are expected to be occupied and

operational by 2040. Tower 1 would be located on the west side (northeast corner of the block) of Eighth Avenue between West 41st Street and West 42nd Street. Tower 1 would contain up to approximately 3.0 million gross square feet of commercial space with an approximate height of 1,343 feet above grade and would be set back above the east side of the Main Terminal. Tower 2 would be located on west side of Eighth Avenue (southeast corner of the block) between West 40th Street and West 41st Street. Tower 2 would contain up to approximately 2.0 million gross square feet of commercial space with an approximate height of 926 feet above grade and would be set back above the east side of the Main Terminal.

The construction timetable can be affected by numerous technical, social, economic, logistical, and other factors, including, but not limited to, market conditions, resource and labor availability, and the practicalities of construction. Accordingly, the actual schedule for the Proposed Project over the course of its implementation may differ from the one assumed for analysis purposes in this assessment. Since the construction schedule for the Proposed Project is not finalized, the representative construction schedule can form the basis for an assessment of potentially significant construction-related environmental impacts under reasonable worst-case conditions, which would involve the concurrent construction of several project components.

The illustrative construction schedule for the Proposed Project, which is presented in **Table B.7-2,** is the basis for the construction impact assessment presented in this appendix. For each of the technical areas, appropriate construction analysis year(s) have been selected to represent reasonable worst-case conditions relevant to that technical area, which can occur at different times for the analyses of different subject areas.

Table B.7-2. Construction Schedule

Phase	Construction Component	Start Month	Finish Month	Approximate Duration (months)
Phase 1	**Dyer Deck-Overs**			
	Site Preparation & Demolition	November 2024	January 2025	3
	Dyer Deck-Over Foundations	January 2025	November 2025	10
	Dyer Deck-Over Steel & Concrete	December 2025	March 2027	15
	Ramps			
	Site Preparation & Demolition*	March 2025	March 2026	12
	Ramps Foundations	June 2025	April 2026	10
	Ramps Steel & Concrete	May 2026	April 2028	23
	Ramps Operational**	December 2028		-
	Ramps Exteriors	December 2027	March 2029	15
	Storage & Staging Facility (SSF)			
	Site Preparation & Demolition	June 2025	March 2026	9
	SSF Foundations	December 2025	March 2027	15
	SSF Steel & Concrete	April 2026	December 2027	20
	SSF Exteriors & Interior Fit-Out	January 2027	March 2029	26
	SSF Operational as Interim Terminal**	December 2028		-
	SSF Retrofit	December 2031	December 2032	12

Phase	Construction Component	Start Month	Finish Month	Approximate Duration (months)
Phase 2	**Main Terminal**			
	Site Preparation & Demolition	September 2028	October 2029	13
	Main Terminal Foundations	October 2029	January 2031	15
	Main Terminal Steel & Concrete	February 2030	July 2032	29
	Main Terminal Exteriors & Interior Fit-Out	October 2030	December 2032	26
Phase 3	**Private Commercial Development Towers, Open Space**			
	Tower 1	January 2034	December 2035	23
	Tower 2	January 2036	December 2037	23
	Publicly Accessible Open Space (Dyer Deck-Overs)	TBD	December 2040	

Source: PANYNJ

Notes: For the purposes of the construction analysis, the timeframes and sequencing associated with the private development were estimated to represent a reasonable worst-case scenario.
* Including a temporary vehicle ramp on W. 40th Street
**Construction has reached level of completion to allow occupancy and operations while commissioning and testing are conducted
*** Including modifications to subway access and temporary elevator connections

B.7.4 CONSTRUCTION DESCRIPTION

The following provides a description of the general construction practices and activities, which would occur during the construction of Proposed Project.

B.7.4.1 General Construction Practices

This section describes the construction practices that would likely be employed during construction of the Proposed Project, including hours of work, site access, deliveries, staging areas, public safety, and rodent control.

B.7.4.1.1 Hours of Work

New York City laws and regulations allow construction activities between 7:00 a.m. and 6:00 p.m. on weekdays. Construction activities, including night and weekend work typically requires a noise mitigation plan submitted to and approved by DEP which follows the *City's Noise Code*. The *New York City Noise Control Code*, as amended in December 2005 and effective as of July 1, 2007, limits construction (other than circumstances described below) to weekdays between the hours of 7:00 a.m. and 6:00 p.m. and sets noise limits for certain pieces of construction equipment. Construction activities occurring after hours (weekdays between 6:00 p.m. and 7:00 a.m. and on weekends) may be permitted only to accommodate one or more of the following: (1) emergency conditions, (2) public safety, (3) construction projects by or on behalf of city agencies, (4) construction activities with minimal noise effects, and (5) undue hardship resulting from unique site characteristics, unforeseen conditions, scheduling conflicts, or financial considerations. PANYNJ does not request approval from DEP for night or weekend work, but instead develops its plans consistent with DEP noise codes. Appropriate consultation with DEP and notifications to proximate residents or businesses with respect to necessary work

outside of normal construction hours would be undertaken. The numbers of workers and pieces of equipment in operation for evening and weekend work would be limited as practicable. Therefore, the level and intensity of activity for evening and weekend work would typically be less than a normal workday.

The construction schedule presented above in **Table B.7-2** assumes five workdays per week with two 8-hour shifts (the day shift from 7:00 a.m. – 3:00 p.m. and the night shift from 3:00 p.m. – 11:00 p.m.) and one eight-hour overnight shift (from 11:00 p.m. – 7:00 a.m.) on an as-needed basis. The overnight shift work would be to complete activities that require lane closures of streets including Tenth Avenue, Dyer Avenue, and West 40th Street. Specifically, due to the proximity of the existing ramp alignments over these roadways, the proposed demolition of the existing ramp and the installation of steel infrastructure for the new ramp would require lane closures for excavation, crane positioning, and concreting activities. Appropriate consultation with NYC DOT and NYC DEP would occur for any nighttime work.

B.7.4.1.2 Access, Deliveries, and Staging Areas

During construction, access to the Project Area would be fully controlled. Generally, work areas would be fenced off and discrete access points for workers and trucks would be provided. Material deliveries to the construction site would be managed and scheduled. As is typical with construction in New York City, parking lanes and sidewalks immediately adjacent to the construction site may need to be closed or narrowed for varying periods of time during the construction period. Maintenance and Protection of Traffic (MPT) plans would be developed for any required temporary sidewalk and lane narrowing or closures to protect the safety of the construction workers and the public. Approval of these plans and implementation of the closures would be coordinated with NYC DOT. Potential implementable measures specified in the MPT plans would include parking lane closures, safety signs, safety barriers, traffic directions / detour signage, traffic enforcement agents, deployment of PANYNJ Police to manage traffic and construction fencing.

It is anticipated that construction staging of materials and equipment would primarily occur within the Project Area (on PANYNJ owned property beneath the existing ramps) and the adjacent curb lanes.

B.7.4.1.3 Public Safety

A variety of measures would be employed to protect the public during construction, including but not limited to, sidewalk sheds (scaffolding) to provide overhead protection (including supplemental lighting), safety signs to alert the public about active construction work, safety barriers to protect the safety of the public passing by construction areas, flag persons to control trucks or vehicles entering and exiting the construction areas and to provide guidance for pedestrians and bicyclists safety, and safety nettings as the superstructure work advances upward to prevent debris from falling to the ground. All applicable safety requirements would be followed to ensure the safety of the community and the construction workers themselves.

PANYNJ would undertake a series of actions to provide information and updates on construction activities to bus operators, bus travelers, and the adjacent residential and business communities. Regular updates will be provided on the PANYNJ project website (www.pabtreplacement.com), and via the PANYNJ social media channels. The PANYNJ will have construction liaisons who will regularly attend community meetings and be available to meet with area residents, property owners and businesses. The PANYNJ will also create a construction phone hotline where feedback or any concerns regarding construction activities can be registered with the PANYNJ.

B.7.4.1.4 Construction Protection Plans

To avoid adverse inadvertent construction-related impacts to properties adjacent to the proposed project site, PANYNJ would develop and implement a Construction Protection Plan (CPP) for each phase of the project's construction to address potential construction-related impacts such as, but not limited to, air quality, noise and vibration. The CPP will be developed prior to the commencement of any project-related demolition, excavation, or construction activities.

The CPP will specifically address eight historic properties.[1] PANYNJ would develop and implement a Construction Protection Plan (CPP) in consultation with NYSHPO and LPC to address potential construction-related impacts including ground-borne vibration and accidental damage from heavy machinery within 90 feet of these historic properties. These properties are depicted in **Figure B.7-10**. The CPP would be developed at least 120 days prior to the commencement of any Project-related construction activities. Preparation and implementation of the CPP is included in the Final Programmatic Agreement as a measure to avoid adverse construction-related impacts on historic properties. The Final Programmatic Agreement can be found in **Appendix B.2.2** of this FEIS.

B.7.4.1.5 Rodent Control

Construction contracts would include provisions for a rodent (i.e., mouse and rat) control program. Before the start of construction, the contractor would survey and bait the appropriate areas and provide for proper site sanitation. During construction, the contractor would carry out a maintenance program, as necessary. Signage would be posted, and coordination would be conducted with appropriate agencies.

[1] The eight properties are: (1) the McGraw-Hill Building, (2) the church and rectory of the Holy Cross Roman Catholic Church complex, (3) the St. Raphael Roman Catholic Church and Rectory, (4) the northern five tenements (531-539 Ninth Avenue) of the row of tenements at 523-539 Ninth Avenue, (5) the tenement at 408 West 39th Street, (6) the Underhill Building, (7) the Hook and Ladder Company No. 21/Engine Co. 34 Firehouse, and (8) properties within the Paddy's Market Historic District.

B.7.4.2 General Construction Tasks

B.7.4.2.1 Construction of Ramps, Dyer Deck-Overs, and SSF

The Proposed Project would result in the construction of a new access ramp structure to provide direct access between the Main Terminal and the Lincoln Tunnel via Galvin Plaza. Before construction activities begin at the Main Terminal, the Proposed Project would construct the SSF, the supporting ramps, and the deck-over components over Dyer Avenue. The construction process would be coordinated to avoid contemporaneous activities that would result in extended closures and disruptions to the extent practicable. The PANYNJ has initiated advance planning for construction activities (including deliveries, MPT plans, detours and street / roadway closures) via a Transportation Management Plan (TMP). The TMP is establishing a series of protocols around providing construction access / deliveries to the Project Site and a forecast of major work which may require changes to the regular operation of traffic. The TMP incorporates a comprehensive and regional perspective, informing construction managers and decision-makers at the PANYNJ about other major construction efforts, and how they can best sequence activities or closures to minimize potential disruptions.

The SSF would be located between West 40th Street and West 39th Street, bounded to the west by Tenth Avenue, and would extend just east of Dyer Avenue (where the existing ramp structure is located). The new ramps would be roughly bounded by Dyer Avenue to the east, Eleventh Avenue to the west, West 40th Street to the north, and West 39th Street to the south. The Dyer Deck-Overs would be constructed over below-grade sections of Dyer Avenue and the Lincoln Tunnel Expressway between West 39th Street and West 37th Street.

The first construction activity involves the siting of work trailers, installation of temporary power and communication lines, and the erection of site-perimeter fencing. Then, site preparation activities would commence, and demolition of portions of the existing ramps would occur alongside the installation of initial foundation elements for the new ramps in areas where no demolition of existing structures is necessary. Next, construction of a temporary access ramp on West 40th Street followed by the demolition of the existing ramp. This would be followed by the construction of structural support elements for the proposed ramps.[2] When the construction of the support elements is complete, construction of the floor beams for the new ramps would occur alongside construction of the SSF building elements and the Dyer Deck-Overs (described below).

The primary stages of building construction are described in greater detail below.

Site Preparation

For the site preparation task, the work area would be prepared for construction. The construction areas would be fenced off to minimize interference between the general public and the construction activities. Additional public safety measures, such as signs, walkways, or

[2] The new "ramps" associated with the Replacement Facility are considered one integrated structure consisting of two ramps, one inbound and another outbound.

additional lighting would be installed and plans for the deployment of flag persons and traffic enforcement agents developed as appropriate. Access points to the construction area and measures specified in the MPT would also be established and construction trailers, portable toilets, and dumpsters for trash would be brought to the site and installed. This task would also include the installation of any temporary power and communication lines.

Roadway Lane and Sidewalk Closures

During the entire duration of construction for the ramps (anticipated to take 48 months to complete), a temporary ramp for buses to and from the existing PABT would be constructed on West 40th Street between Tenth Avenue and Dyer Avenue and one lane of West 40th Street would be closed to public traffic. The northern parking lane and traffic lanes on West 39th Street between Ninth and Tenth Avenues would also be closed to public access for the entire construction duration of the ramp structures. However, the northern sidewalk would remain open for pedestrian access, as well as parking and the bike lane on the southside of the street. Additionally, demolition of the existing ramp (on sections crossing over streets) and installation of overhead steel would require nighttime lane closures at several locations on an as-needed basis. These locations are anticipated to include 1) Tenth Avenue between West 40th Street and West 39th Street, 2) Dyer Avenue between West 40th Street and West 39th; 3) West 40th Street at Dyer Avenue, and 4) West 40th Street between Dyer Avenue and Ninth Avenue.

During construction of the Dyer Deck-Overs, shoulder lanes would be closed on Dyer Avenue South and the Lincoln Tunnel Expressway for installation of drilled foundation elements on both sides of the southbound and northbound approaches on Dyer Avenue. While construction of the foundation would avoid lane closures, installation of steel girders would require full closures of these affected roadways listed above during overnight hours. Construction would be coordinated to ensure that Dyer Avenue South and the Lincoln Tunnel Expressway would not be closed at the same time.

Drilled Foundations

Following preparation of the construction areas, drilled foundation elements would first be constructed within and surrounding Galvin Plaza and continue east to Dyer Avenue to support the future ramp structure for the SSF and Main Terminal. Concrete steel fill tubes would be installed to support elevated ramp structures between Tenth Avenue and Dyer Avenue. Concrete trucks would be used to pour the foundation and the below-grade elements. These trucks would typically be staged on the closest curb lane from where the concrete would be pumped into position. Foundation activities would involve the use of drill rigs, loaders, generators, welders and compressors.

Existing Ramp Demolition

Following the initial installation of drilled foundation elements, general demolition of existing ramp structures would commence. Any economically salvageable materials would be re-

moved. Hand tools (including concrete wet saws) and excavators with hoe ram attachments[3] and hydraulic shears would mainly be used in the demolition of the existing structure and loaders would be used to load the debris onto dump trucks. The demolition debris would be sorted prior to being disposed at landfills to maximize recycling opportunities. Temporary ramps would be constructed along West 40th Street between Tenth Avenue and Dyer Avenue to allow access between the existing terminal and the Lincoln Tunnel for the duration of construction.

Roadway Shielding, Ramp Support Structure, and Floor Beams

Before roadway ramps are installed, braces and trusses would be installed to provide supporting structures to the future ramps. First, shielding would be installed (as necessary) over the West 39th Street underpass and the western portion of Galvin Plaza to provide protection to the below-grade travel lanes. Next, cranes would be used to install the support structures to the foundation elements in place, with floor beams being installed initially over Galvin Plaza and between Tenth Avenue and Dyer Avenue. Afterward, floor beams would be installed over Tenth Avenue and Dyer Avenue. Construction of the ramps would involve nighttime closures of Tenth Avenue, Dyer Avenue, 40th Street, and Galvin Plaza at intermittent periods.

SSF Superstructure & Core

The superstructure of the SSF would include the building's framework (beams and columns) and floor decks. A tower crane would first be brought onto the construction site during the superstructure task and would be used to lift structural components, facade elements, and other large materials. The crane would be on-site for both the superstructure and exterior stages of construction. Superstructure activities would also require the use of mobile cranes, concrete pumps, walk-behind trowel machines (for smoothing concrete) and a variety of trucks. In addition, temporary construction elevators (hoists) would be used for the delivery of materials and vertical movement of workers during superstructure construction activities. Construction of the interior structure, or core, of the building would include elevator shafts, vertical risers for mechanical, electrical, and plumbing systems, electrical and mechanical equipment rooms, core stairs, and restroom areas.

SSF Exteriors

During this stage of construction, the exterior envelope systems of the proposed building would be installed. The prefabricated exterior units would arrive on trucks and be lifted into place for attachment or transported via a hoist to the appropriate floors for installation.

SSF Interior Fit-Out

Activities during the interior fit-out stage would include the construction of interior partitions, installation of lighting fixtures and interior finishes (e.g., flooring, painting, etc.), and mechanical and electrical work, such as the installation of elevators and lobby finishes. Final cleanup and touchup of the building and final building systems (e.g., electrical system, fire alarm, plumbing,

[3] A hoe ram is a hydraulic hammer fitted to an excavator typically used for demolishing concrete structures. Hoe rams are used for work too large for jackhammering alone, but where blasting or means of removal may not be possible due to safety or environmental issues.

etc.) testing and inspections would be part of this stage of construction. Equipment used during interior fit-out would include a hoist, welders, and a variety of small handheld tools.

Interior fit-out would typically be the quietest period of construction in terms of its effect on the public because most of the construction activities would occur inside the building with the facades substantially complete and the building enclosed.

Deck-Over Foundation

Similar to the foundation elements for the ramps, the Dyer Deck-Overs would be supported by drilled foundation elements that would be installed on the east and west shoulder lanes of Dyer Avenue South and the Lincoln Tunnel Expressway, and Dyer Plaza. Concrete steel fill tubes would be installed to support the steel girders and concrete decks. Concrete trucks would be used to pour the foundation and the below-grade elements. These trucks would be staged within the shoulder lanes of the two roadways from where they would pump the concrete. Foundation activities would involve the use of drill rigs, loaders, generators, and compressors.

Deck-Over Steel Girders and Concrete Decks

Before the concrete decks are formed and placed, steel girders would be erected to provide support. Cranes would be used to install the steel girder supports over the roadways. Afterward, concrete decks would be formed and poured on the steel supports over Dyer Avenue South and the Lincoln Tunnel Expressway. Construction would involve overnight full closures of Dyer Avenue South and the Lincoln Tunnel Expressway at intermittent periods, as needed. However, both roadways would not be closed at the same time.

Dewatering

Water from rain and snow collected in the excavation area during construction would be removed using a dewatering pump. If groundwater dewatering is required, it would be performed in accordance with NYS DEC regulations and DEP sewer use regulations.

B.7.4.2.2 Construction of Main Terminal

The existing PABT would be demolished following completion of the SSF, the Dyer Deck-Overs, and connection of the newly constructed ramps by 2028. While construction activities are ongoing at the new Main Terminal, the SSF would be utilized as an interim terminal for bus operations. The Dyer Deck-Overs would also provide temporary space for bus operations during the second phase of construction.

With temporary operations starting in 2028 (and continuing through 2031 with construction of the new Main Terminal), the Proposed Project would remove existing elevators to the 42nd Street-Port Authority Bus Terminal Subway Station within the existing PABT. During this period, any passengers requiring elevator access to the Eighth Avenue subway lines would have access to an ADA-accessible temporary elevator near the temporary stairs to the subway station, in the vicinity of existing elevator access, which would be constructed prior to the removal of the existing elevator. Therefore, elevator access would be maintained for the duration of

construction activities. During interim operations, all temporary gates within the SSF would be ADA-accessible.

Construction of the Main Terminal would begin with a startup phase, which involves the siting of work trailers, installation of temporary power and communication lines, and the erection of site-perimeter fencing. Demolition of the existing PABT would begin with removal or abatement of any potential hazardous materials (such as asbestos) in adherence with applicable safety measures, as described in **Section B.7.5.5**. Existing connections from PABT to the subway mezzanine would be closed; temporary stairs connecting to the subway would be installed on the western side of Eighth Avenue between West 40th and West 42nd Streets. During this phase of work materials removed during demolition (using similar equipment as described in the 'existing ramp demolition' task) would be recycled or taken to a licensed disposal facility. With the existing building removed, excavation and construction foundations for the Main Terminal would commence.

After the below-grade construction is complete, construction of the core and shell of the new building would begin. The core is the central part of the building and is an important part of the structural system. It contains the elevators and the mechanical systems for heating, ventilation, and air conditioning (HVAC). The shell is the outside of the building. As the core and floor decks of the building are being erected, installation of the mechanical and electrical internal systems would start. As the building progresses upward, the exterior cladding would be placed, and the interior fit-out work would begin. During the busiest time of construction, the buildings' upper cores and structures would be built while the mechanical/electrical connections, exterior cladding, and interior finishing progress on lower floors. Additional ramps would be connected to the Main Terminal and bus service at the Main Terminal would begin in 2032. Finally, site work, including landscaping and other site work (such as resurfacing of sidewalks or restoration of roadways) would be undertaken.

The primary stages of building construction are described in greater detail below.

Site Preparation

In the site preparation task, the work area would be prepared for construction. The construction areas would be fenced off to minimize interference between passersby and the construction work. Additional public safety measures, such as signs, would be installed. Access points to the construction area and measures specified in the MPT would also be established and construction trailers, portable toilets, and dumpsters for trash would be brought to the site and installed.

Roadway Lane and Sidewalk Closures

During the entire duration of construction for the new Main Terminal (anticipated duration of four years), West 41st Street between Ninth Avenue and Eighth Avenue would be closed to both pedestrians and motorized traffic, while maintaining limited access for tenants, deliveries, construction, and emergency services maintained. The temporary ramp constructed on West

40th Street between Tenth Avenue and Dyer Avenue would remain for construction vehicle use until the demolition of the ramp structure at the existing PABT is complete (approximately 2029).

Abatement and Demolition of the Existing Port Authority Bus Terminal

The existing PABT would first be abated of potential asbestos and any other hazardous materials before the start of demolition. A DEP and DOL-certified asbestos investigator would inspect the facility for asbestos-containing materials (ACM) and those materials would be removed by a DOL-licensed asbestos abatement contractor prior to interior demolition. Asbestos abatement is strictly regulated by DEP, DEC, DOL, EPA, and OSHA to protect the health and safety of construction workers and nearby residents and workers.

Depending on the extent and type of ACM, these agencies would be notified of the asbestos removal efforts and may inspect the abatement site to ensure that work is being performed in accordance with applicable regulations. Any activities with the potential to disturb lead-based paint would be performed in accordance with the applicable OSHA regulation (including federal OSHA regulation 29 CFR 1926.62—*Lead Exposure in Construction*). In addition, any suspected polychlorinated biphenyl (PCB)-containing equipment (such as fluorescent light ballasts) that would be disturbed would be evaluated prior to disturbance. Unless labeling or test data indicate that the suspected PCB-containing equipment does not contain PCBs, such equipment would be assumed to contain PCBs, and would be removed and disposed of at properly licensed facilities in accordance with all applicable regulatory requirements.

General demolition is the next step. First, any economically salvageable materials would be removed. Then the interior of the terminal building would be deconstructed to the floor plates and structural columns. Enclosed chutes would be used to move the debris from upper floors to the ground level. Netting around the exterior of the building would be used to prevent materials from falling into public areas. Hand tools and excavators with hoe ram attachments and hydraulic cutting shears would mainly be used in the demolition of the existing structure and loaders would be used to load the debris into waste containers to be removed by carting trucks. The demolition debris would be sorted prior to being disposed at landfills to maximize recycling opportunities, consistent with PANYNJ's Clean Construction program.[4]

Excavation and Foundation

For building construction, first, sheet piles would be installed along the perimeter of the construction site to hold back soil around the areas to be excavated. Next, excavators would be used for the task of removing soil and below-grade material. The soil would be loaded onto dump trucks for transport to a licensed disposal facility or for reuse at a construction site that needs fill. As the excavation becomes deeper, a temporary ramp would be built to provide access for the dump trucks to the work site. This stage of construction would also include the construction of the Main Terminal's foundation and below-grade elements. Columns and concrete walls would be built to grade level. Trucks would be used to transport the concrete,

[4] More information on the PANYNJ's Clean Construction Program can be found at https://www.panynj.gov/port-authority/en/about/Environmental-Initiatives/clean-construction.html

which will eventually be pumped to form the foundation and the below-grade structures. These trucks would typically be staged on the closest curb lane from where the concrete would be pumped to the active work area. During the foundation stage of construction, permanent utility connections to existing water, sewer, electric, gas, and telecommunications services would also be made. Excavation and foundation activities would also involve the use of drill rigs, loaders, generators, and compressors.

Dewatering

Water from rain and snow collected in the excavation area during construction would be removed using a dewatering pump. If groundwater dewatering is required, it would be performed in accordance with applicable NYS DEC permit and DEP sewer use requirements.

Superstructure

The superstructure of the Main Terminal would include the building's framework (beams and columns) and floor decks. Construction of the interior structure, or core, of the building would include elevator shafts, vertical risers for mechanical, electrical, and plumbing systems, electrical and mechanical equipment rooms, core stairs, passenger circulation areas, and restroom areas. A tower crane would first be brought onto the construction site during the superstructure task and would be used to lift structural components, facade elements, and other large materials. The crane would be on-site for both the superstructure and exterior stages of construction. Superstructure activities would also require the use of mobile cranes, concrete pumps, and a variety of trucks. In addition, temporary construction elevators (hoists) would be used for the delivery of materials and vertical movement of workers during superstructure activities.

Exteriors

During this stage of construction, the exterior envelope systems of the proposed building would be installed. The exterior facade units (commonly referred to as panels) would arrive on trucks and be lifted into place for attachment or transported via a hoist for installation.

Interior Fit-Out

Activities during the interior fit-out stage would include the construction of interior partitions, installation of lighting fixtures and interior finishes (e.g., flooring, painting, etc.), and mechanical and electrical work, such as the installation of elevators and lobby finishes. Final cleanup and touchup of the building and final building system (e.g., electrical system, fire alarm, plumbing, etc.) testing and inspections would be part of this stage of construction. Equipment used during interior fit-out would include a hoist, welders, and a variety of small handheld tools.

B.7.4.2.3 Retrofit of the SSF

As construction of each floor of the Main Terminal is completed, bus service will be transferred from the SSF to the Main Terminal, and the vacated floors of the SSF will be retrofitted to provide bus storage and staging. These activities would occur over one year with bus service fully transferred to the Main Terminal in 2032.

Temporary gates that were installed for the bus operations within the SSF would be removed. Additional demolition and concrete installation for interior structures (including bus parking and circulation areas) within the SSF would be performed. Construction would include retrofits to previously constructed elevator shafts, vertical risers for mechanical, electrical, and plumbing systems, electrical and mechanical equipment rooms, core stairs, and restroom areas. Since construction activities would be interior to the building, construction would only require a medium-sized excavator, concrete pumps, and variety of trucks or light vehicles. Heavy construction equipment such as pile drivers, mobile cranes, or drill rigs would not be utilized.

B.7.4.2.4 Restoration of Streets and Sidewalks

As major construction activities conclude, the PANYNJ will restore all elements of any streets, sidewalk and accompanying equipment or amenities as appropriate. Examples of restoration would include:

- Milling, paving and re-striping of city streets which were excavated for utility connections or otherwise damaged in the course of construction of the Proposed Project.
- Installation of new curb and sidewalk for areas where sidewalk was removed or damaged in the course of construction.
- Replacement of light poles, hydrants, or traffic signals which may have been removed or relocated during construction.
- Removal of any monitoring, recording or messaging equipment used to manage or coordinate construction efforts.

Typically, restoration of any disrupted or damaged city infrastructure is included as a requirement of any permits issued by NYC DOT or DEP.

B.7.4.2.5 Conversion of the Dyer Deck-Overs to Open Space

After completion of the Main Terminal, and once operations are fully accommodated within the Replacement Facility, the Dyer Deck-Overs would no longer be required to accommodate interim bus operations and would be converted to publicly accessible open space. PANYNJ would fund and construct the open space and would coordinate with community stakeholders to determine the final design and operation of the open space. The design of the open space has not started, nor has a timeline for design, construction or operation of the space been established. For the purposes of analysis, the open space is assumed to be completed by 2040. While construction of the open space could not begin before the completion of the new Main Terminal in 2032, construction could be completed earlier than 2040.

B.7.4.2.6 Construction of the Private Development

Following the initial two years of bus operation at the Main Terminal, construction of the two private commercial tower developments would occur above the Main Terminal (Towers 1 and 2). Both towers would be set back above the east side of the Main Terminal. Foundation elements would be incorporated into the design of the Main Terminal to support both towers.

Therefore, construction of the private development would only require superstructure, exterior, and interior construction activities with limited activity at street level.

Private Development Superstructure

The superstructure of the private development would include the building's framework (beams and columns) and floor decks extending above the newly constructed Main Terminal. Construction of the interior structure, or core, of the buildings would include elevator shafts, vertical risers for mechanical, electrical, and plumbing systems, electrical and mechanical equipment rooms, core stairs, and restroom areas. A tower crane would first be brought onto the construction site during the superstructure task and would be used to lift structural components, facade elements, and other large materials. The crane would be on-site for both the superstructure and exterior stages of construction of the private development. Superstructure activities would also require the use of mobile cranes, concrete pumps, and a variety of trucks. In addition, temporary construction elevators (hoists) would be used for the delivery of materials and vertical movement of workers during superstructure activities.

Private Development Exteriors

During this stage of construction, the exterior envelope systems of the private development would be installed. The exterior units / facade panels would arrive on trucks and be lifted into place for attachment or transported via a hoist for installation.

Private Development Interior Fit-Out

Activities during the interior fit-out stage would include the construction of interior partitions, installation of lighting fixtures and interior finishes (e.g., flooring, painting, etc.), and mechanical and electrical work, such as the installation of elevators and lobby finishes. Final cleanup and touchup of the building and final building system (e.g., electrical system, fire alarm, plumbing, etc.) testing and inspections would be part of this stage of construction. Equipment used during interior fit-out would include a hoist, welders, and a variety of small handheld tools.

Interior fit-out would typically be the quietest period of construction in terms of its effect on the public because most of the construction activities would occur inside the building with the facades substantially complete and the proposed building enclosed.

B.7.4.3 Description of No Action Alternative Construction

As discussed in **Chapter 1** of the FEIS, PANYNJ would retain the existing PABT but would undertake extensive repairs of the PABT and its ramps under the No Action Alternative. Repair work would require the replacement of existing floor slabs throughout the PABT and substantial work to make the terminal compliant with the Americans with Disabilities Act (ADA). Similar to construction activities in the Preferred Alternative, construction activities would utilize typical equipment such as excavators, skid steers, mobile cranes, and concrete pumps. Construction would occur over an approximately 10- to 13-year period and include interior demolition activities, interior superstructure, exterior roadway construction of the ramps, and interior fit out of the repaired spaces. Under the No Action Alternative, repairing the existing PABT terminal

could take longer than the construction of the Replacement Facility in the Proposed Project due to the extremely difficult construction and operational logistics. However, no excavation or foundation activities would be included under the No Action Alternative.

Work would primarily focus on the South Wing of the Terminal. The effort would begin with a survey of existing mechanical, electrical and plumbing (MEP) services in the PABT, and development of a plan to relocate these utilities out of areas being repaired, while maintaining critical services to active operations areas. This will require a series of temporary utility connections that are constantly modified as repair work progresses to maintain critical systems including sprinklers, air conditioning, and data (including fire alarm, security cameras, phone, and radio systems). Implementing a continual series of large MEP relocations and adjustments may also require the temporary relocation of the electrical spot network and refrigeration plant to an exterior location (the PABT roof and 41st Street are both under consideration). Survey and abatement of any hazardous materials would be conducted in coordination with MEP and demolition work.

Slab replacement work would be conducted one or two structural "bays" at a time,[5] working across the terminal. Once the slab across a bay has been removed, a new slab would be installed, and the work area would move to the next bay. Work would likely begin on the fourth-floor slab of the South Wing and work down to the third-floor slab.

Temporary structural support (shoring) would follow MEP relocation and any abatement. Before any structural slabs are removed temporary columns (shoring towers) must be installed to support adjacent areas of floor slab. These shoring towers would be placed on the floor below the area of slab demolition. While the area around the demolition could not be operable, the shoring towers on the floor below may also limit capacity or require modifications to bus operations. The shoring towers also would support a temporary platform that would both provide a working surface and protection for operations on the floor below.

The floor slab would be removed in sections with concrete wet saws. Removed slab sections would be taken by skid-steer (or similar small construction vehicle) to an opening in the terminal's exterior wall where it would be lowered via crane to carting trucks or dumpsters on street level. Following removal of the slab in a bay (or series of bays) steel rebar would be brought up via crane to the work area, installed, and concrete would be pumped to form a new section of floor slab.

Certain sections of floor replacement will require placing temporary shoring towers in the circulation lane used by buses entering the terminal. This could require shifting the circulation lane away from the work zone, taking additional gates out of service on the third floor. Other sections may require removal of one bus lane, requiring inbound and outbound buses to share one lane, controlled by a flag person or other traffic control device. Bus service in the north wing

[5] "A structural bay is defined by the closest four columns in a standard building design." - https://emilms.fema.gov/is_0156/groups/430.html#:~:text=Note%3A%20A%20structural%20bay%20is,as%20indicated%20on%20this%20screen.

would be affected by any changes to circulation lanes in the south wing as all traffic entering the terminal enters though the south wing.

Safety requirements must be met throughout all areas of the terminal that would remain operational. It is assumed that extensive scaffolding / overhead protection would be required within and around the terminal to protect against falling debris, material, or equipment. Interior dust control measures would include tenting, watering, and supplemental ventilation, most acutely needed during removal of floor slabs.

Replacement of floor slabs may require temporary closure of 25% to 100% of bus gates on any one floor on a rolling basis. Therefore, bus operations may be diverted to curbside locations, similar to the Preferred Alternative. In addition, PANYNJ may seek to purchase or lease other lots near the existing PABT to provide space for construction staging. PANYNJ would not undertake any private development of PANYNJ properties near the PABT under the No Action Alternative.

With construction of the No Action Alternative primarily taking place within the terminal, using fewer construction vehicles and equipment, and a smaller workforce, construction would be less intensive than construction under the Preferred Alternative. However, construction activities would have the potential to be disruptive to locations within the immediate vicinity of the existing Bus Terminal and, construction impacts are anticipated to be similar or less than those projected for the Proposed Project.

B.7.5 CONSTRUCTION EFFECTS OF THE PROPOSED PROJECT

Construction activities can be disruptive to the surrounding area for periods of time. The following analyses describe the potential impacts that could result from construction of the Proposed Project with respect to transportation, air quality, and noise and vibration as well as land use and neighborhood character, socioeconomic conditions, historic and cultural resources, hazardous materials, and water and sewer infrastructure.

B.7.5.1 Transportation

The transportation analysis for construction, analyzes the impacts of the construction activities on traffic, parking, transit, bicycle and pedestrian facilities. This analysis was performed based on the peak quarter traffic for both Phase 1 (2024 to 2028) and Phase 2 (2028 to 2032) of construction generated by the construction in terms of both vehicles and workers. Detailed trip estimates for both vehicles and workers were developed corresponding to the construction activities and were used as the basis of the analyses discussed in the following sections. This results in two separate types of analyses being performed; one to analyze the effect of the added day-to-day construction-related worker and truck trips on the roadway network (construction traffic), and another to analyze the effects of the construction activities such as closures, detours, etc. and their effects on the roadway network (construction staging). The detailed description of interim bus operations is described in **Appendix B.4.1, "Bus Services"** of the FEIS.

B.7.5.1.1 Traffic

Construction Traffic Methodology

The construction sequencing and traffic/worker projections were analyzed to assess potential impacts. Aimsun modeling software was used to analyze various construction staging alternatives, and Synchro modeling software was used to analyze the construction-related traffic impacts per City Environmental Quality Review (CEQR) guidelines.

CONSTRUCTION TRIP GENERATION

Average Daily construction-worker and truck trips were developed for each quarter of each construction year to determine the peak quarter for each phase of construction. Trip projections for Phases 1 and 2 were refined to determine modal splits, vehicle occupancy, arrival and departure times, and passenger car equivalents (PCEs) for truck traffic.

A detailed process for determining these assumptions and planning processes can be found in Appendix 14D, "Construction Travel Demand Factors Memorandum" (Construction TDF) of the DEIS (**Appendix A).**

CONSTRUCTION-WORKER MODAL SPLITS AND VEHICLE OCCUPANCY

Modal splits from the Pennsylvania Station Civic and Land Use Project (Final Environmental Impact Statement [FEIS] published in 2022) were utilized for this project. The data from the Pennsylvania Station FEIS showed 28.9% of workers would use private auto to access the site. 13.3% of workers would use local bus (MTA / NYCT service), 47.8% would use subway, 8.9% would use "rail,"[6] and 1.1% would walk. The workers using private auto would have an average vehicle occupancy of 2.04 persons per vehicle. Average daily construction truck trips were converted to PCEs, using an average of 2.0 cars per truck (assuming a 3-axle truck) in accordance with *CEQR Technical Manual* guidelines (Table 16-3). The anticipated construction-worker auto trips and construction truck trips were then combined to generate the average daily construction-generated vehicle trips.

DAILY WORKFORCE AND TRUCK DELIVERIES

For each quarter of construction, the average daily construction personnel (including laborers, managers, and administrative staff) as well as daily construction trucks were forecast based on materials quantities, manpower rates, and other related factors.

The peak construction-generated activity for Phase 1 is expected to occur during the 3rd quarter of 2025 with a daily average of 762 workers and 40 trucks. The peak construction activity for Phase 2 is expected to occur during the 1st quarter of 2031 with a daily average of 1,635 daily workers and 86 trucks.

The average daily workforce and truck trips were used to estimate the peak hour construction trips to determine the construction transportation impacts of the Project. Worker auto trips and

[6] Rail is a term used in the *CEQR Technical Manual* to encompass regional / commuter rail service as well as busses that serve the terminal.

construction truck delivery trips were further determined with arrival and departure times for trips to and from the Project Site.

PEAK HOUR CONSTRUCTION-WORKER VEHICLE AND TRUCK TRIPS

Construction activities are anticipated to occur throughout the day during three shifts (day shift, evening shift, and overnight shift).[7] The day shift would occur from 7:00 a.m. to 3:00 p.m. and comprise approximately 60% of the daily construction personnel. The evening shift would occur from 3:00 p.m. to 11:00 p.m. while the overnight shift would occur from 11:00 p.m. to 7:00 a.m. The evening shift and overnight shift each comprise approximately 20% of the daily construction personnel.

For the purposes of undertaking a conservative analysis, it was assumed that 90% of construction personnel for each shift would arrive during the hour before the start of their shift, while the remaining personnel would arrive before or after these times to account for a slight variation in schedule and work activities. For each shift it was assumed that 100% of workers would leave during the hour immediately after the end of their shift. Truck trips were distributed across the three shifts similarly to construction workers (60%, 20%, and 20%, respectively) with trucks spread evenly throughout each shift. It was assumed that trucks would remain on-site for relatively short durations (1 hour or less). Average daily construction truck trips were converted to PCEs, using an average of 2.0 cars per truck (assuming a 3-axle truck) in accordance with *CEQR Technical Manual* guidelines.

Using these work shift assumptions for construction personnel and trucks hourly construction-related vehicle trips (represented as PCEs) were estimated for the peak periods of activity (3rd quarter of 2025 for Phase 1 and the 1st quarter of 2031 for Phase 2). The construction trip hourly projections for Phase 1 and Phase 2 respectively can be found in **Table B.7-3** and **Table B.7-4**.

Phase 1 construction would result in 62 PCE trips during the morning peak hour (6:00 a.m. – 7:00 a.m.), 70 PCE trips in the midday peak hour (3:00 p.m. – 4:00 p.m.) and would generate 27 PCE trips during the late-night peak hour (11:00 p.m. – 12:00 a.m.), during the 3rd quarter of 2025.

Phase 2 construction would result in 134 PCEs during the morning peak hour (6:00 a.m. – 7:00 a.m.), 150 PCEs in the midday peak hour (3:00 p.m. – 4:00 p.m.) and would generate 57 PCEs during the late-night peak hour (11:00 p.m. – 12:00 a.m.), during the 1st quarter of 2031.

A detailed traffic and parking analysis is required if new vehicles trips are expected to exceed the *CEQR Technical Manual's* threshold of 50 trips or more per hour. Based on the preliminary Level 1 Screening Assessment results, the project would generate peak hour trips above the *CEQR Technical Manual* threshold for at least one hour in both Phase 1 and Phase 2. Therefore, a detailed analysis of the construction peak hours was prepared to identify potential impacts during Phase 1 and Phase 2 construction of the Proposed Project. The detailed analyses were performed for three peak hours: AM (6:00 a.m. – 7:00 a.m.), midday (3:00 p.m. – 4:00 p.m.), and

[7] Construction shifts used for traffic analysis were intentionally expansive when compared to the description provided in **Section B.7.4.1.1** in order to model a reasonable worst-case scenario.

PM (11:00 p.m. – 12:00 a.m.). This analysis looks at the incremental number of trips added due to these construction activities when compared to a baseline condition with no construction activities. If the results of this assessment are compared to the No Action Alternative, impacts would be understated because construction activities associated with the No Action Alternative would also result in closures and impacts.

Table B.7-3. Phase 1 - Hourly Construction Trip Projections

Hour	Auto				Truck (PCE)				Total (PCE)		
	In		Out		In		Out				
	%	Volume	%	Volume	%	Volume	%	Volume	In	Out	Total
12-1 a.m.	0%	0	0%	0	2.5%	2	2.5%	2	2	2	4
1-2 a.m.	0%	0	0%	0	2.5%	2	2.5%	2	2	2	4
2-3 a.m.	0%	0	0%	0	2.5%	2	2.5%	2	2	2	4
3-4 a.m.	0%	0	0%	0	2.5%	2	2.5%	2	2	2	4
4-5 a.m.	0%	0	0%	0	2.5%	2	2.5%	2	2	2	4
5-6 a.m.	3%	3	0%	0	2.5%	2	2.5%	2	5	2	7
6-7 a.m.	**54%**	**58**	**0%**	**0**	**2.5%**	**2**	**2.5%**	**2**	**60**	**2**	**62**
7-8 a.m.	3%	3	20%	22	7.5%	6	7.5%	6	9	28	37
8-9 a.m.	0%	0	0%	0	7.5%	6	7.5%	6	6	6	12
9-10 a.m.	0%	0	0%	0	7.5%	6	7.5%	6	6	6	12
10-11 a.m.	0%	0	0%	0	7.5%	6	7.5%	6	6	6	12
11 a.m.-12 p.m.	0%	0	0%	0	7.5%	6	7.5%	6	6	6	12
12-1 p.m.	0%	0	0%	0	7.5%	6	7.5%	6	6	6	12
1-2 p.m.	1%	1	0%	0	7.5%	6	7.5%	6	7	6	13
2-3 p.m.	18%	19	0%	0	7.5%	6	7.5%	6	25	6	31
3-4 p.m.	**1%**	**1**	**60%**	**65**	**2.5%**	**2**	**2.5%**	**2**	**3**	**67**	**70**
4-5 p.m.	0%	0	0%	0	2.5%	2	2.5%	2	2	2	4
5-6 p.m.	0%	0	0%	0	2.5%	2	2.5%	2	2	2	4
6-7 p.m.	0%	0	0%	0	2.5%	2	2.5%	2	2	2	4
7-8 p.m.	0%	0	0%	0	2.5%	2	2.5%	2	2	2	4
8-9 p.m.	0%	0	0%	0	2.5%	2	2.5%	2	2	2	4
9-10 p.m.	1%	1	0%	0	2.5%	2	2.5%	2	3	2	5
10-11 p.m.	18%	19	0%	0	2.5%	2	2.5%	2	21	2	23
11 p.m. - 12 a.m.	**1%**	**1**	**20%**	**22**	**2.5%**	**2**	**2.5%**	**2**	**3**	**24**	**27**
TOTAL	**100%**	**106**	**100%**	**109**	**100%**	**80**	**100%**	**80**	**186**	**189**	**375**

Note: Bold text denotes peak travel hours

Table B.7-4. Phase 2 - Hourly Construction Trip Projections

Hour	Auto				Truck (PCE)				Total (PCE)		
	In		Out		In		Out				
	%	Volume	%	Volume	%	Volume	%	Volume	In	Out	Total
12-1 a.m.	0%	0	0%	0	2.5%	4	2.5%	4	4	4	9
1-2 a.m.	0%	0	0%	0	2.5%	4	2.5%	4	4	4	9
2-3 a.m.	0%	0	0%	0	2.5%	4	2.5%	4	4	4	9
3-4 a.m.	0%	0	0%	0	2.5%	4	2.5%	4	4	4	9
4-5 a.m.	0%	0	0%	0	2.5%	4	2.5%	4	4	4	9
5-6 a.m.	3%	7	0%	0	2.5%	4	2.5%	4	11	4	16
6-7 a.m.	**54%**	**125**	**0%**	**0**	2.5%	**4**	2.5%	**4**	**129**	**4**	**134**
7-8 a.m.	3%	7	20%	46	7.5%	13	7.5%	13	20	59	79
8-9 a.m.	0%	0	0%	0	7.5%	13	7.5%	13	13	13	26

Hour	Auto				Truck (PCE)				Total (PCE)		
	In		Out		In		Out				
	%	Volume	%	Volume	%	Volume	%	Volume	In	Out	Total
9-10 a.m.	0%	0	0%	0	7.5%	13	7.5%	13	13	13	26
10-11 a.m.	0%	0	0%	0	7.5%	13	7.5%	13	13	13	26
11 a.m.-12 p.m.	0%	0	0%	0	7.5%	13	7.5%	13	13	13	26
12-1 p.m.	0%	0	0%	0	7.5%	13	7.5%	13	13	13	26
1-2 p.m.	1%	2	0%	0	7.5%	13	7.5%	13	15	13	28
2-3 p.m.	18%	42	0%	0	7.5%	13	7.5%	13	55	13	67
3-4 p.m.	**1%**	**2**	**60%**	**139**	2.5%	**4**	2.5%	**4**	**7**	**143**	**150**
4-5 p.m.	0%	0	0%	0	2.5%	4	2.5%	4	4	4	9
5-6 p.m.	0%	0	0%	0	2.5%	4	2.5%	4	4	4	9
6-7 p.m.	0%	0	0%	0	2.5%	4	2.5%	4	4	4	9
7-8 p.m.	0%	0	0%	0	2.5%	4	2.5%	4	4	4	9
8-9 p.m.	0%	0	0%	0	2.5%	4	2.5%	4	4	4	9
9-10 p.m.	1%	2	0%	0	2.5%	4	2.5%	4	7	4	11
10-11 p.m.	18%	42	0%	0	2.5%	4	2.5%	4	46	4	50
11 p.m. - 12 a.m.	**1%**	**2**	**20%**	**46**	2.5%	**4**	2.5%	**4**	**7**	**51**	**57**
TOTAL	**100%**	**231**	**100%**	**231**	**100%**	**168**	**100%**	**168**	**402**	**400**	**812**

Note: Bold text denotes peak travel hours

Construction Traffic Capacity Analysis

PHASE 1 CONSTRUCTION

A total of 62 PCE vehicle trips would be generated during the Phase 1 weekday AM (6:00 a.m. – 7:00 a.m.), peak hour, 70 PCE vehicle trips would be generated during the weekday midday peak hour (3:00 p.m. – 4:00 p.m.), and 27 PCE vehicle trips would be generated during the weekday PM peak hour (11:00 p.m. – 12:00 a.m.). Weekday AM, midday, and PM construction peak hour PCE vehicle trips were assigned to the study area intersections to determine the construction vehicle increments for each peak hour. For full details of how trips were assigned to the study area network, see Appendix 14D of the DEIS (**Appendix A**).

For all three peak hours in Phase 1 construction, no intersections show an increase of 50 or more vehicles.

PHASE 2 CONSTRUCTION

A total of 134 PCE vehicle trips would be generated during the Phase 2 weekday AM (6:00 a.m. – 7:00 a.m.), peak hour, 150 PCE vehicle trips would be generated during the weekday midday peak hour (3:00 p.m. – 4:00 p.m.), and 57 PCE vehicle trips would be generated during the weekday PM peak hour (11:00 p.m. – 12:00 a.m.). Weekday AM, midday, and PM construction peak hour PCE vehicle trips were assigned to the study area intersections to determine the construction vehicle increments for each peak hour. For full details of how trips were assigned to the study area network, see Appendix 14D of the DEIS (**Appendix A**).

The results show that Phase 2 construction activities would not result in 50 or more vehicles at any intersections in the AM and PM peak hours, but five intersections in the midday peak hour.

The five intersections that are expected to experience an increase of 50 or more construction-related vehicle trips during the midday peak hour (3:00 p.m. – 4:00 p.m.) of Phase 2 construction are:

- Seventh Avenue and West 40th Street
- Ninth Avenue and West 40th Street
- Ninth Avenue and West 41st Street
- Ninth Avenue and West 42nd Street
- Tenth Avenue and West 41st Street

The incremental traffic added in Phase 2 midday peak hour, with intersections requiring analysis being highlighted are shown in **Table B.7-5**. The five intersections expected to experience 50 or more construction-related trips are shown in **Figure B.7-1**.

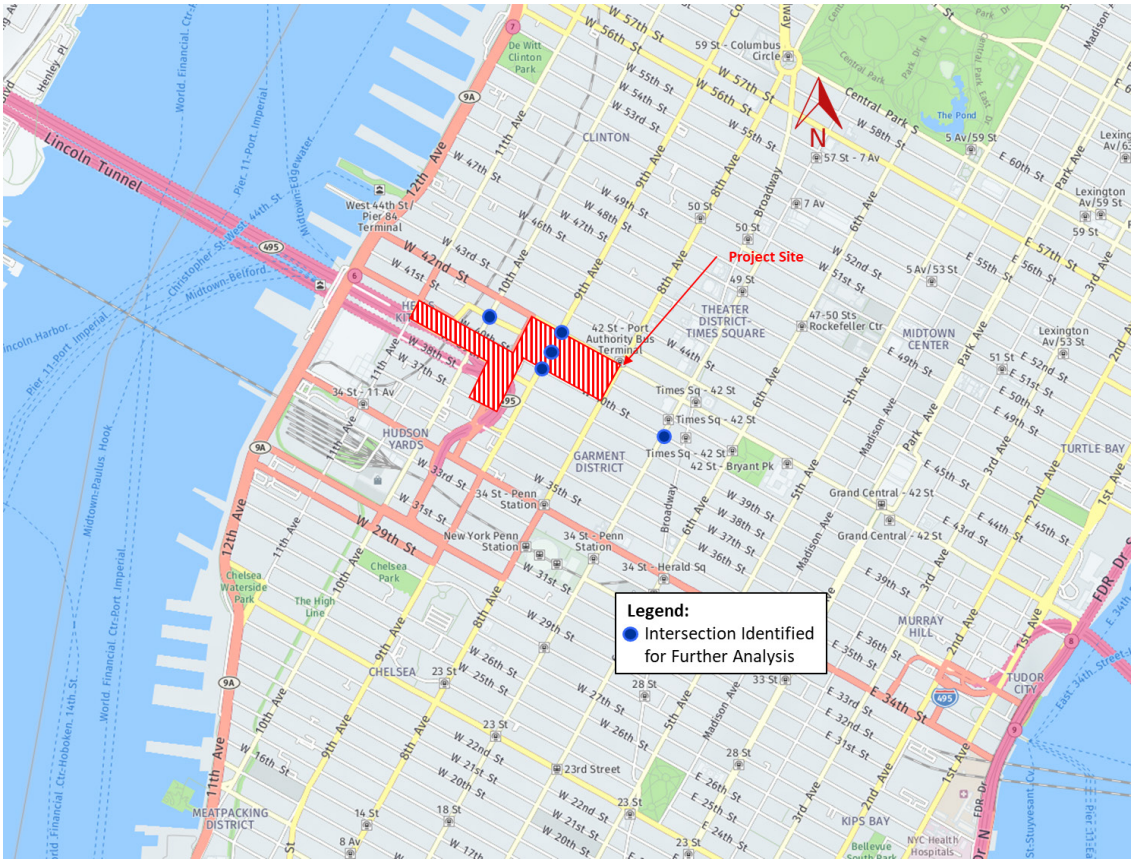
Table B.7-5. Intersections Requiring Analysis

	Driveway	Twelfth Avenue	Eleventh Avenue	Galvin Ave	Tenth Avenue	Dyer Ave	Ninth Avenue	Eighth Avenue	Broadway	Seventh Avenue	Broadway	Sixth Avenue
West 51st Street		14	0		5		0	11	0	0		
West 50th Street		14	0		5		0	11	0	0		0
West 49th Street		14	0		5		0	11	0	0		0
West 48th Street	0	14	0		5		0	11	0	0		0
West 47th Street		14	0		5		0	11	0	0		0
West 46th Street	0	14	0		5		0	11		0		0
West 45th Street		14	0		5		0	11		0		0
West 44th Street		14	0		5		0	11		0		0
West 43rd Street	0	14	0		5		0	3		0		0
West 42nd Street		14	0		35	30	56	30		0	0	0
West 41st Street		33	16	15	50	1	60	8		27	1	1
West 40th Street	0	19	2	0	12	1	61	33		52	34	34
West 39th Street	0	19	2		12		42	7		18	0	0
West 38th Street	0	19	2		0		37	14		25		0
West 37th Street		19	2		0		34	3		25		0
West 36th Street		19	2	0	0	0	3	3		25		18
West 35th Street			2	0	0	0	3	3		7		0
West 34th Street		21	6	2	2	2	4	3		9		2
West 33rd Street		19	3		1	0	1	1		7		0
West 32nd Street										7		0
West 31st Street					1	0	1	1		7		0
West 30th Street		19	3		1	0	1	1		7		0
West 29th Street		19	3		1		1	1		7		

Notes

XX	Construction Increment Vehicle Volume Added
	Study Location
	Not an Intersection

Figure B.7-1. Intersections Requiring Analysis



Source: Radin Consulting, 2023

Phase 2 construction would occur between the years of 2028 and 2032, therefore the 2028 no-build volumes (See **Appendix B.4.2, "Vehicular Traffic"** of the FEIS for volume development) were used as the baseline for Phase 2 construction volumes. Since the peak hours for the EIS analysis and the peak hours for this construction analysis do not match up, a new flow map for 3:30-4:30 p.m. was created using count data, where available, and then balanced through the remaining network. The data collection performed for this project did not include counts prior to 3:30 p.m. but using a slightly later time period for this analysis provides a worst-case scenario since traffic in the surrounding area gets heavier later in the afternoon. This was used to perform the Synchro analysis for the analysis of the five intersections that were flagged for analysis by CEQR.

Table B.7-6 shows the level of service (LOS) and Delay results comparing the Synchro models of the 3:00-4:00 p.m. base model, and the Synchro model which also has the construction trips added in. Out of the five intersections that warranted analysis, none are LOS E or F. However, two intersections (Ninth Avenue at West 42nd Street and Tenth Avenue at West 41st Street)

would experience a significant impact per the *CEQR Technical Manual 2020.* A significant impact is defined as follows:

- A lane group with LOS D that had a delay increase of 5.0s or more with a total greater than 45s.
- A lane group with LOS E that had an increase of 4.0s or more.
- A lane group with LOS F that had an increase of 3.0s or more.

Table B.7-6. Construction Synchro Results[8]

Intersection	No Construction Trips		With Construction Trips	
	Delay	LOS	Delay	LOS
Seventh Avenue at West 40th Street	12.7	B	13.9	B
Ninth Avenue at West 40th Street	26.6	C	63.3	E
Ninth Avenue at West 41st Street	10.5	B	10.9	B
Ninth Avenue at West 42nd Street	33.5	C	42.6	D
Tenth Avenue at West 41st Street	24.8	C	46.8	D

Based on the results, the construction would result in significant impacts to two intersections, Ninth Avenue at West 40th Street, and Tenth Avenue at West 41st Street. See discussion of mitigation measures in **Appendix B.8, "Mitigation**."

Construction Sequencing Analysis

In addition to performing a CEQR analysis using Synchro models, the construction sequencing was also modeled using Aimsun software. This modeling software analyzes changes in the roadway network and has the capability of rerouting traffic as expected in the field due to lane closures, thus providing an accurate look at how traffic would react to construction-related modifications. Models were developed only for the worst-case scenarios in each construction phase, instead of modeling every stage, in order to determine the maximum impacts cause during that construction phase. Models analyzed only a representative peak hour of the construction period for the same purposes. Synchro models were also utilized to determine LOS and Delay results for each construction stage.

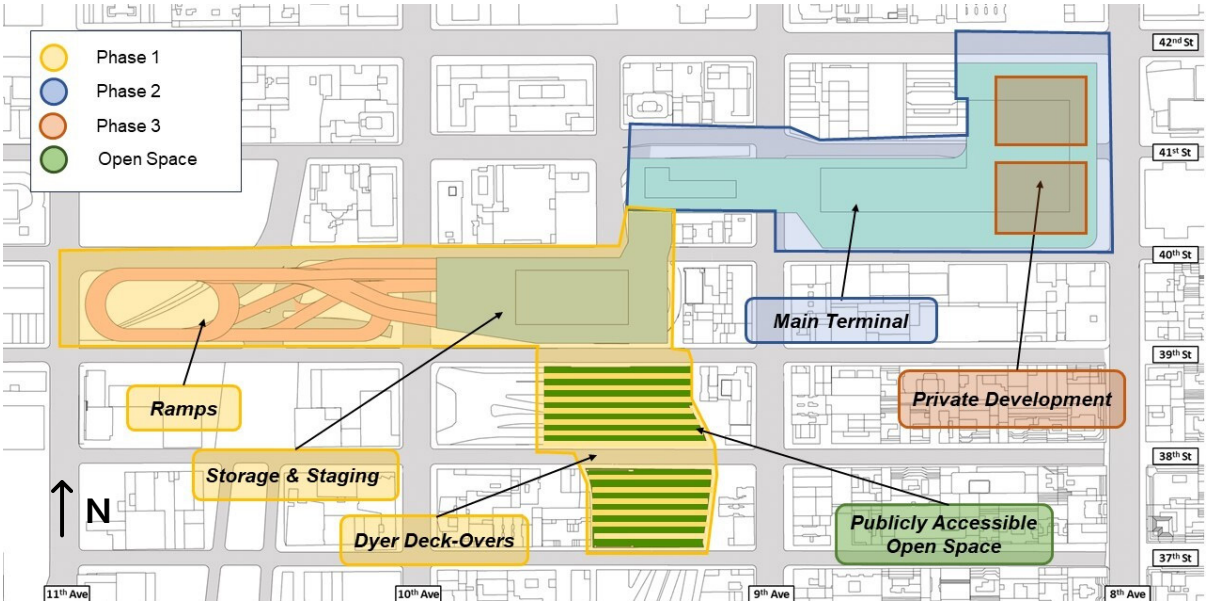
Some of the construction activities will result in lane closures, geometry changes, and traffic detours, and would have traffic impacts on the street network and bus operations. Aimsun models were used to identify traffic impacts to the network as a result of the proposed construction staging, construction working hours, and the need for any mitigation. Implementation of mitigation measures depend on the frequency and length of the proposed closures and detours, and may require additional support from NYC DOT.

The construction activity would occur over three phases, two of which are critical in evaluating the construction activity impacts Phase 1 construction, which is to include the construction of

[8] This table shows the impacted intersections due only to added construction trips and should not be confused with the tables showing intersection results in **Appendix B.4.2 "Traffic"** of this FEIS. The peak hours for construction are also different than the peak hours for the analysis shown in that chapter, applying to general traffic evaluation. The construction peak hours are 6:00 a.m. – 7:00 a.m., 3:00 p.m. – 4:00 p.m., and 11:00 p.m. – 12:00 a.m.

the SSF, the Dyer Deck-Overs, and the Ramp System, and Phase 2, which is the construction of the Main Terminal, as shown in **Figure B.7-2**. The results from these analyses are summarized below. The analysis time for the construction sequencing analysis is different from the analysis time analyzed above for the construction trips; therefore, these were analyzed independently.

Figure B.7-2. Construction Phasing Diagram



Source: WSP 2023
Note: Publicly accessible open space anticipated to be complete as part of Phase 3, following completion of Replacement Facility / Phases 1 & 2.

PHASE 1 CONSTRUCTION

Dyer Deck-Over Construction Staging

It is anticipated that the construction of the Dyer Deck-Overs would be the initial stage of Phase 1 construction. Completion of the decks would provide additional space for bus operations and staging during construction. Generally, the construction of the Dyer Deck-Overs would not directly impact traffic operations at street level. However, there are two construction stages when the Lincoln Tunnel Expressway, Dyer Avenue South, parts of Dyer Plaza, and Dyer Avenue North would be required to be closed to accommodate overhead beam placement. These closures would occur during the overnight period and would require the detouring of traffic to provide ingress and egress to the Lincoln Tunnel, which would place additional vehicles on surrounding streets. The closure of Dyer Avenue South cannot be performed at the same time as the Lincoln Tunnel Expressway closure, and this construction cannot be performed at the same time as SSF or Ramp construction. With the implementation of a Traffic Management Center, prior to the start of construction, public notices would be disseminated to allow motorists to make informed route decisions and avoid traveling in the Project Area. This will help to reduce the traffic demand and reduce the additional delays estimated to occur during the project's construction.

Dyer Avenue South Closure for Dyer Deck-Overs Construction

The models for construction closure of Dyer Avenue South closure were performed for the 11:00 p.m. – 12:00 a.m. overnight period. Several closures were assumed during Phase 1, but only during the overnight period. Several conservative analysis assumptions were made as follows:

- There is a full closure of all lanes on Dyer Avenue South from West 38th street to West 37th Street. Note that ramp B will remain open, allowing access to Dyer Ave/36th street from the Lincoln Tunnel Expressway southbound.
- Closure of Dyer Avenue South cannot occur at the same time as the Lincoln Tunnel Expressway closure.
- Roadway closures would be coordinated with routine closures of the South Tube of the Lincoln Tunnel for regular maintenance and inspections.
- Closures would not occur at the same time as the SSF or ramp construction.
- Detours from the Holland Tunnel (anticipated to be under construction through 2025) will continue.
- It is assumed that the South Tube can remain open. In instances where the South Tube is closed, then the Center Tube is Inbound, and the North Tube is outbound.

Based on the analysis conducted, travel times on Ninth Avenue and Tenth Avenue were compared to existing travel times (2019) to represent a worst-case scenario. The analysis as shown in **Table B.7-7** showed an increase of 1 to 3 minutes in travel times along these avenues.

Table B.7-7. Dyer Deck-Overs Dyer Avenue South Closure Overnight Travel Time Results

Travel Time Section	Existing Travel Time (mm:ss)	Dyer Avenue South Closure (mm:ss)
Tenth Avenue – West 30th Street to West 41st Street	2:05	4:58
Ninth Avenue – West 42nd Street to West 34th Street	2:34	3:13

Based on the above results it was determined that closing down Dyer Avenue from West 37th Street to West 38th Street between 11:00 p.m. – 5:00 a.m. would add less than 3 minutes of additional traffic delays. Level of Service and Delay for intersections near the construction activities are shown in **Table B.7-8**.

No mitigation was included in the model, however the following measures would be enacted, to reduce delays.

- Refinement of Mitigation can occur during development of Full Transportation Management Plan (Signal Timing Changes, Lane Adjustments, etc.).
- Implementation of Traffic Monitoring Program Prior to Construction.
- Utilize planned PABTR Transportation Management Center.
- Provide Port Authority Police & Traffic Enforcement Agents to direct traffic at key locations.

Table B.7-8. Dyer Deck-Overs Dyer Avenue South Closure Overnight LOS Results

Intersection	Approach	Existing (2019)		Construction Condition	
		Delay	LOS	Delay	LOS
Eleventh Avenue at West 37th Street	Intersection	12.7	B	4.5	A
Eleventh Avenue at West 38th Street	Intersection	7.8	A	14.4	B
Eleventh Avenue at West 39th Street	Intersection	8.4	A	9.2	A
Eleventh Avenue at West 40th Street	Intersection	15.6	B	34.7	C
Eleventh Avenue at West 41st Street	Intersection	14.7	B	14.3	B
Eleventh Avenue at West 42nd Street	Intersection	29.9	C	17.6	B
Eleventh Avenue at West 43rd Street	Intersection	10.4	B	15.9	B
Galvin Avenue at West 40th Street	Intersection	48.7	D	25	C
Tenth Avenue at West 37th Street	Intersection	12.3	B	11	B
Tenth Avenue at West 38th Street	Intersection	14.2	B	12.2	B
Tenth Avenue at West 39th Street	Intersection	56.3	E	7.8	A
Tenth Avenue at West 40th Street	Intersection	68	E	12.2	B
Tenth Avenue at West 41st Street	Intersection	64.4	E	11.4	B
Tenth Avenue at West 42nd Street	Intersection	11	B	30.5	C
Tenth Avenue at West 43rd Street	Intersection	11.6	B	16.9	C
Dyer Avenue at West 40th Street	Intersection	21.4	C	27.2	C
Dyer Avenue at West 41st Street	Intersection	19.3	B	29.5	C
Dyer Avenue at West 42nd Street	Intersection	17	B	23.4	C
Ninth Avenue at West 37th Street	Intersection	22.3	C	18.1	B
Ninth Avenue at West 38th Street	Intersection	12.8	B	9.4	A
Ninth Avenue at West 39th Street	Intersection	16.8	B	45.1	D
Ninth Avenue at West 40th Street	Intersection	8.6	A	36.6	D
Ninth Avenue at West 41st Street	Intersection	12.9	B	17.5	B
Ninth Avenue at West 42nd Street	Intersection	19.2	B	27.5	C
Ninth Avenue at West 43rd Street	Intersection	10.7	B	22.5	C

Note: Highlighted cells reflect an impact condition

* The Existing results shown are from the PM peak hour, and construction results are from the nighttime peak hour. This comparison is used to show the effects of the construction condition when compared to the highest volume hour of the day for traffic conditions.

Lincoln Tunnel Expressway Closure for Dyer Deck-Overs Construction

Similar to the above discussion, traffic models for the Lincoln Tunnel Closure were performed for the 11:00 p.m. – 12:00 a.m. nighttime peak hour of the construction period. Several analysis assumptions were made for the analysis of the Dyer Deck-Overs construction:

- Full Closure of Lincoln Tunnel Expressway would be required.
- The Lincoln Tunnel Expressway closure cannot occur at the same time as Dyer Avenue South closure.
- Roadway closures coordinated with routine closures of the Lincoln Tunnel center tube for maintenance and inspection.
- Cannot be done at the same time as the SSF or Ramp construction.
- The Holland Tunnel Detour is in place.

Based on the analysis conducted, travel times on Ninth and Tenth Avenues were compared to existing travel times (2019). The analysis showed a less than three-minute increase in travel times when mitigation is applied, along these avenues (**Table B.7-9**).

Table B.7-9. Dyer Deck-Overs – Lincoln Tunnel Expressway Closure - Overnight Model Results

Travel Time Section	Existing Travel Time (mm:ss)	No Mitigation (mm:ss)	With Mitigation (mm:ss)
Ninth Avenue Detour – West 37th Street to Eleventh Avenue	N/A	17:39	2:51
Tenth Avenue from West 30th Street to West 41st Street	4:48	12:28	6:12

The following mitigations were included as a part of the model:

- Temporary opening of West 39th Street entrance ramp to the North Tube.
- Provide Port Authority Police & Traffic Enforcement Agents to direct traffic at key locations.

Level of Service and Delay for intersections near the construction activities are shown in **Table B.7-10**.

Additional potential mitigation measures, as described below, would also be incorporated as appropriate as and in coordination with NYC DOT as part of the construction operations to further reduce delays.

- Refinement of mitigation will occur, as needed, during development of Full TMP (Signal Timing Changes, Lane Adjustments, etc.).
- Implementation of Traffic Monitoring Program Prior to Construction.
- Utilize Planned PABTR Transportation Management Center.

Table B.7-10. Dyer Deck-Overs Lincoln Tunnel Expressway Overnight LOS Results

Intersection	Approach	Existing (2019)		Construction Condition (With Mitigation)	
		Delay	LOS	Delay	LOS
Eleventh Avenue at West 37th Street	Intersection	12.7	B	6.9	A
Eleventh Avenue at West 38th Street	Intersection	7.8	A	11.5	B
Eleventh Avenue at West 39th Street	Intersection	8.4	A	13.9	B
Eleventh Avenue at West 40th Street	Intersection	15.6	B	64.8	E
Eleventh Avenue at West 41st Street	Intersection	14.7	B	14.5	B
Eleventh Avenue at West 42nd Street	Intersection	29.9	C	20.1	C
Eleventh Avenue at West 43rd Street	Intersection	10.4	B	16.3	B
Galvin Avenue at West 40th Street	Intersection	48.7	D	35.2	D
Tenth Avenue at West 37th Street	Intersection	12.3	B	13.4	B
Tenth Avenue at West 38th Street	Intersection	14.2	B	12.4	B
Tenth Avenue at West 39th Street	Intersection	56.3	E	9.7	A
Tenth Avenue at West 40th Street	Intersection	68	E	19.5	B
Tenth Avenue at West 41st Street	Intersection	64.4	E	16.4	B

Intersection	Approach	Existing (2019)		Construction Condition (With Mitigation)	
		Delay	LOS	Delay	LOS
Tenth Avenue at West 42nd Street	Intersection	11	B	43.4	D
Tenth Avenue at West 43rd Street	Intersection	11.6	B	13.4	B
Dyer Avenue at West 40th Street	Intersection	21.4	C	88.2	F
Dyer Avenue at West 41st Street	Intersection	19.3	B	31.9	C
Dyer Avenue at West 42nd Street	Intersection	17	B	28.1	C
Ninth Avenue at West 37th Street	Intersection	22.3	C	21.7	C
Ninth Avenue at West 38th Street	Intersection	12.8	B	6.8	A
Ninth Avenue at West 39th Street	Intersection	16.8	B	58.7	E
Ninth Avenue at West 40th Street	Intersection	8.6	A	21.9	C
Ninth Avenue at West 41st Street	Intersection	12.9	B	11.9	B
Ninth Avenue at West 42nd Street	Intersection	19.2	B	13.7	B
Ninth Avenue at West 43rd Street	Intersection	10.7	B	20.7	C

Note: Highlighted cells reflect an impact condition

*Please note that the Existing results shown are from the PM peak hour, and construction results are from the nighttime peak hour. This comparison is used to show the effects of the construction condition when compared to the highest volume hour of the day for traffic conditions.

SSF Construction Staging

It is anticipated that the construction of the SSF will be the second stage of construction within the overall first phase. There are two critical construction stages related to the SSF where traffic must be detoured:

- Stage 1 - Demolition & Foundations: the demolition of the existing ramps over Dyer Avenue, which will require all eastbound traffic from the Lincoln Tunnel to utilize Dyer Avenue South.
- Stage 2 - Construction of the SSF and ramping system, which will require long-term implementation (24/7 for multiple years) of a contraflow lane (in effect from 3:00 p.m. – 7:00 p.m.) on Tenth Avenue between West 39th Street and West 40th Street to accommodate terminal bus traffic.

The following sections detail the assumptions, model results, and mitigation options for each of these stages of SSF construction.

SSF - Stage 1

The models for Stage 1 SSF were performed for the 11:00 p.m.-12:00 a.m. weekday nighttime period to capture the highest hourly traffic volumes when PABT ramps are anticipated to be closed. Several analysis assumptions were made for the analysis of the SSF Stage 1 construction:

- Dyer Avenue North would be closed
- West 40th Street between Ninth and Tenth Avenues would be closed

- The center tube of the Lincoln Tunnel would be closed (traffic conditions with the Center Tube open are shown in **Table B.7-11** for comparison).[9]
- All eastbound traffic from the Lincoln Tunnel would be routed to Dyer Avenue South

Based on the analysis conducted, travel times on Ninth Avenue and Tenth Avenue were compared to existing conditions (2019). The analysis showed an increase in travel times along these avenues. Model results are shown in **Table B.7-11.**

Table B.7-11. SSF Stage 1 Nighttime Results

Volume	Existing	Center Tube Open		Center Tube Closed	
		Volume	Processing %	Volume	Processing %
Lincoln Tunnel Inbound	1,494	1,493	100%	1,352	90.5%
Lincoln Tunnel Outbound	2,703	2,631	98%	2,641	97.7%

Travel Time Section	Existing Travel Time (mm:ss)	Center Tube Open (mm:ss)	Center Tube Closed (mm:ss)	Change in Travel Time (mm:ss)
Center Tube EB (From NJ portal to Dyer Avenue South & North of West 36th Street)	3:13	5:53		
South Tube EB (From NJ portal to Dyer Avenue South & North of West 36th Street)	3:02	6:15	12:36	+ 9:34
Center Tube WB (From Ramp C @ 9th Avenue to NJ portal)	5:17	5:15		
North Tube WB (From ramp 99 to NJ portal)	4:20	4:19	5:40	+1:20
Eighth Avenue NB (West 30th to West 42nd Street)	5:21	5:06	5:07	- 0:14
Ninth Avenue SB (West 42nd to West 34th Street)	2:19	2:23	2:40	+ 0:21
Tenth Avenue NB (West 30th to West 41st Street)	2:18	12:40	10:09	+ 7:51
Eleventh Avenue NB (West 34th to West 40th Street)	1:25	3:12	5:35	+ 4:10
West 35th Street WB (Eighth to Eleventh Avenues)	8:07	11:24	10:03	+ 1:56
West 36th Street EB (Eighth to Eleventh Avenues)	3:23	5:57	6:45	+ 3:22
West 3Eighth Street EB (Eighth to Eleventh Avenues)	2:34	3:16	3:23	+ 0:39
West 42nd Street EB (Eighth to Eleventh Avenues)	3:20	3:15	3:16	- 0:04

The SSF Stage 1 results show up to a nine and half minute increase in travel times when compared to existing conditions. However, when compared to the condition with the center tube open, there is less than two minutes of added delay for all travel time sections other than the South Tube, which experiences an added six minutes of delay. With the implementation of a Traffic Management Center, prior to the start of construction, public notices will be disseminated to allow motorists to make informed route decisions and avoid traveling in the Project Area. This

[9] The PANYNJ regularly closes portions of the Lincoln Tunnel or access ramps / roadways in the course of normal (non-construction) operations. The 39th Street Underpass is closed weekdays during the PM peak period to facilitate bus movements from the PABT to the North Tube of the Lincoln Tunnel. Individual tubes of the Lincoln Tunnel (North, Center and South) are closed at least once per week between 11:00 p.m. and 5:00 a.m. with only one tube being closed at a time. The closures allow for regular maintenance, inspections and light repairs.

will help to reduce the traffic demand and reduce the additional delays estimated to occur during the project's construction. No mitigations were applied to the model. However, there are several mitigation options that would be considered at time of implementation, including:

- Optimize signal timings on Tenth Avenue
- Temporarily change street parking regulations to allow more travel lanes on Tenth Avenue between West 30th Street and West 41st Street during the overnight peak hours
- Optimize signal timings on Dyer Avenue South at West 36th, West 35th, and West 34th Streets
- Provide PANYNJ Police and Traffic Enforcement Agents to direct traffic at key locations

SSF Stage 2

There are six interim phases for the second stage of SSF construction when sections of existing ramps are removed and both temporary and permanent new ramps are constructed. Two of these interim phases were analyzed, representing the worst-case scenarios, Concept Stage (CS)-3 and CS-5. The models for SSF Stage 2 were performed for both the AM (8:00 – 9:00 a.m.) and PM (5:00 – 6:00 p.m.) peak hours to capture the highest hourly traffic volumes when the detour for construction of the new ramps is in place.

Stages are in place for over the course of the SSF construction with initial stages lasting for several months each and CS-5 – the most significant phase – in place for approximately three years.

Assumptions for the CS-3 model are summarized below:

- Assumptions for AM peak period:

  Prohibit eastbound through movement at Galvin Plaza and West 40th Street intersection allowing for free flow condition for buses on West 40th Street entering the Lincoln Tunnel. Otherwise, recirculating buses on Ramp 99 may need to stop for oncoming traffic, thereby restricting the movement of existing buses heading to the Lincoln Tunnel. Movements on the southern-most lane (right turn only) could continue unrestricted. There are two westbound lanes on West 41st Street between Galvin Plaza & Eleventh Avenue.
- Assumptions for PM peak period:
  - Galvin Avenue returns to existing operations in the PM Peak Period

During the evening peak hours, the two western most lanes of Dyer Ave from West 42nd Street to West 39th Street/Center Tunnel currently provide counterflow operations for buses only. This allows buses from West 42nd Street and the Greyhound Tunnel to proceed south on Dyer Ave and access the Center Tunnel via Ramp H at the merge with the Dyer Plaza Ramp. Similarly, this allows terminal buses to use the reversible Ramp 97 to access the Center Tube A diagram of the Bus Routing is shown in **Figure B.7-3** for the AM peak hour and **Figure B.7-4** for the PM peak hour for CS-3 of the SSF's construction.

Figure B.7-3. AM Proposed Bus Routing Mitigation During Construction - CS-3 – 2025

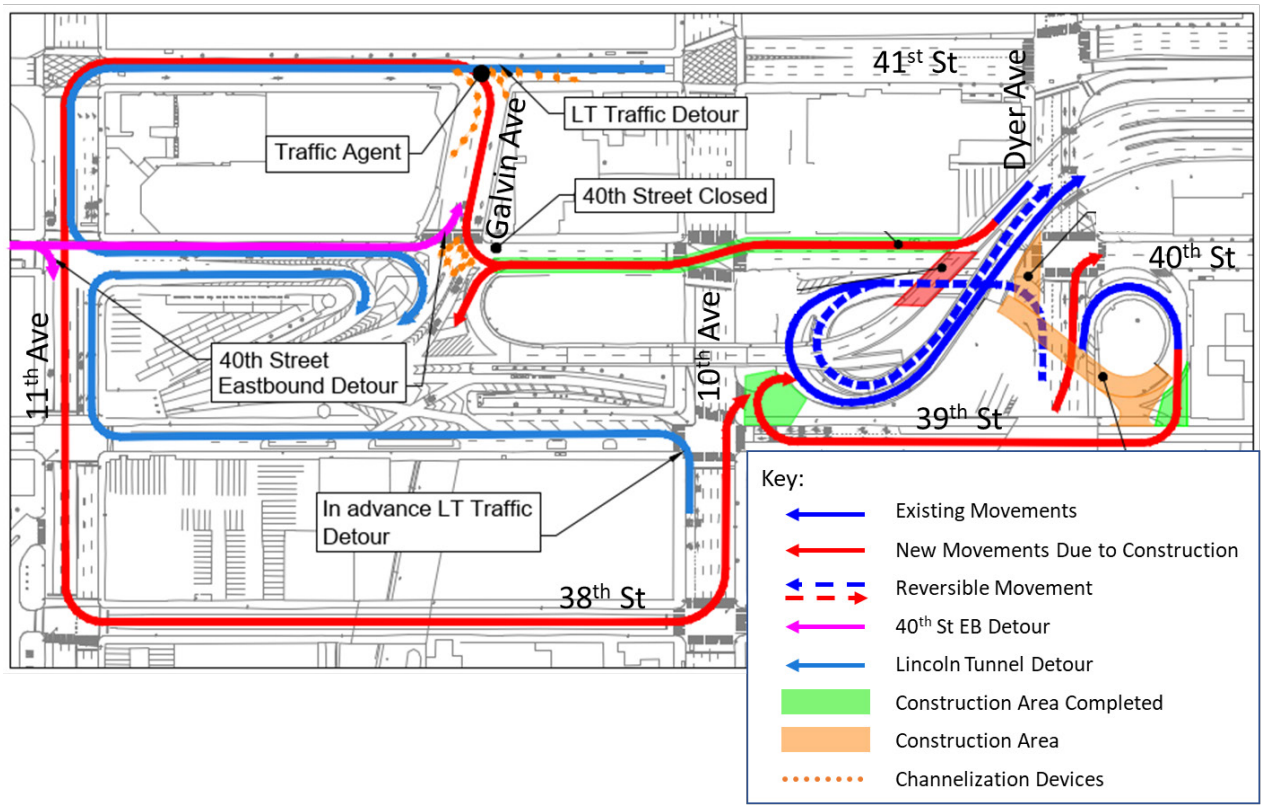
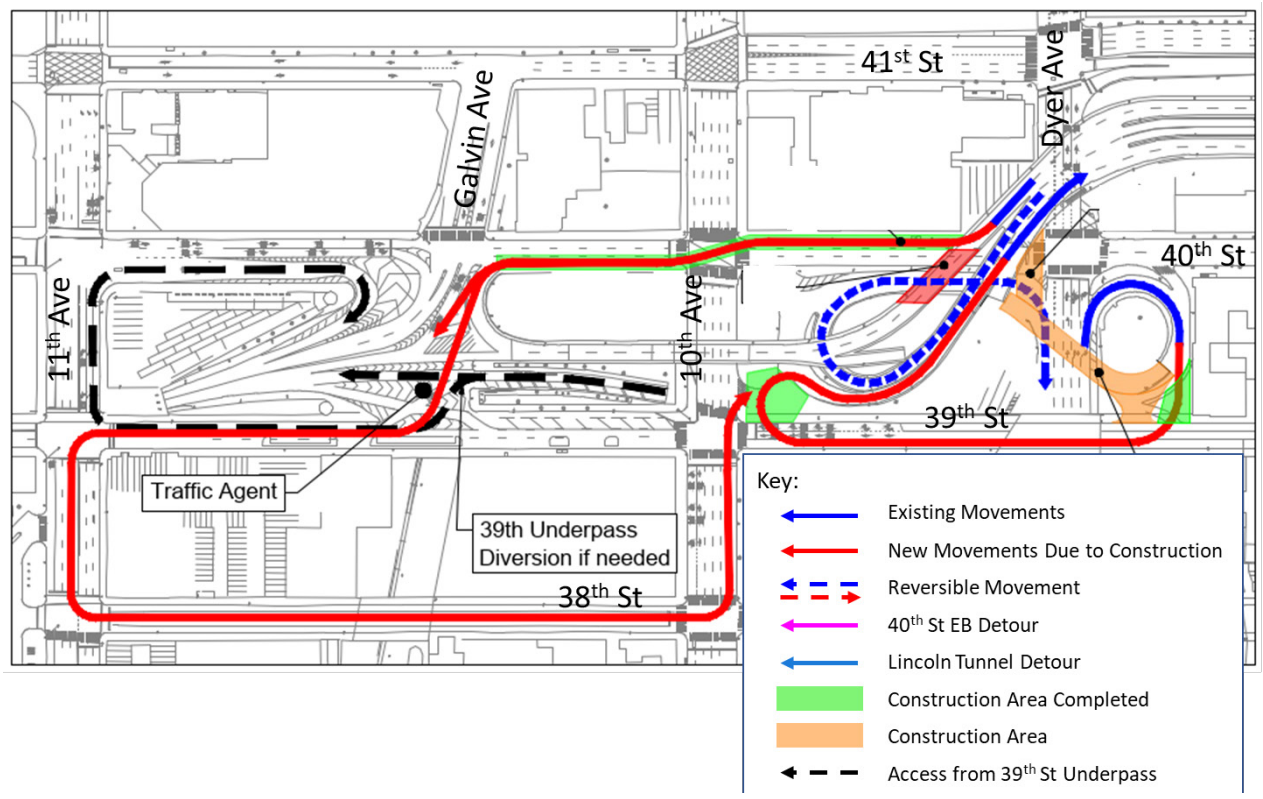


Figure B.7-4. PM Proposed Bus Routing During Construction – CS-3 - 2025



The following potential mitigation measures were applied to the models:

- Signal timing changes at Eleventh Avenue at West 41st Street – Additional green signal time to westbound approach in the AM Peak Period. (No mitigation is required for the PM Peak Period.) [10]

Model Results for the AM peak hour are shown in **Table B.7-12** and **TableB.7-13.** Model results for the PM peak hour are shown in **Table B.7-14** and **Table B.7-15**.

Table B.7-12. AM Peak Model Analysis Results – Volumes Processed with Mitigation (CS-3)

	Demand	Construction Conditions	
		Aimsun	Processed %
XBL to 97/98	615	602	98%
XBL to West 40th Street EB	132	127	96%
Non-XBL to 96	7	7	100%
Tenth Avenue NB to Terminal	9	7	78%
Tenth Avenue to Lincoln Tunnel outbound	80	62	78%
Outbound buses to Eleventh Avenue SB	49	48	97%
Recirculation via West 38th Street	15	13	88%
Exit Terminal via West 41st Street	102	102	100%
Terminal Outbound via 99 to North Tube	481	473	98%

TableB.7-13. AM Peak model analysis results – Change in Travel Times (CS-3)

Travel Time Section	Existing (mm:ss)	Build Non-Mitigated (mm:ss)	Build Mitigated (mm:ss)	Change in Travel Time (mm:ss)
Inbound via XBL	3:52	4:10	4:01	+ 0:09
Outbound via Ramp 99	3:15	6:32	3:24	+ 0:09
Outbound from Tenth Avenue/West 41st Street	0:51	4:31	2:30	+ 1:39
Recirculation – Exit & back to Terminal	3:00	15:59	8:22	+ 5:22
West 38th Street EB from 11th to Eighth Avenue	3:18	4:54	5:13(1)	+1:55
West 42nd Street EB from 11th to Eighth Avenue	10:48	14:29	14:14	+ 3:26

Note: (1) - The Aimsun analysis is performed in a holistic model, so as one traffic movement is mitigated, volumes may shift and affect other locations, so the results need to be looked at in their totality. While there may be an overall improvement in traffic conditions, not all routes may see improvements.

[10] Mitigation is intended to improve traffic conditions by determining modifications which may reduce delay / improve efficiency of vehicle movements. When applying mitigation to a network of inter-related streets, it is possible that while mitigation improves travel times for many routes, other routes may not see improvements and some many even see increases to delays. Successful mitigation must weigh the overall benefits to travel times against any movements which see worsening outcomes.

Table B.7-14. PM Peak model analysis results – Volumes – Demand vs. Processed (CS-3)

Travel Time Section	Demand	Construction Conditions	
		Aimsun	Processed %
Outbound Ramp 97/98 to Dyer (contraflow)	84	84	100%
Outbound non-contraflow to Ramp 96	325	322	99%
Tenth Avenue NB to Terminal	108	87	81%
Outbound buses to Eleventh Avenue SB	8	8	100%
Recirculation via West 38th Street*	53	53	100%
Terminal Outbound via 99 to North Tube	374	374	100%

*Routing distance for this section differs between Existing and Construction condition, but that this section has still been included to provide understanding of bus operations

Table B.7-15. PM Peak model analysis results – Change in Travel Times (CS-3)

Travel Time Section	Existing (mm:ss)	Build Non-Mitigated (mm:ss)(1)	Change in Travel Time (mm:ss)
Outbound via contraflow (Sputnik)(2)	1:10	1:30	+ 0:20
Outbound via Ramp 99	1:08	1:15	+ 0:07
Outbound from Tenth/West 41st Street	1:06	1:08	+ 0:02
Recirculation – Exit & back to Terminal(3)	2:35	4:09	+ 1:34
West 38th Street EB from 11th to Eighth Avenue	2:48	2:38	- 0:10
West 42nd Street EB from 11th to Eighth Avenue	4:11	3:53	- 0:18

(1) No mitigation was required in the PM analysis
(2) During the evening peak hours, the two western most lanes of Dyer Ave from 42nd Street to 39th Street/Center Tunnel provide counterflow operations for buses only. This allows buses from 42nd Street and the Greyhound Tunnel to proceed south on Dyer Ave and access the Center Tunnel via Ramp H at the merge with the Dyer Plaza Ramp. Similarly, this allows terminal buses to use the reversible Ramp 97 to access Dyer Ave south of 40th Street to enter the Center Tube.
(3) Routing distance for this section differs between Existing and Construction condition, but that this section has still been included to provide understanding of bus operations

Level of Service and Delay for intersections near the construction activities are shown in **Table B.7-16** for AM results and **Table B.7-17** for PM results.

Table B.7-16. SSF Construction - Stage CS-3 AM Results

Intersection	Approach	Existing (2019)		Construction Condition (With Mitigation)	
		(mm:ss)	LOS	(mm:ss)	LOS
Eleventh Avenue at West 37th Street	Intersection	6.1	A	10.7	B
Eleventh Avenue at West 38th Street	Intersection	10.5	B	9.7	A
Eleventh Avenue at West 39th Street	Intersection	15.8	B	58.6	E
Eleventh Avenue at West 40th Street	Intersection	15.3	B	27.7	C
Eleventh Avenue at West 41st Street	Intersection	15.5	B	52	D

Intersection	Approach	Existing (2019)		Construction Condition (With Mitigation)	
		(mm:ss)	LOS	(mm:ss)	LOS
Eleventh Avenue at West 42nd Street	Intersection	8.2	A	7.1	A
Eleventh Avenue at West 43rd Street	Intersection	25.9	C	N/A	N/A
Galvin Avenue at West 40th Street	Intersection	16.1	B	16.6	B
Tenth Avenue at West 37th Street	Intersection	10.2	B	9	A
Tenth Avenue at West 38th Street	Intersection	10	A	8.4	A
Tenth Avenue at West 39th Street	Intersection	14.5	B	7.7	A
Tenth Avenue at West 40th Street	Intersection	43.5	D	13.5	B
Tenth Avenue at West 41st Street	Intersection	22.2	C	59.6	E
Tenth Avenue at West 42nd Street	Intersection	15.8		14.3	B
Tenth Avenue at West 43rd Street	Intersection	18.3	B	15.3	B
Dyer Avenue at West 40th Street	Intersection	20	C	32.1	C
Dyer Avenue at West 41st Street	Intersection	12.9	B	34.9	C
Dyer Avenue at West 42nd Street	Intersection	12.1	B	20.1	C
Ninth Avenue at West 37th Street	Intersection	12.1	B	10.6	B
Ninth Avenue at West 38th Street	Intersection	18.8	B	11	B
Ninth Avenue at West 39th Street	Intersection	20	C	49.1	D
Ninth Avenue at West 40th Street	Intersection	11.5	B	11.9	B
Ninth Avenue at West 41st Street	Intersection	30.3	C	99.6	F
Ninth Avenue at West 42nd Street	Intersection	6.9	A	11.9	B
Ninth Avenue at West 43rd Street	Intersection	8.3	A	9.4	A

Note: Highlighted cells reflect an impact condition

Table B.7-17. SSF Construction - Stage CS-3 p.m. Results

Intersection	Approach	Existing (2019)		Construction Condition	
		(mm:ss)	LOS	(mm:ss)	LOS
Eleventh Avenue at West 37th Street	Intersection	7.8	A	64.7	E
Eleventh Avenue at West 38th Street	Intersection	8.4	A	45.2	D
Eleventh Avenue at West 39th Street	Intersection	15.6	B	227.1	F
Eleventh Avenue at West 40th Street	Intersection	14.7	B	50.8	D
Eleventh Avenue at West 41st Street	Intersection	29.9	C	76.8	E
Eleventh Avenue at West 42nd Street	Intersection	10.4	B	8.9	A
Eleventh Avenue at West 43rd Street	Intersection	48.7	D	16.4	B
Galvin Avenue at West 40th Street	Intersection	12.3	B	17.1	B
Tenth Avenue at West 37th Street	Intersection	14.2	B	13.2	B
Tenth Avenue at West 38th Street	Intersection	56.3	E	9.5	A
Tenth Avenue at West 39th Street	Intersection	68	E	16.8	B
Tenth Avenue at West 40th Street	Intersection	64.4	E	37.6	D
Tenth Avenue at West 41st Street	Intersection	11	B	51.5	D
Tenth Avenue at West 42nd Street	Intersection	11.6	B	11.7	B
Tenth Avenue at West 43rd Street	Intersection	21.4	C	28	C
Dyer Avenue at West 40th Street	Intersection	19.3	B	31.6	C
Dyer Avenue at West 41st Street	Intersection	17	B	24.9	C
Dyer Avenue at West 42nd Street	Intersection	22.3	C	36.3	D
Ninth Avenue at West 37th Street	Intersection	12.8	B	10.9	B
Ninth Avenue at West 38th Street	Intersection	16.8	B	42.8	D
Ninth Avenue at West 3Ninth Street	Intersection	8.6	A	53.6	D
Ninth Avenue at West 40th Street	Intersection	12.9	B	45.1	D
Ninth Avenue at West 41st Street	Intersection	19.2	B	75.1	E
Ninth Avenue at West 42nd Street	Intersection	10.7	B	20.1	C
Ninth Avenue at West 43rd Street	Intersection	12.7	B	6.8	A

Note: Highlighted cells reflect an impact condition

Based on the analysis conducted, travel times were compared to base conditions (2019). The analysis showed up to a 5.5-minute increase in travel times along these segments in the AM, resulting in impacts to traffic. In the PM peak hour, travel times only experience two minutes or less of additional delay. With the implementation of a Traffic Management Center, prior to the start of construction, public notices will be disseminated to allow motorists to make informed route decisions and avoid traveling in the Project Area. This will help to reduce the traffic demand and reduce the additional delays estimated to occur during the project's construction.

CS-5 models are summarized below. Several analysis assumptions were made for the analysis of this phase of construction:

- West 39th Street is closed to general traffic between Ninth Avenue and Tenth Avenue.

A diagram of the Bus Routing is shown in **Figure B.7-5** for AM and **Figure B.7-6** for PM.

Figure B.7-5. AM Proposed Bus Routing During Construction – CS-5 ~2025 – 2028

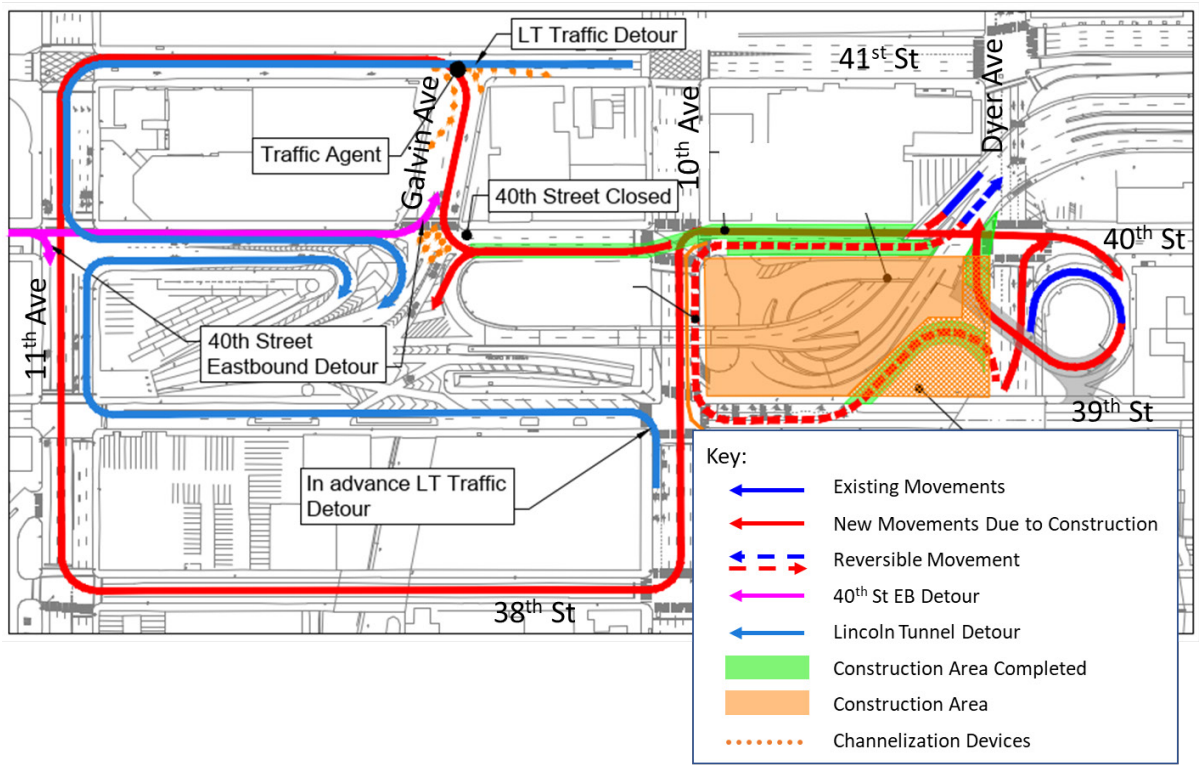
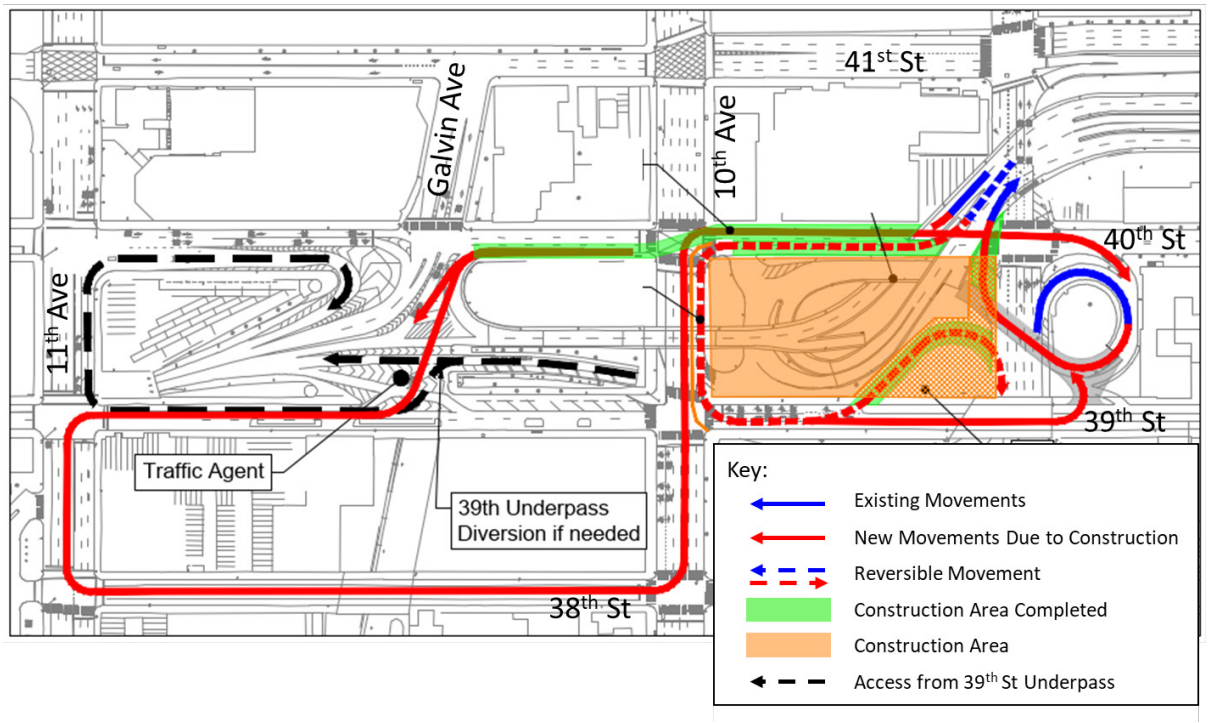


Figure B.7-6. PM Proposed Bus Routing During Construction – CS-5 ~2025-2028



The following mitigation measures were applied to both the AM and PM models:

- Tenth Avenue at West 39th Street – Signal timings were updated to give additional green time to the northbound approach (9.5 seconds were taken from the westbound movement and given to the northbound movement in the AM model. Also: 0.5 seconds were taken from the westbound movement and added to the northbound movement in the PM).
- Tenth Avenue at West 40th Street – Additional Green time to Northbound approach (for the AM 12 seconds was added to northbound, eastbound movement removed; for PM pedestrian crossing lead time removed, four seconds added to northbound, three seconds added to eastbound).

Model Results for the AM peak hour are shown in **Table B.7-18** and **Table B.7-19**. Model results for the PM peak hour are shown in **Table B.7-20** and **Table B.7-21**.

Table B.7-18. AM Peak Model Analysis Results – Volumes Processing with Mitigation (CS-5)

Travel Time Section	Demand	Construction Conditions	
		Aimsun	Processed %
XBL to 97/98	489	485	99%
XBL/GPL to West 40th Street EB	132	130	98%
Non-XBL to 96	133	129	97%
Outbound buses to Eleventh Avenue Southbound	49	46	95%
Recirculation via West 38th Street	15	14	93%
Terminal Outbound via West 41st Street	102	99	97%
Terminal Outbound via 99 to North Tube	481	481	100%

Table B.7-19. AM Peak Model Analysis Results – Change in Travel Times (CS-5)

Travel Time Section	Existing (mm:ss)	Build Non-Mitigated (mm:ss)	Build Mitigated (mm:ss)	Change in Travel Times (mm:ss)(1)
Inbound via XBL	1:15	1:33	1:24	+ 0:09
Outbound via Ramp 99	1:04	1:11	1:11	+ 0:07
Outbound from Tenth Avenue/West 39th Street to Portal	3:23	3:17	2:31	- 0:52
Recirculation – Exit & back to Terminal	3:00	18:36	10:06	+ 7:06

(1) Note: Change is the difference between existing travel times (without construction) and travel times under construction conditions, with mitigation.

Table B.7-20. PM Peak Model Analysis Results – Volumes – Demand vs. Processed (CS-5)

Travel Time Section	Demand	Construction Conditions	
		Aimsun	Processed %
97/98 Outbound	84	84	100%
Inbound to 96	325	325	100%
Outbound buses to Eleventh Avenue SB	8	8	100%
Recirculation via West 38th Street	52	52	100%
Terminal Outbound via 99 to North Tube	374	374	100%
97/98 Outbound	84	84	100%

Table B.7-21. PM Peak Model Analysis Results – Change in Travel Times (CS-5)

Travel Time Section	Existing (mm:ss)	Build Non-Mitigated (mm:ss)	Build Mitigated (mm:ss)	Change in Travel Time (mm:ss)(1)
Inbound to Terminal	1:10	1:05	1:05	- 0:05
Outbound via Ramp 99	1:08	1:15	1:15	+ 0:07
Outbound via 97/98	1:06	1:20	1:19	+0:13
Recirculation – Exit & Back to Terminal	2:35	7:10	5:26	+2:51

(1) Note: Change is the difference between existing travel times (without construction) and travel times under construction conditions, with mitigation.

Level of Service and Delay for intersections near the construction activities are shown in **Table B.7-22** for AM results and **Table B.7-23** for PM results.

Table B.7-22. SSF Construction - Stage CS-5 a.m. Results

		Existing (2019)		Construction Condition (With Mitigation)	
Intersection	Approach	(mm:ss)	LOS	(mm:ss)	LOS
Eleventh Avenue at 37th Street	Intersection	6.1	A	18.5	B
Eleventh Avenue at 38th Street	Intersection	10.5	B	50.5	D
Eleventh Avenue at 39th Street	Intersection	15.8	B	64.3	E
Eleventh Avenue at 40th Street	Intersection	15.3	B	62.8	E
Eleventh Avenue at 41st Street	Intersection	15.5	B	36.3	D
Eleventh Avenue at 42nd Street	Intersection	8.2	A	6.9	A
Eleventh Avenue at 43rd Street	Intersection	25.9	C	N/A	N/A
Galvin Avenue at 40th Street	Intersection	16.1	B	28.1	C
Tenth Avenue at 37th Street	Intersection	10.2	B	10.2	B
Tenth Avenue at 38th Street	Intersection	10	A	6.9	A
Tenth Avenue at 39th Street	Intersection	14.5	B	12	B
Tenth Avenue at 40th Street	Intersection	43.5	D	19.5	B
Tenth Avenue at 41st Street	Intersection	22.2	C	91.8	F
Tenth Avenue at 42nd Street	Intersection	15.8	B	43.6	D
Tenth Avenue at 43rd Street	Intersection	18.3	B	15.4	B
Dyer Avenue at 40th Street	Intersection	20	C	34.3	C
Dyer Avenue at 41st Street	Intersection	12.9	B	25.7	C
Dyer Avenue at 42nd Street	Intersection	12.1	B	20.1	C
9th Avenue at 37th Street	Intersection	12.1	B	13.3	B
9th Avenue at 38th Street	Intersection	18.8	B	10.3	B
9th Avenue at 39th Street	Intersection	20	C	82.4	F
9th Avenue at 40th Street	Intersection	11.5	B	13.4	B
9th Avenue at 41st Street	Intersection	30.3	C	103	F
9th Avenue at 42nd Street	Intersection	6.9	A	15.7	B
9th Avenue at 43rd Street	Intersection	8.3	A	10.7	B

Note: Highlighted cells reflect an impact condition

Table B.7-23. SSF Construction - Stage CS-5 p.m. Results

		Existing (2019)		Construction Condition (With Mitigation)	
Intersection	**Approach**	**(mm:ss)**	**LOS**	**(mm:ss)**	**LOS**
Eleventh Avenue at West 37th Street	Intersection	7.8	A	50.8	D
Eleventh Avenue at West 38th Street	Intersection	8.4	A	23.7	C
Eleventh Avenue at West 39th Street	Intersection	15.6	B	120.4	F
Eleventh Avenue at West 40th Street	Intersection	14.7	B	18.6	B
Eleventh Avenue at West 41st Street	Intersection	29.9	C	91.1	F
Eleventh Avenue at West 42nd Street	Intersection	10.4	B	10.1	B
Eleventh Avenue at West 43rd Street	Intersection	48.7	D	14.9	B
Galvin Avenue at West 40th Street	Intersection	12.3	B	48.2	D
Tenth Avenue at West 37th Street	Intersection	14.2	B	24.5	C
Tenth Avenue at West 38th Street	Intersection	56.3	E	26.7	C
Tenth Avenue at West 39th Street	Intersection	68	E	12.1	B
Tenth Avenue at West 40th Street	Intersection	64.4	E	33	C
Tenth Avenue at West 41st Street	Intersection	11	B	82.4	F
Tenth Avenue at West 42nd Street	Intersection	11.6	B	15.8	B
Tenth Avenue at West 43rd Street	Intersection	21.4	C	42.6	D
Dyer Avenue at West 40th Street	Intersection	19.3	B	27.2	C
Dyer Avenue at West 41st Street	Intersection	17	B	33.9	C
Dyer Avenue at West 42nd Street	Intersection	22.3	C	40.8	D
Ninth Avenue at West 37th Street	Intersection	12.8	B	12.9	B
Ninth Avenue at West 38th Street	Intersection	16.8	B	155.7	F
Ninth Avenue at West 3Ninth Street	Intersection	8.6	A	83	F
Ninth Avenue at West 40th Street	Intersection	12.9	B	45.6	D
Ninth Avenue at West 41st Street	Intersection	19.2	B	52.4	D
Ninth Avenue at West 42nd Street	Intersection	10.7	B	28.8	C
Ninth Avenue at West 43rd Street	Intersection	12.7	B	9.8	A

Note: Highlighted cells reflect an impact condition

To undertake the analysis conducted, travel times were compared to base conditions (2019). The analysis showed an increase of up to seven minutes in travel times along these segments in the AM peak hour, resulting in an impact to traffic. The PM peak hour shows three minutes or less of added delay. With the implementation of a Traffic Management Center, prior to the start of construction, public notices will be disseminated to allow motorists to make informed route decisions and avoid traveling in the Project Area. This will help to reduce the traffic demand and reduce the additional delays estimated to occur during the project's construction.

RAMP CONSTRUCTION STAGING

One representative stage was analyzed for the steel installation for new ramp construction at Ramp 99 crossing Tenth Avenue. Aimsun models were developed and run for this condition, assuming a full closure of Tenth Avenue between West 39th Street and 40th Street, but this resulted in major delays and significant impacts across all of the study area. This delay was deemed unacceptable, so instead only the following closures will be allowed during this stage:

- Overnight intermittent closures of Tenth Avenue between West 39th Street and 40th Street for placement of overhead materials, following New York City Office of Construction Mitigation and Coordination guidance of a maximum closure of 15-min every 3 hours.
- Closure occurs multiple times overnight, but traffic is fully restored by AM peak hour.

With the implementation of a Traffic Management Center, prior to the start of construction, public notices will be disseminated to allow motorists to make informed route decisions and avoid traveling in the Project Area. This will help to reduce the traffic demand and reduce the additional delays estimated to occur during the project's construction.

PHASE 2 CONSTRUCTION

Main Terminal Construction Staging

Only one stage was analyzed for the Main Terminal construction. While modifications may be made, this analysis considers the most expansive and potentially impactful modifications to provide a conservative analysis. The models for the Main Terminal construction were performed for both the AM (8:00 – 9:00 a.m.) and PM (5:00 – 6:00 p.m.) peak hours. Construction and bus operation logistics require changes to multiple roadways in the Project Area to accommodate equipment and alternate bus routes while ramps are removed / replaced. These conditions are anticipated to be in place for the duration of Phase 2 construction (2028-2032).

Several assumptions were made for the analysis of the Main Terminal construction:

- Bike lanes are in place on Eleventh/Tenth/Ninth/Eighth Avenues
- Bike lanes are in place on West 39th Street[11]
- The SSF is operating as a temporary terminal
- Operation of North and South Dyer Deck-Overs for bus operations
- Temporary Bus Gates along Dyer Avenue between West 36th Street and West 34th Street
- Roadway Network Changes:
  - Lane reduction on West 40th Street between Eighth Avenue and Dyer Avenue
  - Lane reduction on West 40th Street between Ninth Avenue and Dyer Avenue
  - Dyer Avenue & West 40th Street geometry update
  - West 39th Street bus only between Ninth Avenue and Tenth Avenue

[11] NYC DOT has or intends to install bike lanes at these locations, assumed to be in place prior to 2032.

- Bus stop/parking lane on Dyer Avenue between West 36th Street and West 34th Street – curbside parking (four positions in total)
- Intersection geometry updates – West 36th Street, West 35th Street, and West 34th Street at Dyer Avenue
- Closure of West 41st Street between Eighth Avenue and Ninth Avenue

The following potential mitigations were developed and would be expected to improve traffic conditions during construction:

- West 37th Street between Tenth Avenue and the southern Dyer Deck-Over:
  - Two travels lanes would operate, with the right lane for bus only to allow bus operation from the southern Dyer Deck-Over to either the Lincoln Tunnel or the SSF / Temporary Terminal
  - Through traffic yields to buses from the southern Dyer Deck-Over
- West 39th Street between Seventh Avenue and Eighth Avenue:
  - Two lanes to allow traffic entering network from east. In 2018 this section of West 39th Street had two lanes. In 2022 it was converted into single lane due to the addition of a bike lane. This would require elimination of a parking lane at the approach to the intersection.
- West 40th Street & Dyer Avenue:
  - Revise the existing striping of the right turn only lane between Ramp 96 and West 40th Street to allow for one right turn only and one right through shared lane. This is to avoid blocking Ramp 96 egress point at Dyer Avenue.

Table B.7-24. Main Terminal Construction Model AM Peak Hour Travel Time Results (2028 – 2032)

Travel Time Section	Existing (mm:ss)	Build Non-Mitigated (mm:ss)	Change in Travel Time (mm:ss)
GPL to Ramp 96	3:38	7:32	+ 3:54
GPL to Ramp 97/98	3:35	6:48	+ 3:13
XBL to Ramp 97/98	3:18	3:58	+ 0:40
South Tube to Dyer Ave/West 40th Street	6:01	12:59	+ 6:58
Deck Gates to Lincoln Tunnel Outbound	N/A	15:53	--
West 37th Street from Seventh Avenue to Eleventh Avenue	9:24	16:16	+ 6:52
West 38th Street from Eleventh Avenue to Seventh Avenue	4:03	4:44	+ 0: 41
West 42nd Street WB from Seventh Avenue to Ninth Avenue	9:19	16:03	+ 6:44
West 42nd Street WB from Ninth Avenue to Twelfth Ave	4:11	5:20	+ 1:09
West 42nd Street EB from Twelfth Avenue to Ninth Avenue	16:27	25:15	+ 8:24
Seventh Avenue from West 42nd Street to West 34th Street	1:17	1:36	+ 0:19
Eighth Avenue from West 30th Street to West 42nd Street	13:27	14:59	+ 1:32

Travel Time Section	Existing (mm:ss)	Build Non-Mitigated (mm:ss)	Change in Travel Time (mm:ss)
Ninth Avenue from West 42nd Street to West 34th Street	1:15	3:17	+ 2:02
Tenth Avenue from West 30th Street to West 41st Street	14:04	16:59	+ 2:55
Tenth Avenue from 37th Street to West 40th Street	4:02	3:54	- 0:08
Eleventh Avenue NB from West 34th Street to West 40th Street	1:50	1:41	- 0:09
Eleventh Avenue SB from West 42nd Street to West 34th Street	1:10	2:08	+ 0:58
Twelfth Avenue NB from West 34th Street to West 42nd Street	2:39	4:18	+ 1:39
Twelfth Avenue SB from West 42nd Street to West 34th Street	1:10	1:36	+ 0:26

(GPL = General Purpose Lanes)

Table B.7-25. Main Terminal Construction AM Peak Hour Volume Results (2028 – 2032)

	Demand	Construction Conditions	
		Aimsun	Processed %
XBL Inbound	557	557	100%
Ramp 97/98 Inbound	701	687	98%
Ramp 96 Inbound	112	102	91%
Staging Deck Entrance	100	91	91%

Table B.7-26. Main Terminal Construction PM Peak Hour Travel Time Results (2028 – 2032)

Travel Time Section	Existing (mm:ss)	Build Non-Mitigated (mm:ss)	Change in Travel Time (mm:ss)
South Tube to Dyer Ave/40th Street	3:15	7:11	3:56
Ninth Avenue from 42nd Street to 34th Street	2:17	3:12	+ 0:55

Level of Service and Delay for intersections near the construction activities are shown in **Table B.7-27** for AM results and **Table B.7-28** for PM results.

Table B.7-27. Main Terminal Construction - AM Results

Intersection	Approach	Existing (2019)		Construction Condition	
Eleventh Avenue at West 37th Street	Intersection	6.1	A	8.9	A
Eleventh Avenue at West 38th Street	Intersection	10.5	B	6.3	A
Eleventh Avenue at West 39th Street	Intersection	15.8	B	17.2	B
Eleventh Avenue at West 40th Street	Intersection	15.3	B	44.5	D
Eleventh Avenue at West 41st Street	Intersection	15.5	B	22.9	C
Eleventh Avenue at West 42nd Street	Intersection	8.2	A	23.2	C
Eleventh Avenue at West 43rd Street	Intersection	25.9	C	6.0	A
Galvin Avenue at West 40th Street	Intersection	16.1	B	616.6	F
Tenth Avenue at West 37th Street	Intersection	10.2	B	9.9	A
Tenth Avenue at West 38th Street	Intersection	10	A	9.5	A
Tenth Avenue at West 39th Street	Intersection	14.5	B	Out of Range	F
Tenth Avenue at West 40th Street	Intersection	43.5	D	5.8	A
Tenth Avenue at West 41st Street	Intersection	22.2	C	133.5	F

Intersection	Approach	Existing (2019)		Construction Condition	
Tenth Avenue at West 42nd Street	Intersection	15.8	B	79.4	E
Tenth Avenue at West 43rd Street	Intersection	18.3	B	13.8	B
Dyer Avenue at West 40th Street	Intersection	20	C	14.1	B
Dyer Avenue at West 41st Street	Intersection	12.9	B	12.6	B
Dyer Avenue at West 42nd Street	Intersection	12.1	B	111.8	F
Ninth Avenue at West 37th Street	Intersection	12.1	B	15.5	B
Ninth Avenue at West 38th Street	Intersection	18.8	B	10.1	B
Ninth Avenue at West 39th Street	Intersection	20	C	3.1	A
Ninth Avenue at West 40th Street	Intersection	11.5	B	9.0	A
Ninth Avenue at West 41st Street	Intersection	30.3	C	3.6	A
Ninth Avenue at West 42nd Street	Intersection	6.9	A	28.8	C
Ninth Avenue at West 43rd Street	Intersection	8.3	A	7.6	A

Note: Highlighted cells reflect an impact condition

Table B.7-28. Main Terminal Construction - PM Results

		Existing (2019)		Construction Condition (With Mitigation)	
Intersection	Approach		LOS		LOS
Eleventh Avenue West 37th Street	Intersection	12.7	B	12.3	B
Eleventh Avenue West 38th Street	Intersection	7.8	A	11.4	B
Eleventh Avenue West 39th Street	Intersection	8.4	A	14.8	B
Eleventh Avenue West 40th Street	Intersection	15.6	B	96.6	F
Eleventh Avenue West 41st Street	Intersection	14.7	B	10.6	B
Eleventh Avenue West 42nd Street	Intersection	29.9	C	13.5	B
Eleventh Avenue West 43rd Street	Intersection	10.4	B	6.3	A
Galvin Avenue West 40th Street	Intersection	48.7	D	7.1	A
Tenth Avenue West 37th Street	Intersection	12.3	B	29.1	C
Tenth Avenue West 38th Street	Intersection	14.2	B	14.5	B
Tenth Avenue West 39th Street	Intersection	56.3	E	Out of Range	F
Tenth Avenue West 40th Street	Intersection	68	E	13.9	B
Tenth Avenue West 41st Street	Intersection	64.4	E	10.2	B
Tenth Avenue West 42nd Street	Intersection	11	B	22.0	C
Tenth Avenue West 43rd Street	Intersection	11.6	B	10.4	B
Dyer Avenue West 40th Street	Intersection	21.4	C	28.1	C
Dyer Avenue West 41st Street	Intersection	19.3	B	16.5	B
Dyer Avenue West 42nd Street	Intersection	17	B	25.1	C
Ninth Avenue West 37th Street	Intersection	22.3	C	27.7	C
Ninth Avenue West 38th Street	Intersection	12.8	B	12.0	B
Ninth Avenue West 39th Street	Intersection	16.8	B	9.5	A
Ninth Avenue West 40th Street	Intersection	8.6	A	25.1	C
Ninth Avenue West 41st Street	Intersection	12.9	B	2.9	A
Ninth Avenue West 42nd Street	Intersection	19.2	B	17.1	B
Ninth Avenue West 43rd Street	Intersection	10.7	B	13.0	B

Note: Highlighted cells reflect an impact condition

B.7.5.1.2 Transit

Analysis of transit conditions during construction of the Proposed Project reviews any change of conditions as a result of additional trips generated by construction workers building the Replacement Facility and changes to general circulation as bus operations, sidewalks and transit access points change during construction.

Construction Trips

During Phase 1 the project is expected to generate 222 subway trips during the afternoon construction peak hour (3:00 p.m. to 4:00 p.m., when workers from the first shift are leaving the Project Site), and during Phase 2 the project is expected to generate 422 subway trips during the morning construction peak hour (6:00 a.m. to 7:00 a.m. when workers from the first shift are arriving at the Project Site) and 477 subway trips during the afternoon construction peak hour. The Proposed Project is not projected to generate any construction-worker trips during the "general" peak hours on transit services, which are 8:00 a.m. to 9:00 a.m. and 5:00 p.m. to 6:00 p.m. Because the subway trips generated by construction workers are distributed among multiple lines and station elements and occur outside of general peak hours, no further analysis was necessary and thus not conducted for construction trips on transit facilities.

During construction Phase 2, when the existing PABT is being demolished and the new Main Terminal is being constructed, commuter bus operations will shift from the PABT to the SSF (in use as an interim terminal), the Dyer Deck-Overs, West 30th Street, and multiple on-street locations west and south of the Project Site. The detailed description of interim bus operations during construction is described in **Appendix B.4.1**.

While most passengers will still connect to subways at the 42nd Street-Eighth Avenue station or Times Square station, some passengers will shift to the 34th Street-Hudson Yards station (No. 7 line) and the 34th Street-Penn Station subway station on Eighth Avenue (A/C/E lines). The number of passengers projected to shift to those two stations exceeds the CEQR threshold of 200 passengers in both the AM and PM peak periods, so detailed analyses are required for those stations.

During construction Phase 2, the existing direct connections between the north and south wings of the PABT and the subway mezzanine will be closed. In their place, two temporary 10-foot-wide stairs are proposed between the subway mezzanine and surface sidewalks, one on the west sidewalk of Eighth Avenue and one on the south sidewalk of West 42nd Street west of Eighth Avenue. It is also expected that subway stair S3 at the northwest corner of West 40th Street and Eighth Avenue would be temporarily widened from five to ten feet, before being replaced by a new stair in the final condition.

While construction will not change routings inside the 42nd Street-Eighth Avenue station or Times Square station, passengers who currently connect directly between the subway mezzanine and the PABT will shift to existing street stairs and the two temporary stairs to the street on Eighth

Avenue, so the existing mezzanine to street stairs at the 42nd Street-Eighth Avenue station are included in detailed analysis for construction Phase 2.

The method of analyzing transit impacts during construction is the same as for analyzing transit for the opening year 2032 and future analysis year (2040) and follows guidance of the CEQR Technical Manual (2021 Edition). In summary, the analysis starts with 2019 baseline volumes on transit elements, background growth is added to represent the construction analysis year, then incremental volumes generated or rerouted by the project are added to each element. Volume-to-capacity ratios are calculated, and impacts are determined according to criteria in the CEQR Technical Manual.

As a result of additional subway trips and changed commuting patterns during the construction of the Proposed Project, the level of service ranges from level B to D on ten station stairs as depicted in **Table B.7-29** below. The analysis identifies no impact to those station stairs. Note that although some passengers would be rerouted to the 34th Street – Hudson Yards station and the 34th Street – Eighth Avenue station, those additional passengers are distributed to multiple station elements and do not result in impacts at those stations.

Table B.7-29. Level of Service of Subway Stairs during Phase 2 Construction of Proposed Project

Station/Stair	Location	Construction Phase 2 Level of Service	
		AM	PM
Eighth Avenue - 42nd Street - PABT Station (A/C/E)			
S1 / M1	Street Stair at the Southwest corner of Eighth Avenue and 40th Street (N63 fare control area)	D	C
S3 / M3	Street Stair at the Northwest Corner of Eighth Avenue and 40th Street (N63 fare control area)	C	B
S8 / M9	Street Stair at the northwest corner of 42nd Street and Eighth Avenue (N62B fare control area)	C	D
Temporary Stair	West sidewalk of Eighth Avenue	B	B
Temporary Stair	South sidewalk of 42nd Street west of Eighth Avenue	C	C
34th Street - Penn Station (A,C,E)			
S4/P3	Street stair at Northwest Corner of Eighth Avenue and West 33rd Street	C	C
S6/P5	Street stair at Southwest Corner of Eighth Avenue and West 34th Street	C	B
O1/O2	Street stair at Southwest Corner of Eighth Avenue and West 33rd Street	A	A
S12/S13	Street stair at Northwest Corner of Eighth Avenue and West 35th Street	B	B
P9	Street stair at Southwest Corner of Eighth Avenue and West 35th Street	A	A

B.7.5.1.3 Pedestrian

A detailed pedestrian analysis is required if new pedestrian trips are expected to exceed the *CEQR Technical Manual (November 2020 Version)'s* threshold of 200 or more pedestrian trips per hour.

Construction Trips

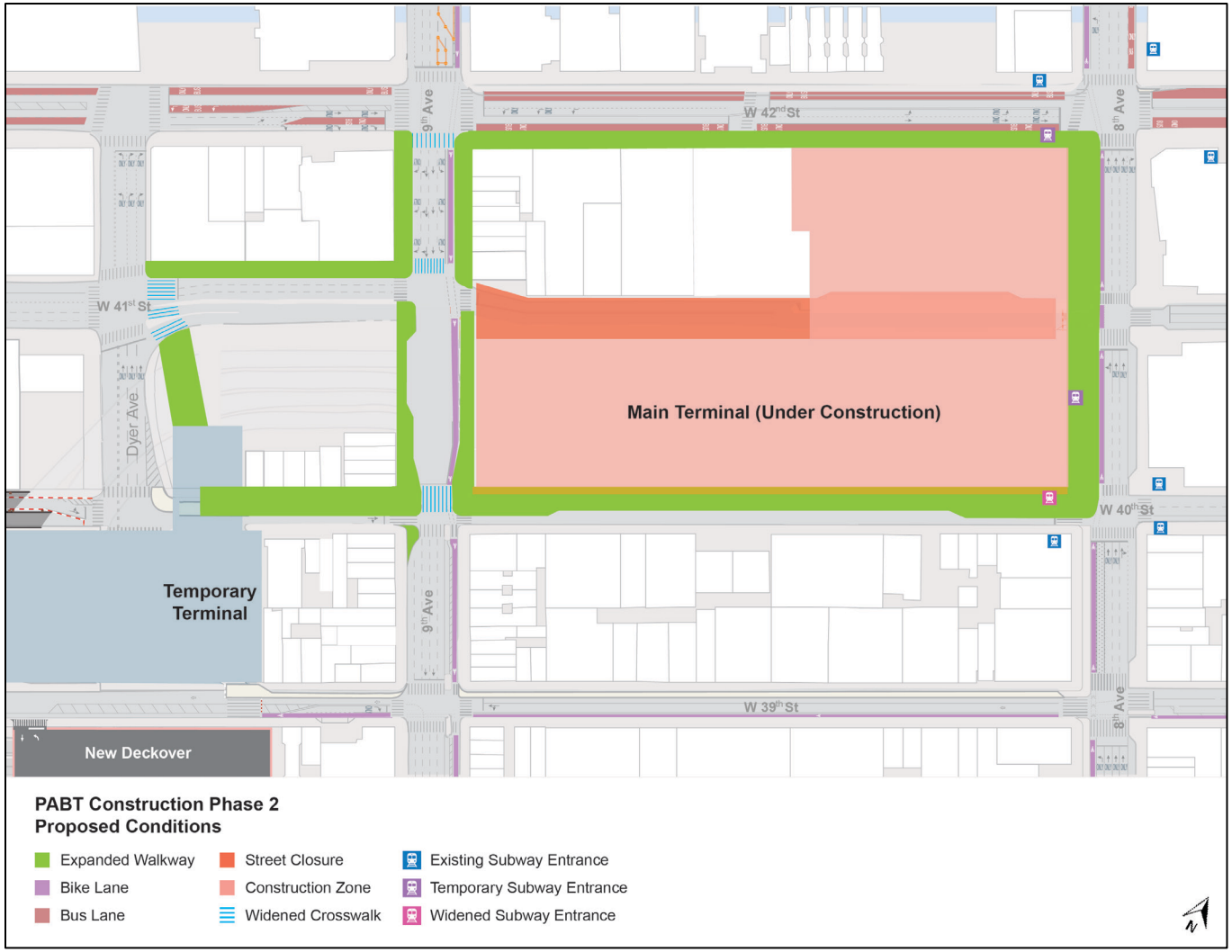
During Phase 1 the project is expected to generate 412 pedestrian trips during the morning construction peak hour and 465 pedestrian trips during the afternoon construction peak hour. During Phase 2 the project is expected to generate 883 pedestrian trips during the morning (day construction shift) construction peak hour, 998 pedestrian trips during the afternoon (evening construction shift) construction peak hour, and 344 pedestrian trips during the overnight construction peak hour. However, the morning construction peak hour is 6:00-7:00 a.m., the afternoon construction peak hour is 3:00-4:00 p.m. and the evening construction peak hour is 11:00 p.m. to midnight—all times when sidewalks in the area operate at lower volumes than their peaks. The Proposed Project is not projected to generate significant numbers of construction-worker trips during the hours when sidewalks are busiest, which are approximately 8:00-9:00 a.m., 12:00-2:00 p.m., and 5:00-6:00 p.m. Because the pedestrian trips generated by construction workers are distributed among many sidewalks around and leading to the construction site and also occur when the sidewalks are operating below peak volume, no further analysis is warranted and was not conducted for construction workers on sidewalks.

General

During construction Phase 2, bus operations will shift from the PABT to the SSF, (which would be serving as an interim terminal), the Dyer Deck-Overs, West 30th Street, and multiple on-street locations in the Hudson Yards area resulting in rerouting of pedestrians to and from those locations. The number of passengers projected to shift to each of those locations exceeds the CEQR threshold of 200 passengers in both the AM and PM peak periods, so Level 2 screening is required for sidewalks leading to those locations. Pedestrian volumes were assigned to sidewalks, corners and crosswalks radiating out from each of the interim bus operating locations and to appropriate subway entrances and local bus stops. Detailed analysis was performed for all elements that are expected to experience an increase of 200 or more pedestrians in the AM or PM peak hour.

Sidewalk and crosswalk widenings, and temporary stairs connecting to the subway, to facilitate pedestrian circulation and access to transit during Phase 2 of construction of the Proposed Project is shown in **Figure B.7-7**.

Figure B.7-7. Pedestrian circulation during Phase 2 of the construction of the Proposed Project



(Source: WSP, 2024)

The method of analyzing pedestrian impacts during construction is the same as for analyzing pedestrian conditions for the opening year (2032) and future analysis year (2040) and follows guidance in the CEQR Technical Manual (2022 Edition). In summary, the analysis starts with 2019 baseline volumes on pedestrian elements, background growth is added to represent the construction analysis year, then incremental pedestrian volumes generated or rerouted by the project are added to each element. Volume-to-capacity ratios are calculated, and impacts are determined according to criteria in the CEQR Technical Manual.

As a result of additional pedestrian trips and changed circulation patterns during the construction of the Proposed Project, significant impacts would occur on 24 sections of sidewalks, at eight (8) sidewalk corners, and at 25 individual crosswalks as presented in **Table B.7-30**, **Table B.7-31**, and **Table B.7-32** below.

Table B.7-30. Sidewalk Conditions During Construction (Phase 2, 2031)

Sidewalk	Side	AM	PM
West 33rd Street, Eighth to Ninth Avenues	North	Impact	Impact
West 33rd Street, Ninth to Tenth Avenues	North	Impact	Impact
West 38th Street, Eighth to Ninth Avenue	South	Impact	Impact
West 38th Street, Ninth to Tenth Avenue	South	Impact	Impact
West 39th Street, Ninth to Tenth Avenue	North	Impact	-
West 39th Street, Ninth to Tenth Avenue	South	Impact	-
West 39th Street, Ninth to Tenth Avenue	North	Impact	-
West 39th Street, Ninth to Tenth Avenue	South	Impact	-
West 40th Street, Eighth to Ninth Avenue	South	Impact	Impact
West 40th Street, Eighth to Ninth Avenues	North	Impact	Impact
West 40th Street, Ninth to Dyer Avenues	North	Impact	-
West 41st Street, Ninth to Tenth Avenue	North	Impact	Impact
West 41st Street, Ninth to Dyer Avenue	North	Impact	Impact
West 42nd Street, Eighth to Ninth Avenue	North	Impact	Impact
Eighth Avenue, West 41st to West 42nd Street	West	-	Impact
Ninth Avenue, West 35th to West 36th Street	East	Impact	Impact
Ninth Avenue, West 38th to West 39th Street	West	Impact	Impact
Ninth Avenue, West 38th to West 39th Street	East	Impact	Impact
Ninth Avenue, West 39th to West 40th Street	West	Impact	Impact
Ninth Avenue, West 39th to West 40th Street	East	Impact	Impact
Ninth Avenue, West 41st to West 42nd Street	West	Impact	Impact
Ninth Avenue, West 41st to West 42nd Street	East	Impact	Impact
Dyer Avenue, West 34th to West 35th Street	West	Impact	Impact
Dyer Avenue, West 41st to West 42nd Street	West	Impact	Impact

Table B.7-31. Sidewalk Corner Conditions During Construction (Phase 2, 2031)

Intersection	Corner	AM	PM
Ninth Avenue-West 37th Street	Northeast	Impact	-
Ninth Avenue-West 37th Street	Northwest	Impact	-
Ninth Avenue-West 38th Street	Southeast	Impact	-
Ninth Avenue-West 39th Street	Northeast	-	Impact
Ninth Avenue-West 39th Street	Southwest	-	Impact
Ninth Avenue-West 40th Street	Northeast	Impact	-
Ninth Avenue-West 41st Street	Northeast	Impact	-
Ninth Avenue-West 42nd Street	Northeast	-	Impact

Table B.7-32. Crosswalk Conditions During Construction (Phase 2, 2031)

Intersection	Crosswalk	AM	PM
Ninth Avenue-West 33rd Street	North	-	Impact
Ninth Avenue-West 34th Street	North	Impact	Impact
Ninth Avenue-West 37th Street	West	Impact	Impact
Ninth Avenue-West 38th Street	North	Impact	Impact
Ninth Avenue-West 38th Street	East	Impact	Impact
Ninth Avenue-West 38th Street	South	Impact	Impact
Ninth Avenue-West 38th Street	West	Impact	Impact
Ninth Avenue-West 39th Street	North	Impact	Impact
Ninth Avenue-West 39th Street	East	Impact	Impact
Ninth Avenue-West 39th Street	South	Impact	Impact
Ninth Avenue-West 39th Street	West	Impact	Impact
Ninth Avenue-West 40th Street	North	Impact	Impact
Ninth Avenue-West 40th Street	East	Impact	Impact
Ninth Avenue-West 40th Street	South	Impact	Impact
Ninth Avenue-West 40th Street	West	Impact	Impact
Ninth Avenue-West 41st Street	North	Impact	Impact
Ninth Avenue-West 41st Street	East	Impact	Impact
Ninth Avenue-West 41st Street	West	Impact	Impact
Ninth Avenue-West 42nd Street	North	Impact	Impact
Ninth Avenue-West 42nd Street	East	Impact	Impact
Ninth Avenue-West 42nd Street	South	Impact	Impact
Ninth Avenue-West 42nd Street	West	Impact	Impact
Tenth Avenue-West 39th Street	East	Impact	
Dyer Ave-West 40th Street	North	Impact	Impact
Dyer Ave-West 41st Street	East	Impact	Impact

For additional details, see the Construction TDF report in Appendix 14D of the DEIS (**Appendix A)**.

Simulation of Pedestrian Flows at Key Intersections

In addition to pedestrian level of service analysis, a pedestrian and traffic simulation was performed to confirm the functionality of pedestrian and traffic movements during the AM and

PM peak periods at the key intersections where high volumes of pedestrians are expected to cross Ninth Avenue moving between the Interim Terminal and subway stations or points to the east and northeast. The simulations were performed with Aimsun Next 2023 simulation software and focused on the intersections of Ninth Avenue and 40th Street, Ninth Avenue and 41st Street, and Ninth Avenue and 42nd Street. Rather than measuring pedestrian level of service, the focus of the simulations was to confirm that with appropriate walkway improvements in the around these intersections, peak pedestrian and traffic volumes could pass within the time available by signal cycles without cumulative backup of pedestrians, which could cause unmanageable pedestrian conditions. The simulations showed that with appropriate enlargement of corner reservoirs, walkways, and widening of crosswalks, the projected high pedestrian volumes could move adequately through the area.

B.7.5.1.4 Parking

The Construction TDF report using CEQR standards was used to determine if detailed parking analyses were needed for either Phase 1 or Phase 2 of this project. Construction workers that arrive to the Project Site via private auto are anticipated to utilize one of the many nearby parking garages. The worker numbers identified were lower than the available parking spaces identified in the surrounding one-half mile radius of the Project Site. Based on this, it was determined that a detailed parking analysis was not required for either Phase 1 or Phase 2 construction. The full Construction TDF report can be found in Appendix 14D of the DEIS **(Appendix A)**.

B.7.5.2 Air Quality

Adjustments were made to the construction schedule (**Table B.7-2**) for the Proposed Project subsequent to the publication of the DEIS. Schedule dates and duration of various phases of construction were updated as a result of additional refinement of construction activities. The effect of changes in the construction schedule resulted in changes in the peak year and peak month of estimated construction emissions. Therefore, annual construction emissions and AERMOD modeling of localized impacts were updated accordingly.

Emissions from on-site construction equipment and on-road construction-related vehicles, as well as dust generating construction activities, have the potential to affect air quality. Therefore, analysis of potential impacts on air quality from the construction of the Proposed Project includes a quantitative analysis of on-site vehicle and equipment sources as well as dust generating activities. In general, much of the heavy equipment used in construction utilizes diesel-powered engines and produces nitrogen oxides (NO_x) and particulate matter (PM). Fugitive dust generated by demolition and construction activities contain PM. Finally, gasoline engines produce carbon monoxide (CO). As a result, the primary air pollutants of concern for construction activities are nitrogen dioxide (NO_2), particulate matter with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}), particulate matter with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$), and CO.

The following specific averaging times were analyzed based on the National Ambient Air Quality Standards (NAAQS):

- 24-hour average $PM_{2.5}$
- Annual average $PM_{2.5}$
- 24-hour average PM_{10}
- Annual NO_2
- One-hour CO
- Eight-hour CO

With the promulgation of the 2010 one-hour average standard for NO_2, local ground-level sources, such as on-site construction sources, may be of greater concern for this pollutant. However, construction effects are typically temporary in nature and do not persist at a single location. The monthly/annual variation in the types of equipment needed on the construction site, and the utilization of the equipment, would fluctuate on an hourly basis. In addition, construction sources would move throughout a construction site over the entire construction period, as opposed to sources that operate on a regular basis in a fixed, defined location such as an exhaust stack on a building. Also, while there are accepted methods to predict the rate of transformation of nitric oxide (NO) to NO_2 for emissions from stationary (point) sources at industrial facilities, the methods are not appropriate for ground-level releases for construction area sources. Current conversion methods in AERMOD have only been evaluated against emission case studies containing elevated releases from point sources. The manner in which an elevated plume released from a point source above ground level interacts with surrounding ambient air and available ozone for the NO to NO_2 conversion is significantly different from an area source at ground level, such as a construction site. The conversion methods have not been evaluated against case studies for area sources. For these reasons, a one-hour NO_2 analysis was not conducted for construction sources.

The detailed construction air quality analysis estimates the overall construction emissions profile for the Proposed Project and evaluates the worst-case analysis time periods for short-term air quality standards and annual air quality standards. The emissions profile for each pollutant was based on peak period (year or month as applicable). For the annual $PM_{2.5}$ standard, the 12 consecutive months of construction with the highest $PM_{2.5}$ emissions are calendar year 2026. A second slightly higher annual peak for all other pollutants occurs in 2031 during demolition of the existing PABT and construction of the new Main Terminal. During 2026, construction activities would include foundation laying, steel erection, and concrete pouring for the ramp structures, SSF, and Dyer Deck-Overs. The single month with the highest emissions for $PM_{2.5}$ and PM_{10} (November 2026) was used for purposes of modeling short-term $PM_{2.5}$ and PM_{10} standards. This peak month includes concurrent construction for the Dyer Deck-Overs (including steel erection, and concrete activities), the ramp structures (including steel erection and concrete activity), and the SSF (including foundations, steel erection and concrete activity and activities on three subphases). For the annual NO_2 standard, the 12 consecutive months of construction with the highest NO_2 emissions are calendar year 2031. The peak in 2031 results from a high level of

activity (foundations, steel erection, concrete) during construction of the new Main Terminal. Modeling of annual standards accounted for the monthly variation in emissions over the year.

After completing construction of the Main Terminal, construction of the private development would occur. The main emission producing activity for the private development would be superstructure; exterior and interior fit-out activities and would generate substantially smaller quantities of emissions when compared to construction of the ramp structures, Dyer Deck-Overs, SSF, and Main Terminal due to use of less-emission intensive construction equipment; therefore, construction emissions are not estimated.

B.7.5.2.1 Emissions Control Measures

The following typical measures are incorporated into the construction air quality analysis: These typical measures are likely less restrictive than the PANYNJ requires for construction projects, and therefore the construction air quality analysis is conservative (i.e., predicted emissions are likely higher than those that will actually occur).

- ***Clean Fuel*:** Ultra-low sulfur diesel fuel would be used exclusively for all diesel engines throughout the construction site.
- ***Dust Control Measures*:** To minimize fugitive dust emissions from demolition and construction activities, a fugitive dust control plan, including a robust watering program, would be required as part of contract specifications. For example, stabilized truck exit areas would be established for washing the wheels of all trucks that exit the construction site; any truck routes within the construction area would be either watered as needed or, in cases where such routes would remain in the same place for an extended duration, the routes would be stabilized, covered with gravel, or temporarily paved to avoid the resuspension of dust; all trucks hauling loose material would be equipped with tight-fitting tailgates and their loads securely covered prior to leaving the construction site; water sprays would be used for all demolition, excavation, and transfer of soils to ensure that materials would be dampened, as necessary, to avoid the suspension of dust into the air. Demolition and cutting of ramp concrete and other large concrete sections would utilize wet cut saws to minimize dust emissions. Loose materials would be watered or covered. All measures required by the portion of the New York City Air Pollution Control Code regulating construction-related dust emissions would be implemented.
- ***Idling Restriction*:** In addition to adhering to the applicable local law restricting unnecessary idling on roadways, on-site vehicle idle time would be restricted to three minutes for all equipment and vehicles that are not using their engines to operate a loading, unloading, or processing device (e.g., concrete mixing trucks) or otherwise required for the proper operation of the engine.
- ***Best Available Tailpipe Reduction Technologies*:** Non-road diesel engines with a power rating of 50 horsepower (hp) or greater and controlled truck fleets (i.e., truck fleets under long-term contract for the Proposed Project) would utilize the "best available tailpipe" technology for reducing diesel particulate matter emissions. Diesel particulate filters (DPFs) are the tailpipe

technology currently proven to have the highest reduction capability. Construction contracts would specify that all diesel non-road engines rated at 50 hp or greater would utilize DPFs, either installed by the original equipment manufacturer or retrofitted. Retrofitted DPFs must be verified by EPA. Active DPFs or other technologies proven to achieve an equivalent reduction may also be used.

B.7.5.2.2 Construction Air Quality Analysis

Analysis Periods

The construction emissions profile for the period January 1, 2024 through December 31, 2031 is shown in **Table B.7-33**. Peak emissions for each pollutant analyzed in the microscale analysis are as follows:

- CO – year 2031 is the peak emission year for CO. Furthermore, the highest monthly CO emissions also occur in 2031, in the month of August. As such, peak 1-hr and 8-hr emissions from August 2031 were used in the microscale analysis.
- NOx – year 2031 is the peak emission year for NOx. As such, peak annual emissions from the year 2031 were used in the microscale analysis.
- PM_{10} – year 2031 is the peak emission year for PM_{10}. However, the highest monthly PM_{10} emissions occur in 2026, in the month of November, which are higher than any monthly peak in the peak annual year of 2031. As such, emissions from November 2026 were used in the microscale analysis.
- $PM_{2.5}$ – year 2026 is the peak emission year for $PM_{2.5}$. Furthermore, the highest monthly $PM_{2.5}$ emissions also occur in 2026, in the month of November. As such, peak 24-hour and annual emissions from November 2026 activities and all months in 2026, respectively, were used in the microscale analysis.

This was based on an emissions profile that was prepared for each month of the construction schedule to identify the peak periods with the greatest potential for air quality impacts. Emissions are shown in units of US short tons per year. The peak in 2026 results from the overlap of activity for multiple construction phases associated with the concurrent construction of the ramp structures, Dyer Deck-Overs, and the SSF. The peak in 2031 results from a high level of activity (foundations, steel erection, concrete) during construction of the Main Terminal.

Table B.7-33. Construction Air Quality Annual Emissions

Year	Total Emission Burden (Tons/Year)					
	CO	NO_x	PM_{10}	$PM_{2.5}$	VOC	SO_2
2024	0.04	0.11	0.03	0.02	0.01	0.00
2025	16.26	3.95	0.59	0.48	0.60	0.01
2026	10.63	14.93	1.33	1.12	1.30	0.02
2027	11.85	10.83	1.00	0.82	1.16	0.02
2028	1.81	1.43	0.68	0.42	0.16	0.00
2029	4.53	2.11	0.63	0.45	0.25	0.01
2030	17.11	11.28	0.94	0.75	1.17	0.02
2031	21.89	15.30	1.57	1.03	1.61	0.03
2032	6.10	4.5	0.67	0.43	0.51	0.01
Total (US Tons)	**90.23**	**64.45**	**7.43**	**5.53**	**6.76**	**0.11**

On-Site Engine Exhaust Emissions

Emission factors for CO, PM_{10}, and $PM_{2.5}$ from on-site construction engines were developed using the latest EPA NONROAD Emission Model, which is incorporated in EPA's MOVES3.1 model interface. The NONROAD model is based on source inventory data accumulated for specific categories of non-road equipment by county. The emission factors in grams per horsepower-hour for each type of equipment, with the exception of trucks, was determined from the output files for the NONROAD model and the application of EPA-generated post-processing scripts.

Tier 1 through 4 standards for non-road engines regulate the emissions of criteria pollutants from new engines, including PM, CO, NO_x, and hydrocarbons (HC).[12] All NONROAD construction equipment was modeled as equipment meeting the fleet average Tier for New York County.

The analysis year for purposes of emissions rate development (e.g., the analysis year input to MOVES) was 2026 and emissions were estimated based on the worse-case month (November) average day temperature and humidity data included in regional MOVES input databases obtained from NYMTC.

On-Site Vehicle Exhaust Emissions

Tailpipe emission rates for NO_x, CO, PM_{10}, and $PM_{2.5}$ from heavy trucks traveling on-site were developed using MOVES3.1, as referenced in the *CEQR Technical Manual*. The MOVES3.1 vehicle type used was the single unit short-haul truck. The majority of construction trucks are single unit trucks (concrete trucks, dump trucks, and delivery trucks). Trucks were assumed to travel a distance of 0.1 mile (528 feet) at 5 mph within the site. Idle emission factors were determined using MOVES to account for truck idling activity. Trucks were assumed to idle five minutes per trip to account for loading and unloading.

[12] For summary of the phase in of Tiers 1-4 exhaust emission standards for non-road compression ignition (diesel) engines, see: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA05.pdf

Worker commute trips would occur off-site during the hour before and after each of the three work shifts. Worker commute trips utilizing personal vehicles would not be concentrated in any one location due to multiple routes that personal vehicles may take and limited parking for workers. As stated in **Section B.7.5.1.4**, private parking garages up to one-half mile from the site may be used for parking, which would keep emissions away from the on-site construction area. Emissions from personal vehicles would be very low in comparison to the non-road equipment, heavy truck trips and fugitive dust-related emission sources that are the focus of the construction air quality analysis. Based on these considerations, emissions associated with worker commutes were not included in the analysis.

On-Site Fugitive Emission Sources

In addition to engine emissions, fugitive dust emissions from demolition and construction were calculated based on procedures in EPA AP-42 Chapter 13.2.3 and associated tables.[13] The quantity of demolition material generated was estimated based on volume estimates of ramps and structures to be demolished and quantity of material, such as concrete, that may generate dust when demolished. Other materials, such as steel in the demolition, produce only nominal fugitive dust when removed. Demolition and construction would also involve soil and aggregate handling and travel on-site on unpaved areas; both activities may generate dust.

Material silt and moisture content values for soil and aggregate were obtained from AP-42 Section 13.2. Soil and aggregate handling was assumed to occur at a constant rate throughout those construction activities requiring bulldozing and loading of soil and aggregate.

Fugitive dust associated with truck travel on-site was calculated based on AP-42 section 13.2.2 (unpaved roads). The average truck weight assumed was 20 tons (40,000 pounds). The average silt content assumed was 6.9%.

The analysis of material handling activities and on-site truck travel in terms of annual average emission rates accounts for 125 days of precipitation per year. No emissions rate adjustments for precipitation were used for short-term PM emission rates.

The analysis of material handling activities and on-site truck travel also accounts for dust control measures. A 75% reduction in PM_{10} and $PM_{2.5}$ emissions from material handling fugitive dust through wet suppression, as well as a 50% reduction for unpaved road dust, were applied to the emission estimates.

Dispersion Modeling

Potential impacts from the construction sources associated with the Proposed Project were evaluated using a refined dispersion model—EPA/AMS AERMOD. AERMOD is a state-of-the-art dispersion model, applicable to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including point, area, and volume sources). AERMOD is

[13] U.S. Environmental Protection Agency, Compilation of Air Pollutant Emission Factors (AP-42), Section 13.2.3 Heavy Construction Operations.

a steady-state plume model that incorporates current concepts about flow and dispersion in complex terrain and includes updated treatments of the boundary layer theory, understanding of turbulence and dispersion, and handling of terrain interactions.

Source Simulation

The construction site was modeled as an area emission source to account for the variable locations within the site where equipment would operate. The area emission rates included exhaust emissions from equipment engines and fugitive dust from demolition, material handling and unpaved road travel. Area source emission rates were used for short-term and annual average air quality standard assessments.

Separate area sources were incorporated to represent the combined temporary ramp, ramp structures, SSF, and Dyer Deck-Over construction areas for modeling execution purposes. A separate area source was included for idling vehicles entering the construction site.

Meteorological Data

The meteorological data set used in AERMOD consisted of five consecutive years of meteorological data: surface data collected at LaGuardia Airport (2017-2021) and concurrent upper air data collected at Brookhaven, New York. These data were processed by and obtained from the New York State DEC.

Background Concentrations

Background concentrations used in the construction air quality analysis were the EPA design values for the New York Metropolitan area, except for PM_{10}, which is not available. Although monitor data is available for PM_{10} at IS52, EPA has not established a design value for PM_{10}. For PM_{10}, monitored data from the closest monitoring station was used. Background concentrations are shown in **Table B.7-34.**

Table B.7-34. Construction Air Quality Microscale Analysis Results

Pollutant	Averaging Period	Units	Maximum Increase in Ambient Concentration	Background Concentration	Total Concentration	NAAQS
CO	1-hour	µg/m³	1,861	4,237	6,098	40,000
	8-hour		489	2,748	3,237	10,000
$PM_{2.5}$	Annual	µg/m³	3.7	6.5	10.2	12
	24-hr		9.8	15.9	25.7	35
PM_{10}	24-hr	µg/m³	13.0	44	57	150
NO_2	Annual	µg/m³	32.3	32.0	64.3	100

Background Data Source https://www.epa.gov/air-trends/air-quality-design-values
https://www.dec.ny.gov/docs/air_pdf/2022airqualreport.pdf

Receptor Locations

An extensive receptor grid was used in the study area, bounded by West 33rd Street to the south, Eighth Avenue to the east, West 47th street to the north and Eleventh Avenue to the west. Surface-based receptors were placed at breathing height (1.8 meters – or 5 feet 9 inches) for

each grid point in open space areas that would remain publicly accessible during construction. Elevated (flagpole) receptors were placed at a height of 10 meters along the facades of buildings along streets surrounding the construction site.

For the construction air quality impact analysis, receptors were placed at points surrounding the Project Area. Receptors were placed at breathing height at existing buildings (1.8 meters), elevated at 10 meters along building facades, and along sidewalks surrounding the construction areas.

Impacts from construction of the ramp structures, Dyer Deck-Overs, and SSF on the existing PABT were evaluated. The dispersion model analysis also included receptors located at and surrounding the Main Terminal.

Construction Air Quality Impact Criteria

The NAAQS were used for screening purposes for construction impacts. If construction impacts are below the NAAQS, no further assessment of the magnitude and duration of impacts is needed.

Construction Air Quality Analysis Results

Maximum predicted increases in ambient air pollutant concentrations and overall concentrations, including background concentrations (converted to consistent units of µg/m^3 for all pollutants), are presented in **Table B.7-34**. EPA design values were used for background concentrations for all pollutants except for PM_{10}, for which they are not available. Background concentrations used reflect post-pandemic conditions. As a result of the change in traffic patterns, continued partial work from home, and continued higher utilization of delivery services, the most current background conditions are used as representative of post-pandemic conditions. As shown in the table, the maximum predicted total concentrations of 1-hour and 8-hour average CO, annual average NO_2, 24-hour average PM_{10}, and 24-hour and annual-average $PM_{2.5}$ are below the applicable NAAQS.

EPA has noted that there can be an exacerbation of asthma symptoms following short-term exposure to NO_2 (i.e., typically hours to days). Based on a review of the full body of scientific evidence, and of the information available from analyses of potential NO_2 exposure, EPA has concluded that the current NAAQS standards protect the public health, including the at-risk populations of older adults, children and people with asthma, with an adequate margin of safety. When combined with background concentrations, the worst-case annual NO_2 impact is 36% below the NAAQS; therefore, impacts to at-risk populations are not anticipated.

B.7.5.2.3 Construction Air Quality Analysis Conclusion

The potential air quality impacts of the Proposed Project were examined through a detailed analysis of the worst-case construction activities at the Project Area. The short-term and annual time periods for analysis were selected through preparation of a monthly emissions profile based on the potential construction equipment requirements for the site. Off-road equipment, on-road

haul trucks, and fugitive dust emissions were quantified, and impacts at receptors were calculated, using the EPA models and methods consistent with the *CEQR Technical Manual*.

For annual $PM_{2.5}$ standards, the 12 consecutive months of construction with the highest $PM_{2.5}$ emissions are year 2026. For annual NO_2, the highest year was 2031. During this timeframe, construction activities would include the construction of the Dyer Deck-Overs, construction of the new ramp structures, and construction of the SSF. The single month with the highest emissions for $PM_{2.5}$ and PM_{10} (November 2026) was used for purposes of modeling short-term $PM_{2.5}$ and PM_{10} standards, and this peak month includes 43 truck trips per day. Modeling of annual standards accounted for the monthly variation in emissions over the year. These analysis periods have the highest potential for air quality impacts, and other construction periods would have lower impacts by comparison. The analysis accounts for the equipment emission control measures mandated by existing laws, including the use of ultra-low sulfur diesel (ULSD), dust control measures, and idling restrictions.

The maximum predicted total concentrations of 1-hour and 8-hour average CO, annual average NO_2, 24-hour average PM_{10}, and 24-hour and annual average $PM_{2.5}$ would all be below the applicable NAAQS. Therefore, construction of the Proposed Project would not result in a significant adverse construction air quality impact.

B.7.5.3 Noise

Construction of the Proposed Project has the potential to result in noise impacts generated by (1) the operation of construction equipment on the various construction sites; and (2) the movement of construction-related vehicles (i.e., worker trips, and material and equipment trips) traveling to and from the Project Area on adjacent roadways. The combined effect of each of these noise sources was evaluated, and the potential for noise impacts due to the construction of the Proposed Project is discussed below.

B.7.5.3.1 CONSTRUCTION NOISE ANALYSIS METHODOLOGY

Construction Airborne Noise Standards and Criteria

FTA NOISE IMPACT CRITERIA

For use in a detailed assessment of construction noise, the FTA Guidance Manual specifies impact thresholds applicable to construction during daytime hours, nighttime hours, and the 30-day average. The impact thresholds[14] for construction are shown in **Table B.7-35.**

[14] Impact thresholds establish a level of noise, over a specified period of time that is acceptable for daytime and nighttime conditions. If the level of noise (measured in decibels) is exceeded, analysis should determine that activities will result in an impact.

Table B.7-35. FTA Construction Noise Impact Criteria for Detailed Analysis (in dBA)

Land Use	L_{eq}[1]		L_{dn}
	Day	Night	30-day Average
Residential	80	70	75
Commercial	85	85	80[1]
Industrial	90	90	85[1]

[1] 24-hour $L_{eq(24hr)}$, not $L_{dn.equip(30day)}$.

NEW YORK CITY CEQR NOISE IMPACT CRITERIA

The construction noise impact criteria from the New York City *CEQR Technical Manual* were also considered in the identification of adverse noise impacts. The *CEQR Technical Manual* was developed by New York City for evaluation of the environmental impacts of projects proposed in New York City, based on local conditions and issues; these criteria for adverse impacts are well suited for evaluation of effects in New York City. Consideration of noise impacts using CEQR impact criteria would allow New York City agencies that are considering issuing a permit or approval to use this analysis to meet their environmental review obligations under CEQR.

Chapter 22, Section 100 of the *CEQR Technical Manual* breaks construction duration into "short-term" and "long-term" and states that construction noise is not likely to require analysis unless it "affects a sensitive receptor over a long period of time." Consequently, for selected noise-sensitive receptors representing the locations whose physical proximity and line of sight to the proposed construction work areas result in the greatest potential for significant noise impacts, the construction noise analysis considers both the potential for construction of a project to create high noise levels (the 'intensity'), and whether construction noise would occur for an extended period of time (the 'duration') in evaluating potential construction noise effects.

The noise impact criteria described in Chapter 19, Section 410 of the *2021 CEQR Technical Manual* serve as a screening-level threshold for potential construction noise impacts. If construction of a proposed project would result in any exceedances of these criteria at a given receptor, further consideration of the intensity and duration of construction noise at that receptor is considered to determine the potential for significant adverse impacts.

Because future noise levels for the Project Area and surrounding area in New York City without the Proposed Project will be comparable to existing noise levels in New York, with only moderate noise increases due to growth of vehicular traffic in the area as a result of the numerous new development projects anticipated, existing noise levels were used as a conservative representation of future noise levels in the Future Without the Proposed Project for the construction noise analysis. Existing noise levels provide a conservative representation of baseline levels, because they are lower and therefore result in larger noise level increments when compared to projected future noise levels in the Future Without the Proposed Project.

Analysis Techniques

Due to the long-term duration of construction, the complexity of the construction project, and its proximity to noise-sensitive receptors, a detailed noise assessment was performed to analyze the airborne noise associated with construction of the Proposed Project. The 8-hour daytime L_{eq}, 8-

hour nighttime L_{eq}, 24-hour L_{eq}, and 30-day average L_{dn} results were compared to FTA's construction noise impact criteria (See **Table B.7-35**).

Noise due to the operation of construction on-site equipment at a specific receptor location near a construction site was calculated by computing the sum of the noise produced by all major pieces of equipment operating at the construction site. For each piece of equipment, the noise levels at a receptor site are a function of:

- The noise emission level and quantity of the construction equipment
- A usage factor, which accounts for the percentage of time the equipment is operating
- The distance between the piece of equipment and the receptor
- Topography and ground effects
- Shielding (e.g., from intervening buildings/structures, site-perimeter noise barriers, etc.)

Similarly, noise levels due to construction traffic are a function of:

- The noise emission levels of the type and quantity of vehicle (e.g., auto, light-duty truck, heavy-duty truck, bus)
- Vehicular speed
- The distance between the roadway and the receptor
- Topography and ground effects
- Shielding (e.g., from intervening buildings/structures, site-perimeter noise barriers, etc.)

This analysis assumed a confluence of worst-case conditions—peak Project-generated construction traffic, peak construction, and lowest ambient noise levels for existing conditions, all operating simultaneously during the construction periods. This methodology resulted in a conservative estimate of impacts. The projected construction noise levels at each receptor were compared to the FTA and *CEQR Technical Manual* construction noise impact criteria to determine the potential for construction noise impacts. The identification of impacts at receptors near the Proposed Project construction work areas considered the magnitude of construction noise at the receptors as well as the duration of construction at the adjacent work area.

The detailed construction noise methodology is as follows:

- **Measure existing noise levels**: A noise survey was conducted to determine existing condition noise levels at receptors in the vicinity of the construction work areas. The noise survey methodology and results are described in **Appendix B.6 "Noise and Vibration"** of the FEIS.
- **Select noise analysis periods during the construction schedule**: The selected noise analysis periods represent the primary noise-producing construction tasks during the construction schedule. Each period was represented by the month that would have the greatest potential to result in construction noise effect. The selected time periods are described below in the "Analysis Periods" section.

- **Calculate construction noise levels for each analysis period at each receptor location**: Given the on-site equipment, the construction truck trips expected during each of the analysis periods, and the location of the construction equipment, a 3D acoustical model (CadnaA) for each analysis period was created. The model includes each of the construction noise sources during the analysis period, calculation points representing multiple locations on various facades and floors of the associated receptors identified, as well as the noise control measures that would be used on the construction sites.
- **Compare construction noise levels to FTA impact criteria**: For each analysis period and each noise receptor, the predicted noise due to construction was assessed using guidance from the Federal Transit Administration (FTA) guidance manual, *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123, September 2018 (FTA Guidance Manual).
- **Determine total noise levels and noise level increments during construction**: For each analysis period and each noise receptor, the calculated level of construction noise was logarithmically added to the existing noise level to determine the cumulative total noise level. The existing noise level was then subtracted from the cumulative noise level in each analysis period to determine the noise level increments.
- **Compare construction noise increments to CEQR impact criteria**: For each analysis period and each noise receptor, the predicted total noise levels and noise level increments due to construction were assessed using guidance from the *2021 CEQR Technical Manual*.
- **Establish construction noise duration**: For each receptor, the noise level increments in each analysis period were evaluated to determine the duration during construction that the receptor would experience exceedances of impact criteria.
- **Identify potential construction noise impacts**: At each existing receptor where exceedances of construction noise impact criteria are predicted, a determination was made as to whether the Proposed Project would have the potential to result in significant adverse construction noise impacts.

SELECTION OF RECEPTOR LOCATIONS

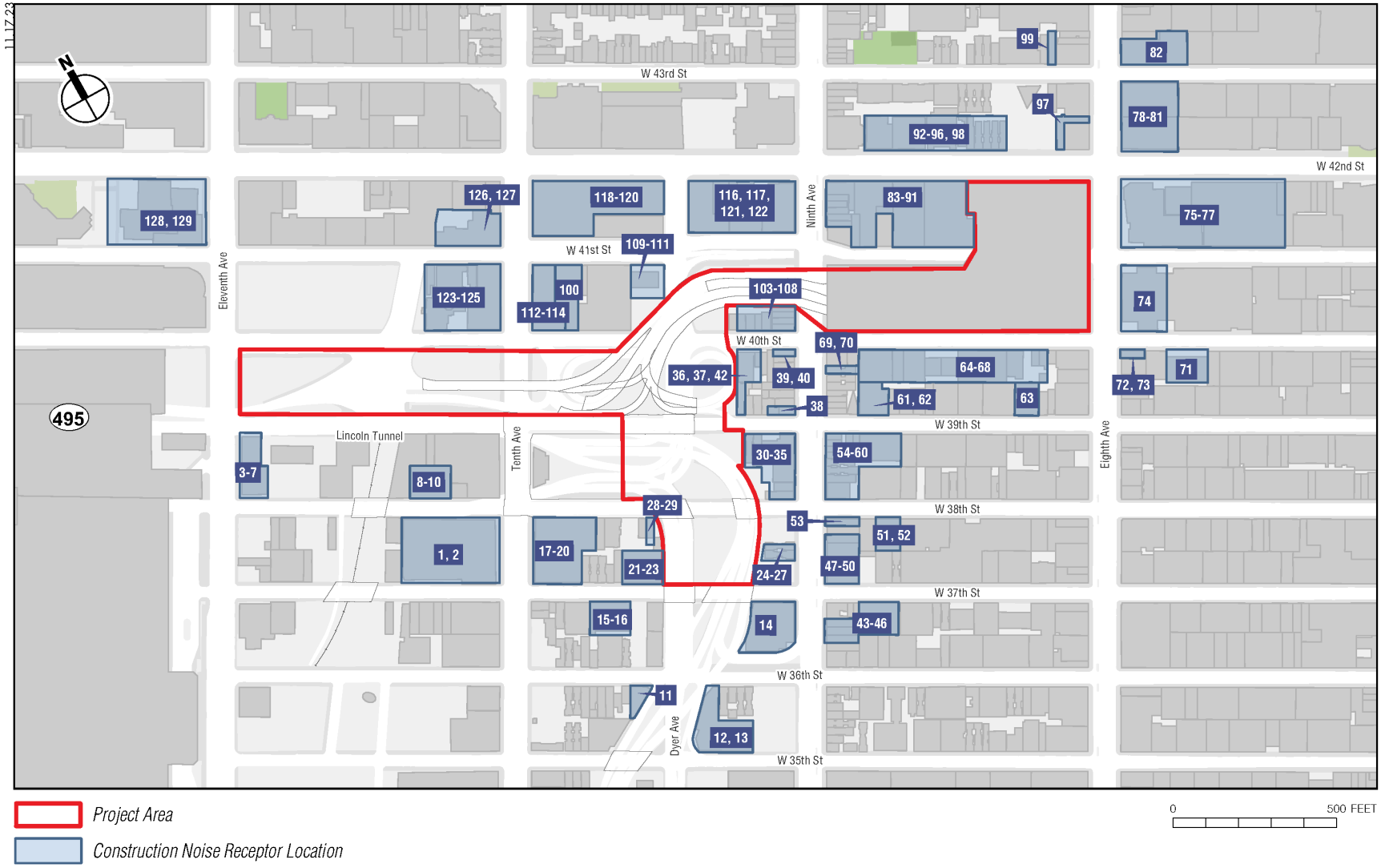
In addition to the noise measurement locations, 129 additional noise analysis receptors were selected to represent receptors where maximum project effects due to construction noise would be expected and are shown in **Figure B.7-8**. These receptors are near the proposed construction work areas. Multiple building facades and elevations were selected. **Table B.7-36** lists the noise receptor sites and the associated land use at each site.

Table B.7-36. Noise Receptors by Location and Land Use

Receptor	Location	Block / Lot	Associated Land Use
M1	Northeast Corner of West 42nd Street and Eighth Avenue	N/A	Noise Measurement Location
M2	42nd Street between Eighth Avenue and Ninth Avenue	N/A	Noise Measurement Location
M3	Ninth Avenue Between West 42nd Street and West 41st Street	N/A	Noise Measurement Location
M4	Ninth Avenue north of 40th Street under ramps to PABT	N/A	Noise Measurement Location
M5	West 40th Street Between Eighth Avenue and Ninth Avenue	N/A	Noise Measurement Location
M6	West 40th Street between Dyer Avenue and Ninth Avenue	N/A	Noise Measurement Location
M7	West 39th Street between Ninth Avenue and the LAZ Parking Ramp	N/A	Noise Measurement Location
M8	Ninth Avenue Between West 38th and West 39th Streets	N/A	Noise Measurement Location
M9	Northwest corner of Tenth Avenue and West 40th Street	N/A	Noise Measurement Location
M10	West 38th Street Between Tenth Avenue and Eleventh Avenue	N/A	Noise Measurement Location
M11	Approximately 70 feet from Tenth Avenue on West 38th Street	N/A	Noise Measurement Location
1, 2	505 West 37th Street	Block 709 / Lot 31	Residential
3-7	555 West 38th Street	Block 710 / Lot 1	Mixed Residential & Commercial
8-10	509 West 38th Street	Block 710 / Lot 7501	Mixed Residential & Commercial
11	453 West 35th Street	Block 733 / Lot 8	Mixed Residential & Commercial
12, 13	421 West 35th Street	Block 733 / Lot 23	Mixed Residential & Commercial
14	400 West 37th Street	Block 734 / Lot 37	Mixed Residential & Commercial
15, 16	438 West 37th Street	Block 734 / Lot 7501	Mixed Residential & Commercial
17-20	453 West 37th Street	Block 735 / Lot 6	Residential
21-23	431 West 37th Street	Block 735 / Lot 17	Mixed Residential & Commercial
24-27	495 Ninth Avenue	Block 735 / Lot 31	Mixed Residential & Commercial
28, 29	432 West 38th Street	Block 735 / Lot 57	Residential
30	507 Ninth Avenue	Block 736 / Lot 31	Mixed Residential & Commercial
31, 32	408 West 39th Street	Block 736 / Lot 40	Residential
33-35	511 Ninth Avenue	Block 736 / Lot 7501	Mixed Residential & Commercial
36, 37	411 West 39th Street	Block 737 / Lot 27	Residential
38	523 Ninth Avenue	Block 737 / Lot 31	Mixed Residential & Commercial
39, 40	539 Ninth Avenue	Block 737 / Lot 39	Mixed Residential & Commercial
42	408 West 40th Street	Block 737 / Lot 43	Church
43	474 Ninth Avenue	Block 760 / Lot 4	Mixed Residential & Commercial
44, 45	352 West 37th Street	Block 760 / Lot 68	Residential
46	478 Ninth Avenue	Block 760 / Lot 76	Mixed Residential & Commercial
47-49	484 Ninth Avenue	Block 761 / Lot 1	Mixed Residential & Commercial
50	492 Ninth Avenue	Block 761 / Lot 4	Mixed Residential & Commercial
51, 52	344 West 38th Street	Block 761 / Lot 59	Residential
53	500 Ninth Avenue	Block 761 / Lot 64	Mixed Residential & Commercial
54	510 Ninth Avenue	Block 762 / Lot 5	Mixed Residential & Commercial
55, 56	350 West 39th Street	Block 762 / Lot 67	Hotels
57, 58	522 Ninth Avenue	Block 762 / Lot 70	Mixed Residential & Commercial
59, 60	502 Ninth Avenue	Block 762 / Lot 7502	Mixed Residential & Commercial
61, 62	353 West 39th Street	Block 763 / Lot 8	Mixed Residential & Commercial
63	311 West 39th Street	Block 763 / Lot 28	Hotels
64	302-304 West 40th Street	Block 763 / Lots 43, 44	Residential

Receptor	Location	Block / Lot	Associated Land Use
65	310 West 40th Street	Block 763 / Lot 47	Hotels
66	314 West 40th Street	Block 763 / Lot 49	NYS Correctional Dept. Office
67	330 West 40th Street	Block 763 / Lot 56	Hotels
68	342 West 40th Street	Block 763 / Lot 65	Hotels
69, 70	536 Ninth Avenue	Block 763 / Lot 76	Mixed Residential & Commercial
71	252 West 40th Street	Block 789 / Lot 69	Hotels
72, 73	618 Eighth Avenue	Block 789 / Lot 78	Mixed Residential & Commercial
74	620 Eighth Avenue	Block 1012 / Lot 7501	Commercial Offices
75, 76	234 West 42nd Street	Block 1013 / Lot 12	Mixed Residential & Commercial
77	640 Eighth Avenue	Block 1013 / Lot 7501	Commercial Offices
78, 79	660 Eighth Avenue	Block 1014 / Lot 1	Mixed Residential & Commercial
80, 81	270 West 43rd Street	Block 1014 / Lot 58	Hotels
82	680 Eighth Avenue	Block 1015 / Lot 1	Mixed Residential & Commercial
83-85	330 West 42nd Street	Block 1032 / Lot 48	Commercial Offices
86, 87	338 West 42nd Street	Block 1032 / Lot 54	Post Office
88	355 West 41st Street	Block 1032 / Lot 101	Mixed Residential & Commercial
89	568 Ninth Avenue	Block 1032 / Lot 103	Mixed Residential & Commercial
90, 91	350 West 42nd Street	Block 1032 / Lot 7501	Mixed Residential & Commercial
92	351 West 42nd Street	Block 1033 / Lot 6	Mixed Residential & Commercial
93, 94	349 West 42nd Street	Block 1033 / Lot 9	Mixed Residential & Commercial
95	327 West 42nd Street	Block 1033 / Lot 18	Mixed Residential & Commercial
96	319 West 42nd Street	Block 1033 / Lot 22	Mixed Residential & Commercial
97	303 West 42nd Street	Block 1033 / Lot 32	Mixed Residential & Commercial
98	332 West 43rd Street	Block 1033 / Lot 49	Church
99	307 West 43rd Street	Block 1034 / Lot 38	Mixed Residential & Commercial
100	460 West 41st Street	Block 1050 / Lot 1	Mixed Residential & Commercial
103, 104	403-407 West 40th Street	Block 1050 / Lots 25, 26, 29	Residential
105-108	541 Ninth Avenue	Block 1050 / Lot 29	Mixed Residential & Commercial
109-111	440 West 41st Street	Block 1050 / Lot 49	Residential
112-114	550 Tenth Avenue	Block 1050 / Lot 61	Mixed Residential & Commercial
116, 117	420 West 42nd Street	Block 1051 / Lot 7501	Mixed Residential & Commercial
118-120	560 Tenth Avenue	Block 1051 / Lot 7502	Mixed Residential & Commercial
121, 122	577 Ninth Avenue	Block 1051 / Lot 7503	Mixed Residential & Commercial
123	503 West 40th Street	Block 1069 / Lot 24	Church
124, 125	551 Tenth Avenue	Block 1069 / Lot 7501	Mixed Residential & Commercial
126, 127	561 Tenth Avenue	Block 1070 / Lot 29	Mixed Residential & Commercial
128, 129	533 Eleventh Avenue	Block 1089 / Lot 7502	Mixed Residential & Commercial

Figure B.7-8. Construction Noise Receptors



Source: AKRF (2023)

CONSTRUCTION NOISE MODELING

Potential noise impacts from construction activities were evaluated using the CadnaA model, a computerized model developed by DataKustik for noise prediction and assessment. The model can be used for the analysis of a wide variety of noise sources, including stationary sources (e.g., construction equipment, industrial equipment, power generation equipment), transportation sources (e.g., roads, highways, railroad lines, busways, airports), and other specialized sources (e.g., sporting facilities). The model accounts for the reference sound pressure levels of the noise sources at 50 feet, attenuation with distance, ground contours, reflections from barriers and structures, attenuation due to shielding, etc. The CadnaA model is based on the acoustic propagation standards promulgated in International Standard ISO 9613-2. This standard is currently under review for adoption by the American National Standards Institute (ANSI) as an American Standard. The CadnaA model is a state-of-the-art tool for noise analysis and is approved for construction noise level prediction by the *2021 CEQR Technical Manual*.

Geographic input data used with the CadnaA model includes CAD drawings that define construction work areas, adjacent building footprints and heights, locations of streets, and locations of sensitive receptors. For each analysis period, the geographic location and operational characteristics—including equipment usage rates (percentage of time operating at full power) for each piece of construction equipment operating at the Project Area, as well as noise control measures—were input to the model.

Construction equipment source strength was determined by the L_{max} levels presented in Table 7-1 of the FTA Guidance Manual and Table 22-1 of the *2021 CEQR Technical Manual.*

Reflections and shielding by barriers erected on the construction sites and shielding from adjacent buildings were accounted for in the model. In addition, construction-related vehicles were assigned to the adjacent roadways. The model produced A-weighted $L_{eq(1)}$ noise levels at each receptor location for each analysis period, as well as the contribution from each noise source. The $L_{10(1)}$ noise levels were conservatively estimated by adding 3 dBA to the $L_{eq(1)}$ noise levels, as is standard practice.[15] The 30-day average L_{dn} and L_{eq} values were determined based on the $L_{eq(1)}$ noise levels and expected number of working hours during a 30-day period.

ANALYSIS PERIODS

The construction noise analysis estimated construction noise levels based on projected activity and equipment usage as well as the level of construction traffic for various stages of construction. Noise analysis periods were selected to cover the most noise-intensive period(s) of each stage of construction. The selected analysis periods are shown in **Table B.7-37.** These are the time periods with the potential to result in the maximum incremental construction noise at nearby receptors.

[15] Federal Highway Administration Roadway Construction Noise Model User's Guide, Page 15. http://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/rcnm.pdf.

Table B.7-37. Summary of Construction Noise Analysis Periods

Start Month	Finish Month	Construction Activities
November, 2024	January, 2025	▪ Deck-Overs: Site Preparation / Demolition
February, 2025	May, 2025	▪ Deck-Overs: Foundations ▪ Ramps: Site Preparation / Demolition
June, 2025	November, 2025	▪ Deck-Overs: Foundations ▪ SSF: Site Preparation ▪ Ramps: Site Preparation / Demolition, Foundations
December, 2025	March, 2026	▪ Deck-Overs: Steel Erection, Concrete ▪ SSF: Site Preparation / Demolition, Foundations ▪ Ramps: Site Preparation / Demolition, Foundations
April, 2026	July, 2026	▪ Deck-Overs: Steel Erection, Concrete ▪ SSF: Foundations, Steel Erection ▪ Ramps: Steel Erection
August, 2026	February, 2027	▪ Deck-Overs: Steel Erection, Concrete ▪ SSF: Foundations, Steel Erection, Concrete ▪ Ramps: Steel Erection
March, 2027	August, 2027	▪ SSF: Steel Erection, Concrete, Finishes ▪ Ramps: Steel Erection, Concrete
September, 2027	March, 2028	▪ SSF: Concrete, Finishes ▪ Ramps: Concrete
September, 2028	May, 2029	▪ SSF: Finishes ▪ Ramps: Finishes ▪ Main Terminal: Site Preparation / Demolition
June, 2029	September, 2029	▪ Main Terminal: Site Preparation / Demolition
October, 2029	January, 2030	▪ Main Terminal: Foundations
February, 2030	December, 2030	▪ Main Terminal: Foundations, Steel Erection, Concrete
January, 2031	November, 2031	▪ Main Terminal: Foundations, Steel Erection, Concrete, Finishes
December, 2031	June, 2032	▪ Main Terminal: Concrete, Finishes ▪ SSF (retrofit): Site Preparation / Demolition, Concrete
July, 2032	November, 2032	▪ Main Terminal: Finishes ▪ SSF (retrofit): Site Preparation / Demolition, Concrete
January, 2034	December, 2034	▪ Tower 1: Core and Shell ▪ Tower 2: Core and Shell
January, 2035	December, 2035	▪ Tower 1: Interior Finishes ▪ Tower 2: Interior Finishes

In addition to the analysis periods shown above, the potential for overnight construction activity during Dyer Deck-Over steel erection was analyzed and is discussed in further detail below.

POTENTIAL OVERNIGHT CONSTRUCTION ACTIVITY

Construction would generally occur over the course of a primary construction day shift as well as a second night shift. However, certain construction activities would be shifted to a third overnight shift between 11:00 p.m. and 7:00 a.m. Construction of the deck-overs would occur during the overnight shift during a period of approximately 14 months. Additionally, demolition

and construction occurring directly over active roadways would occur during the overnight shift on a limited/occasional basis.

Steel demolition for the existing ramps would occur during the overnight shift, but would occur very infrequently, only a few nights per quarter for nine months. This work would involve the use of generators, air compressors, and a crane. Due to the infrequent occurrence and very limited equipment necessary for this overnight work, it would not result in any significant adverse noise impacts beyond those described above and was not analyzed further.

Steel erection for the Dyer Deck-Over construction would need to occur during the overnight shift on an intermittent basis over the course of approximately one year. When necessary, a limited subset of the construction equipment for this task consisting of man lifts, cranes, compressors, generators would operate during this overnight shift rather than during the day or night shifts. The effects of overnight steel erection for the Dyer Deck-Over construction over the course of approximately one year, including the potential for nighttime impacts, was analyzed and is discussed further below.

NOISE REDUCTION MEASURES

Construction of the Proposed Project would be required to follow the requirements of the *New York City Noise Control Code* (also known as Chapter 24 of the *Administrative Code of the City of New York*, or Local Law 113) for construction noise control measures. Additionally, construction of the Proposed Project would incorporate certain noise control measures that go beyond those required by the Code. Specific noise control measures would be incorporated in noise mitigation plan(s) required under the *New York City Noise Control Code*. These measures could include a variety of source and path controls.

In terms of source controls (i.e., reducing noise levels at the source or during the most sensitive time periods), the following measures would be implemented in accordance with the *New York City Noise Control Code:*

Equipment that meets the sound level standards specified in Subchapter 5 of the *New York City Noise Control Code* would be utilized from the start of construction. **Table B.7-38** shows the noise levels for typical construction equipment and the mandated noise levels for the equipment that would be used for construction of the Proposed Project.

- As early in the construction period as logistics allow diesel- or gas-powered equipment would be replaced with electrical-powered equipment such as welders and water pumps (i.e., early electrification) to the extent feasible and practicable. Where electrical equipment cannot be used, diesel or gas-powered generators and pumps would be located within buildings to the extent feasible and practicable.
- Where feasible and practicable, construction sites would be configured to minimize back-up alarm noise. In addition, trucks would not be allowed to idle more than 3 minutes at the

construction site per Title 24, Chapter 1, Subchapter 7, Section 24-163 of the New York City Administrative Code.

- Contractors and subcontractors would be required to properly maintain their equipment and mufflers.

Table B.7-38. Typical Construction Equipment Noise Levels

Equipment List	L_{max} Noise Level at 50 feet[1]
Auger Drill Rig	85
Backhoe	80
Bar Bender	80
Compactor	82[2]
Compressor	80
Concrete Pump Truck	82
Concrete Saw	90
Concrete Trowel [Walk Behind]	70[3]
Concrete Vibrator	76[2]
Crane	85
Crane [Mobile]	83[2]
Dozer	85
Drum Mixer	80
Forklift	65[4]
Front End Loader	80
Generator	82
Hoist	75[3]
Jackhammer	88[2]
Man Lift	75[4]
Paver	85
Pump	77
Roller	85
Scissor Lift	75[4]
Shears	85
Welder / Torch	73

[1] Rules for Citywide Construction Noise Mitigation, Chapter 28, DEP, 2007, except where noted.
[2] Federal Transit Administration, Report No. 0123 September 2018, Table 7-1 Construction Equipment Noise Emission Levels
[3] Previous project equipment noise certification
[4] Manufacturer's specification

In terms of path controls (e.g., placement of equipment, implementation of barriers or enclosures between equipment and sensitive receptors), the following measures for construction would be implemented:

- Where logistics allow, noisy equipment, such as cranes, concrete pumps, concrete trucks, and delivery trucks, would be located away from and shielded from sensitive receptor locations.
- Where logistics allow, noise barriers constructed from plywood or other materials would be utilized around the ramp, SSF, and Main Terminal construction work areas to provide shielding (e.g., the constructions sites would have a minimum 8-foot-tall barrier around the perimeter).
- Concrete trucks would be required to be located inside site-perimeter noise barriers while pouring or being washed out.
- Path noise control measures (i.e., portable noise barriers, panels, enclosures, and acoustical tents) would be used for certain dominant noise equipment to the extent feasible and practical based on the results of the construction noise calculations. The details to construct portable noise barriers, enclosures, tents, etc. are shown in DEP's *Rules for Citywide Construction Noise Mitigation*.[16]

B.7.5.3.2 Construction Noise Analysis Results

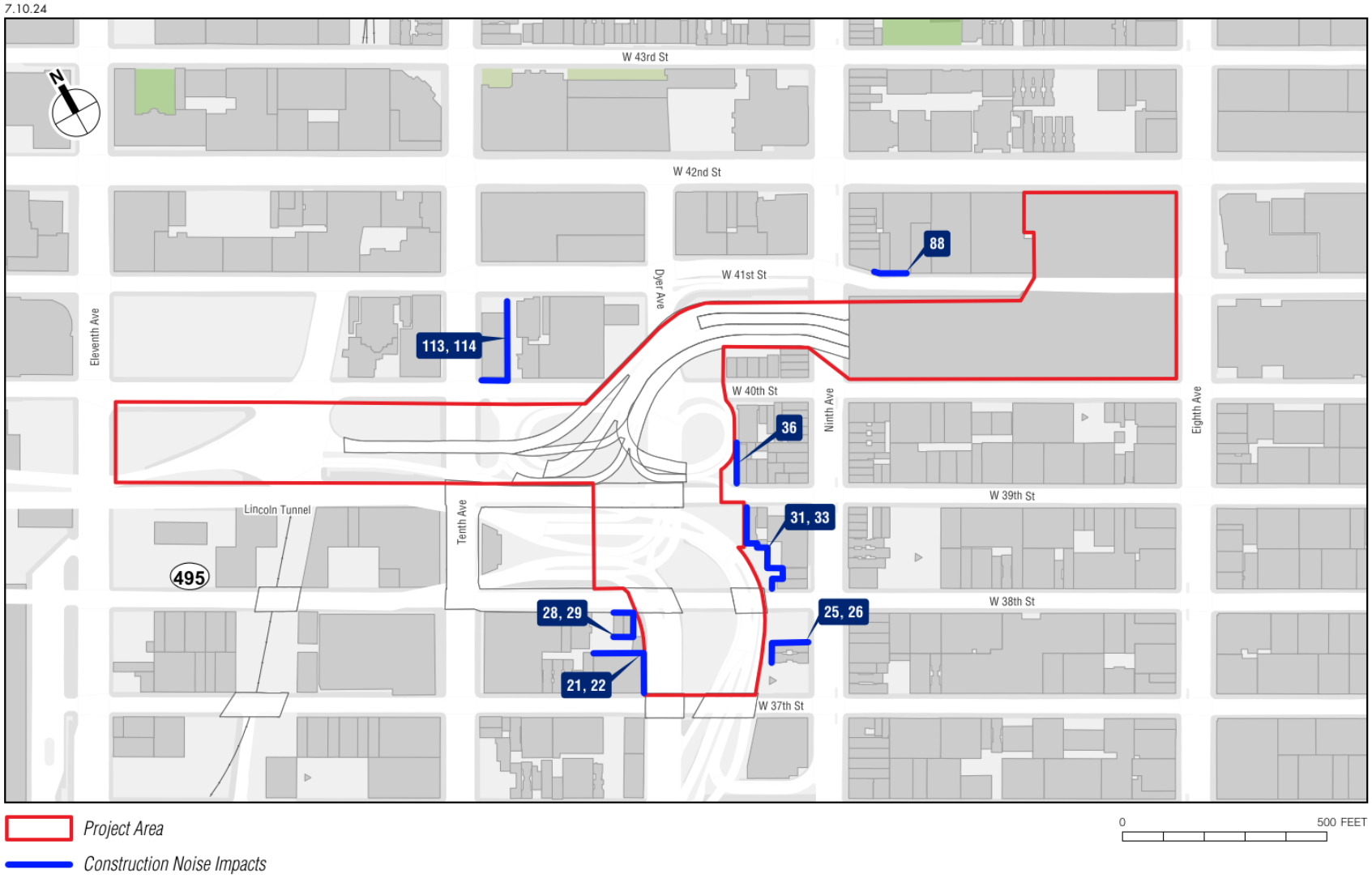
Using the methodology described and considering the noise abatement measures specified above, cumulative noise analyses were performed to determine maximum $L_{eq(1)}$ noise levels that would be expected at each of the 129 noise receptor locations during each of the selected construction noise analysis periods. This resulted in a predicted range of peak hourly construction noise levels throughout the construction period. The hourly noise levels were used along with the expected number of work hours over the course of an 8-hour daytime period, an 8-hour nighttime period, a 24-hour period, and a 30-day period to also determine the 8-hour daytime L_{eq}, 8-hour nighttime L_{eq}, 24-hour L_{eq}, and 30-day average L_{dn} values where appropriate.

FTA Construction Noise Evaluation

At most receptors, noise levels resulting from construction of the Proposed Project were predicted not to exceed the applicable construction noise criteria specified in the FTA Guidance Manual at any point during the construction period. The locations of predicted exceedances of the FTA construction noise impact criteria are shown in **Table B.7-39** along with the maximum predicted noise levels and durations of continuous exceedance. Commercial receptors did not exceed the thresholds presented in **Table B.7-35**. Consequently, the 24-hour L_{eq} noise levels are excluded from the results shown in **Table B.7-39**. Locations with predicted significant adverse noise impacts are shown in **Figure B.7-9**.

[16] As found at http://www.nyc.gov/html/dep/pdf/noise_constr_rule.pdf

Figure B.7-9. Construction Noise Impacts



Source: AKRF (2024)

Table B.7-39. FTA Construction Noise Impact Criteria Exceedances

Site	Address	Land Use	Maximum Predicted Daytime $L_{eq.equip(8hr)}$ in dBA	Maximum Predicted Nighttime $L_{eq.equip(8hr)}$ in dBA	Maximum Predicted 30-day average L_{dn} in dBA	Maximum Predicted Increment over Existing L_{eq} in dBA	Consecutive Months of Predicted Criteria Exceedance
21, 22	431 W 37th Street	Mixed Residential & Commercial	78.8	71.7	78.0	8.3	21
25, 26	495 Ninth Avenue	Mixed Residential & Commercial	80.1	71.6	79.3	13.1	11
28, 29	432 W 38th Street	Residential	76.8	71.8	77.7	6.4	17
31	408 W 39th Street	Residential	76.3	71.0	77.4	9.6	15
33	511 Ninth Avenue	Mixed Residential & Commercial	74.2	70.2	76.0	7.8	11
36	411 W 39th Street	Residential	78.4	69.9	77.6	10.1	21
64	302-304 W 40th Street	Residential	78.3	69.3	77.5	9.1	6
88	355 W 41st Street	Mixed Residential & Commercial	76.2	67.1	75.4	6.9	11
103	403-407 W 40th Street	Residential	82.6	73.6	81.8	9.4	4
106,	541 Ninth Avenue	Mixed Residential & Commercial	82.8	73.8	82.0	11.4	4
113, 114	550 Tenth Avenue	Mixed Residential & Commercial	80.2	71.2	79.4	9.3	17
124	551 Tenth Avenue	Mixed Residential & Commercial	78.0	69.0	77.2	6.8	14

RECEPTORS 103 AND 106

Receptors 103 and 106 represent the residences immediately south of the ramps serving the Main Terminal. At these receptors, construction of the Proposed Project is predicted to produce L_{dn} noise levels up to the low 80s dBA during the most noise-intensive stages of construction, daytime $L_{eq(8h)}$ noise levels in the low 80s dBA, and nighttime 8-hour $L_{eq(8h)}$ noise levels in the low 70s dBA, all of which would exceed the FTA construction noise impact criteria. However, the predicted duration of this exceedance would be approximately four consecutive months for both receivers. Outside of this four-month period, construction noise levels would not exceed FTA construction noise impact criteria. Based on the prediction of construction noise levels up to the low 80s dBA during weekday daytime hours during the worst-case construction activities, with the total 30-day average L_{dn} noise levels exceeding the FTA construction noise impact criteria by no more than 7 dBA, and FTA impact criteria exceedances lasting no longer than four consecutive months construction noise associated with the Proposed Project would not rise to the level of a significant adverse impact at these receptors.

RECEPTOR 124

Receptor 124 represents the residences at 551 Tenth Avenue, where construction of the Proposed Project is predicted to produce 30-day average L_{dn} noise levels up to 77.2 dBA during the most noise-intensive stages of construction; this level would exceed the FTA construction noise impact criteria. Neither the 8-hour average daytime nor the 8-hour average nighttime L_{eq} noise levels would exceed the FTA construction noise impact thresholds. The estimated 30-day average L_{dn} noise levels during weekday daytime hours associated with the worst-case construction activities would be anticipated to exceed the FTA construction noise impact criteria; however, the increase would be less than 3dBA and would be barely perceptible. Therefore, the increase in noise levels at this receptor would not constitute a significant adverse construction noise impact.

RECEPTORS 21, 22, 25, 26, 28, 29, 31, 33, 36, 88, 113, AND 114

At Receptors 21, 22, 25, 26, 28, 29, 31, 33, 36, 88, 113, and 114, construction of the Proposed Project is predicted to produce 8-hour average nighttime L_{eq} noise levels up to the low 70s dBA and both 8-hour average daytime L_{eq} and 30-day average L_{dn} noise levels up to approximately 80 dBA during the most noise-intensive stages of construction. The exceedances of FTA's noise impact threshold would occur at times over the course of 11 to 21 consecutive months at each receptor. As construction of the Proposed Project would result in noise levels exceeding the FTA noise impact thresholds over extended durations up to 21 consecutive months, it would result in adverse impacts at these receptors.

Many of these receptors are in buildings of relatively recent construction that have insulated glass windows and central air conditioning (i.e., an alternate means of ventilation). As mitigation for the potential construction noise effects at buildings that do not have insulated glass windows and alternate means of ventilation, storm windows and window air conditioning units could be offered to building owners. These measures would improve the window/wall attenuation provided by the building facade and allow for the maintenance of a closed-window condition. Consequently, interior noise levels at these receptors would be reduced by approximately 30 dBA, resulting in interior noise levels no more than approximately 7 dBA above the 45 dBA acceptable threshold for residential use referenced in the FTA Guidance Manual. See further discussion of mitigation measures in Appendix 2D of the DEIS **(Appendix A)** and **Appendix B.8, "Mitigation,"** of the FEIS.

CEQR Construction Noise Evaluation

Noise levels resulting from construction of the Proposed Project were predicted to exceed the *CEQR Technical Manual* construction noise screening thresholds for some portion of the construction period at several of the analyzed receptors. The potential for significant adverse impacts at these receptors, which represent the locations whose physical proximity and line of sight to proposed construction work areas result in the greatest potential for significant noise impacts, was determined by evaluating the duration and magnitude of these increments. At most receptors, maximum predicted daytime construction noise level increments would be less than 10 dBA throughout construction. While such increases in noise may be noticeable at times,

predicted noise level increments would be moderate and would occur over a limited duration. Noise levels generated by construction at these receptors would generally be in the "acceptable" to "marginally unacceptable" categories according to the *2021 CEQR Technical Manual* noise exposure criteria throughout construction. Consequently, construction noise associated with the Proposed Project would not rise to the level of a significant adverse impact at these receptors.

As described above, while construction would generally occur over the course of a primary construction shift and second evening shift, some limited construction activities would be shifted to an overnight shift between 11:00 p.m. and 7:00 a.m. Steel erection for the Dyer Deck-Over construction would need to occur during the overnight shift on an intermittent basis over the course of approximately one year using a limited subset of the construction equipment for this task as necessary.

For receptors where noise level increments would exceed 10 dBA, the construction noise level predictions are summarized in **Table B.7-40** and discussed further below. For receptors where nighttime steel erection for the Dyer Deck-Over construction would result in noise level increments exceeding 3 dBA, the construction noise level predictions are summarized in **Table B.7-41** and discussed further below.

Table B.7-40. CEQR Daytime Construction Noise Analysis Results in dBA

Receptor	Address	Total L_{10}		Change in L_{10}		Maximum Consecutive Duration (months)
		Minimum	Maximum	Minimum	Maximum	
25, 26	495 Ninth Avenue	70.2	83.3	0.0	13.1	3
36	411 West 39th Street	71.7	81.8	0.0	10.1	6
106	541 Ninth Avenue	72.7	86.5	0.0	11.4	4

Table B.7-41. CEQR Nighttime Construction Noise Analysis Results in dBA

Receptor	Address	Total L_{10}		Change in L_{10}		Maximum Consecutive Duration
		Minimum	Maximum	Minimum	Maximum	
22	431 West 37th Street	74.9	77.0	1.5	3.6	14
25, 26	495 Ninth Avenue	75.5	77.1	2.1	3.7	14
29	432 West 38th Street	76.4	77.0	3.0	3.6	14
31	408 West 39th Street	72.2	74.8	1.8	4.4	14

RECEPTORS 22, 25, 26, 29, 31, AND 36—431 WEST 37TH STREET, 495 NINTH AVENUE, 432 WEST 38TH STREET, 408 WEST 39TH STREET, AND 411 WEST 39TH STREET

Receptors 22 and 29 represent the residences along the eastern facade of 431 West 37th Street and 432 West 38th Street, respectively, between West 37th and West 38th Streets, receptors 25 and 26 represent residences along the northern and western facades of 485 Ninth Avenue between West 37th and West 38th Streets, receptor 31 represents residences along the west facade of the building at 408 West 39th Street, and receptor 36 represents residences along the west facade of 433 West 39th Street between West 39th and West 40th Streets. These receptors are located immediately adjacent to the proposed Dyer Deck-Over construction at the Lincoln Tunnel approach between West 37th and West 40th Streets.

Construction is predicted to produce noise levels up to the low 80s dBA, resulting in noise level increases up to approximately 13 dBA, at receptors 25 and 26 during the most noise-intensive stages of construction (i.e., demolition at the adjacent Dyer Deck-Over construction site), which would occur for up to approximately three consecutive months. Additionally, construction is predicted to produce noise level increases up to approximately 10 dBA at receptor 36 during the most noise-intensive stages of construction (i.e., the overlap of concrete operations at the SSF and ramps), which would occur for up to approximately six consecutive months. Noise levels at these buildings for the remainder of construction would remain in the mid- to high 70s dBA.

At receptors 22, 25, 26, 29, and 31, nighttime construction consisting of steel erection at the Dyer Deck-Overs is expected to produce noise levels up to the mid-70s dBA, resulting in noise level increases up to approximately four dBA, which would occur for up to approximately 14 consecutive months. These predicted noise level increments would be considered less than readily noticeable, and the total noise levels at these receptors during nighttime construction would be considered "marginally unacceptable" according to *CEQR Technical Manual* noise exposure criteria, as are the existing noise levels at these receptors. All of these receptors were determined to have the potential to experience significant adverse construction noise impacts necessitating mitigation according to FTA criteria, as described above.

Based on the prediction of construction noise levels up to the low 80s dBA during weekday daytime hours during the worst-case deck-over construction activities, with total noise levels remaining in the "marginally unacceptable" range over the remainder of construction, construction noise associated with the Proposed Project would not rise to the level of a significant adverse impact at the residences at 431 West 37th Street, 495 Ninth Avenue, 432 West 38th Street, and 408 West 39th Street, according to *CEQR Technical Manual* guidance.

RECEPTOR 106 – 541 NINTH AVENUE

Receptor 106 represents the residences at 541 Ninth Avenue. These receptors are located immediately south of the ramps serving the Main Terminal.

At these receptors, construction is predicted to produce noise levels up to the mid 80s dBA, resulting in noise level increases up to approximately 11 dBA during the most noise-intensive stages of construction (i.e., demolition of the ramps serving the Main Terminal), which would occur for up to approximately four months and result in noise levels in the "marginally unacceptable" to "clearly unacceptable" category according to the *2021 CEQR Technical Manual* noise exposure criteria. Noise levels for the remainder of construction would remain in the low to high 70s dBA.

Based on the prediction of construction noise levels up to the mid 80s dBA during weekday daytime hours occurring only during approximately four consecutive months of worst-case demolition of ramps serving the Main Terminal, with total noise levels remaining in the "marginally unacceptable" range over the remainder of construction, construction noise associated with the Proposed Project would not rise to the level of a significant adverse impact at the residences at 541 Ninth Avenue according to *CEQR Technical Manual* guidance.

B.7.5.3.3 Construction Noise Analysis Conclusion

Construction of the Proposed Project is predicted to result in elevated noise levels at several of the analyzed receptors. At receptors closest to and facing the Dyer Deck-Over and Main Terminal construction sites, construction is predicted to result in noise level increases up to approximately 13 dBA at residential, hotel, and office receptors during limited periods of time. However, such noise level increases would only occur on a portion of each building and would result in maximum interior noise levels in the mid-40s to mid-50s dBA. Construction of the Proposed Project would typically occur during weekday daytime hours with intermittent overnight work over the course of approximately one year, limiting the noise produced during nighttime hours when residents would be most sensitive to noise. Additionally, construction in each work area would occur over limited periods and would therefore be considered temporary and transient. Per *New York City Noise Control Code* regulations, the Proposed Project would be required to prepare a Construction Noise Mitigation Plan, which may identify more control measures that would further reduce construction noise levels.

However, predicted construction noise levels would exceed FTA construction noise impact criteria, resulting in noise level increments at least 6 dBA greater than existing conditions over an extended duration at receptors 21, 22, 25, 26, 28, 29, 30, 31, 33, 36, 88, 113, and 114 and consequently result in significant adverse impacts at residential or hotel receptors at 431 West 37th Street, 495 Ninth Avenue, 432 West 38th Street, 507 Ninth Avenue, 408 West 39th Street, 511 Ninth Avenue, 411 West 39th Street, 342 West 40th Street, and 550 Tenth Avenue.

PANYNJ will require noise monitoring systems to be installed around the perimeter of active construction areas and will develop a noise monitoring plan to direct a series of reductive measures to take place if noise levels approach or exceed allowable levels. As previously mentioned, PANYNJ will maintain a regular series of updates on construction activities and create a telephone hotline for complaints, concerns or questions about the project's construction. See discussion of mitigation measures in **Appendix B.8, "Mitigation,"** of the FEIS.

B.7.5.4 Vibration

Construction activities have the potential to result in vibration levels that may cause structural or architectural damage, or annoyance or interference with vibration-sensitive activities. Vibration levels at a receiver are a function of the source strength (which is dependent upon the construction equipment and methods utilized), the distance between the equipment and the receiver, the characteristics of the transmitting medium, and the receiver building construction. Construction equipment operation causes ground vibrations which spread through the ground and decrease in strength with distance. Vehicular traffic, even in locations close to major roadways, typically does not result in perceptible vibration levels unless there are discontinuities in the roadway surface. With the exception of the case of fragile and possibly historically significant structures or buildings, construction activities generally do not reach the levels that can cause architectural or structural damage, but can achieve levels that may be perceptible and annoying in buildings very close to a construction site. An assessment has been prepared to

quantify potential vibration impacts of construction activities on structures and residences near the Project Area. A vibration monitoring plan would be prepared and implemented as further described below.

B.7.5.4.1 ANALYSIS METHODOLOGY

Construction Vibration and Ground-Borne Noise Standards and Criteria

FTA VIBRATION IMPACT CRITERIA

Table B.7-42 and **Table B.7-43** show architectural and structural damage risk and perceptibility thresholds for residential and historic structures in proximity to the types of construction activities that would occur during construction of the Proposed Project. Architectural damage includes cosmetic damage, such as cracked plaster, etc. Architectural damage is not considered potentially dangerous. As shown in **Table B.7-42**, pile driving has the greatest potential to result in architectural damage to most building types, but will not be used to construct the Proposed Project. Most other construction activities require very short (i.e., less than 25 feet) distances between the structure and the construction equipment, or the presence of highly fragile buildings, for impacts to occur. When considering the potential for vibration to result in damage at existing structures, the peak particle velocity (PPV) is the metric used to quantify the intensity of vibration according to FTA guidance. When considering the potential for vibration to be perceptible to humans, Vibration decibels (VdB) is the prescribed metric. For fragile and highly fragile buildings, respectively, FTA recommends a limit of PPV of 0.2 and 0.12 inches per second, which are approximately equivalent to 94 and 90 VdB, respectively.

Table B.7-42. Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 feet (in/sec)	Approximate L_v[1] at 25 feet
Pile Driver (impact)	0.644 to 1.518	104 to 112
Pile Driver (sonic)	0.170 to 0.734	93 to 105
Blasting	>0.400[2]	>100[2]
Clam Shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall in soil)	0.008	66
Hydromill (slurry wall in rock)	0.017	75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drilling	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Source: Transit Noise and Vibration Impact Assessment, FTA-VA-90-1003-06, September 2018.

1 RMS velocity in decibels (VdB) re 1 micro-inch/second

2 Estimated minimum based on approximately 0.75 pound explosive

Table B.7-43. Construction Vibration Damage Criteria

Building Category	PPV (in/sec)	Approximate L_v*
I. Reinforced-concrete, steel or timber (no plaster)	0.50	102
II. Engineered concrete and masonry (no plaster)	0.30	98
III. Non-engineered timber and masonry buildings	0.20	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: Transit Noise and Vibration Impact Assessment, FTA-VA-90-1003-06, September 2018.
* RMS velocity in decibels (VdB) re 1 micro-inch/second

NYCDOB CONSTRUCTION VIBRATION EVALUATION CRITERIA

Specifications for construction-generated vibration are set forth in the New York City Department of Buildings' (NYCDOB) Technical Policies and Procedures Notice (TPPN #10/88). As per TPPN #10/88, PPV from project construction is not permitted to exceed the vibration damage threshold criterion of 0.5 inch per second at historic structures. While NYCDOB does not provide a definition of "historic structures," it is generally interpreted to mean a nationally or locally listed landmark structure or a contributing structure in a listed historic district. For buildings that are not historic, the 0.5 inch per second threshold is often used as a conservative criterion to evaluate vibration, although non-historic buildings are typically able to safely withstand PPV up to 2.0 inches per second as specified by U.S. Bureau of Mines vibration evaluation criteria.

Analysis Techniques

Following the general analysis procedures described in the FTA Guidance Manual, for each construction work area, vibration levels were projected to nearby receptors and compared to FTA vibration impact criteria.

Potential structural or architectural damage is determined using the following formula:

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

where: PPV_{equip} is the peak particle velocity in in/sec of the equipment at the receiver location;

PPV_{ref} is the reference vibration level in in/sec at 25 feet; and

D is the distance from the equipment to the received location in feet.

For purposes of assessing potential annoyance or interference with vibration-sensitive activities, the following formula was used:

$$L_v(D) = L_v(ref) - 30\log(D/25)$$

where: $L_v(D)$ is the vibration level in VdB of the equipment at the receiver location;

Lv(ref) is the reference vibration level in VdB at 25 feet; and

D is the distance from the equipment to the receiver location in feet.

B.7.5.4.2 CONSTRUCTION VIBRATION ANALYSIS RESULTS

Use of the drill rig (i.e., shaft drilling) would be the most vibration-intensive activity associated with construction of the Proposed Project. Using the formula for assessing potential damage above, the reference vibration level of drilling was projected to the distance in which vibrations may result in PPV levels no greater than 0.5 (i.e., distances at least 20 feet from the equipment).

The buildings of most concern with regard to the potential for structural or architectural damage due to vibration are the existing buildings and structures immediately adjacent to the proposed construction work areas, including the McGraw-Hill Building at 330 West 42nd Street. To avoid the potential for vibration-induced damage on architectural resources located immediately adjacent to project construction (i.e., within 20 feet), the Proposed Project would develop and implement a Monitoring Plan. The Monitoring Plan would include a requirement for monitoring of vibration levels at any structures within 20 feet of active subsurface construction or any historic structure within 90 feet of active subsurface construction, as well as a prohibition on vibration exceeding the acceptable threshold (i.e., PPV of 0.5 in/sec). If construction were to result in vibration exceeding this threshold, the Monitoring Plan would require construction means and methods to be altered to avoid producing such exceedances. Additional receptors farther away from the Project Area would experience less vibration than those listed above, which would not be expected to cause structural or architectural damage.

In terms of potential vibration levels that would be perceptible and annoying, the equipment that would have the most potential for producing levels that exceed the 65 VdB limit is also the drill rig (i.e., shaft drilling). Using the formula for assessing potential annoyance above, it was determined that shaft drilling would have the potential to produce perceptible vibration levels (i.e., vibration levels exceeding 65 VdB) at receptor locations within a distance of approximately 135 feet depending on soil conditions. However, the operation would only occur for limited periods of time at a particular location and therefore would not result in any significant adverse impacts.

Consequently, significant adverse vibration impacts would not result from construction of the Proposed Project.

B.7.5.5 Contaminated and Hazardous Materials

As stated in DEIS Chapter 8, "Hazardous Materials," (see FEIS **Appendix A**) the environmental site assessments and investigations identified presence of contaminated soil and groundwater based on elevated analytical results for petroleum-related compounds, and the historical use of the area. Contaminants of concern within the area occupied by the PABT footprint and ramps include volatile organic compounds (VOCs), semi-volatile organic compounds, petroleum constituents, and metals. In addition, the following contaminants could be encountered, based on the historical uses and age of the properties: urban fill (fill materials of unknown origin), asbestos, lead-based paint (LBP), polychlorinated biphenyls (PCBs), and mercury-containing light bulbs and thermostats. The detailed assessment of hazardous materials is expanded upon in DEIS Appendix 8A, "Hazardous Materials" (see FEIS **Appendix A**) and includes information about

Areas of Concern, Recognized Environmental Conditions, and a Phase II Site Investigation summary.

Soils/Groundwater and Contaminated Materials Sampling Plan

Site-specific plans would be prepared and present measures for managing contaminated soil and groundwater in accordance with applicable federal, state, and local regulations. The plans would incorporate safety and other measures to minimize the potential for impacts to the community and workers. These plans would also specify the need for engineering controls as warranted based on the testing, such as incorporating vapor mitigation systems into the project design.

Construction Health and Safety Plan (CHASP)

Site-specific CHASPs will specify testing, monitoring, and detail measures to be implemented (including notification of regulatory agencies, dust suppression techniques, community air monitoring, and appropriate air monitoring action levels and responses) if soil and groundwater contamination or other unforeseen environmental conditions are encountered. The CHASP will be developed during final design in accordance with OSHA requirements, including 29 CFR § 1910.120 (Hazardous Waste Operations and Emergency Response), to protect construction workers from potential exposure. The CHASP will set out procedures for handling contaminated materials, conditions triggering personal protective equipment, response plans, designation and training of appropriate personnel, and monitoring for the presence of contamination. This would include procedures for underground storage tanks, drums or other containers, sludges, and soils that exhibit evidence of potential contamination, such as discoloration, staining, or odors. The CHASP would also define procedures to minimize dust generation during soil disturbance and excavation activities, such as dust and air monitoring of the work area, the use of water spray and dust retardants, securing tie-downs for vehicles transporting soil, and truck wheel washing.

Soils and Materials Management Plan (SMMP)

Site-specific SMMPs will be developed to manage contaminated materials encountered during construction. The SMMP will provide procedures for materials handling during construction activities, including Best Management Practices, such as procedures for stockpiled or containerized material, as well as testing procedures for sampling material prior to off-site disposal or on-site reuse. The SMMP would define how regulatory compliance (federal, state, and as applicable, local) would be achieved with respect to the management of excavated, hazardous, and petroleum-contaminated materials. It would also provide protocols for the protection of workers, contingencies for community air monitoring, and other procedures that would be implemented to protect public health and the environment.

Potential PABT Building Materials

Prior to construction activities that have the potential to disturb ACM, the proper removal and disposal of such materials would be required under State of New York Article 30 –Labor Law, Asbestos or Products Containing Asbestos Licensing 12 NYCRR – Part 56 Asbestos Regulations (i.e., ICR #56), and PANYNJ policies.

Surfaces coated with LBP would require proper removal of the paint prior to any construction activity that would generate lead-containing dust or vapors. Lead dust could be generated through mechanical processes (e.g., scraping demolition, scarification, etc.) that disturb surfaces coated with LBP (e.g., plaster, brick, etc.)

Suspect PCB-containing equipment and electrical fixtures would be surveyed and evaluated prior to demolition and reconstruction. PCB-containing equipment that would be disturbed by demolition or construction activities would be removed and disposed of in accordance with applicable federal Toxic Substances Control Act (TSCA), state, and local regulations, as well as PANYNJ policies.

Mercury-containing light bulbs and thermostats would be identified and removed prior to demolition. The bulbs would be disposed of in accordance with federal (including the Resource Conservation and Recovery Act (RCRA) and Universal Waste Regulations), state, and PANYNJ protocols.

All other materials that need to be discarded (e.g., universal wastes, miscellaneous debris, contaminated soil, and any excess fill) would be characterized and disposed of off-site in accordance with applicable federal, state, and local requirements. Contaminated materials encountered during construction would be removed, stored, transported, and disposed of in accordance with applicable federal and state regulations, including the RCRA and TSCA. All on-site project personnel would be required to follow all applicable local, state, and OSHA construction codes and regulations. Contaminated materials will be identified and managed prior to construction. Once construction activities are completed, remaining subsurface contaminated materials would be contained using an engineering control such as pavement or other barriers, and would not present a hazard to the public or on-site personnel.

By implementing the plans and protocols above, no significant adverse impacts related to contaminated materials would result from demolition or construction activities related to the Proposed Project.

B.7.5.6 Other Technical Areas

B.7.5.6.1 Urban Design

Construction for the Proposed Project would occur in three major phases over an extended period, incorporating various levels and types of activity at multiple locations over those phases. There would be an incremental realization of the Proposed Project, as project elements are completed in a sequential manner. Because each construction phase would address a distinct component of the Proposed Project, construction would occur at different locations, and would require different activities, the effects of construction on urban design and visual resources would change over time and by location. Overall, it is anticipated that construction for the Proposed Project would be a prominent feature of the visual character of Primary Study Area used in the Urban Design analysis (roughly bounded by West 36th Street and West 43rd Street to

the south and north, the midblock between Seventh and Eighth Avenue to the east, and Eleventh Avenue to the west) during this period.

Construction staging and activities would occur at multiple locations within the Primary Study Area, and it is anticipated that construction fencing would be erected around the construction activities and staging areas. Pedestrian views from sidewalks on streets adjacent to active construction would consist of conditions that would be typical of any construction site in the City. Those views would include construction workers, visible above construction fencing, truck traffic entering and leaving active construction sites, large pieces of equipment such as cranes, and protective elements including barriers, fences, and sidewalk bridges.[17] Construction fencing would block views of some construction activities to pedestrians, bicyclists, and motorists in the surrounding area. Bus passengers on the elevated ramps leading to and from the PABT would have views of some construction activities. However, bus passengers have a transient perspective, and their views would be limited by their speed of travel. The construction fencing itself and any construction activities above such fencing would be visible to pedestrians, bicyclists, and motorists on surrounding streets and could result in temporary visual obstructions.

Construction staging areas and protective sheds and fencing would be in place around the SSF and Dyer Deck-Over areas for approximately four years; would be in place around the Main Terminal during demolition and new construction for approximately four years; and then would be in place during construction of the new towers (which will be constructed above the fully operational new Main Terminal) for another two years. Therefore, project construction would become a visual element of the Project Area for an extended period of time, consistent with other major infrastructure projects undertaken in the city. It would be part of the visual character of the area for this time, and there would be long-term (multi-year) changes to view corridors in the study areas. Once project elements are complete, views from adjacent sidewalks would include the nearest completed project element, along with other more distant completed project elements, ongoing construction activities elsewhere within the study area, and longer views that would include the surrounding streetscapes.

Road and sidewalk closures could be in place for extended periods and would affect the experience of the Primary Study Area for pedestrians, bicyclists, and motorists. There would be temporary changes to circulation patterns; however, in dense, walkable urban areas such as this, temporary and localized changes to such circulation patterns would not disrupt neighborhood cohesiveness.

Views of bus passengers as they pass through the Project Area would change during construction, as they will be traveling on the temporary ramp on West 40th Street between Tenth Avenue and Dyer Avenue. The temporary ramp would be prominent in surrounding views on these three streets for an extended period; however, as described in detail in Appendix 6C, "Urban Design and Visual Resources" of the DEIS (**Appendix A**), the visual character of the

[17] Sidewalk bridges are temporary structures, typically scaffolding, that allow sidewalks to remain open for foot traffic and businesses operations during construction.

Primary Study Area is defined in part by the existing large-scale transportation infrastructure extending through the area, including the ramps and tunnels for the Lincoln Tunnel as well as the ramps leading to and from the PABT. Therefore, the temporary ramp on West 40th Street would be consistent with that visual character. The ramps above Ninth and Tenth Avenues are a prominent feature of those view corridors in existing conditions; as those ramps are removed and the temporary ramp is constructed, views along these view corridors would be altered.

The eastern portion of the study area, generally the area east of Ninth Avenue, is more visually connected with the remainder of Midtown Manhattan, with taller buildings mostly in commercial, residential, and manufacturing use. The existing dense development in this portion of the study area would serve to obscure most views of construction fencing and activities from beyond the immediately affected areas. Furthermore, there are multiple construction projects currently underway and planned within the primary and secondary study areas, and construction activities and equipment associated with the Proposed Project could be difficult to distinguish from these other activities at some locations.

In the first phase of construction, as the Dyer Deck-Overs are constructed, motorist views from portions of the below-grade roadway will begin to be constrained; however, the development of this project element also would shield motorists from some views of construction activities. Views by motorists also are limited by their speed of travel. In the latter phases of construction, views along West 37th Street and West 38th Street adjacent to Dyer Avenue would include the new decks or platforms, and later the new publicly accessible open space to be created on the decks; this change is anticipated to enhance views from this location.

Overall, while construction of the Proposed Project would notably alter the visual character of the surrounding area for an extended period of time, it would not result in a significant adverse impact to urban design and visual resources as a result of construction activities.

B.7.5.6.2 Historic and Cultural Resources

Archaeological Resources

As described in **Appendix B.2 "Historic and Cultural Resources"** of the FEIS one archaeologically sensitive site has been identified in the Project Area. This is the location of the former 19th-century Presbyterian cemetery on Block 1050, Lot 13, which has the potential to contain human remains. Where construction activities for the Proposed Project would occur in the same location and depth as the identified sensitivity, this could result in potential adverse effects to archaeological resources, if they are present. Further archaeological analysis is not warranted for all other portions of the Project Area except for Block 1050, Lot 13. While the likelihood of encountering archaeological resources is low due to previous disturbances, further analysis in the form of archaeological testing or monitoring would be implemented (prior to and during construction) to determine the presence or absence of human remains. Details on how the construction will work to avoid, reduce or minimize any effect on archaeological resources are outlined in the draft Programmatic Agreement found in **Appendix B.2.2** of the FEIS.

Architectural Resources

As described in **Appendix B.2**, to avoid adverse inadvertent construction-related impacts to eight historic properties, PANYNJ will develop and implement a CPP in consultation with NYSHPO and LPC to address potential construction-related impacts including ground-borne vibration and accidental damage from heavy machinery within 90 feet of these historic properties. More details on construction related vibration can be found in **Section B.7.5.4**. The eight properties are: (1) the McGraw-Hill Building, (2) the church and rectory of the Holy Cross Roman Catholic Church Complex, (3) the Street Raphael Roman Catholic Church and Rectory, (4) the northern five tenements (531-539 Ninth Avenue) of the row of tenements at 523-539 Ninth Avenue, (5) the tenement at 408 West 39th Street, (6) the Underhill Building, (7) the Hook and Ladder Company No. 21/Engine Co. 34 Firehouse, and (8) properties within the Paddy's Market Historic District (**Figure B.7-10**). The CPP would be implemented by a professional engineer and a Secretary of the Interior (SOI)-qualified Architectural Historian before any excavation would take place. The CPP would comply with the procedures set forth in DOB's TPPN #10/88 and follow the guidelines set forth in section 522 of the CEQR Technical Manual, including conforming to LPC Guidelines for Construction Adjacent to a Historic Landmark and Protection Programs for Landmark Buildings. The CPP would also conform to guidance contained in the National Park Service's Preservation Tech Notes No. 3, "Temporary Protection: Protecting a Historic Structure during Adjacent Construction" (July 2001). With implementation of the CPP, the Proposed Project would have no construction related adverse effect on these historic properties. Additional details can be found in the draft Programmatic Agreement in **Appendix B.2.2**.

FigureB.7-10. Historic Properties Requiring a Construction Protection Plan



Source: FHI Studio (2024)

B.7.5.6.3 Neighborhood Character

Long-term construction activity associated with the Proposed Project would not result in significant adverse neighborhood character impacts during construction. While construction activities would cause temporary disruption, due to the phasing, location, and nature of construction activity associated with the various components for the Proposed Project, significant adverse impacts are not expected.

During the first phase of construction, the Dyer Deck-Overs, ramp structure, and SSF would be constructed while bus service would be redirected to the existing PABT building using West 39th Street and a temporary ramp structure on West 40th Street. The construction of this infrastructure, particularly the new ramps, would occur in an area that is currently characterized by an abundance of transportation infrastructure, including existing ramps for the PABT and Lincoln Tunnel portals. Construction activity in this area is not expected to result in a significant adverse construction impact associated with neighborhood character because the immediate areas contain an abundance of transportation infrastructure, reduced pedestrian activity and limited visual interest.

Following the completion of the ramp structures, Dyer Deck-Overs and SSF, commuter bus service would primarily operate in the newly constructed SSF while demolition and construction of the new Main Terminal would be undertaken. After construction of the new Main Terminal is completed, bus service would be redirected from the SSF to the new Main Terminal, anticipated to be in operation by 2032. The Dyer Deck-Overs would also be converted to publicly accessible open space by 2040. Although the site of the Main Terminal is more congested and contains more pedestrian activity, safety measures as described above, would minimize the effects of construction on pedestrians and the surrounding community, and significant adverse construction impacts associated with neighborhood character are not anticipated.

The final phase of development includes the construction of two commercial towers (private development) on Eighth Avenue, between West 40th and West 42nd Streets. During this phase, the ramp structures, the SSF, and the Main Terminal would be fully operational. The Dyer Deck-Overs would be operational as new publicly accessible open space. The private development would be constructed approximately 157 feet above street level, on the roof of the Main Terminal, which would substantially minimize disruption at street level. Therefore, significant adverse construction impacts associated with neighborhood character are not anticipated during this phase of construction.

Throughout the construction period, measures would be implemented to limit airborne emissions, noise, and vibration, including the erection of construction fencing. The fencing would reduce potentially undesirable views of construction sites and provide a buffer from construction activities. Construction-related disruption would be localized and would not alter the character of the neighborhoods surrounding the development sites.

B.7.5.6.4 Socioeconomic Conditions

This section describes the effects on socioeconomic conditions from construction activities associated with the Proposed Project.

The construction of the Replacement Facility would occur during two major phases incorporating various levels of activity at multiple locations. The initial phase would entail the construction of the Dyer Deck-Overs, the SSF, and the ramp structure. The second phase would include the demolition of the existing terminal and the construction of the new Main Terminal. As noted earlier, trans-Hudson bus service would be maintained throughout the construction period. There would be additional construction activity associated with the two private development towers following the completion of the Replacement Facility by the 2032 analysis year.

Construction activities in each phase would temporarily impact pedestrian and vehicular access to businesses near the Project Area. However, the lane and sidewalk closures or modifications needed to accommodate construction of the Proposed Project are not expected to obstruct entrances to any existing businesses. For each phase of construction, the PANYNJ would develop MPT plans to ensure safe pedestrian, bicyclist, and vehicle circulation near the Project Area during construction of the Proposed Project as required by NYC DOT. The MPT plans would specify the use of measures commonly implemented in such plans and may include, but are not limited to, the following: sidewalk closures or modifications, parking lane closures, safety signs, safety barriers, and construction fencing. While there would be periodic and temporary changes to the surrounding streets and sidewalks during construction, the MPT would ensure construction activities would minimize potential effects to businesses and regular access to businesses and residences would be maintained. Approval of these plans and implementation of the closures would be coordinated with NYC DOT. In addition, throughout construction, appropriate air quality and noise monitoring would be performed.

As detailed above, the study area does not contain a disproportionately large number of elderly people or persons with disabilities. With the implementation of MPT plans, construction associated with the Proposed Project would not adversely affect the elderly or persons with disabilities, except any individuals seeking to access the Eighth Avenue subway for which elevator access would be farther away from bus operations during the construction period.

As described in Appendix 4B, "Economic Benefits Analysis," of the DEIS **(Appendix A)**, construction of the Proposed Project would create direct economic benefits resulting from expenditures on labor, materials, and services, and indirect economic benefits near the Project Area created by expenditures by material suppliers, construction workers, and other employees involved in the construction activity. Construction would also contribute to increased tax revenues for the City and State, including those from personal income taxes.

Therefore, construction associated with the Proposed Project would not result in any significant adverse impacts on socioeconomic conditions.

The potential for the Proposed Project's construction to have effects on Environmental Justice communities is discussed in Chapter 5, "Environmental Justice," of the DEIS **(Appendix A).**

B.7.5.6.5 Natural Resources

Groundwater

Construction for building footings or structures may require subsurface excavation which could reach groundwater close to the surface. Should that occur, then the excavation would require dewatering to allow access for construction workers and equipment. Any construction activities that require withdrawal of groundwater, such as by dewatering an excavation, must be done in accordance with Article 15 of the New York Environmental Conservation Law. Discharge of recovered groundwater to a city sewer requires a dewatering permit from the City (DEP) and may require a State Pollutant Discharge Elimination System permit. Typically, pretreatment is required to remove solids or VOCs.

Aquatic Resources

Construction of the Proposed Project would not involve in-water work or result in discharges to the Lower Hudson River Estuary. Therefore, water quality, aquatic biota, Essential Fish Habitat, or other aquatic resources would not be directly or indirectly affected by construction of the Proposed Project.

Terrestrial Resources

Ecological communities within the Project Area are regionally common and characterized by human disturbance. Construction of the Proposed Project would result in the loss of approximately 10 street trees or trees on PANYNJ property in the Project Area. Construction would be performed in compliance with NYC Local Law 3 of 2010, Chapter 5 of Title 56 of the Rules of the City of New York, and NYC Parks' Tree Protection Protocol, if necessary, to mitigate potential adverse impacts to trees including the replacement or restitution of any trees that fall under the jurisdiction of NYC Parks. Construction activities associated with the Proposed Project would not impact vegetation at either the High Line or Javits Center.

Wildlife likely to occur in the Project Area is limited to disturbance-tolerant, urban-adapted species that can tolerate the degraded environment and high levels of human activity currently present within the Project Area. Indirect disturbance of wildlife due to construction noise, lighting, or emissions would be minimal, as urban-adapted species are acclimated to the noise, lighting, and emissions of an urban environment. Any wildlife temporarily displaced from within or adjacent to the Project Area during construction activities would be expected to move to alternative habitat common within or adjacent to the Project Area.

Threatened, Endangered, Candidate, and Special Concern Species, and Significant Natural Communities

As discussed in Appendix 7A, "Natural Resources" of the DEIS **(Appendix A)** the only federally or state-listed endangered, threatened, candidate, and special concern species with the potential to occur or are known to occur within the one-half mile radius surrounding the Project Area are

the peregrine falcon and monarch butterfly. Also discussed in Appendix 7A of the DEIS **(Appendix A)**, the New York State status of the peregrine falcon has been proposed to be changed to "Special Concern" (DEC 2019). Buildings and structures that would be demolished as a result of the Proposed Project are not generally high enough to attract peregrines for nesting. A pre-demolition survey for peregrine falcon would be conducted prior to commencement of construction activities on the Project Area. Urban peregrine falcons have a particularly high tolerance for noise and indirect human disturbance (White et al. 2002). Therefore, peregrine falcons within the one-half mile radius surrounding the Project Area would not be anticipated to be affected by construction noise (see **Section B.7.5.3** for additional information regarding construction-period noise). Based on this information, construction activities associated with the Proposed Project would not be anticipated to impact peregrine falcons. Adult monarch butterflies are only likely to occur as transient individuals and are unlikely to breed within the Project Area due to the lack of suitable habitat. Construction of the Proposed Project would not result in the removal of monarch butterfly host plants such as milkweed. Therefore, the Proposed Project would not impact monarch butterflies.

Construction of the Proposed Project would not include in-water work or result in discharges to the Hudson River, and would therefore not directly or indirectly affect shortnose or Atlantic sturgeon in the Hudson River.

NYNHP indicated that the yellow bumblebee, an unlisted species identified as of conservation concern, has the potential to occur within one-half mile of the Project Area. As discussed in 7A of the DEIS (**Appendix A**) the only potential habitat within one-half mile of the Project Area is located along the High Line and atop the Javits Center green roof. Construction activities for the Proposed Project would not occur within the immediate vicinity of either location where vegetation may exist conducive to bumblebee activity. Thus, the Proposed Project would not directly or indirectly impact yellow bumblebee.

Therefore, the construction activities for the Proposed Project would not have significant adverse impacts to threatened, endangered, candidate, and special concern species or significant natural communities.

B.7.6 CONCLUSIONS

Construction associated with the Proposed Project would result in temporary disruptions in the surrounding area. As described below, the Proposed Project's construction activities would result in significant adverse noise and transportation impacts. For all other technical areas, construction activities associated with the Proposed Project would not result in significant adverse impacts. Findings specific to each of the key technical areas are summarized below.

B.7.6.1 Transportation

Based on the analysis results, the construction activities and associated roadway modifications would create significant delays on critical street links, affecting bus operations and general

traffic. With mitigation such as signal timing changes, roadway geometric changes and other traffic management measures as suggested in the above sections, some delays could be reduced. With the implementation of a Traffic Management Center, prior to the start of construction, public notices will be disseminated to allow motorists to make informed route decisions and avoid traveling in the Project Area. This will help to reduce the traffic demand and reduce the additional delays estimated to occur during the project's construction.

As a result of additional pedestrian trips and changed circulation patterns during the construction of the Proposed Project, significant impacts would occur on 24 sections of sidewalks, at 25 individual crosswalks and at 8 sidewalk corners.

The construction trips and changes to pedestrian circulation patterns during the construction of the Proposed Project would not result in impacts to subway station stairs.

The number of construction workers who would be expected to drive to the Project Area during construction would not exceed the supply of available private parking.

B.7.6.2 Air Quality

Measures would be taken to reduce pollutant emissions during construction of the Proposed Project in accordance with all applicable laws, regulations, and building codes. These include the use of ULSD fuel, dust suppression measures, idling restrictions, and diesel equipment reduction. In addition, construction of the Proposed Project would use best available tailpipe reduction technologies to reduce air pollutant emissions. With the implementation of these emission reduction measures, the dispersion modeling analysis of construction-related air emissions for both non-road and on-road sources determined that particulate matter ($PM_{2.5}$ and PM_{10}), annual average nitrogen dioxide (NO_2), and carbon monoxide (CO) concentrations would be below the NAAQS. Therefore, construction under the Proposed Project would not result in significant adverse air quality impacts due to construction sources.

In addition, PANYNJ will ensure that construction contractors develop a Community Air Monitoring Program (CAMP), which will provide real-time monitoring of particulate matter and volatile organics during soil disturbing construction activities and demolition. The plan will meet criteria for site-specific contaminants such as lead. Personal lead monitoring will be conducted consistent with the Occupational Safety and Health Administration (OSHA) lead standard.

B.7.6.3 Noise

Based on the construction activities predicted for the Proposed Project, construction-generated noise is expected to exceed FTA construction noise impact criteria at residential receptors near the construction area. Construction of the Proposed Project would have the potential to result in significant adverse noise impacts under *CEQR Technical Manual* guidance as well.

Thirteen construction time periods were analyzed and the results from each of these analysis time periods were utilized to represent the entire duration of construction. Construction of the Proposed Project is predicted to result in elevated noise levels at several of the analyzed

receptors. At receptors closest to and facing Dyer Deck-Over and Main Terminal construction, construction is predicted to result in noise level increases up to approximately 13 dBA at residential, hotel, and office receptors during limited periods of time. However, such noise level increases would only occur on a portion of each building and would result in maximum interior noise levels in the mid-40s to mid-50s dBA.

Construction of the Proposed Project would typically occur during weekday daytime hours with intermittent overnight work over the course of approximately one year, limiting the noise produced during nighttime hours when residents would be most sensitive to noise. Additionally, construction in each work area would occur over limited periods and resulting noise impacts would therefore be considered temporary and transient.

B.7.6.4 Vibration

The buildings of most concern with regard to the potential for structural or architectural damage due to vibration are the existing buildings and structures immediately adjacent to the proposed construction work areas. To avoid the potential for vibration-induced damage on architectural resources located close enough to project construction (within 20 feet), the Proposed Project would develop and implement a Monitoring Plan. The Monitoring Plan would include a requirement for monitoring of vibration levels at any structures within 20 feet of active subsurface construction or any historic structure within 90 feet of active subsurface construction, as well as a prohibition on vibration exceeding the acceptable threshold (i.e., PPV of 0.5 in/sec). If construction were to result in vibration exceeding this threshold, the Monitoring Plan would require construction means and methods to be altered to avoid producing such exceedances. Additional receptors farther away from the Project Area would experience less vibration than those listed above, which would not be expected to cause structural or architectural damage.

In terms of potential vibration levels that would be perceptible and annoying, the equipment that would have the most potential for producing levels that exceed the 65 VdB limit is also the drill rig. It would have the potential to produce perceptible vibration levels (i.e., vibration levels exceeding 65 VdB) at receptor locations within a distance of approximately 135 feet depending on soil conditions. However, the operation would only occur for limited periods of time at a particular location and therefore would not result in significant adverse impacts.

Consequently, significant adverse vibration impacts would not result from construction of the Proposed Project.

B.7.6.5 Contaminated and Hazardous Materials

During construction, whenever contaminated soils, groundwater or vapors, or hazardous materials are encountered, appropriate remediation techniques or other measures to prevent exposure would be implemented based on the procedures set forth in the CHASP, SMMP, hazardous materials management and abatement plans. These plans would contain measures that will be implemented proactively in order to avoid or to minimize potential significant adverse environmental impacts that otherwise could potentially occur as a result of construction

activities. By implementing the protocols identified above, no significant adverse impacts related to contaminated or hazardous materials would result from demolition or construction activities related to the Proposed Project.

B.7.6.6 Historic Resources

Construction of the Proposed Project would be expected to create a significant adverse effect with the removal of elements of the National Register of Historic Places (NRHP) Lincoln Tunnel (retaining walls and Art Deco light towers around the North Tube). The PANYNJ is developing mitigation strategies in coordination with the FTA, SHPO, LPC and Consulting Parties as part of Section 106; options under consideration include developing information display about the history of the Lincoln Tunnel and incorporating salvaged materials into the publicly accessible open spaces on the Dyer Deck-Overs.

Construction of the Proposed Project also has the potential to inadvertently damage several (eight) nearby historic properties. Due to a former 19th-Century cemetery being located within the Project Area there is the potential for archaeological resources to be disturbed. As part of the Programmatic Agreement, the PANYNJ is developing mitigation strategies including a CPP when work occurs within 90 feet of identified historic properties and for archaeological monitoring before and during construction.