Chapter 20: Construction

A. INTRODUCTION

This chapter summarizes the proposed project's construction plans and assesses the potential for significant adverse construction impacts. For construction activities of the scale and duration estimated for the proposed New York University (NYU) Core project, the *CEQR Technical Manual* calls for an assessment of construction-related impacts, with a focus on transportation, air quality, and noise, as well as consideration of other technical areas such as open space, historic and cultural resources, hazardous materials, and natural resources. The assessment focuses on project construction within the Proposed Development Area, bounded by LaGuardia Place to the west, Mercer Street to the east, West Houston Street to the south, and West 3rd Street to the north. No construction is proposed for the Mercer Plaza Area, and the projected development within the Commercial Overlay Area would involve only interior renovations to the ground floors of existing or planned buildings.

Over a period of approximately 19 years, NYU is proposing to construct within the Proposed Development Area four permanent new buildings. These buildings would include: academic uses; residential units for NYU faculty and students; a new athletic facility; a University-affiliated hotel, and retail uses. In addition, below-grade academic uses and replacement below-grade accessory parking facilities would be constructed, as well as approximately four acres of publicly-accessible open spaces. NYU also anticipates making space available for an approximately 100,000-square-foot public school. If by 2025 the New York City School Construction Authority (SCA) does not exercise its option to build a public school, NYU would build and utilize the 100,000-square-foot space for its own academic purposes. By 2031, the Proposed Actions would result in the development of approximately 2.5 million gross square feet (gsf) of new uses in the Proposed Development Area.

Phase 1 of construction—from 2013 to 2021—would occur primarily on the South Block. During Phase 1, the Coles Sports and Recreation Center (Coles) would be demolished and replaced by the proposed Zipper Building; the site of the existing Morton-Williams Associated Supermarket would be redeveloped with the proposed Bleecker Building; a temporary gym would be constructed on the North Block; and new open spaces would be created on the North and South Blocks. Phase 2 of construction—from 2022 to 2031—would occur entirely on the North Block and would involve construction of two new academic buildings, below-grade academic uses and parking facilities, and open space components.

For each of the various technical areas presented below, appropriate construction analysis years were selected to represent reasonable worst case conditions relevant to that technical area, which can occur at different times for different analyses. For example, the noisiest part of the construction may not be at the same time as the heaviest construction traffic. Therefore, the analysis periods may differ for different analysis areas. Where appropriate, the effects of project elements that would be completed and operational during the selected construction analysis years were also accounted for.

PRINCIPAL CONCLUSIONS

The Proposed Actions would result in significant adverse construction impacts related to transportation, noise, and open space.

TRANSPORTATION

Construction of the proposed project is expected to result in significant adverse traffic, transit, and pedestrian impacts during Phase 2 construction, as summarized below. The proposed project is not expected to result in significant adverse parking impacts during construction.

Traffic

The proposed project would result in significant adverse traffic-related construction impacts during Phase 2 of construction, but not during Phase 1. As discussed further in Chapter 21, "Mitigation," traffic mitigation measures needed for the 2031 build year would also be sufficient to mitigate Phase 2 traffic-related construction impacts and would be implemented when needed during Phase 2.

A detailed traffic analysis conducted for the area intersections most affected by estimated construction-related traffic concluded that Phase 1 construction of the proposed project would not result in any significant adverse traffic impacts. During Phase 2 construction, peak activities generated by construction workers and truck deliveries would be substantially lower in comparison to those during Phase 1 construction. However, together with new trips resulting from the completion of Phase 1 components of the proposed project, there would still be a potential for significant adverse traffic impacts during Phase 2 construction. The cumulative project trip generation during Phase 2 construction would be less than what would be realized upon the full build-out of the proposed project in 2031. Therefore, the anticipated impacts would be of equal or lesser magnitude than the significant adverse traffic impacts identified for the 2031 Build condition in Chapter 14, "Transportation." These impacts can be similarly addressed with the mitigation measures described in Chapter 21, "Mitigation."

Parking

Based on the parking analysis results presented in Chapter 14, "Transportation," the parking demand generated by construction workers commuting by private automobiles would be adequately accommodated by available nearby off-street parking facilities during Phase 1 construction. However, there is expected to be a temporary parking shortfall during the peak midday hours during Phase 2 construction. Based on the magnitude of available and total parking spaces within ½-mile of the Proposed Development Area, it is anticipated that the excess demand could be accommodated with a slightly longer walking distance beyond the ¼-mile radius. Furthermore, as stated in the 2012 *CEQR Technical Manual*, for proposed projects located in Manhattan, this projected parking shortfall does not constitute a significant adverse parking impact due to the magnitude of available alternative modes of transportation.

Transit

The area around NYU is well served by public transit, including the B/D/F/M lines at the Broadway-Lafayette Station; the No. 6 line at the Bleecker Street Station; the A/B/C/D/E/F/M lines at the West 4th Street Station; and the N/R lines at the Prince Street Station and the 8th Street-NYU Station. There are also several local bus routes, including the M1, M2, M3, M5, M8, and M21. Based on the number of projected construction workers being distributed among the various subway and bus routes, station entrances, and bus stops near the project area, only nominal increases in transit demand would be experienced along each of these routes and at each of the transit access locations during hours outside of the typical commuter peak periods. There would not be a potential for significant adverse transit impacts attributable to the projected construction worker transit trips during Phase 1 construction. After the completion of Phase 1 components of the proposed project, the area's subway stations would incur increases in passengers generated by the completed uses. As discussed in Chapter 14, "Transportation," subway impacts are expected to occur in 2021 with the development of Reasonable Worst-Case Development Scenario (RWCDS) 1 at the Broadway-Lafayette Station and would occur at both the Broadway-Lafayette and West 4th Street stations under both RWCDSs by 2031. The combination of the Phase 2 construction worker subway trips and those generated by the completed Phase 1 and portions of the Phase 2 projects during the commuter peak hours would result in comparable significant adverse impacts to the subway station elements described for the completed proposed project (i.e., S9 stairway at the Broadway-Lafayette Station and S2A/B stairway at the West 4th Street Station).

As described in Chapter 21, "Mitigation," an engineering analysis to determine the feasibility of widening this stairway was undertaken and the recommended stairway widening mitigation measures were found to be feasible. The analysis conducted for this EIS to determine the potential for significant adverse impacts was based on the RWCDS that maximizes the potential for impacts to the subway station stairways. It is possible that the actual built program will contain a mix of uses with lower transit demand, and therefore would have less potential to adversely affect these subway stairways. Accordingly, prior to implementation of the required stairway mitigation, NYU may undertake a study to determine whether the required mitigation would be unwarranted based on the then anticipated built program and service conditions in 2021 and 2031. If NYU undertakes such a study, it would be submitted to DCP and the Metropolitan Transportation Authority (MTA) New York City Transit (NYCT) for review. NYU, in coordination with the MTA NYCT, would implement the required subway stairway mitigation measures unless DCP, in consultation with the MTA NYCT, determines, based on its review of the study and applying applicable CEQR methodologies, that the required mitigation is unwarranted. Any temporary relocation of bus stops along bus routes that operate adjacent to the project area would be coordinated with and approved by the New York City Department of Transportation (NYCDOT) and NYCT to ensure that proper access is maintained.

Pedestrians

During Phase 1 construction, pedestrian trips generated by construction workers are not expected to result in significant adverse pedestrian impacts. However, construction of the Zipper building would necessitate closing the Mercer Street west sidewalk between Bleecker Street and West Houston Street pedestrian access along this segment of the sidewalk would not be available. A detailed analysis of the redirected pedestrian trips during peak periods showed that these trips could be adequately accommodated by Mercer Street's east sidewalk across from the Zipper building, such that this sidewalk closure is not expected to result in a significant adverse pedestrian impact. After the completion of Phase 1 components of the proposed project, the combination of the Phase 2 construction worker pedestrian trips and those generated by the completed Phase 1 project during the commuter peak hours would result in a comparable significant adverse impact at the southeast corner of University Place and Waverly Place, requiring the same mitigation measure described for the project's 2021 Phase 1 build-out. During both Phase 1 and Phase 2 construction, other sidewalks may also be closed for limited periods of time, but pedestrian circulation and access would be maintained at all times through the use of temporary sidewalks or sidewalk bridges as approved by NYCDOT.

AIR QUALITY

The proposed project would not result in significant adverse impacts with respect to air quality. A detailed analysis of the combined effects of on-site and on-road emissions, determined that annual-average nitrogen dioxide (NO_2), carbon monoxide (CO), and particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}) concentrations would be below their corresponding National Ambient Air Quality Standards (NAAQS). Therefore, the proposed projects would not cause or contribute to any significant adverse air quality impacts with respect to these standards.

Dispersion modeling determined that the maximum predicted incremental concentrations of particulate matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$) (using a worst-case emissions scenario) would exceed the City's applicable 24-hour interim guidance criterion of 2 micrograms per cubic meter ($\mu g/m^3$) at sidewalk receptor locations and one residential location. The occurrences of elevated 24-hour average concentrations for $PM_{2.5}$ would be very limited in duration, frequency, and magnitude. Therefore, taking into account the limited duration and extent of these predicted exceedances, and the limited area-wide extent of the 24-hour impacts, it was concluded that no significant adverse air quality impacts for $PM_{2.5}$ would occur from the on-site construction sources.

Because background concentrations are not known and the analysis methodology for mobile and construction sources have not been developed for the new 1-hour NO_2 NAAQS, exceedances of the 1-hour NO_2 standard resulting from construction activities cannot be ruled out. Therefore, measures including diesel equipment reduction, utilization of newer equipment, and source location and idling restriction, would be implemented by the proposed project to minimize NO_x emissions from construction activities.

NOISE AND VIBRATION

Noise

The proposed project would result in significant adverse impacts with respect to construction noise.

NYU has committed to a proactive approach to minimize noise during construction activities. This approach includes both source and path controls that exceed measures typical of standard construction practices.

Even with these measures, the results of detailed construction analyses indicate that significant noise impacts are predicted to occur for two or more consecutive years at forty-five (45) of the one hundred and ten (110) analyzed receptor sites. Significant noise impacts are predicted to occur at the following residential locations:

- Washington Square Village 1 & 2 - at various locations on the south façades of the residential buildings (Receptors from A1 through A8), at various locations on the west façade of the residential building (Receptor A9), and at various locations on the east façade of the residential building (Receptor A15);
- Washington Square Village 3 & 4 - at various locations on the north façades of the residential buildings (Receptors from B1 through B8), at various locations on the west façade of the residential building (Receptor B9), at various locations on the south façades of

the residential buildings (Receptors from B10 through B17), and at various locations on the east façade of the residential building (Receptor B18);

- Silver Tower II - at various locations on the east façade (Receptor C2) and south façade (Receptor C3) of the residential building;[1]
- Silver Tower I - at various locations on the east façade of the residential building (Receptor D2), and at various locations on the south façade of the residential building (Receptor D3);
- At various locations on the east façades of the sensitive receptor buildings located on LaGuardia Place between Washington Square South and West Houston Street (Receptors H1, H2, I, J, and K);
- At various locations on the west façades of the sensitive receptor buildings located on Mercer Street between Washington Square South and Prince Street (Receptors O, P, Q, Q1 and EE);
- At top floor locations on the south façade of the sensitive receptor building located on Bleecker Street between Mercer Street and Broadway (Receptor KK);
- At top floor locations on the south façade of the sensitive receptor building located on Bleecker Street between Thompson Street and LaGuardia Place (Receptor NN); and
- At various locations on the east façade of the sensitive receptor building located on Mercer Street between West Houston Street and Prince Street (Receptor S1).

In addition, noise levels at on-site open space locations adjacent to where construction activities are taking place would increase significantly above the 3-5 dBA CEQR impact criteria. Due to the close proximity of on-site open spaces to construction activities, construction of the proposed project would result in significant adverse noise impacts on open spaces.

Vibration

The proposed project is not expected to result in significant adverse construction impacts with respect to vibration. To avoid architectural damage, a Construction Protection Plan (CPP) would be developed to protect known architectural resources with a lateral distance of 90 feet from the proposed construction activities. The CPP would include a monitoring component to ensure that if vibration levels approach the 0.5 inches per second PPV criterion, corrective action would be taken to reduce vibration levels, thereby avoiding architectural damage and significant vibration impacts.

Use of construction equipment that would have the most potential to exceed the 65 VdB criterion within a distance of 550 feet of sensitive receptor locations (e.g., equipment used during tangent wall drilling) would be perceptible and annoying. Therefore, for limited time periods, perceptible vibration levels may be experienced by occupants and visitors to all of the buildings and locations on and immediately adjacent to the construction sites. However, the operations which would result in these perceptible vibration levels would only occur for finite periods of time at any particular location and therefore the resulting vibration levels, while perceptible and annoying, would not result in any significant adverse impacts.

[1] If the construction of the Bleecker Building were advanced three quarters earlier in Phase 1, Receptor C1 (representing various locations on the north façade of Silver Tower II) would also experience a significant adverse construction noise impact (see section F below).

OTHER TECHNICAL AREAS

Historic and Cultural Resources

No significant adverse impacts to archaeological, historic or cultural resources would result from construction of the proposed project.

Construction would involve subsurface disturbance to areas that have been identified as archaeologically sensitive by the Phase 1A studies (see Chapter 7, "Historic and Cultural Resources" for more detail). Therefore, further investigation in the form of Phase 1B archaeological testing would be conducted in any of the sensitive areas that would be affected by construction. The Phase 1B survey would be completed prior to the start of construction of the proposed project. A Phase 1B testing protocol would be prepared and submitted to New York City Landmarks Preservation Commission (LPC) and New York State Office of Parks, Recreations and Historic Preservation (OPRHP) for review and approval before the Phase 1B survey would begin. Should any intact archaeological resources be identified during the course of the survey, they would be properly documented and evaluated in consultation with OPRHP and LPC. The Phase 1B survey would also determine the need for additional archaeological analysis (i.e., a Phase 2 survey). With this testing and compliance with any OPRHP and/or LPC directive based on the results of such testing, no significant adverse impacts to archaeological resources would result from construction.

The Proposed Development Area's South Block contains University Village, which has been determined eligible for listing on the State and National Registers of Historic Places (S/NR-eligible) and is also a designated New York City Landmark (NYCL). The North Block of the Proposed Development Area contains Washington Square Village, which has also been determined S/NR-eligible.

To avoid potential adverse impacts to University Village and Washington Square Village from construction-related activities, a CPP would be developed and implemented in consultation with OPRHP and LPC prior to construction of the proposed project. The CPP would be prepared in coordination with a licensed professional engineer and would follow the guidelines set forth in section 523 of the *CEQR Technical Manual*, including conforming to LPC's *New York City Landmarks Preservation Commission Guidelines for Construction Adjacent to a Historic Landmark* and *Protection Programs for Landmark Buildings*. The CPP would also comply with the procedures set forth in the New York City Department of Buildings (DOB)'s *Technical Policy and Procedure Notice* (TPPN) #10/88.[1] With these measures in place, no significant adverse impacts to historic or cultural resources would occur.

Hazardous Materials

The proposed project would not result in significant adverse impacts with respect to hazardous materials during construction.

The Phase 1 Environmental Site Assessment identified historical uses on the Proposed Development Area that could have caused soil and groundwater contamination. A subsurface

[1] TPPN #10/88 was issued by DOB on June 6, 1988, to supplement Building Code regulations with regard to historic structures. TPPN #10/88 outlines procedures for the avoidance of damage to historic structures resulting from adjacent construction, defined as construction within a lateral distance of 90 feet from the historic resource.

(Phase II) investigation has been conducted to determine whether past or present, on or off-site activities have affected subsurface conditions. The Phase II investigation found soils typical of an urban environment with polycyclic aromatic hydrocarbons and metals above New York State Department of Environmental Conservation's (NYSDEC) most stringent soil standards in some locations.

Based on the findings of the Phase II investigation, a Remedial Action Plan (RAP) and associated Construction Health and Safety Plan (CHASP) would be prepared (and submitted to the New York City Office of Environmental Remediation (OER) for review and approval) for implementation during project construction. The RAP would address requirements for items such as: soil stockpiling, soil disposal and transportation; dust control; quality assurance; and contingency measures should petroleum storage tanks or contamination be unexpectedly encountered. The CHASP would identify potential hazards that may be encountered during construction and specify appropriate health and safety measures to be undertaken to ensure that subsurface disturbance is performed in a manner protective of workers, the community, and the environment (such as personal protective equipment, air monitoring requirements and emergency response procedures). In addition, a vapor barrier (or other form of vapor control) would be installed below any proposed new construction to reduce the potential for vapor intrusion from volatile organic compounds in the soil or groundwater. This barrier would also function as waterproofing.

With these measures in place, no significant adverse impacts related to hazardous materials would occur as a result of the proposed project.

Natural Resources

The proposed project would not result in significant adverse impacts with respect to natural resources during construction.

Foundation construction of the proposed project would not materially affect groundwater flow.

Minetta Brook had been a surface water body, flowing from what is now West 16th Street and Avenue of the Americas to the Hudson River at Charlton Street. The surface course of Minetta Brook ran approximately 1,500 feet to the west of the site of the proposed basement under the LaGuardia Building. Therefore, the construction of the proposed project would not interfere with any flow that may remain from the underground expression of Minetta Brook.

Open Space

The Proposed Actions would result in significant adverse direct open space impacts to LaGuardia Corner Gardens due to the potential displacement of this resource during construction, and to other nearby open spaces due to construction noise. In addition, the Proposed Actions would result in temporary significant adverse indirect open space impacts within the residential (1/2-mile) study area during a portion of Phase 2 of construction.

Direct Effects

Prior to construction of the Zipper Building on the Coles Gym site, a temporary gym would be constructed on the North Block. This construction would displace the southern portion of the publicly accessible Mercer Playground and the private Washington Square Village Playground. The Washington Square Village Playground would be relocated to a similarly-sized space within the southern portion of the private Washington Square Village Elevated Garden.

During construction of the Zipper Building, several public and private open spaces on the South Block would be directly displaced. To offset some of these losses, temporary open spaces similar in function would be made available within the Proposed Development Area. For example, the loss of Coles Plaza on the South Block would be offset with a larger passive open space on the North Block (the Temporary Mercer Entry Plaza), and similar to Coles Plaza, this new space would contain seating and landscaping adjacent to the temporary gym facility, thereby serving a similar function. The displaced Mercer-Houston Dog Run would be replaced with a similarly-sized space on the South Block located along West Houston Street. The Zipper Building construction would also displace Coles Playground, the Silver Tower Seating, and the private Silver Tower Playground. These losses would be offset in part by construction of a Temporary LaGuardia Play Area, which would be located on the southern half of the LaGuardia Landscape on the North Block, as well as the Bleecker Seating Area, a passive open space that would be located along Bleecker Street between LaGuardia Place and Mercer Street, immediately north of the Oak Grove. Both of these open spaces would be operational upon commencement of construction of the Proposed Zipper Building, which is anticipated to begin in 2014. Construction of the publicly accessible Toddler Playground would commence once the Zipper Building is enclosed, concurrent with building fit-out. While the completion of the Zipper Building would occur at the end of 2018, the Toddler Playground could be open by the end of 2017.

By 2018, no publicly accessible open spaces would be directly affected by the Proposed Actions in terms of displacement under the LaGuardia Place Staging Option (construction staging for the proposed Bleecker Building along the LaGuardia Place frontage). However, under the Bleecker Street Staging Option (construction staging along the Bleecker Street frontage), the portion of the Bleecker Street Strip directly north of the construction site would be utilized for construction staging and therefore would be temporarily displaced.

Under the LaGuardia Place Staging Option, the LaGuardia Corner Gardens—a Green Thumb garden on City-owned land that is not assessed as public open space under guidance set forth in the *CEQR Technical Manual* would not be available for the approximately 39-month construction period, because it would be located inside of the construction perimeter, within an area that would be utilized for construction staging. The temporary displacement of the LaGuardia Corner Gardens would be a significant adverse impact on this resource; however, upon completion of the Bleecker Building, the community garden could be restored to its current location. Under the LaGuardia Place Staging Option the portion of the Bleecker Street Strip north of the construction site would remain publicly accessible. However, for an approximately 27-month period during construction that portion of the Bleecker Street Strip would be covered by a construction shed in order to provide a safe construction perimeter. Specifically, protective measures would be necessary during above-grade work on the Bleecker Building (i.e., superstructure, building envelope, and interior finishes). The construction shed would reduce the overall utility of this portion of the Bleecker Street Strip and the landscaped areas contained therein during the 27-month period.

Under the Bleecker Street Staging Option, it is expected that the LaGuardia Corner Gardens would remain accessible throughout Bleecker Building construction. However, under the Bleecker Street Staging Option, for an approximately 27-month period during construction, most, if not all, of the garden would need to be covered by a construction shed in order to provide a safe construction site. Specifically, protective measures would be necessary during above-grade work on the Bleecker Building (i.e., superstructure, building envelope, and interior finishes). The construction shed would reduce the overall utility of the garden, and would block most, if not all, direct sunlight for an approximately 27-month period, thereby affecting the viability of plantings, and therefore would result in a significant adverse impact on this resource.

During construction of the Mercer Building, the remaining portion of the Mercer Playground would be displaced. The Temporary Mercer Entry Plaza would also be displaced.

No publicly accessible open spaces would be displaced during construction of the North Block Below-Grade/Central Open Space/Above-Grade Mercer Building. As mentioned above, construction of the new central publicly accessible open spaces (the Public Lawn, Philosophy Garden and Washington Square Village Play Garden) would displace the private Washington Square Village Elevated Garden and temporary Washington Square Village Playground. The proposed central publicly accessible open spaces and the new Mercer Entry Plaza would be open for use while the above-grade portion of the Mercer Building would still be under construction.

In order to accommodate construction of the LaGuardia Building, Adrienne's Garden and the Temporary LaGuardia Play Area would be displaced. These areas would be relocated and expanded to a play area that would also be located along LaGuardia Place on the North Block, following completion of the LaGuardia Building.

The construction air quality analyses showed that construction activities would not result in any significant adverse air quality impacts at any sensitive receptors, which included areas such as public and private open spaces adjacent to construction activities.

During the construction of the Zipper Building, there would be no significant adverse noise impacts on publicly accessible open spaces. Construction of the Bleecker and Mercer Buildings (prior to the opening of the central open spaces in 2027) would not result in any significant adverse noise impacts at any publicly accessible open spaces. The above-grade construction of the Mercer Building would result in temporary significant adverse noise impacts on the publicly accessible central opens spaces on the North Block (the Public Lawn, Philosophy Garden and Washington Square Village Play Garden). During construction of the LaGuardia Building, there would be no significant adverse construction noise impacts on publicly accessible open spaces.

Indirect Effects

During construction of Phase 1, there would be no temporary significant adverse indirect open space impacts resulting from the proposed project; all of the open space ratios within the non-residential (¼-mile) study area and residential (½-mile) study area would improve, or would decrease by less than 1 percent as compared to open space conditions in the future without the Proposed Actions. However, during the first few years of Phase 2 construction, as additional existing open spaces are displaced to accommodate construction of future project buildings and open spaces, the Proposed Actions would temporarily exacerbate future deficiencies in active open spaces in the residential study area. According to the *CEQR Technical Manual*, in areas that are extremely lacking in open space, a reduction of open space ratios as small as 1 percent may be considered significant, as it may result in overburdening existing facilities or further exacerbating a deficiency in open space. Given that the study areas could be considered extremely lacking in open space resources, the projected decreases in active open space ratios would result in temporary significant adverse impacts to open space resources in the residential study area. The temporary impact on active open space resources in the residential study area would not begin until the proposed Mercer Building has initiated construction, and would be eliminated by the provision of the project open spaces associated with the next stage of construction (i.e., completion of the Mercer Building and central portion of the North Block's proposed open space).

Tree Replacement

Although NYU's landscape plans would protect some existing street trees, many street trees would be removed and replaced to facilitate the construction of the proposed project. Specifically, street trees expected to be removed during construction of the proposed project include: all street trees on the portion of the Mercer Street Strip between West Houston and West 3rd Streets; all street trees associated with the LaGuardia Landscape (within the LaGaurdia Place Strip between Bleecker and West 3rd Streets); street trees north and south of Coles Gym on Bleecker Street and West Houston Street; and depending on construction staging activities, street trees within and surrounding the LaGuardia Corner Gardens (on the LaGuardia Place Strip south of Bleecker Street) as well as the portion of the Bleecker Street Strip north of the Morton Williams supermarket site. During the design and permitting phases for the Proposed Actions, New York City Department of Parks and Recreation (DPR) would be consulted with respect to tree evaluation for the street trees that would be removed in the vicinity of the Proposed Development Area. Under Chapter 5 of Title 56 of the Rules of the City of New York and under Title 18 of the Administrative Code of the City of New York, NYU would be required to obtain a permit to remove existing street trees, which are under the jurisdiction of DPR. If such approvals were obtained, NYU would be required to post a bond with DPR to insure that within thirty days after completion of construction all trees removed, destroyed or severely damaged would be replaced at the expense of NYU. A method to calculate the number of replacement trees as per the New York City tree replacement code such as the caliper replacement method, would be used to quantify the size and number of trees that would be required to replace those removed from the Proposed Development Area. Therefore, construction of the proposed project would not result in any significant adverse impacts to street trees of the region.

Socioeconomic Conditions

The proposed project would not result in significant adverse construction impacts with respect to socioeconomic conditions.

Construction activities would affect pedestrian and vehicular access in the immediate vicinity of the construction. However, lane and/or sidewalk closures would not obstruct entrances to any existing businesses, or obstruct major thoroughfares used by customers, and businesses would not be significantly affected by any temporary reductions in the amount of pedestrian foot traffic or vehicular delays that could occur as a result of construction activities, because of the MPT measures required by NYCDOT. Utility service would be maintained to all businesses, although very short term interruptions (i.e., hours) may occur when new equipment (e.g., a transformer, or a sewer or water line) is put into operation. Overall, construction of the proposed projects is not expected to result in any significant adverse impacts on surrounding businesses.

Construction would create direct benefits resulting from expenditures on labor, materials, and services, and indirect benefits created by expenditures by material suppliers, construction workers, and other employees involved in the direct activity. Construction also would contribute to increased tax revenues for the City and State, including those from personal income taxes.

Community Facilities

No community facilities would be directly affected by construction activities, because none would be directly displaced or altered by construction. The construction sites would be surrounded by construction fencing and barriers that would limit the effects of construction on nearby facilities. Measures outlined in the CPP and MPT Plan would ensure that lane closures and sidewalk closures are kept to a minimum and that adequate pedestrian access is maintained.

The construction workers would not place any burden on public schools and would have minimal, if any, demands on libraries, child care facilities, and health care. Construction of the proposed project would not block or restrict access to any facilities in the area, and would not materially affect emergency response times. New York Police Department (NYPD) and Fire Department (FDNY) emergency services and response times would not be materially affected due to the geographic distribution of the police and fire facilities and their respective coverage areas.

Land Use and Neighborhood Character

No significant adverse impacts would occur from construction of the proposed project with respect to land use and neighborhood character.

No portion of the area around the Proposed Development Area would be subject to the full effects of the construction for the entire construction period. Except for the six months needed to erect the temporary gymnasium, construction would be limited to the South Block during Phase 1 and to the North Block during Phase 2. For the vast majority of the time, only one building is planned to be under construction at one time. The major construction tasks are planned to be consequent and not concurrent, which limits the area being disrupted by construction. Construction activities would adhere to the provisions of the New York City Building Code and other applicable regulations. Access to surrounding residences, businesses, and institutions, as well as access among the surrounding neighborhoods, would be maintained throughout the duration of the construction period.

Construction activities would be disruptive and concentrated on one superblock at a time over an about 10 year period for each superblock. Throughout the construction period, measures would be implemented to control noise, vibration, and dust on construction sites, including the erection of construction fencing and in some areas fencing incorporating sound-reducing measures. This fencing would reduce potentially undesirable views of construction sites and buffer noise emitted from construction activities. Barriers would be used to protect the safety of pedestrians and to reduce noise from particularly disruptive activities where practicable. Construction activity associated with the proposed project would be localized and would not alter the character of the larger neighborhoods surrounding the project site.

Rodent Control

Construction contracts would include provisions for a rodent (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 the construction phase, as necessary, the contractor would carry out a maintenance program. Coordination would be maintained with appropriate public agencies. Only U.S. Environmental Protection Agency (EPA) and New York State Department of Environmental Conservation (DEC) registered rodenticides would be permitted, and the contractor would be required to perform rodent control programs in a manner that avoids hazards to persons, domestic animals, and non-target wildlife.

BLEECKER BUILDING ALTERNATE PHASING SCENARIO

The proposed Bleecker Building is assumed to be constructed following the proposed Zipper Building as part of Phase 1 (from Q4 2018 and Q4 2021). However, the timing of construction of the Bleecker Building could be different, depending upon the timing of the SCA’s decision on whether to move forward with the development of a public school as part of the Bleecker

Building. Specifically, if SCA does not identify a need and/or capital budget for the school during Phase 1, the Bleecker Building could be constructed during Phase 2 of the proposed project. A discussion of a "Bleecker Building Alternate Phasing Scenario," is provided at the end of this chapter.

In order to minimize to the maximum extent practicable the potential for significant adverse impacts that could be generated by construction activities associated with the Proposed Actions, NYU would commit to the following restrictions on the types of concurrent construction activities:

> The demolition of the Morton Williams Associated Supermarket building, Bleecker Building excavation/foundations, and Bleecker Building super structure/foundation work would not occur during:

- excavation/foundations or super structure/exterior work associated with the temporary gymnasium (estimated 6-month cumulative duration);
- demolition of Coles Gymnasium (6 months);
- excavation/foundation or super structure/exterior work associated with the proposed Zipper Building (36 months);
- foundations, super structure/exterior, or interior work associated with the proposed Washington Square Village parking garage (18 months);
- below-grade foundations and below-grade super structure/exterior work associated with the proposed Mercer Building (27 months);
- demolition of the LaGuardia retail building (3 months); and
- excavation/foundations and super structure/exterior work associated with the proposed LaGuardia Building (18 months).

In addition, to avoid the potential for significant adverse impacts not already analyzed and identified in this DEIS, the SCA would be required to commit to construction of the public school as part of the Bleecker Building by 2025. With these restrictions in place, the DEIS analysis establishes that there would be no new or different significant adverse impacts other than those identified in this DEIS if the proposed Bleecker Building were to be constructed prior to the proposed Zipper Building (between Q1 2013 and Q2 2018); after the Zipper Building (between Q1 2018 and Q1 2023), or after completion of the below-grade construction activities associated with the parking garage and Mercer Building (between Q1 2026 and Q2 2030).

Similar to the analysis for the conceptual construction schedule, the shifting of the sequencing of the Bleecker Building would not result in significant adverse impacts to: historic and cultural resources; hazardous materials; natural resources; socioeconomic conditions; community facilities; land use and neighborhood character; air quality; and rodent control. There would be the same potential significant adverse impacts from construction-related noise, and they would be of the same duration, but may occur at different points in time than identified for the conceptual construction schedule. If the Bleecker Building were to occur during Phase 2, the operational traffic analysis reflecting full development would still represent worst-case traffic conditions for construction, and the mitigation identified for those service levels would be appropriate for addressing construction-period traffic impacts, if necessary. Shifting the construction sequence of the Bleecker Building is expected to similarly not result in significant adverse impacts with respect to other transportation analysis areas, including transit and pedestrians.

B. METHODOLOGY

This section discusses the level of analysis used to assess the potential for significant adverse impacts in each of the construction-related analysis areas presented in the *CEQR Technical Manual.* The analyses in this chapter represent the reasonable worst-case development scenario for each analysis area. The reasonable worst-case can occur at different times for different analyses. For example, the noisiest part of the construction may not be at the same time as the heaviest construction traffic. Therefore, the analysis periods may differ for traffic, air quality, and noise. In each section, the methodologies to determine the period of reasonable worst-case potential impacts are explained. All methodologies used in the impact analyses are in accordance with the *CEQR Technical Manual.* For all construction-related analysis areas, the methodologies used to assess potential construction-related impacts can be found in the chapters for each analysis area addressing potential operational impacts (e.g., the methodologies used in assessing potential construction-related indirect open space impacts are described in full in Chapter 5, "Open Space"). Additional details relevant only to the construction air quality and noise analysis methodologies are given in their respective analysis sections below.

- Detailed anaplyses are presented for transportation, air quality, noise, historic and cultural resources, hazardous materials and open space.

  Although they are used by urban mammals (e.g., squirrels) and some migratory birds, the open spaces on the two superblocks constitute a commonly found natural resource in New York City. Therefore, an analysis of these natural resources was not warranted. A discussion of the effects of construction on groundwater flow and Minetta Brook is presented.
- A preliminary qualitative assessment was undertaken for socioeconomic conditions, based on plans from the construction consultant that show that access would not be blocked to any business.
- A screening of potential impacts on community facilities is included.
- An assessment of neighborhood conditions during construction is presented.
- No major changes to or demands on the infrastructure systems are planned as part of this project, and therefore an analysis of potential infrastructure impacts from construction is not warranted.

The next section in this chapter describes the expected construction schedule, the construction methods to be used, and City, state, and federal regulations and policies that govern construction. This section establishes the framework used for the assessment of potential impacts from construction. The construction timeline—determined by the timing of the various major construction stages associated with constructing a building—such as foundations, superstructure, and interior finishing—is described. The types of equipment are discussed, and the number of workers and truck deliveries estimated. The analyses use these data to determine the potential for significant adverse environmental impacts.

C. CONSTRUCTION PHASING AND ACTIVITIES

INTRODUCTION

The following section describes the expected schedule and methods and means of construction. While the methods and means described below have been developed with an experienced New York City construction manager (and are commonly used in New York City), the discussion is only illustrative as other means and methods may be chosen at the time of construction. The described means and methods are conservatively chosen to serve as the basis of the analyses in this chapter and are representative of the reasonable worst case for potential impacts.

If the Proposed Actions are approved, complete build-out of the proposed project would occur over time with the last building being completed by approximately 2031. This section of the chapter first gives an overview of the anticipated construction phasing and schedule of the Phase 1 and Phase 2 buildings, and then provides a detailed description of each type of construction activity. The activities discussed include: abatement and demolition; excavation and foundations; construction of the core and shell of the buildings; exterior cladding; and interior fit-out. General construction practices are then presented, including those associated with deliveries and access, hours of work, and sidewalk and lane closures. Estimates of the number of construction workers and truck trips are presented. Following the discussion of construction techniques, the chapter discusses potential impacts with regard to transportation, air quality, noise and vibration, historical and cultural resources, hazardous materials, open space, socioeconomic conditions, community facilities, land use and public policy, neighborhood character, and rodent control.

CONSTRUCTION PHASING AND SCHEDULE

For purposes of analysis in the DEIS, the construction of the proposed project is analyzed in two overall phases, which generally represent construction on the South Block (Phase 1) followed by construction on the North Block (Phase 2). The conceptual construction schedule is shown on **Figure 20-1** and **Table 20-1** and reflects the sequencing of construction events as currently contemplated.

Table 20-1
Conceptual Construction Schedule

Building	Start Month	Finish Month	Approximate duration (months)
Phase 1			
Temporary gymnasium	4th quarter 2013	2nd quarter 2014	9
Zipper Building	3rd quarter 2014	4th quarter 2018	54
Bleecker Building	4th quarter 2018	4th quarter 2021	39
Demolition of temporary gymnasium	4th quarter 2021	4th quarter 2021	3
Phase 2			
Washington Square Village parking garage	1st quarter 2022	3rd quarter 2023	21
Mercer Building below-grade	4th quarter 2023	4th quarter 2026	39
Mercer Building above-grade	2nd quarter 2026	3rd quarter 2028	33
LaGuardia Building below-grade	1st quarter 2029	1st quarter 2031	30
LaGuardia Building above-grade	3rd quarter 2030	4th quarter 2031	18

Note: Start dates are dependent on many factors and may change. The components of Phase 1 and Phase 2 correspond to the phases that are presented in the ULURP application. The sequence of construction activities is the same in this FEIS and the ULURP application; however, the ULURP drawings are intended to represent site plans at the end of discrete construction activities, while the figures herein are intended to support the environmental analysis.
Source: Turner Construction Company

Section F, below, assesses an alternative phasing scenario for the proposed Bleecker Building.

Phase 1 construction is assumed to start in the last quarter of 2013 and would be completed by the end of 2021. In Phase 1, the existing Coles Sports and Recreation Center and the Morton-Williams Supermarket would be demolished to make room for two new Phase 1 buildings: the

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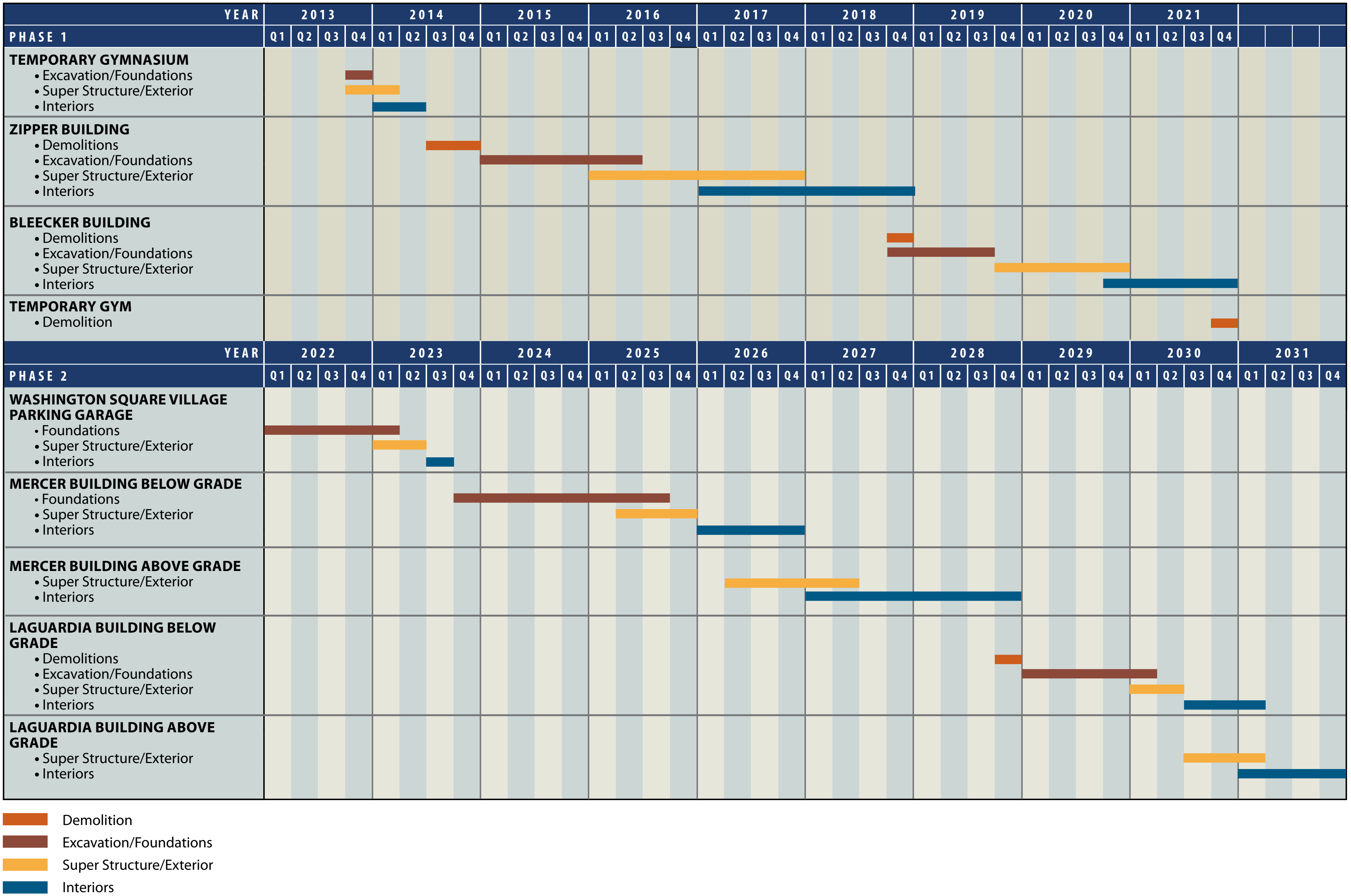


Figure 20-1
Conceptual Construction Schedule

Zipper Building and the Bleecker Building. The proposed Zipper Building would be constructed on the site of the Coles Sports and Recreation Center. The Zipper Building would be just over 1,000,000 gross square feet and have several components. These would include a gymnasium, academic space, housing for faculty and students, retail space, a university-oriented hotel and other university-related uses. To reduce the above-ground bulk of the building, the underground portion of the building would extend to about 70 feet below street grade and would house the new athletic facilities. The Bleecker Building would be located on the site of the Morton-Williams Supermarket and would house NYU academic space and student housing, and a public school. If the SCA determines that it does not need public school space at this location, NYU would build and utilize the 100,000-square-foot space for its own academic purposes. In Phase 1, the only construction activities on the North Block would be the relocation of the Washington Square Village playground to the southern portion of the Washington Square Village Elevated Garden (located above the Washington Square Village garage), and the construction of the temporary gymnasium.

Phase 2 is assumed to begin in 2021, with all construction being completed by 2031. A substantial portion of the Phase 2 construction is underground, and the entire area between Washington Square Village Buildings 1 and 2 and Washington Square Village Buildings 3 and 4 would, in stages, be excavated to approximately 70 feet below street grade.

CONSTRUCTION DESCRIPTION

OVERVIEW

Construction of large-scale buildings in New York City typically follows a general pattern. The first task is construction startup, which involves the siting of work trailers, installation of temporary power and communication lines, and the erection of site perimeter fencing. Then, if there are existing buildings on the site, any potential hazardous materials (such as asbestos), are abated, and the building is then demolished with some of the materials recycled and the debris taken to a licensed disposal facility. Excavation of the soils is next along with the construction of the foundations. When the below-grade construction is completed, construction of the core and shell of the new buildings begins. The core is the central part of the building and is the main 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 networks would start. As the building progresses upward, the exterior cladding is placed, and the interior fit out begins. During the busiest time of building construction, the upper core and structure is being built while mechanical/electrical connections, exterior cladding, and interior finishing are progressing on lower floors.

Since the construction approach and procedures for each building would be similar, general construction procedures will be described followed by the major construction tasks (construction startup, abatement and demolition, excavation and foundations, superstructure, exterior cladding, and interior finishing). Then any specific approaches and differences for the construction tasks will be described on a building-by-building basis. The specific buildings will be the temporary gymnasium, the Zipper Building, the Bleecker Building, the new parking garage, the Mercer Building, and finally the LaGuardia Building.

GENERAL CONSTRUCTION PRACTICES

Certain activities would be employed throughout the construction of the proposed project. NYU would have a field representative throughout the entire construction period. The representative would serve as the contact point for the community and local leaders, and would be available to resolve concerns or problems that arise during the construction process. New York City maintains a 24-hour-a-day telephone hotline (311) so that concerns can be registered with the city. Once demolition activities begin, a security staff would be on the specific construction sites as needed.

Governmental Coordination and Oversight

The following describes construction oversight by government agencies, which in New York City is extensive and involves a number of city, state, and federal agencies. **Table 20-2** shows the main agencies involved in construction oversight and the agencies' areas of responsibilities. Primary responsibilities lie with the New York City Department of Buildings (DOB), which ensures that the construction meets the requirements of the Building Code and that the buildings are structurally, electrically, and mechanically safe. In addition, DOB enforces safety regulations to protect both the workers and the public. The areas of oversight include installation and operation of the equipment, such as cranes and lifts, sidewalk sheds, and safety netting and scaffolding. In addition, DOB with LPC concurrence approves the CPP used when the construction is in proximity to historic structures. DEP enforces the Noise Code, regulates water disposal into the sewer system and the removal of tanks. OER reviews and approves RAPs/CHASPs. The Fire Department of New York City (FDNY) has primary oversight for compliance with the Fire Code and for the installation of tanks containing flammable materials. NYCDOT reviews and approves any traffic lane and sidewalk closures. NYCT is responsible for subway access and, if necessary, bus stop relocations. NYCT also regulates vibrations that might affect the subway system. LPC approves studies, the CPP, and monitoring to prevent damage to historic structures. New York City Department of Parks and Recreation is responsible for the oversight, enforcement, and permitting of the replacement of street trees that are lost due to construction. Section 5-102 et. seq. of the Laws of the City of New York requires a permit to remove any trees and the replacement of the trees as determined by calculating the size, condition, species and location rating of the tree proposed for removal.

Table 20-2
Construction Oversight in New York City

Agency	Areas of Responsibility
New York City	
Department of Buildings	Primary oversight for Building Code and site safety
Department of Environmental Protection	Noise, hazardous materials, dewatering, tanks
Fire Department	Compliance with Fire Code, tanks
Department of Transportation	Lane and sidewalk closures
New York City Transit	Subway access, bus stop relocation
Landmarks Preservation Commission	Archaeological and architectural protection
Department of Parks and Recreation	Street trees
New York State	
Department of Labor	Asbestos workers
Department of Environmental Conservation	Hazardous materials and tanks
United States	
Environmental Protection Agency	Air emissions, noise, hazardous materials, poisons
Occupational Safety and Health Administration	Worker safety

DEC regulates disposal of hazardous materials, and construction and operation of bulk petroleum and chemical storage tanks. The New York City Department of Labor (DOL) licenses asbestos workers. On the federal level, the EPA has wide ranging authority over environmental matters, including air emissions, noise, hazardous materials, and the use of poisons. Much of the responsibility is delegated to the state level. OSHA sets standards for work site safety and the construction equipment.

Deliveries and Access

Because of site constraints, the presence of large equipment, and the type of work, access to the construction sites would be tightly controlled. The work areas would be fenced off, and limited access points for workers and trucks would be provided. Private worker vehicles would not be allowed into the construction area. Security guards and flaggers would be posted, and all persons and trucks would have to pass through security points. Workers or trucks without a need to be on the site would not be allowed entry. After work hours, the gates would be closed and locked. Security guards would patrol the construction sites after work hours and over the weekends to prevent unauthorized access.

As is the case with almost all large urban construction sites, material deliveries to the site would be highly regimented and scheduled. Because of the high level of construction activity and constrained space, unscheduled or haphazard deliveries would not be allowed. For example, during excavation, each delivery truck would be assigned a specific block of time during which it must arrive on the site. If a truck is late for its turn, it would be accommodated if possible, but if not, the truck would be assigned to a later time. A similar regimen would be instituted for concrete deliveries, but the schedule would be even stricter. If a truck is late, it would be accommodated if possible, but if on-time concrete trucks are in line, the late truck would not be allowed on-site. Because construction documents specify a short period of time within which concrete must be poured (typically 90 minutes), the load would be rejected if this time limit is exceeded.

During the finishing of the building interiors, individual deliveries would be scheduled to the maximum extent practicable. Studs for the partitions, drywall, electrical wiring, mechanical piping, ductwork, and other mechanical equipment are some of the materials that must be delivered and moved within each building. The available time for subcontractors’ use of the hoists would be tightly scheduled. Each trade, such as the drywall subcontractor, would be assigned a specific time to have its materials delivered and hoisted into the building. If the delivery truck arrives outside its assigned time slot, it would be accommodated if possible without disrupting the schedule of other deliveries. However, if other scheduled deliveries would be disrupted, the out-of-turn truck would be turned away. This strict adherence to a schedule for trucks minimizes any queuing of the trucks on the street. In addition, some queuing takes place within the construction fence line.

To aid in adhering to the delivery schedules, as is normal for building construction in New York City, flaggers would be employed, where needed,. The flaggers could be supplied by the subcontractor on-site at that time or by the construction manager. The flaggers would control trucks entering and exiting the site, so that they would not interfere with one another. In addition, they would provide an additional traffic aid as the trucks enter and exit the on-street traffic streams.

During Phase 1 construction, access to the construction of the temporary gym on the North Block would be maintained along Mercer Street. For construction of the Zipper Building on the south block, pedestrian access would be available on all three sides (Bleecker, Mercer, and West Houston Streets). While truck activities could also occur along all three sides of the construction site, delivery access would be maintained only along Mercer and West Houston Streets. For construction of the Bleecker Building, pedestrian access is expected to be available on both the LaGuardia Place and Bleecker Street sides of the construction site. However, as further explained later in this chapter, depending on whether the site's staging area would be maintained via the temporary displacement of publicly accessible open space currently provided by the LaGuardia Corner Gardens or the Bleecker Street Strip, primary delivery access could be maintained on either LaGuardia Place or Bleecker Street, respectively.

During Phase 2 construction, access to the construction of the new accessory parking garage and the Mercer Building above- and below-grade space would be provided primarily along Mercer Street to minimize disturbances to the Washington Square Village Buildings fronting West 3rd and Bleecker Streets. For the same reason, access to the construction of the LaGuardia Building above- and below-grade space would be provided primarily along LaGuardia Place.

Hours of Work

Construction is expected to take place Monday through Friday and with minimal, weather make-up work on Saturdays. Certain exceptions to these schedules are discussed separately below. In accordance with New York City laws and regulations, construction work would generally begin at 8:00 AM on weekdays, with most workers arriving to prepare work areas between 7:00 AM and 8:00 AM. Normally weekday work would end by 4:30 PM, but it can be expected that to meet the construction schedule or to complete certain construction tasks, the workday would be extended beyond normal work hours on occasions. The work could include such tasks as completing the drilling of piles, finishing a concrete pour for a floor deck, or completing the bolting of a steel frame erected that day. The extended workday would generally last until about 6:00 PM and would not include all construction workers on-site, but just those involved in the specific task requiring additional work time.

Weekend work would not be regularly scheduled, but could occur to make up for weather delays or other unforeseen circumstances. Again, the numbers of workers and pieces of equipment in operation would be limited to those needed to complete the particular task at hand. For extended weekday and weekend work, the level of activity would be reduced from the normal workday. The typical weekend workday would be on Saturday from 9:00 AM with worker arrival and site preparation to 4:30/5:00 PM for site cleanup.

Some tasks may have to be continuous, and the work could extend to more than a typical 8-hour day. For example, in certain situations, concrete must be poured continuously to form one structure without joints.

An example of this is pouring concrete for foundations and podiums, which would be poured in sections. This type of concrete pour can require over 12 hours to complete. The plans for each long concrete pour would be coordinated with NYCDOT. In addition, a noise mitigation plan pursuant to New York City Code would be developed and implemented to minimize intrusive noise affecting nearby sensitive receptors. A copy of the noise mitigation plan would be kept on-site for compliance review by DEP and DOB.

Sidewalk and Lane Closures

During the course of construction, traffic lanes and sidewalks would be closed or protected for varying periods of time. Some street lanes and sidewalks could be continuously closed, and some lanes and sidewalks would be closed only intermittently to allow for certain construction activities. With the exception of the Mercer Street west sidewalk between Bleecker Street and West Houston Street during Phase 1 construction of the Zipper building, pedestrian circulation and access would be maintained through the use of temporary sidewalks or sidewalk bridges. This work would be coordinated with and approved by NYCDOT.

GENERAL CONSTRUCTION TASKS

Construction Startup Tasks

Construction startup work prepares a site for construction and involves the installation of public safety measures, such as fencing, sidewalk sheds, and Jersey barriers. The site is fenced off, typically with solid fencing to minimize interference with the persons passing by the site. Separate gates for workers and for trucks are installed, and sidewalk shed and Jersey barriers are erected. Trailers for the construction engineers and managers are hauled to the site and installed. These trailers could be placed within the fence line, in curb lane, or over the sidewalk sheds. Also, portable toilets, dumpsters for trash, and water and fuel tankers are brought to the site and installed. Temporary utilities are connected to the construction trailers. If an on-site building is to be demolished, it would be covered with netting to prevent debris from falling onto the streets or sidewalk sheds. During the startup period, permanent utility connections may be made, especially if the construction manager has obtained early electric power for construction use, but utility connections may be made almost any time during the construction sequence. Construction startup tasks may have anywhere from 5 to 20 workers on site, and usually less than 10 truck deliveries per day. The task is normally completed within weeks.

New utility connections can be made at any time during the construction process. The initial investigatory work often occurs early during excavation and foundations, with the actual connections typically occurring once the building mechanical, electrical and plumbing systems are installed. The existing utility lines in the street have sufficient capacity to support the proposed project with its new buildings. Connections to the new buildings would be made from the existing utility lines. NYU's central cogeneration facility (Cogeneration Plant) (operating below-grade at 251 Mercer Street) would be an energy source for the proposed project. To serve the new buildings, the lines from the plant would cross under West 3rd Street using conventional cut and cover construction techniques. West 3rd Street would be partly closed to traffic with one lane remaining open, during the utility construction phase. This utility construction is expected to take approximately three months. The utility trench would be covered with steel plates when construction is not active, and the steel plates may remain to allow access to the connections until all phased work, testing, inspections, etc. are complete at different stages of the project. Construction of pedestrian bump outs may cause some catch basins to be relocated, and manholes to be reset at the new grade of the bump out.

Abatement and Demolition

The buildings that would be demolished include the Coles Sports and Recreation Center, the Morton Williams Associated Supermarket, and the existing Washington Square Village parking garage. These facilities would be abated of asbestos and any other hazardous materials within the existing buildings and structures, recyclable materials removed, and then demolished.

A New York City-certified asbestos investigator would inspect the buildings for asbestos-containing materials (ACMs), and those materials must be removed by a DOL-licensed asbestos abatement contractor prior to interior demolition. Asbestos abatement is strictly regulated by DEP, DOL, the

United States Environmental Protection Agency (EPA), and the U. S. Occupational Safety and Health Administration (OSHA) to protect the health and safety of construction workers and nearby residents and workers. Depending on the extent and type of ACMs, these agencies would be notified of the asbestos removal project and may inspect the abatement site to ensure that work is being performed in accordance with applicable regulations, including the new February 2, 2011 DEP regulations. These regulations specify abatement methods, including wet removal of ACMs that minimize asbestos fibers from becoming airborne, and containment measures. The areas of the building with ACMs would be isolated from the surrounding area with a containment system and a decontamination system. The types of these systems would depend on the type and quantity of ACMs, and may include hard barriers, isolation barriers, critical barriers, and caution tape. Specially trained and certified workers, wearing personal protective equipment, would remove the ACMs and place them in bags or containers lined with plastic sheeting for disposal at an asbestos-permitted landfill. Depending on the extent and type of ACMs, an independent third-party air-monitoring firm would collect air samples before, during, and after the asbestos abatement. These samples would be analyzed in a laboratory to ensure that regulated fiber levels are not exceeded. After the abatement is completed and the work areas have passed a visual inspection and monitoring, if applicable, the general demolition work can begin. Depending on the amount of ACMs to be removed, about 25 workers are expected to be needed for abatement, and this task is expected to last about two months per building but may take longer depending on actual conditions.

Any activities with the potential to disturb lead-based paint would be performed in accordance with the applicable OSHA regulation (OSHA 29 CFR 1926.62—*Lead Exposure in Construction*). When conducting demolition (unlike lead abatement work), lead-based paint is generally not stripped from surfaces. Structures are disassembled or broken apart with most paint still intact. Dust control measures (spraying with water) would be used. The lead content of any resulting dust is therefore expected to be low. Work zone air monitoring for lead may be performed during certain activities with a high potential for releasing airborne lead-containing particulates in the immediate work zone, such as manual demolition of walls with lead paint or cutting of steel with lead-containing coatings. Such monitoring would be performed to ensure that workers performing these activities are properly protected against lead exposure.

Any suspected 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, it would be assumed to contain PCBs and removed and disposed of at properly licensed facilities in accordance with all applicable regulatory requirements.

General demolition is the next step, and first any economically salvageable materials are removed. Then the interior of the building is deconstructed to the floor plates and structural columns. Netting around the exterior of the building would be used to prevent materials from falling into public areas. As the interior is being deconstructed, the existing elevators and other vertical transportation shafts would be used to move debris to ground level. When structures on the roof are being razed, enclosed chutes would be used to move the debris to the ground level. Front-end loaders would be used on the ground floor to load materials into dump trucks. The demolition debris would be sorted prior to being disposed at landfills to maximize recycling opportunities. About 25 workers are expected to be on-site, and typically six to eight truckloads of debris would be removed per day. The general demolition phase is expected to last about six months for the Coles Recreation Center and about two months for the Morton Williams Associated Supermarket.

Secant Walls, Excavation/Foundation, Hazardous Materials and Dewatering

Extensive below-grade space in all four proposed buildings would be built as part of the project. The bottom floor grade would be about 70 feet below the street. Deep below-grade structures extending well below the groundwater table are common in New York City. The below-grade space would be designed to withstand groundwater-induced water pressures and to minimize the potential for flooding. To address groundwater pressure, the bottom slab of the below-grade facilities would provide a horizontal cut-off wall to resist uplift pressures. The expected type of foundations to be constructed is secant walls, which are used in New York City and other localities where adjacent buildings could be damaged from the foundation construction. The secant walls would also provide vertical groundwater cut-off. Other construction techniques could be used for the below-grade wall, such as slurry walls, but the potential impacts caused by those techniques are similar to those caused by the construction of secant walls.

Secant Walls

Secant wall construction is a specialized technique for building foundations when the new construction is close to or adjacent to buildings that could be damaged by vibrations. The technique has been used in the rebuilding of downtown Manhattan and is currently being used in sections of the Second Avenue subway. Secant wall construction drills or augers an opening for the piles in the ground, rather than using a pile driver or vibratory hammer to pound the piles into the ground.

The first step would be to install soldier piles to a depth of about 25 feet below street level. Then soil would be removed using large diesel excavators. Lagging is installed between the soldier piles as the excavation proceeds. The lagging would have tiebacks into the surrounding soil to provide stability. The soldier piles and lagging would act as bracing to allow excavation to happen while the secant piles are being installed at the same time.

Along the perimeter of the proposed buildings, a hole is drilled or augured to the final depth, which would be more than 70 feet below street level. The hole, which can be 2 to 4 feet in diameter, is held open with a bentonite slurry. A cage of steel reinforcing bars is lowered into the hole. The hole is then filled with concrete. After the first hole is drilled and filled with concrete, the process is repeated. The second hole is located the diameter of the hole minus 3 to 6 inches away from the first pile. As an example, if the diameter of the hole is 48 inches, the second pile would be constructed between 36 to 42 inches from the edge of the first pile. After the second pile is constructed, the third pile is drilled and constructed between the first two. The in-between pile would have an overlap of 3 to 6 inches into the first 2 piles. This interlocking forms a strong, waterproof wall. This process is repeated around the perimeter of the site. Because of the size of the four building foundations, it is expected that 2 drill rigs and cranes would be operating to install the secant wall.

The secant pile operation would require the use of auger drills, tieback drill rigs, compressors, and cranes. The duration of the installation of the secant piles is dependent on the length of the perimeter of the building and the number of secant pile augers in operation. About 20 to 30 workers would be on-site for the installation of the secant walls.

Excavation/Foundations

Large excavators would be used for the task of digging foundations. The soil would be loaded onto dump trucks for transport to a licensed disposal facility or for reuse on a construction site that needs fill. At first the dump trucks would be loaded in the excavation itself, and a ramp would be built to the street level. After a certain depth, the ramp would be too steep for the trucks to negotiate. Then the soil would be loaded into large containers, which would be lifter to the street level. The soil would be placed into the dump trucks located behind solid, noise-attenuating walls. The walls would be about 16 feet high.

On the two larger foundations for the Zipper and Mercer Buildings, the excavation would happen in sections. One part of the excavation would be taken to about 25 feet below street grade, and then a temporary sheet pile wall would be installed across the excavation from one side to the other. By that time, the secant piles would be installed completely around the perimeter of the section. The excavation would proceed to the final depth of about 70 feet below street grade. On the adjacent section, the installation of the secant piles would proceed while excavation to 25 feet below street grade advances in that section. In this second section, the temporary sheet piling is removed when the secant wall is complete, and the excavation proceeds to the final depth.

The final step in the foundations is the installation of the concrete basement floor. In the two larger buildings, the concrete floor would be poured in sections. When one section has reached its final depth, a reinforced concrete floor would be poured.

The excavation/foundation task would involve the use of excavators, cranes, bull dozers, vibratory sheet pile drivers and extractors, and hand tools. The installation of the basement floor would require concrete trucks, concrete pumps, vibrators, and compressors. About 20 to 30 workers would be on-site at any given time.

Below-Grade Hazardous Materials

All construction subsurface soil disturbances would be performed in accordance with an OER-approved RAP and CHASP. At a minimum, the RAP would provide for the appropriate handling, stockpiling, testing, transportation, and disposal of excavated materials, as well as any unexpectedly encountered tanks, in accordance with all applicable federal, state, and local regulatory requirements. The RAP would also provide for vapor control measures such as vapor barriers. The CHASP would ensure that all subsurface disturbances are done in a manner protective of workers, the community, and the environment.

Dewatering

The excavated area would not be water proof until the slab-on-grade is built. In addition, rain and snow could collect in the excavation, and that water would have to be removed. The water would be sent to an on-site pretreatment system to remove the sediment. The pretreatment system often includes sedimentation tanks, filters, and carbon adsorption. The decanted water would then be discharged into the New York City sewer system. The settled sediments, spent filters, and removed materials would be transported to a licensed disposal area. Discharge in the sewer system is governed by DEP regulations.

DEP has a formal procedure for issuing a Letter of Approval to discharge into the New York City sewer system. The authorization is issued by the DEP Borough office if the discharge is less than 10,000 gallons per day; an additional approval by the Division of Connections & Permitting is needed if the discharge is more than 10,000 gallons per day. All chemical and physical testing of the water has to be done by a laboratory that is certified by the New York State Department of Health (NYSDOH). The design of the pretreatment system has to be signed by a New York State Professional Engineer or Registered Architect. For water discharged into New York City sewers, DEP regulations specify the following maximum concentration of pollutants.

- Petroleum hydrocarbons — 50 parts per million (ppm)
- Cadmium — 2 ppm
- Hexavalent chromium — 5 ppm

• Copper	5 ppm
• Amenable cyanide	0.2 ppm
• Lead	2 ppm
• Mercury	0.05 ppm
• Nickel	3 ppm
• Zinc	5 ppm
• pH	between 5 to 12
• Temperature	less than 150 degrees Fahrenheit (F)
• Flash Point	greater than 140 degrees F
• Benzene	134 parts per billion (ppb)
• Ethylbenzene	380 ppb
• Methyl-Tert-Butyl-Ether (MTBE)	50 ppb
• Naphthalene	47 ppb
• Tetrachloroethylene (perc)	20 ppb
• Toluene	74 ppb
• Xylenes	74 ppb
• PCB	1 ppb
• Total Suspended Solids	350 ppm

Any groundwater discharged in the New York City system would meet these limits. DEP can also impose project-specific limits, depending on the location of the project and contamination that has been found in nearby areas.

Superstructure

The cores of each building create the building's framework (beams and columns) and floor decks. The superstructure would likely consist of reinforced concrete, but could be constructed of steel. Construction of the interior structure, or core, of the proposed buildings would include elevator shafts; vertical risers for mechanical, electrical, and plumbing systems; electrical and mechanical equipment rooms; core stairs; and restroom areas. Core construction would begin when the podium over the foundation is completed and would continue through the interior construction and finishing stage. Because of the depths of the foundations, the superstructure construction would start below the street level, rise to the street grade, and then climb to its final height.

Superstructure activities would require the use of cranes, derricks, delivery trucks, forklifts, or loaders, and other heavy equipment such as tower cranes, concrete pumps, welding machines, rebar benders and cutters, and compressors. Temporary construction elevators (hoists) would also be constructed for the delivery of materials and vertical movement of workers during this stage. Cranes would be used to lift structural components, façade elements, large construction equipment, and other large materials. Smaller construction materials and debris generated during this stage of construction would generally be moved with hoists. During peak construction, the number of workers would be about 200 to 300 per day. Anywhere from 55 to 75 trucks per day would deliver materials to the site.

Exterior Cladding

As the superstructure advances upward above ground, the vertical mechanical systems would start to be installed. After the superstructure is 5 to 10 floors above street grade, the exterior façade would be installed on the lower floors. The exterior façade would arrive on trucks and be lifted into place for attachment by cranes.

Interiors

This stage would include the construction of interior partitions, installation of lighting fixtures, and interior finishes (flooring, painting, etc.), and mechanical and electrical work, such as the installation of elevators. Mechanical and other interior work would overlap with the building core and shell construction. This activity would employ the greatest number of construction workers: with about 300 to 400 workers per day. Equipment used during interior construction would include exterior hoists, pneumatic equipment, delivery trucks, and a variety of small hand-held tools. Cranes may be used to lift mechanical equipment onto the roof of the building. However, this stage of construction is the quietest.

BUILDING-BY-BUILDING DESCRIPTION

Temporary Gymnasium (Phase 1)

The first task before the temporary gymnasium could be constructed would be to move the Washington Square Village playground from its current location on the east side of the North Block to the southern portion of the Washington Square Village Elevated Garden close to Washington Square Village Buildings 3 and 4. In addition, in order to accommodate construction and user access to the temporary gymnasium from Mercer Street, the southernmost portion of Mercer Playground would be redeveloped into the “Temporary Mercer Entry Plaza,” a 17,555-square-foot publicly accessible passive space with seating and planting beds. Also prior to Zipper Building construction, NYU would develop an approximately 10,300-square-foot temporary publicly accessible play area along LaGuardia Place on the North Block (the Temporary LaGuardia Play Area), displacing the southern half of the existing LaGuardia Landscape.

Because the gymnasium is temporary and would be a single story with a height of 38 feet above street grade, the structure would have a simple steel frame with exterior panels. A concrete floor would be poured, and the steel frame erected on the floor. The panels would be hung on the steel frame. The construction would involve concrete trucks and pumps for the floor, cranes and welders for the frame, and lifts and compressor for the installation of the panels.

Access to the construction site would be from Mercer Street. Because the temporary gymnasium would be located approximately 57 feet from the Mercer Street sidewalk, no sidewalk sheds are expected to be needed. About 20 to 35 workers would be on-site. The construction is expected to take about 9 months. The temporary gymnasium would be removed when the new athletic facility in the Zipper Building is operational, and the removal would take about 2 months.

Prior to construction of the proposed Zipper Building (beginning in approximately the second quarter of 2014), proposed landscaping changes to the South Block would include improvements to the Bleecker Street Strip, where there would be new trees, low plantings, and possibly benches (final design changes to the Bleecker Street Strip would require DPR and Public Design Commission approval).

Zipper Building (Phase 1)

The Zipper Building is the largest and most complex of the proposed buildings, and its construction is assumed to start in third quarter 2014 and be completed by the end of 2018.

Coles Plaza and Coles Playground, located on the Mercer Street Strip immediately east of Coles Gym, would be located within the construction area and therefore would be displaced. The dog run, which is currently located on the east of Coles, would be relocated from its current location on the corner of Mercer Street and West Houston Street to the west side of Coles, with frontage on West Houston Street. Coles Gym would then be demolished in an approximately 6-month period. Then the installation of soldier piles and excavation would begin. The current plan is for excavation to be done in four sections from south to north, but the number of sections and the direction of the construction could change depending on the design or the contractor. The secant wall and excavation foundation would take about 18 months. Construction of the superstructure would start below grade and take about 24 months. The superstructure construction is expected to start at the south about 6 months before the excavation/foundation task is complete. Interior fit out would take about 15 months, during which time little outside activity with the exception of truck deliveries and roof work, would occur.

During the construction of the proposed Zipper Building, to the extent practicable, all construction engines would be located at least 15 feet east of the western construction fence. Sidewalk sheds would be erected on Bleecker and West Houston Streets. The sidewalk along Mercer Street would be closed, and pedestrians would have to use the east side of Mercer Street. A 16-foot high sound attenuation fence would surround the whole site. Truck entrances gates would be located on Mercer and West Houston Streets and all truck movements would be along these streets. However, when foundation work progresses to the north end of the street, the trucks would load and unload behind the sound attenuation fences on Bleecker Street for a period of approximately four months. It is estimated that up to four electric hoists would be employed during the superstructure erection and interior fit out tasks. One would be located on the corner of Mercer and West Houston Streets, one along Mercer Street, and two within the building envelope. When the building is enclosed, construction of the Toddler Playground would be complete.

Bleecker Building (Phase 1)

Construction of the Bleecker Building is assumed for the purposes of analysis to start when the Zipper Building is completing the interior fit out in the third quarter of 2018. The timing of the start of construction of this building is ultimately dependent upon the SCA exercising its option to build the public school. Accordingly, construction of the building could also occur in Phase 2 (see discussion below under “Bleecker Building Alternate Phasing Scenario”). Demolition of the existing Morton Williams building would take about three months. The secant wall and excavation/foundation would take about 12 months, and because of the small footprint, erection of the superstructure would begin when the foundations are complete. The superstructure would take about 15 months, followed by 15 months for the interior fit out.

This FEIS considers two distinct staging options for construction of the proposed Bleecker Building:

- **LaGuardia Place Staging Option** assesses the potential for significant adverse impacts if construction staging occurred entirely within the LaGuardia Place Strip immediately west of the proposed building footprint. Under this staging option, during the approximately 39-month construction period of the Bleecker Building the LaGuardia Corner Gardens would not be available because it would be located inside the construction perimeter, within the area that would be utilized for construction staging. The northern, eastern, and southern sides of the Bleecker Building construction area would be protected by construction sheds. Truck deliveries would be made through the staging area situated along LaGuardia Place.

- **Bleecker Street Staging Option** assesses the potential for significant adverse impacts if construction staging occurred within the Bleecker Street Strip immediately north of the proposed building footprint. Under this staging option, during the approximately 39-month construction period of the Bleecker Building the portion of the strip immediately north of the proposed building footprint may not be publicly accessible because it may be located inside the construction perimeter, within the area that would be utilized for construction staging. However, where feasible construction staging may be shifted from the Bleecker Street Strip to the Bleecker Street road bed (parking lane) to allow public access to the strip. The eastern, western, and southern sides of the Bleecker Building construction area would be protected by construction sheds. Truck deliveries would be made through the staging area situated along Bleecker Street.

These are the only two staging options considered for Bleecker Building construction because LaGuardia Place and Bleecker Street would be the only sides of the construction site with street frontages; under the terms of NYU's property lease agreement with 505 LaGuardia Place, NYU does not have the rights to utilize the eastern and southern frontages of the site for construction staging for the Bleecker Building. Where appropriate, these two staging options are assessed in the technical analyses presented below. Because a public school may operate in the new Bleecker Building, as discussed in Chapter 14, "Transportation," the SCA would consult with NYCDOT during planning and construction of the new school to incorporate the necessary safety measures. The Department of Education may also be consulted on the likely zones from which the students may travel to identify, where appropriate, "safe routes to school" and the need for additional school crosswalks. It is also expected that during construction of the proposed project and while the school is in session, additional measures, if necessary, would be explored to ensure safety of students traveling to and from this school.

New Parking Garage (Phase 2)

The new parking garage would be constructed directly adjacent to Washington Square Village Building 2 on the south and east sides of that building. This would require the displacement of the Temporary Mercer Entry Plaza and the remainder of the Mercer Street Playground. Installation of the secant piles and the excavation/foundations would commence in the first quarter of 2022 and take about 15 months to be completed. During this time, the existing 670-space public parking garage would remain in operation. The east driveway would be closed, but the west driveway would remain open during construction. The superstructure and interior fit out would take a total of 9 months and would be competed by the end of third quarter 2023. The Washington Square Village Elevated Garden and relocated Washington Square Village Playground would remain open during construction of the new parking garage. Truck access to the construction site would be from Mercer Street, and the sidewalk on the west side of Mercer Street would be closed. However, pedestrian circulation would be maintained on the west side of Mercer Street on the curb lane protected by a pedestrian bridge. A 16-foot high sound attenuating wall would surround the site.

Mercer Building (Phase 2)

During both above- and below-grade construction of the Mercer Building, all diesel construction engines would be located at least 50 feet away from all of the Washington Square Village Buildings, to the extent practicable. The existing garage would be demolished, and all parking would be relocated to the new parking garage. The access to the new parking garage would be from West 3rd and Bleecker Streets. The below-grade construction is expected to take about 39 months. The excavation/foundations would be done in two sections, starting on the east side and progressing to the west. The secant wall for the new parking garage would be incorporated into the below-grade space.

During this period, the Washington Square Village Elevated Garden and Washington Square Village Playground would be closed, but the Temporary LaGuardia Play Area would remain open along LaGuardia Place. Access to the construction site would be from Mercer Street, and the sidewalk on the west side of Mercer Street would remain closed. However, pedestrian circulation would be maintained on the west side of Mercer Street on the curb lane protected by a pedestrian bridge. Completion of the below-grade space is expected in fourth quarter 2026 at which time the expanded parking garage would be opened.

The above-ground portion of the Mercer Building would start construction in second quarter 2026. By second quarter 2027, the construction perimeter would be reduced, and the central portion of Washington Square Village would be outside of the building construction zone. Within about a year, the Public Lawn, the Philosophy Garden, and the Washington Square Village Play Garden are expected to open. The construction of the above-grade portion of the Mercer Building is expected to take about 33 months and be completed by the fourth quarter of 2028. Truck access would be from designated gates along Mercer Street, and the sidewalk on the west side of Mercer Street would be reopened to pedestrians. The hoists would face Mercer Street. A 16-foot high sound attenuating wall would surround the site.

LaGuardia Building (Phase 2)

Construction of the LaGuardia Building would take about 39 months and begin in the fourth quarter of 2028. Construction access would be from West 3rd and Bleecker Streets and from LaGuardia Place. A sidewalk shed would be placed along LaGuardia Place. During both above- and below-grade construction, all diesel construction engines would be located at least 50 feet away from the Washington Square Village Buildings, to the extent practicable. The demolition of the existing commercial building would take about three months, and excavation/foundations about 15 months. In order to place the large diesel equipment as far away from the Washington Square Buildings as possible, a temporary platform would be built on the center line of the excavation on the LaGuardia Place side. The excavation would take place is two sections, starting at the south and progressing north. During the construction of the LaGuardia Building, Adrienne's Garden, the Temporary LaGuardia Play Area and the remainder of the LaGuardia Landscape would be closed. When the below-grade space is completed, the loading dock and hoists would be on the LaGuardia Place side of the proposed building. A 16-foot high sound attenuating wall would surround the site. Upon completion of the building's super structure/exterior, the permanent open spaces along LaGuardia Place—the LaGuardia Entry Plaza and LaGuardia Gardens—would be developed and would be completed by 2031.

NUMBER OF CONSTRUCTION WORKERS AND MATERIAL DELIVERIES

Construction is labor intensive, and the number of workers varies with the general construction task and the size of the building. Likewise, material deliveries generate many truck trucks, and the number also varies. **Table 20-3** shows the estimated numbers of workers and deliveries to the project area by calendar quarter for all construction. These represent the average number of daily workers and trucks within each quarter. The average number of workers would be about 221 per day during Phase 1 and 120 per day during Phase 2. The average number of trucks would be 37 per day during both Phases 1 and 2.

Table 20-3
Average Number of Daily Workers and Trucks by Quarter

Phase 1																
Year	**2014**				**2015**				**2016**				**2017**			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Workers	33	57	28	30	27	57	60	60	80	222	400	564	567	475	430	200
Trucks	19	18	13	13	14	43	43	43	62	**84**	66	58	60	55	38	42
Year	**2018**				**2019**				**2020**				**2021**			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Workers	383	**733**	728	343	37	40	25	63	150	158	177	150	242	300	300	143
Trucks	35	35	37	57	40	40	40	28	30	29	21	29	27	27	27	32
Phase 2																
Year	**2022**				**2023**				**2024**				**2025**			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Workers	24	47	50	45	37	40	30	30	60	60	60	60	60	118	135	75
Trucks	35	45	45	20	24	26	27	31	37	39	39	39	39	40	37	29
Year	**2026**				**2027**				**2028**				**2029**			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Workers	68	182	287	250	170	175	250	283	**317**	250	67	28	30	60	60	60
Trucks	28	44	45	**47**	34	40	38	38	38	41	43	19	43	44	45	45
Year	**2030**				**2031**				**Phase 1**				**Phase 2**			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	**Average**		**Peak**		**Average**		**Peak**	
Workers	97	83	120	213	185	200	283	158	221		733		120		317	
Trucks	44	31	46	40	42	28	28	23	37		84		37		47	

Notes: Construction would begin In the fourth quarter of 2013, and would involve about 20 workers per day and 16 trucks per day. Construction activities in the last quarter of 2013 are not shown on the table.
Sources: Turner Construction Company

For Phase 1, the highest number of workers would be 733 per day in the second quarter of 2018, and the highest number of trucks would be 84 per day in the third quarter of 2016. The main activity for the peak number of workers would be the interior fit out of the Zipper Building. The peak number of trucks in Phase 1 would occur during the finishing of the foundations, while the superstructure construction has begun.

In Phase 2, the peak number of workers is 317 per day in the first quarter of 2028, and the peak number of trucks would be 47 per day in the fourth quarter of 2026. The peak number of workers would occur during interior fit out of the Mercer Building, and the peak number of trucks would corresponds with interior finishing of the below-grade portion of the Mercer Building and start of the above grade Mercer Building superstructure. Detailed workforce and delivery projections can be found in **Appendix E-1**.

D. FUTURE WITHOUT THE PROPOSED ACTIONS

In the future without the Proposed Actions, it is assumed that the building housing Morton Williams Associated Supermarket would be redeveloped at some time after 2021, when the property's deed restriction expires. The as-of-right development would be an approximately 175,000 square foot, nine-story building, with an approximately 25,000-square-foot supermarket and NYU academic space. The as-of-right construction would not have the same restrictions (such as the emissions reduction program or the specific noise reduction measures) that are discussed below in the future with the Proposed Action section, to minimize potential impacts.

E. FUTURE WITH THE PROPOSED ACTIONS

Similar to many large development projects in New York City, construction can be disruptive to the surrounding area for periods of time. The following analyses describe potential construction impacts with respect to transportation, air quality, noise and vibration, historic resources, hazardous materials, open space, socioeconomic conditions, community facilities, land use and public policy, neighborhood character, and rodent control.

The analyses in this chapter represent the reasonable worst-case development scenario in each technical area. The reasonable worst-case can occur at different times for different analyses. For example, the noisiest part of the construction is not at the same time as the heaviest construction traffic. Therefore, the analysis periods differ for traffic, air quality, and noise. In each section, the methodologies to determine the period of reasonable worst-case potential impacts are explained.

TRANSPORTATION

TRAFFIC

Construction activities would generate construction worker and truck traffic. An evaluation of construction sequencing and worker/truck projections was undertaken to assess potential transportation-related impacts. For Phase 1 construction, detailed analyses of traffic operations during construction concluded that there would not be a potential for significant adverse traffic impacts. During Phase 2 construction, peak activities generated by construction workers and truck deliveries, as depicted in **Table 20-3**, would be substantially lower in comparison to those during Phase 1 construction. However, together with new trips resulting from the completion of Phase 1 components of the proposed project, there would still be a potential for significant adverse traffic impacts during Phase 2 construction. Because the cumulative project trip generation during Phase 2 construction would be less than what would be realized upon the full build-out of the proposed project in 2031, the anticipated impacts would be within the envelope of significant adverse traffic impacts identified for the 2031 Build condition in Chapter 14, “Transportation,” and can be similarly addressed with the mitigation measures described in Chapter 21, “Mitigation.”

Level 1 Construction Trip Generation Screening Assessment

Average daily construction worker and truck activities by quarter were projected for the entire construction period. Phase 1 construction is anticipated to begin in the fourth quarter of 2013 with the construction of the temporary gym on the north superblock. Construction of the Zipper and Bleecker buildings on the south superblock would follow beginning in mid-2014 and completing by the end of 2021. Phase 2 construction of north superblock would start in late 2021 and be completed by the end of 2031. Phase 1 and Phase 2 worker and truck trip projections were further refined to account for worker modal splits and vehicle occupancy, arrival and departure distribution, and passenger car equivalent (PCE) factor for construction truck traffic. These estimates are presented in **Tables 20-4** and **20-5**.

Daily Workforce and Truck Deliveries

For a reasonable worst-case development scenario analysis of potential transportation-related impacts during construction, the daily workforce and truck trip projections in the peak quarter were used as the basis for estimating peak hour construction trips. It is expected that construction activities would generate the highest amount of daily traffic in the first quarter of 2017 (or the first quarter of year 5 construction), with an estimated average of 567 workers and 60 truck deliveries per day (see **Appendix E-2** for details). Because trucks are considered to be equivalent to two passenger vehicles each and they are assumed to enter and exit the construction site within the one hour, the large number of trucks during this period cause it to have the largest number of PCEs, although there are other periods during construction with more anticipated construction workers. These estimates of construction activities are further discussed below.

Construction Worker Modal Splits and Vehicle Occupancy

Based on the survey conducted at the construction site of the New York Times Building in 2006, it is anticipated that construction workers' travel within or commute to Manhattan would be primarily by public transportation (approximately 70 percent), with a smaller percentage by private autos (approximately 30 percent) at an average occupancy of approximately 2 persons per vehicle.

Peak Hour Construction Worker Vehicle and Truck Trips

According to NYU, site activities would mostly take place during the construction shift of 8:00 AM to 4:30 PM. While construction truck trips would be made throughout the day (with more trips made during the early morning), and most trucks would remain in the area for short durations, construction workers would typically commute during the hours before and after the work shift. For analysis purposes, each worker vehicle was assumed to arrive in the morning and depart in the afternoon or early evening, whereas each truck delivery was assumed to result in two truck trips during the same hour (one "in" and one "out"). Furthermore, in accordance with the *CEQR Technical Manual*, the traffic analysis assumed that each truck has a PCE of 2.

The estimated daily vehicle trips were distributed throughout the workday based on projected work shift allocations and conventional arrival/departure patterns of construction workers and trucks. For construction workers, the majority (80 percent) of the arrival and departure trips would take place during the hour before and after each shift. For construction trucks, deliveries would occur throughout the day when the construction site is active. Construction truck deliveries typically peak during the early morning (25 percent), overlapping with construction worker arrival traffic. The peak construction hourly trip projections for Phase 1 and Phase 2 construction are summarized in **Tables 20-6 and 20-7.** The maximum Phase 1 construction activities would result in 124 PCEs between 7 and 8 AM and 76 PCEs between 4 and 5 PM on weekdays in the first quarter of 2017 while the maximum phase 2 construction activities would result in 77 PCEs between 7 and 8 AM and 41 PCEs between 4 and 5 PM in the third quarter of 2026.

Since the above peak hour vehicle trip estimates (in PCEs) exceed the *CEQR* analysis threshold of 50 peak hour vehicle trips for the Phase 1 AM peak hour (7 to 8 AM) and PM peak hour (4 to 5 PM), and Phase 2 AM peak hour (7 to 8 AM), a Level 2 screening assessment was conducted for each of these peak periods to determine the need for additional quantified traffic analyses, as discussed below. For the other hours of construction, projected construction generated traffic would be below the CEQR threshold of 50 peak hour vehicle trips. Hence, for Phase 1 construction, additional analyses are not warranted and construction activities during these other hours would not have the potential to result in significant adverse traffic impacts. For Phase 2 construction, although the traffic contribution from construction activities would be nominal, the cumulative effects of these activities together with those generated by the completed Phase 1 components of the proposed project would also need to be considered, as further described below.

Table 20-4
Phase 1 Construction Level 1 Screening: Trip Generation

Vehicle PCE Trips (Auto + Truck)	2013	2014				2015				2016				2017			
	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
7 AM - 8 AM	18	24	26	15	15	19	50	51	51	73	109	113	124	**124**	110	89	67
8 AM - 9 AM	9	9	10	5	5	5	18	18	18	26	38	39	40	40	37	28	22
9 AM -10 AM	8	8	8	4	4	4	16	16	16	24	32	28	24	24	24	16	16
10 AM -11 AM	8	8	8	4	4	4	16	16	16	24	32	28	24	24	24	16	16
11 AM - 12 PM	8	8	8	4	4	4	16	16	16	24	32	28	24	24	24	16	16
12 PM - 1 PM	8	8	8	4	4	4	16	16	16	24	32	28	24	24	24	16	16
1 PM - 2 PM	8	8	8	4	4	4	16	16	16	24	32	28	24	24	24	16	16
2 PM - 3 PM	4	4	4	4	4	4	8	8	8	12	16	12	12	12	12	8	8
3 PM - 4 PM	4	4	4	4	4	4	8	8	8	13	18	15	16	16	15	11	9
4 PM - 5 PM	6	8	10	7	7	7	14	15	15	21	41	57	76	**76**	66	57	31
5 PM - 6 PM	0	1	1	1	1	1	1	1	1	2	5	9	12	12	10	9	4
Daily Total	81	90	95	56	56	60	179	181	181	267	387	385	400	**400**	370	282	221

Vehicle PCE Trips (Auto + Truck)		2018				2019				2020				2021			
		1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
7 AM - 8 AM		79	119	119	95	44	45	43	35	49	46	40	45	55	62	62	48
8 AM - 9 AM		27	37	37	34	17	17	17	14	16	16	13	16	19	21	21	16
9 AM -10 AM		16	16	16	24	16	16	16	12	12	12	8	12	12	12	12	12
10 AM -11 AM		16	16	16	24	16	16	16	12	12	12	8	12	12	12	12	12
11 AM - 12 PM		16	16	16	24	16	16	16	12	12	12	8	12	12	12	12	12
12 PM - 1 PM		16	16	16	24	16	16	16	12	12	12	8	12	12	12	12	12
1 PM - 2 PM		16	16	16	24	16	16	16	12	12	12	8	12	12	12	12	12
2 PM - 3 PM		8	8	8	12	8	8	8	4	8	4	4	4	4	4	4	8
3 PM - 4 PM		11	13	13	14	8	8	8	4	9	5	5	5	6	6	6	9
4 PM - 5 PM		51	91	91	51	12	13	11	11	25	22	24	21	31	38	38	24
5 PM - 6 PM		8	16	15	7	1	1	1	1	3	3	4	3	5	6	6	3
Daily Total		264	364	363	333	170	172	168	129	170	156	130	154	180	197	197	168

Table 20-5
Phase 2 Construction Level 1 Screening: Trip Generation

Vehicle PCE Trips (Auto + Truck)	2022				2023				2024				2025				2026			
	1Q	**2Q**	**3Q**	**4Q**	**1Q**	**2Q**	**3Q**	**4Q**	**1Q**	**2Q**	**3Q**	**4Q**	**1Q**	**2Q**	**3Q**	**4Q**	**1Q**	**2Q**	**3Q**	**4Q**
7 AM - 8 AM	39	49	50	25	28	33	31	35	43	47	47	47	47	53	51	37	36	65	**77**	76
8 AM - 9 AM	17	21	21	9	9	13	13	13	18	18	18	18	18	19	20	14	14	21	28	27
9 AM -10 AM	16	20	20	8	8	12	12	12	16	16	16	16	16	16	16	12	12	16	20	20
10 AM -11 AM	16	20	20	8	8	12	12	12	16	16	16	16	16	16	16	12	12	16	20	20
11 AM - 12 PM	16	20	20	8	8	12	12	12	16	16	16	16	16	16	16	12	12	16	20	20
12 PM - 1 PM	16	20	20	8	8	12	12	12	16	16	16	16	16	16	16	12	12	16	20	20
1 PM - 2 PM	16	20	20	8	8	12	12	12	16	16	16	16	16	16	16	12	12	16	20	20
2 PM - 3 PM	8	8	8	4	4	4	4	8	8	8	8	8	8	8	8	4	4	8	8	8
3 PM - 4 PM	8	8	8	4	4	4	4	8	8	8	8	8	8	9	9	5	4	9	10	10
4 PM - 5 PM	11	13	14	9	8	9	7	11	15	15	15	15	15	21	23	13	12	29	41	36
5 PM - 6 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	2	1	4	6	5
Daily Total	164	200	202	92	94	124	120	136	173	177	177	177	177	193	194	135	131	216	**270**	262

Vehicle PCE Trips (Auto + Truck)	2027				2028				2029				2030				2031			
	1Q	**2Q**	**3Q**	**4Q**	**1Q**	**2Q**	**3Q**	**4Q**	**1Q**	**2Q**	**3Q**	**4Q**	**1Q**	**2Q**	**3Q**	**4Q**	**1Q**	**2Q**	**3Q**	**4Q**
7 AM - 8 AM	55	60	68	72	76	68	52	23	47	51	51	51	55	41	62	64	65	51	60	42
8 AM - 9 AM	17	21	23	24	25	23	18	9	17	18	22	22	19	14	23	22	21	18	20	12
9 AM -10 AM	12	16	16	16	16	16	16	8	16	16	20	20	16	12	20	16	16	12	12	8
10 AM -11 AM	12	16	16	16	16	16	16	8	16	16	20	20	16	12	20	16	16	12	12	8
11 AM - 12 PM	12	16	16	16	16	16	16	8	16	16	20	20	16	12	20	16	16	12	12	8
12 PM - 1 PM	12	16	16	16	16	16	16	8	16	16	20	20	16	12	20	16	16	12	12	8
1 PM - 2 PM	12	16	16	16	16	16	16	8	16	16	20	20	16	12	20	16	16	12	12	8
2 PM - 3 PM	8	8	8	8	8	8	8	4	8	8	8	8	8	8	8	8	8	4	4	4
3 PM - 4 PM	9	9	10	10	10	10	8	4	8	8	8	8	9	9	9	10	9	5	6	5
4 PM - 5 PM	27	28	36	40	44	36	16	7	11	15	15	15	19	17	22	32	29	27	36	22
5 PM - 6 PM	4	4	5	6	7	5	1	1	1	1	1	1	2	2	3	5	4	4	6	3
Daily Total	180	210	230	240	250	230	183	88	172	181	205	205	192	151	227	221	216	169	192	128

Table 20-6
Phase 1 Peak Construction Vehicle Trip Projections

Hour	Auto Trips Regular Shift			Truck Trips Regular Shift			Total Vehicle Trips			Total PCE Trips		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Weekday (1st Quarter of 2017)												
7 AM - 8 AM	**64**	**0**	**64**	**15**	**15**	**30**	**79**	**15**	**94**	**94**	**30**	**124**
8 AM - 9 AM	16	0	16	6	6	12	22	6	28	28	12	40
9 AM -10 AM	0	0	0	6	6	12	6	6	12	12	12	24
10 AM -11 AM	0	0	0	6	6	12	6	6	12	12	12	24
11 AM - 12 PM	0	0	0	6	6	12	6	6	12	12	12	24
12 PM - 1 PM	0	0	0	6	6	12	6	6	12	12	12	24
1 PM - 2 PM	0	0	0	6	6	12	6	6	12	12	12	24
2 PM - 3 PM	0	0	0	3	3	6	3	3	6	6	6	12
3 PM - 4 PM	0	4	4	3	3	6	3	7	10	6	10	16
4 PM - 5 PM	**0**	**64**	**64**	**3**	**3**	**6**	**3**	**67**	**70**	**6**	**70**	**76**
5 PM - 6 PM	0	12	12	0	0	0	0	12	12	0	12	12
Daily Total	80	80	160	60	60	120	140	140	280	200	200	400

Note: Hourly construction worker and truck trips were derived from an estimated quarterly average number of construction workers and truck deliveries per day, with each truck delivery resulting in two daily trips (arrival and departure).

Table 20-7
Phase 2 Weekday Peak Construction Vehicle Trip Projections

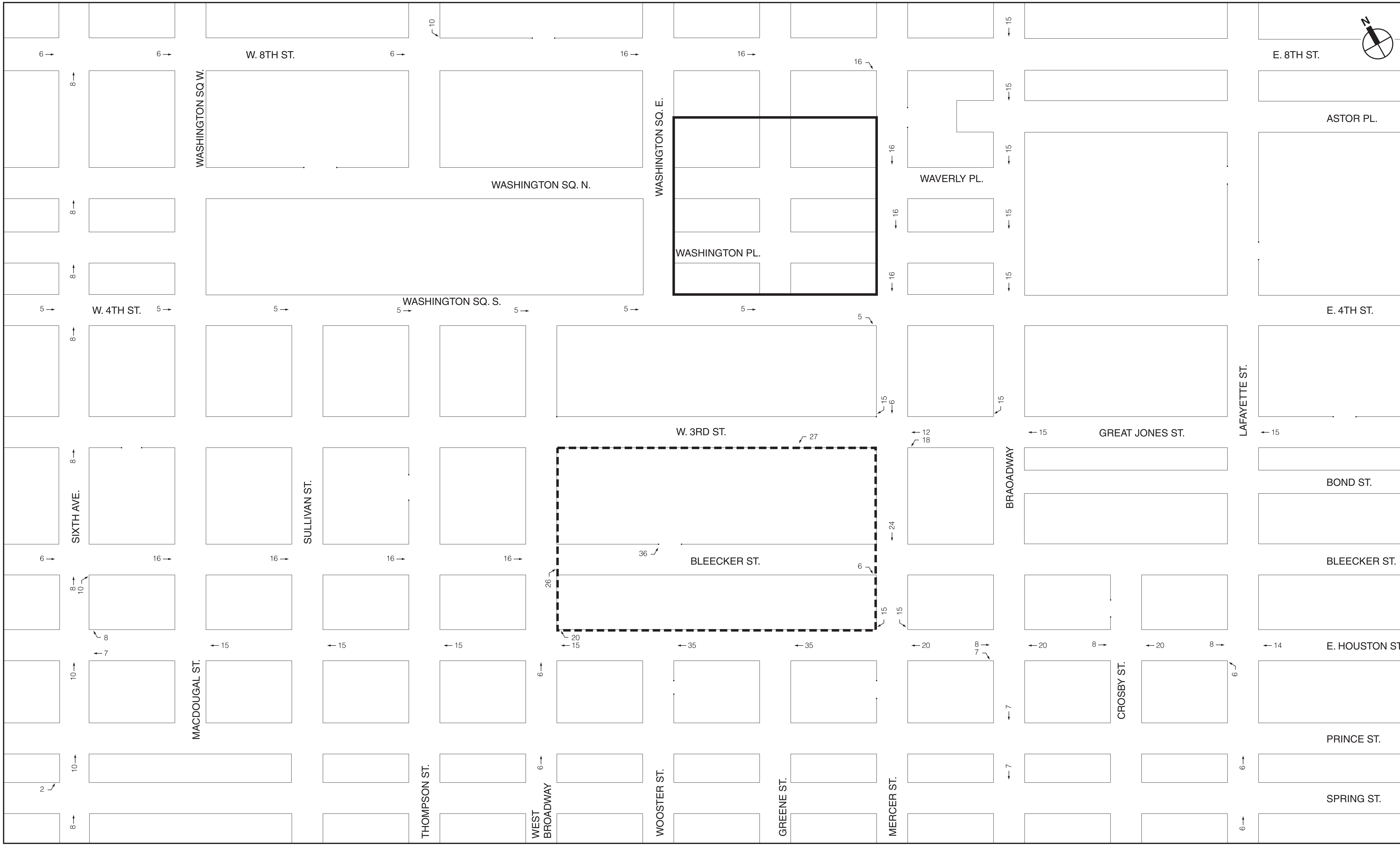
Hour	Auto Trips Regular Shift			Truck Trips Regular Shift			Total Vehicle Trips			Total PCE Trips		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Weekday (3rd Quarter of 2026)												
7 AM - 8 AM	**33**	**0**	**33**	**11**	**11**	**22**	**44**	**11**	**55**	**55**	**22**	**77**
8 AM - 9 AM	8	0	8	5	5	10	13	5	18	18	10	28
9 AM -10 AM	0	0	0	5	5	10	5	5	10	10	10	20
10 AM -11 AM	0	0	0	5	5	10	5	5	10	10	10	20
11 AM - 12 PM	0	0	0	5	5	10	5	5	10	10	10	20
12 PM - 1 PM	0	0	0	5	5	10	5	5	10	10	10	20
1 PM - 2 PM	0	0	0	5	5	10	5	5	10	10	10	20
2 PM - 3 PM	0	0	0	2	2	4	2	2	4	4	4	8
3 PM - 4 PM	0	2	2	2	2	4	2	4	6	4	6	10
4 PM - 5 PM	**0**	**33**	**33**	**2**	**2**	**4**	**2**	**35**	**37**	**4**	**37**	**41**
5 PM - 6 PM	0	6	6	0	0	0	0	6	6	0	6	6
Daily Total	41	41	82	47	47	94	88	88	176	135	135	270

Note: Hourly construction worker and truck trips were derived from an estimated quarterly average number of construction workers and truck deliveries per day, with each truck delivery resulting in two daily trips (arrival and departure).

Level 2 Construction Generated Trip Assignment Screening Assessment

Auto trips made by construction workers were assigned to the nearby available off-street parking facilities in the traffic network. Delivery trips made by construction trucks were assigned to NYCDOT-designated truck routes, including Sixth Avenue, Broadway, The Bowery/Third Avenue, 8th Street, and Houston Street. Illustrative traffic assignments for the construction-generated vehicle trips during the weekday peak hours for the first quarter of 2017 and the third quarter of 2026 are shown in **Figures 20-2** to **20-4**. These assignments show that incremental construction vehicle trips (in PCEs) during weekday AM peak hour (7 to 8 AM) in Phase 1 construction would exceed the CEQR threshold of 50 peak hour vehicle trips at two intersections. A detailed analysis of these intersections for Phase 1 construction during the 7 to 8 AM peak

5.2.12



NOT TO SCALE

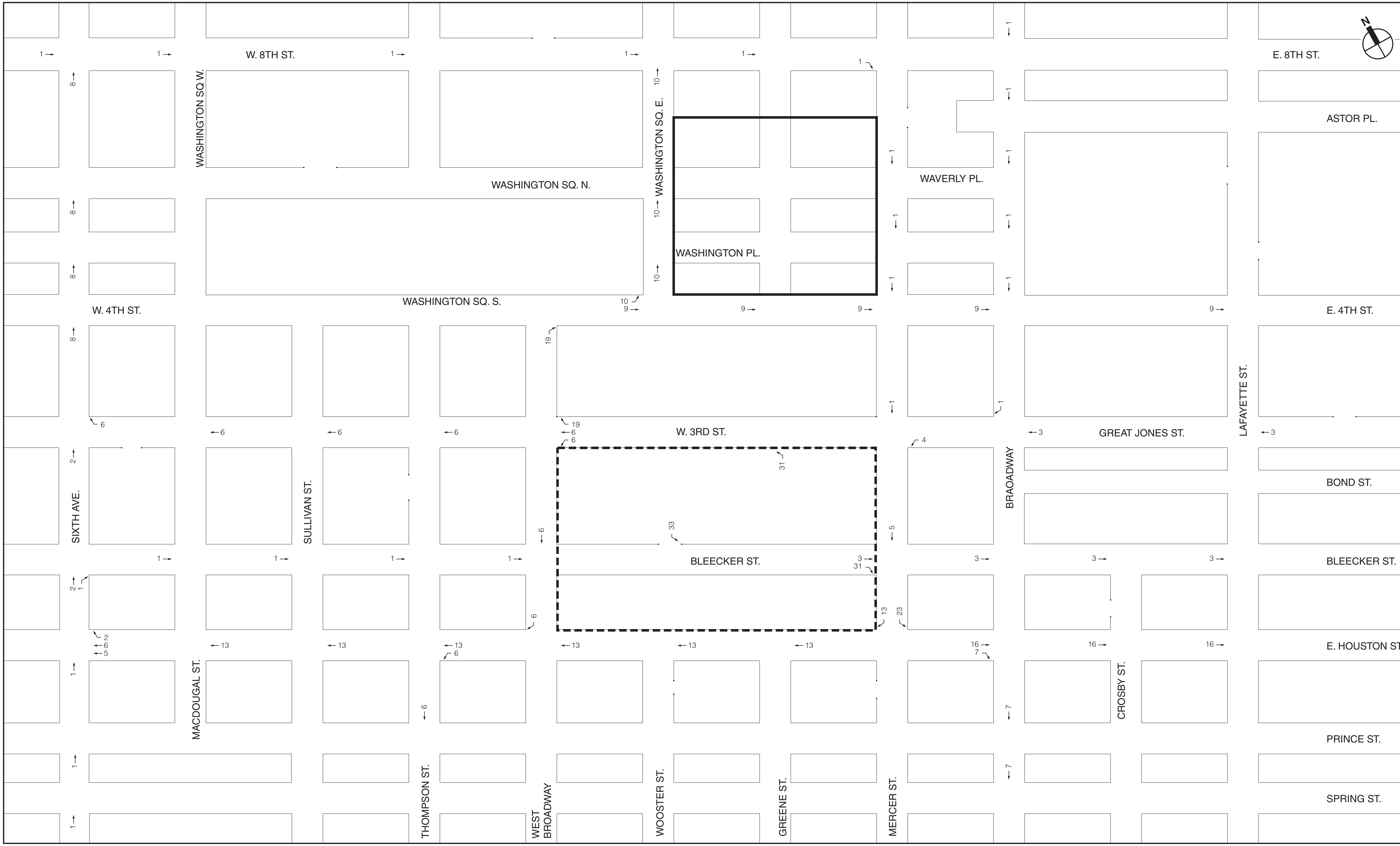
Project Area Boundary

Commercial Overlay Area Boundary

2017 Phase 1 Construction Net Incremental Vehicle Trips (in PCE's)
Weekday AM Peak Hour (7 to 8 AM)

Figure 20-2

5.2.12



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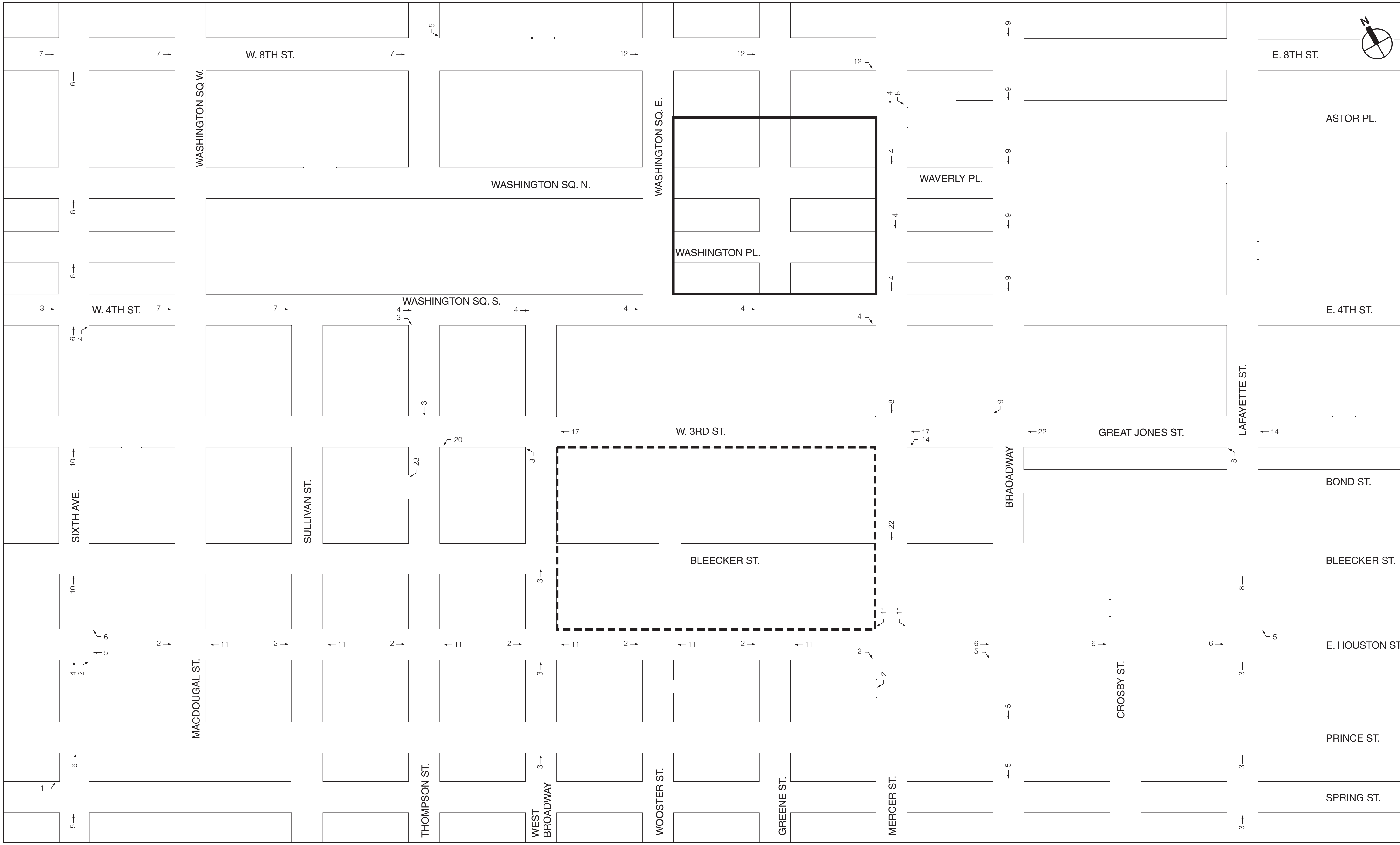
Project Area Boundary

Commercial Overlay Area Boundary

2017 Phase 1 Construction Net Incremental Vehicle Trips (in PCE's)
Weekday PM Peak Hour (4 to 5 PM)

Figure 20-3

NYU Core



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Project Area Boundary

Commercial Overlay Area Boundary

2026 Phase 2 Construction Net Incremental Vehicle Trips (in PCE's)
Weekday AM Peak Hour (7 to 8 AM)

Figure 20-4

hour is provided below. Incremental construction vehicle trips during the PM peak hour (4 to 5 PM) in Phase 1 construction and during the AM peak hour (7 to 8 AM) in Phase 2 construction would be below the CEQR threshold at all area intersections. Therefore, a quantitative traffic analysis was prepared for the Phase 1–AM peak hour (7 to 8 AM) only. Since the Phase 1–PM peak hour (4 to 5 PM) would not incur 50 or more peak hour vehicle trips at any of the intersections, a quantified analysis is not warranted and construction activities during this time period would not have the potential to result in significant adverse traffic impact. For Phase 2 construction, the cumulative effects of activities generated by construction and Phase 1 completion of the proposed project are addressed below.

Phase 1 Construction Traffic Capacity Analysis

Based on the weekday 7 to 8 AM construction traffic assignments for the first quarter of 2017, as shown in **Figure 20-2**, the Mercer Street intersections with West 3rd Street and with West Houston Street would experience 50 or more PCEs of construction-related traffic and therefore were selected for a detailed traffic analysis. Both of these locations are signalized intersections. The operations at these intersections were analyzed using the Highway Capacity Software (HCS+) version 5.5, which is based on the methodologies presented in the *2000 Highway Capacity Manual (HCM)*. A discussion of the analysis methodology can be found in Chapter 14, “Transportation.”

Existing Conditions

Existing traffic volumes were established based on turning movement counts and automatic traffic recorder (ATR) data collected in 2009 and 2011. These data show that background traffic levels during the 7 to 8 AM construction peak hour are approximately 81 percent of the AM peak hour traffic volumes analyzed in Chapter 14, “Transportation,” for the proposed project. Official signal timings obtained from NYCDOT were used in the analysis for all intersections. **Figure 20-5** shows the 7 to 8 AM traffic volumes for the 2011 existing conditions.

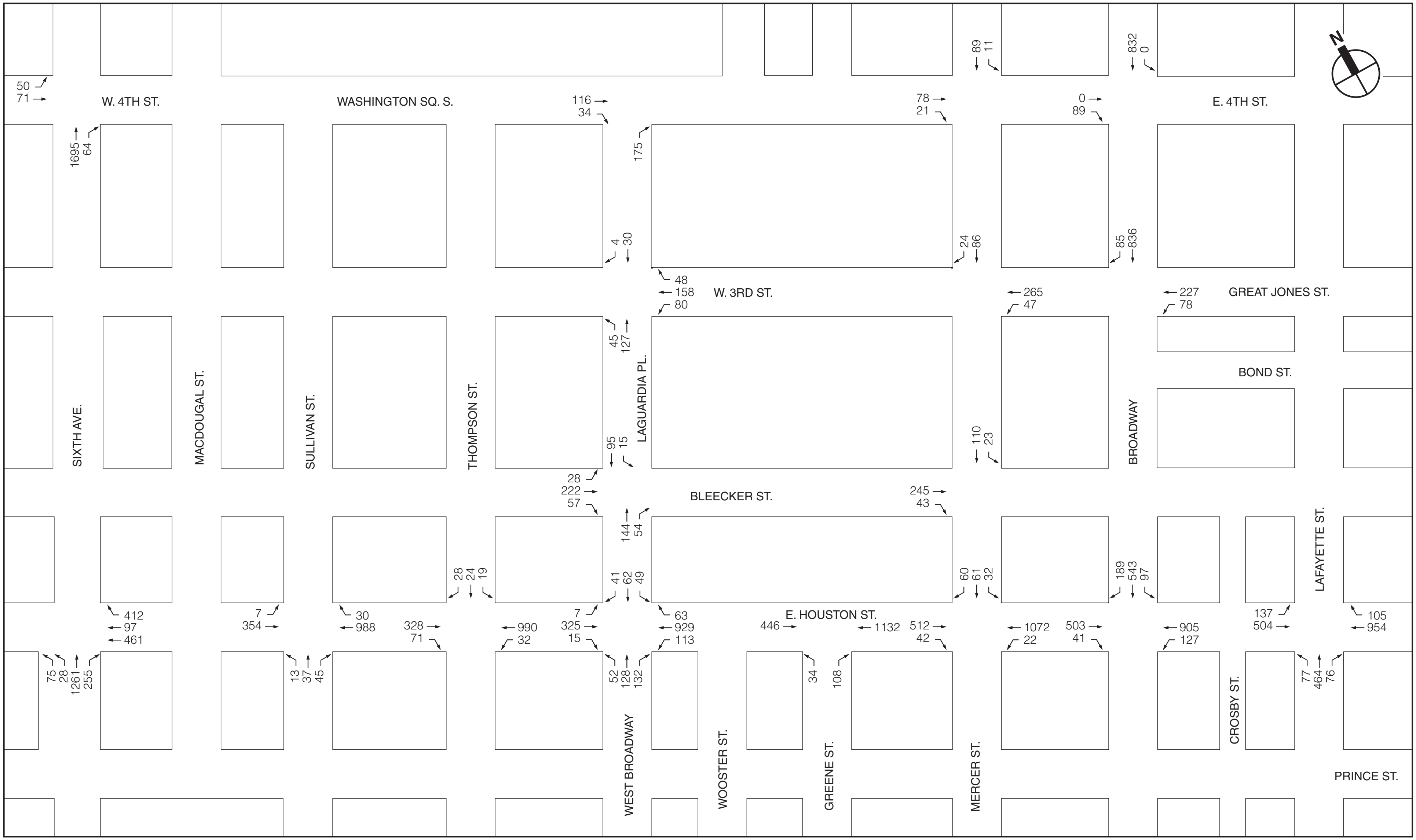
Future without Construction of the Proposed Project

No Build traffic volumes are typically developed by applying background traffic growth and adding traffic generated by other potential developments within the study area. The *CEQR Technical Manual* recommends a background growth rate of 0.25 percent per year for the first 5 years and 0.125 percent per year for subsequent years for projects in Manhattan. For a conservative analysis, the 2021 No Build condition operational AM peak hour traffic volumes were adjusted, based on ATR data and parking accumulation estimates developed for future No Build projects, to the 7 to 8 AM peak hour for the analysis of the 2017 construction No Build condition, as shown in **Figure 20-6**.

Future with Construction of the Proposed Project

The analysis contemplated a future with the proposed project (Build) condition that incorporates the No Build traffic volumes and overlays these volumes with construction-generated vehicle trips (in PCEs), as shown in **Figure 20-7**. **Table 20-8** summarizes the capacity analysis results for the 7 to 8 AM construction peak hour under existing, No Build, and Build conditions. All approach lane groups and movements of the studied intersections would operate at acceptable LOS C or better during the morning construction peak hour. Therefore, construction activities from Phase 1 construction are not expected to result in any significant adverse traffic impacts.

11.8.11



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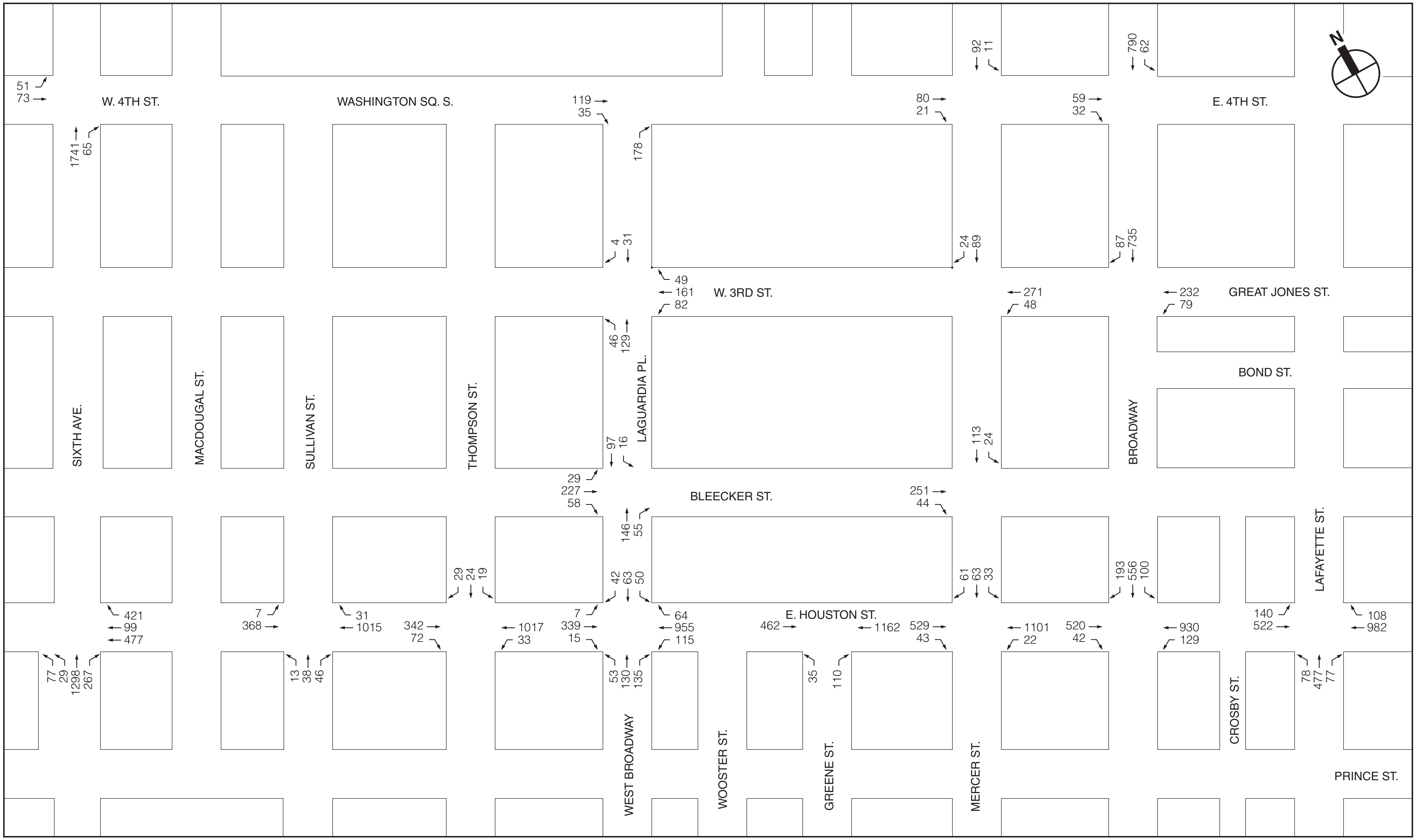
2011 Existing Traffic Volumes
Weekday AM Peak Hour (7 to 8 AM)
Figure 20-5

NYU Core



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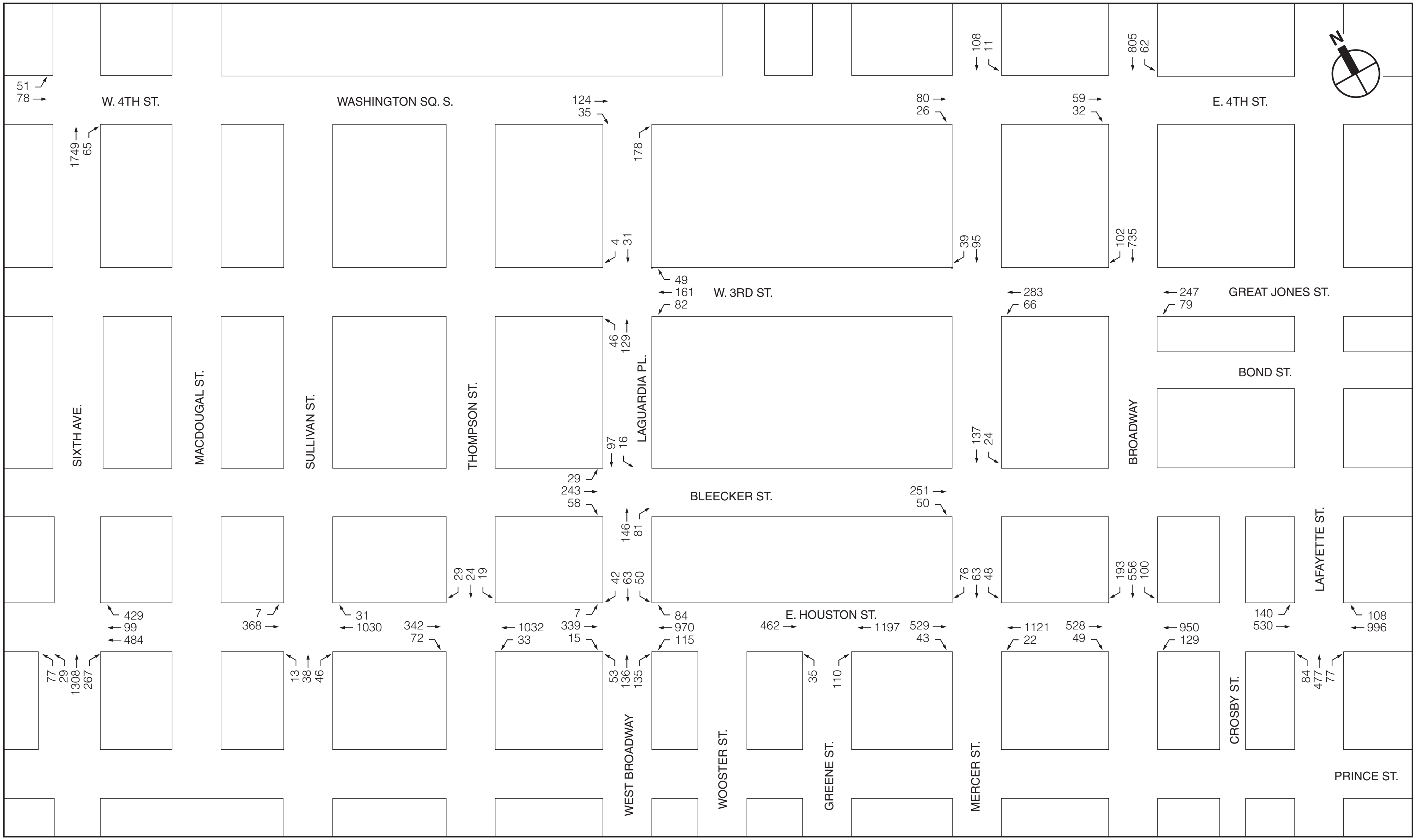
NYU Core

2017 No Build Traffic Volumes
Weekday AM Peak Hour (7 to 8 AM)
Figure 20-6



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NYU Core

2017 Construction Traffic Volumes
Weekday AM Peak Hour (7 to 8 AM)
Figure 20-7

Table 20-8
2011 Existing, 2017 No Build, and 2017 Construction Build LOS Summary

Intersection	Approach	2011 Existing 7-8AM				2017 No Build 7-8AM				2017 Construction 7-8AM			
		Lane Group	V/C Ratio	Delay (SPV)	LOS	Lane Group	V/C Ratio	Delay (SPV)	LOS	Lane Group	V/C Ratio	Delay (SPV)	LOS
Mercer Street and West 3rd Street	Westbound	LT	0.57	22.6	C	LT	0.58	23.1	C	LT	0.64	25.0	C
	Southbound	TR	0.23	16.3	B	TR	0.23	16.4	B	TR	0.29	17.1	B
		Intersection		20.8	C	Intersection		21.1	C	Intersection		22.5	C
Mercer Street and West Houston Street	Eastbound	TR	0.33	14.0	B	TR	0.34	14.1	B	TR	0.34	14.1	B
	Westbound	L	0.11	12.9	B	L	0.11	13.0	B	L	0.11	13.0	B
		T	0.59	17.3	B	T	0.61	17.5	B	T	0.62	17.7	B
	Southbound	LTR	0.37	21.7	C	LTR	0.38	21.9	C	LTR	0.44	23.0	C
		Intersection		16.6	B	Intersection		16.8	B	Intersection		17.1	B

Notes: L = Left-Turn; T = Through; R = Right-Turn. V/C = Volume to Capacity; SPV = Seconds per Vehicle; LOS = Level of Service.

Comparison of Cumulative Operational and Construction Traffic

During Phase 2 construction, completed Phase 1 components of the proposed project would generate incremental traffic to the area in addition to the activities anticipated to be generated by Phase 2 construction. As described above, peak Phase 2 construction is expected to occur in the 3rd quarter of 2026. A comparison of the projected traffic levels generated at the project site during peak Phase 2 construction and those upon full build-out of the proposed project in 2031 was developed and summarized in **Table 20-9**. As shown, the cumulative operational and construction traffic during peak Phase 2 construction would be of lower magnitudes than what the overall project would generate when completed in 2031. Therefore, the potential traffic impacts during peak Phase 2 construction would be within the envelope of significant adverse traffic impacts identified for the 2031 Build condition in Chapter 14, "Transportation."

Table 20-9
Comparison of Weekday Vehicle Trip Generation—Construction and Operational

Time	Phase 2 Construction in 2026									2031 Full Build-Out Operational Trips in PCEs		
	Construction Trips in PCEs (Q3 2026)			2021 Phase 1 Completion Operational Trips in PCEs			Total PCEs					
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
7-8 AM	55	22	77	21	10	31	76	32	108	45	10	55
8-9 AM	18	10	28	139	114	253	157	124	281	215	152	367
12-1 PM	10	10	20	132	127	259	142	137	279	157	147	304
4-5 PM	4	37	41	71	83	154	75	120	195	80	101	181
5-6 PM	0	6	6	109	126	235	109	132	241	142	188	330

Notes: Peak hours of operational traffic are generally 8-9 AM, 12-1 PM, and 5-6 PM.
PCEs = passenger car equivalents where 1 truck trip equals 2 PCEs.

The construction and operational traffic increments summarized above provide an indication that peak hour traffic conditions during peak construction in 2026 would be slightly worst than those described for the 2021 Phase 1 completion but more favorable than those concluded for the 2031 full build-out of the proposed project. As detailed in Chapter 21, "Mitigation," mitigation measures would be imposed at five intersections to mitigate the 2021 operational traffic impacts. While the slightly higher traffic levels during peak construction in 2026 could result in additional impacts beyond those identified for the 2021 Phase 1 Build condition, the required mitigation measures are expected to be part of those presented for the 2031 full build-out of the proposed project. The additional mitigation would encompass only signal timing adjustments that would be required to mitigate the 2031 Build condition traffic impacts. These adjustments could be implemented early at the discretion of NYCDOT to address actual conditions experienced at that time.

Curb Lane Closures and Staging

Because the majority of construction activities would be accommodated on-site, construction trucks would be staged primarily within the project superblocks. During Phase 1 construction, temporary curb lane closures are expected to be required only along Mercer Street between Bleecker and West Houston Streets. In Phase 2, temporary curb lane closures are expected to be required along Mercer Street and LaGuardia Place between West 3rd Street and Bleecker Street. During the entire construction period, at least one moving lane would be maintained along all surrounding streets.

Over the periods of the construction, each of the construction sites would have dedicated gates, driveways, or ramps for delivery vehicle access. Flag-persons are expected to be present at these active driveways, where needed, to manage the access and movement of trucks and to ensure no on-street queuing. Some of the site deliveries may also occur along the perimeters of the construction sites within delineated closed-off areas for concrete pour or steel delivery. As with any other construction projects, these activities would take place in accordance with NYCDOT-approved MPT plans and would be managed by on-site flag-persons.

MPT plans would be developed for any curb lane and sidewalk closures. Approval of these plans and implementation of all temporary sidewalk and curb lane closures during construction would be coordinated with NYCDOT OCMC.

PARKING

The construction activities of the proposed project would generate a maximum daily parking demand of up to approximately 80 spaces during the first quarter of 2017. For the Phase 1 construction traffic analysis, the construction worker vehicles were assigned to the Washington Square Village (WSV) parking garage located at 91-133 Bleecker Street. As discussed in Chapter 14, “Transportation,” the WSV off-street parking facility would provide a total parking supply of approximately 670 spaces with over 120 spaces available during all peak parking utilization periods. Therefore, the parking demand from construction worker vehicles (maximum of 80) is expected to be adequately accommodated.

During Phase 2 construction, peak construction worker activities are expected to occur during the first quarter of 2028, with a maximum daily parking demand of up to approximately 45 spaces. As discussed in Chapter 14, “Transportation,” there would be an off-street public parking shortfall upon the proposed project’s Phase 1 completion due to the displacement of two nearby public parking facilities and the parking demand generated by Phase 1 of the proposed project. Upon the full build-out of the proposed project, this shortfall would increase with the elimination of the existing WSV off-street public parking garage and additional parking demand from Phase 2 of the proposed project. Similarly, during Phase 2 construction, the additional parking demand generated by the construction workers would be expected to result in temporary parking shortfalls within ¼-mile of the project site during the peak midday hours. However, this projected parking shortfall is expected to be of lesser magnitude than that identified for the project’s full build-out in 2031. Based on the magnitude of available and total parking spaces within ½-mile of the Proposed Development Area, it is anticipated that the excess demand could be accommodated with a slightly longer walking distance beyond the ¼-mile radius. Furthermore, as stated in the 2012 *CEQR Technical manual*, for proposed projects located in Manhattan, this parking shortfall would not constitute a significant adverse parking impact due to the magnitude of available alternative modes of transportation.

TRANSIT

The study area is well served by public transit, including the B/D/F/M lines at the Broadway-Lafayette Station; the No. 6 line at the Bleecker Street Station; the A/B/C/D/E/F/M lines at the West 4th Street Station; the N/R lines at the Prince Street and 8th Street-NYU Stations. There are also several local bus routes, including the M1, M2, M3, M5, M8, and M21.

The bulk of the workers (70 percent) are estimated to travel to and from the construction sites via transit. During peak Phase 1 construction of the proposed project (maximum of 567 average daily construction workers, as shown in **Appendix E-2**), this distribution would represent approximately 400 daily workers traveling by transit. With 80 percent of these workers arriving or departing during the construction peak hours, the total estimated number of peak hour transit trips would be approximately 320. Since these incremental construction transit trips would be distributed among the various available subway and bus services, no single transit element is expected to experience an increase of more than 200 peak hour transit riders, the recommended CEQR threshold for a detailed quantified analysis. Hence, there would not be a potential for significant adverse transit impacts attributable to the projected construction worker transit trips during Phase 1 construction. After the completion of Phase 1 components of the proposed project, the area's subway stations would incur increases in passengers generated by the completed uses. As discussed in Chapter 14, "Transportation," subway impacts are expected to occur in 2021 with the development of Reasonable Worst-Case Development Scenario (RWCDS) 1 at the Broadway-Lafayette Station and would occur at both the Broadway-Lafayette and West 4th Street stations under both RWCDSs by 2031. The combination of the Phase 2 construction worker subway trips and those generated by the completed Phase 1 and portions of the Phase 2 projects during the commuter peak hours would result in comparable significant adverse impacts to the subway station elements described for the completed proposed project (i.e., S9 stairway at the Broadway-Lafayette Station and S2A/B stairway at the West 4th Street Station).

As described in Chapter 21, "Mitigation," an engineering analysis to determine the feasibility of widening this stairway was undertaken and the recommended stairway widening mitigation measures were found to be feasible. The analysis conducted for this EIS to determine the potential for significant adverse impacts was based on the RWCDS that maximizes the potential for impacts to the subway station stairways. It is possible that the actual built program will contain a mix of uses with lower transit demand, and therefore would have less potential to adversely affect these subway stairways. Accordingly, prior to implementation of the required stairway mitigation, NYU may undertake a study to determine whether the required mitigation would be unwarranted based on the then anticipated built program and service conditions in 2021 and 2031. If NYU undertakes such a study, it would be submitted to DCP and the MTA NYCT for review. NYU, in coordination with the MTA NYCT, would implement the required subway stairway mitigation measures unless DCP, in consultation with the MTA NYCT, determines, based on its review of the study and applying applicable CEQR methodologies, that the required mitigation is unwarranted. Any temporary relocation of bus stops along bus routes that operate adjacent to the project area would be coordinated with and approved by NYCDOT and NYCT to ensure proper access is maintained.

PEDESTRIANS

During Phase 1 construction, with a maximum of 567 average daily construction workers, as shown in **Appendix E-2**, there would be up to approximately 454 workers arriving or departing during the construction peak hours via various modes of transportation. These pedestrian trips would primarily be concentrated during the shoulder peak hours (7 to 8 AM and 4 to 5 PM) and would be distributed among numerous pedestrian facilities (i.e. sidewalks, corner reservoirs, and crosswalks) in the area. Accordingly, there would not be a potential for significant adverse pedestrian impacts attributable to the projected construction worker pedestrian trips.

During Phase 2 construction of the North Block, existing pedestrian paths through that block would be temporarily disrupted. Currently those paths are not heavily patronized and have been assumed to maintain similar operational characteristics until the North Block is substantially completed. Therefore, the future 2021 Build condition pedestrian analyses presented in Chapter 14, "Transportation," conservatively allocated incremental pedestrian trips onto the area sidewalks (access through the prominent pedestrian corridor through the North Block would not be completed until the full build-out of the Proposed Project). This condition would also prevail throughout the construction of the North Block. Although the peak construction pedestrian increment during Phase 2 construction is expected to be less than that in Phase 1, the combination of the Phase 2 construction worker pedestrian trips and those generated by the completed Phase 1 project during the commuter peak hours would result in a comparable significant adverse impact at the southeast corner of University Place and Waverly Place, requiring the same mitigation measure described for the project's 2021 Phase 1 build-out.

Sidewalk protection or temporary sidewalks would be provided in accordance with NYCDOT requirements to maintain pedestrian access for most Phase 1 and Phase 2 construction periods. However, during Phase 1 construction of the Zipper building, the Mercer Street west sidewalk between Bleecker Street and West Houston Street would be closed. A pedestrian analysis was prepared to examine whether the redirected pedestrian flow can be adequately accommodated on adjacent pedestrian facilities. As summarized in **Table 20-10**, the analysis results show that the redirected pedestrian flow from this sidewalk closure could be adequately accommodated by Mercer Street's east sidewalk across from the Zipper building and would not result in a significant adverse pedestrian impact.

Table 20-10
2017 Construction Build Redirected Pedestrians Analysis

Location	Sidewalk	Effective Width (ft)	Peak Period	15-Minute Two-Way Volume	Non-Platoon Flow		Platoon Flow	
					PMF	LOS	PMF	LOS
Mercer Street between Bleecker Street and West Houston Street	East	8.2	AM	102	0.83	A	0.83	B
			Midday	372	3.02	A	3.02	C
			PM	346	2.81	A	2.81	B

Notes: Pedestrian volumes on the closed west sidewalk were reallocated to the intersection's east sidewalk for analysis.

AIR QUALITY

INTRODUCTION

Emissions from on-site construction equipment and on-road construction-related vehicles, and the effect of construction vehicles on background traffic congestion, have the potential to affect air quality. The analysis of potential impacts of the construction of the proposed project on air quality includes a quantitative analysis of both on-site and on-road sources of air emissions, and the overall combined impact of both sources, where applicable.

In general, most construction engines are diesel-powered, and produce relatively high levels of nitrogen oxides (NO_x) and particulate matter (PM). Construction activities also emit fugitive dust. Although diesel engines emit much lower levels of carbon monoxide (CO) than gasoline engines, the stationary nature of construction emissions and the large quantity of engines could lead to elevated CO concentrations, and impacts on traffic could increase mobile source-related emissions of CO as well. Therefore, the pollutants analyzed for the construction period are nitrogen dioxide (NO_2), particles with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}), particles with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$), and CO. Since ultra-low-sulfur diesel (ULSD) would be used for all diesel engines used in the construction of the proposed project, sulfur oxides (SO_x) emitted from those construction activities would be negligible. For more details on air pollutants, see Chapter 15, "Air Quality."

Construction activity in general, and large-scale construction in particular, has the potential to adversely affect air quality as a result of diesel emissions. The main component of diesel exhaust that has been identified as having an adverse effect on human health is fine PM. To ensure that the construction of the proposed project results in the lowest practicable diesel particulate matter (DPM) emissions, NYU will implement an emissions reduction program for all construction activities, consisting of the following components:

1. *Diesel Equipment Reduction.* Construction of the proposed project would minimize the use of diesel engines and use electric engines, to the extent practicable. Equipment that would use electric power instead of diesel engines would include, but not be limited to, concrete vibrators, and material/personnel hoists.
2. *Clean Fuel.* ULSD would be used exclusively for all diesel engines throughout the construction sites. This would enable the use of tailpipe reduction technologies (see below) and would directly reduce DPM and SO_x emissions.
3. *Best Available Tailpipe Reduction Technologies*. Nonroad diesel engines with a power rating of 50 horsepower (hp) or greater and controlled truck fleets (i.e., truck fleets under long-term contract with NYU) including but not limited to concrete mixing and pumping trucks, would utilize the best available tailpipe (BAT) technology for reducing DPM emissions. Diesel particulate filters (DPFs) have been identified as being the tailpipe technology currently proven to have the highest reduction capability. Construction contracts would specify that all diesel nonroad engines rated at 50 hp or greater would utilize DPFs, either installed on the engine by the original equipment manufacturer (OEM) or a retrofit DPF verified by the United States Environmental Protection Agency (USEPA) or the California Air Resources

Board, and may include active DPFs,[1] if necessary; or other technology proven to reduce DPM by at least 90 percent. This measure is expected to reduce site-wide tailpipe PM emissions by at least 90 percent.

4. *Utilization of Newer Equipment.* In addition to the tailpipe controls commitments, NYU's construction program would mandate the use of construction equipment rated Tier 3[2] or higher for all nonroad diesel engines with a power output of 50 hp or greater during Phase 1 of construction; and the use of Tier 4 rated engines during Phase 2 of construction.

   Tier 3 and 4 construction equipment would minimize emissions of NO_x. In addition, the use of newer engine models with lower PM emissions is expected to reduce the likelihood of DPF plugging due to soot loading (i.e., clogging of DPF filters by accumulating particulate matter). Additionally, while all engines undergo some deterioration over time, newer and better maintained engines will emit less PM than their older Tier or unregulated counterparts. Therefore, restricting site access to equipment with lower tailpipe emission values would enhance this emissions reduction program and implementation of DPF systems as well as reduce maintenance frequency due to soot loading (i.e., less downtime for construction equipment to replace clogged DPF filters).

5. *Source Location.* In order to reduce the resulting concentration increments at residential, academic, and open space locations, large emissions sources and activities such as concrete trucks and pumps would be located away from residential buildings, schools, and publicly accessible open spaces to the extent practicable. This measure would reduce potential concentration increments from on-site sources at such locations by increasing the distance between the emission sources and the sensitive locations, resulting in enhanced dispersion of pollutants.

   During the construction of the proposed Zipper Building, to the extent practicable, all construction engines would be located at least 15 feet away from the western construction fence. In addition, since the sidewalk on the west side of Mercer Street between Bleecker Street and West Houston Street would be closed during the construction of the Zipper Building, all gasoline engines used during this period of construction would be located on Mercer Street, away from accessible sidewalk locations. This measure would reduce the likelihood of these gasoline engines to be located immediately adjacent to the construction fence in areas that would lead to elevated CO concentrations at sidewalk locations.

[1] There are two types of DPFs currently in use: passive and active. Most DPFs currently in use are the "passive" type, which means that the heat from the exhaust is used to regenerate (burn off) the PM to eliminate the buildup of PM in the filter. Some engines do not maintain temperatures high enough for passive regeneration. In such cases, "active" DPFs can be used (i.e., DPFs that are heated either by an electrical connection from the engine, by plugging in during periods of inactivity, or by removal of the filter for external regeneration).

[2] The first federal regulations for new nonroad diesel engines were adopted in 1994, and signed by EPA into regulation in a 1998 Final Rulemaking. The 1998 regulation introduces Tier 1 emissions standards for all equipment 50 hp and greater and phases in the increasingly stringent Tier 2 and Tier 3 standards for equipment manufactured in 2000 through 2008. In 2004, the EPA introduced Tier 4 emissions standards with a phased-in period of 2008 to 2015. The Tier 1 through 4 standards regulate the EPA criteria pollutants, including particulate matter (PM), hydrocarbons (HC), oxides of nitrogen (NO_x) and carbon monoxide (CO). Prior to 1998, emissions from nonroad diesel engines were unregulated. These engines are typically referred to as Tier 0.

Similarly, all gasoline engines used during the construction of the Bleecker Building would be located away from accessible sidewalk locations, to the extent practicable.

During Phase 2 of construction, all diesel construction engines would be located at least 50 feet away from the Washington Square Village Buildings 1 and 2 and the Washington Square Village Buildings 3 and 4, to the extent practicable. This measure would reduce potential concentration increments from on-site sources at such locations by increasing the distance between the emission sources and the sensitive locations, resulting in enhanced dispersion of pollutants.

6. *Dust Control.* Strict fugitive dust control plans will be required as part of contract specifications. For example, stabilized truck exit areas would be established for washing off the wheels of all trucks that exit the construction sites. Truck routes within the sites 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 re-suspension of dust. All trucks hauling loose material will be equipped with tight fitting tailgates and their loads securely covered prior to leaving the sites. In addition to regular cleaning by the City, streets adjacent to the sites would be cleaned as frequently as needed. Chutes would be used for material drops during demolition. An on-site vehicular speed limit of 5 mph would be imposed. Water sprays will be used for all excavation, demolition, and transfer of spoils to ensure that materials are dampened as necessary to avoid the suspension of dust into the air. Loose materials will be watered, stabilized with a biodegradable suppressing agent, or covered. The fugitive emissions reduction program would reduce dust emissions by at least 50 percent for demolition, excavation, stockpiles, and handling of materials.
7. *Idle Restriction.* In addition to adhering to the local law restricting unnecessary idling on roadways, on-site vehicle idle time will also 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.

Additional measures would be taken to reduce pollutant emissions during construction of the proposed project in accordance with all applicable laws, regulations, and building codes. Overall, this program is expected to significantly reduce DPM emissions by more than the reduction that would be achieved by applying the currently defined best available control technologies under New York City Local Law 77, which are required only for publically funded City projects.

As discussed in Chapter 15, "Air Quality," EPA recently established a 1-hour average standard for NO_2. Great uncertainty exists as to 1-hour NO_2 background concentrations at ground level, especially near roadways, since these concentrations have not been measured. In addition, there are no clear methods to predict the rate of transformation of NO to NO_2 at ground-level given the level of existing data and models. Therefore, the significance of predicted construction impacts cannot be determined based on comparison with the new 1-hour NO_2 NAAQS since total 98th percentile values, including local area roadway contributions, cannot be estimated. In addition, methods for accurately predicting 1-hour NO_2 concentrations from construction activities have not been developed. However, exceedances of the 1-hour NO_2 standard resulting from construction activities cannot be ruled out and therefore, as discussed above, non-road diesel-powered vehicles and construction equipment rated Tier 3 or higher would be used during Phase 1 of construction and Tier 4 equipment would be used during Phase 2 of construction to reduce NO_x emissions. The electrification, source location and idling restrictions mentioned above would also reduce NO_X emissions and NO_2 concentration levels.

METHODOLOGY

Chapter 15, "Air Quality," contains a review of the pollutants for analysis; applicable regulations, standards, and benchmarks; and general methodology for stationary and mobile source air quality analyses. Additional details relevant only to the construction air quality analysis methodology are presented in the following section.

CEQR Technical Manual state that the significance of a likely consequence (i.e., whether it is material, substantial, large, or important) should be assessed in connection with its setting (e.g., urban or rural), its probability of occurrence, its duration, its irreversibility, its geographic scope, its magnitude, and the number of people affected. In terms of the magnitude of air quality impacts, an action predicted to increase the concentration of a criteria air pollutant to a level that would exceed the NAAQS, or increase the concentration of $PM_{2.5}$ above the interim guidance thresholds, could have an adverse impact of significant magnitude. The factors identified above would then be considered in determining the overall significance of the potential impact.

On-Site Construction Activity Assessment

To determine which construction periods constitute the worst-case periods for the pollutants of concern (PM, CO, NO_2), construction-related emissions were calculated throughout the duration of construction on an annual and peak day basis for $PM_{2.5}$. $PM_{2.5}$ was selected for determining the worst-case periods for all pollutants as analyzed, because the ratio of $PM_{2.5}$ emissions to impact criteria is higher than for other pollutants. Therefore, initial estimates of $PM_{2.5}$ emissions throughout the construction years were used for determining the worst-case periods for analysis of all pollutants. Generally, emission patterns of PM_{10} and NO_2 would follow $PM_{2.5}$ emissions, since they are related to diesel engines by horsepower (hp). CO emissions may have a somewhat different pattern but generally would also be highest during periods when the most activity would occur. Based on the resulting multi-year profiles of annual average and peak day average emissions of $PM_{2.5}$, and the proximity of the construction activities to residences, academic buildings, and publicly accessible open spaces, a worst-case year and a worst-case short-term period for Phase 1 and Phase 2 were identified for dispersion modeling of annual and short-term (i.e., 24-hour, 8-hour, and 1-hour) averaging periods. Dispersion of the relevant air pollutants from the site during these periods was then analyzed, and the highest resulting concentrations are presented in the following sections. Broader conclusions regarding potential concentrations during other periods, which were not modeled, are presented as well, based on the multi-year emissions profiles and the worst-case period results.

The general methodology for stationary source modeling (regarding model selection, receptor placement, and meteorological data) presented in Chapter 15 was followed for modeling dispersion of pollutants from on-site sources during the construction period.

The sizes, types, and number of construction equipment were estimated based on the construction activity schedule. Emission factors for NO_x, CO, PM_{10}, and $PM_{2.5}$ from on-site construction engines were developed using the EPA's NONROAD2008 Emission Model (NONROAD). Since emission factors for concrete pumps are not available from either the EPA MOBILE6.2 emission model (MOBILE6) or NONROAD, emission factors specifically developed for this type of application were used.[1] With respect to trucks, emission rates for NO_X, CO, PM_{10}, and $PM_{2.5}$ for truck engines were developed using MOBILE6.

As described in the introduction above, NYU has committed to a number of measures to substantially reduce air pollutant emissions during construction of the proposed project, with special attention given to DPM. These measures include the exclusive use of ULSD for all construction engines, the use of Tier 3 or newer equipment with DPFs (OEM or the equivalent tailpipe controls to reduce DPM emissions by at least 90 percent compared with normal private construction practices) during Phase 1 of construction on all nonroad construction engines with an engine output rating of 50 hp or greater; and the use of Tier 4 equipment during Phase 2 of construction. In addition, controlled truck fleets (i.e., truck fleets under long-term contract, such as concrete trucks) would only use trucks equipped with DPFs.

Based on NYU's commitments, emission factors for the construction of the proposed project were calculated assuming the exclusive use of ULSD, diesel engines of Tier 3 certification for Phase 1, diesel engines of Tier 4 certification for Phase 2, and the application of DPFs on all nonroad diesel engines 50 hp or greater and on concrete delivery and pumping trucks; other trucks were assumed to have emissions consistent with the general truck fleet (all on-road diesel vehicles currently use ULSD, as mandated by federal regulations). During Phase 1 of construction, $PM_{2.5}$ emission factors for engines retrofit with a DPF (i.e., all nonroad engines with a power output of 50 hp or greater and all concrete delivery trucks) were calculated as 10 percent of the NONROAD Tier 3 emission factors. During Phase 2 of construction, NONROAD Tier 4 emissions factors were used (these engines include OEM installed DPF, reflected in the NONROAD emission factors). The emission factors specifically developed for concrete pump trucks were also reduced by 90 percent to account for the DPFs. All personnel/material hoists and small hand tools would be electric and would therefore have no associated emissions.

In addition to engine emissions, fugitive dust emissions from operations (e.g., excavation and loading excavated materials into dump trucks) were calculated based on EPA procedures delineated in AP-42 Table 13.2.3-1. It was estimated that the planned control of fugitive emissions would reduce PM emissions from such processes by 50 percent. Vehicle speeds on-site would be limited to 5 miles per hour to avoid the re-suspension of dust, and a robust watering program would be implemented for all demolition, excavation, and transfer of loose materials to and from trucks.

The resulting emission factors were used for the emissions and dispersion analyses. Average annual (running 12-month averages) and peak-day $PM_{2.5}$ engine emissions profiles for the entire duration of the construction were prepared by multiplying the above emission rates by the number of engines, the work hours per day, and fraction of the day each engine would be expected to work during each month. The resulting overall peak day and annual average emission profiles are presented in **Figures 20-8** through **Figure 20-11**.

Based on the $PM_{2.5}$ construction emissions profiles, peak short-term and annual periods in each construction phase were selected for modeling, representing the reasonable worst case for each

[1] Concrete pumps are truck mounted and use the truck engine to power the pumps at high load. This application of truck engines is not addressed by the MOBILE6 model, and since it is not a non-road engine, it is not included in the NONROAD model. Emission factors were obtained from a study which developed factors specifically for this type of activity. *FEIS for the Proposed Manhattanville in West Harlem Rezoning and Academic Mixed-Use Development*, CPC–NYCDCP, November 16, 2007.

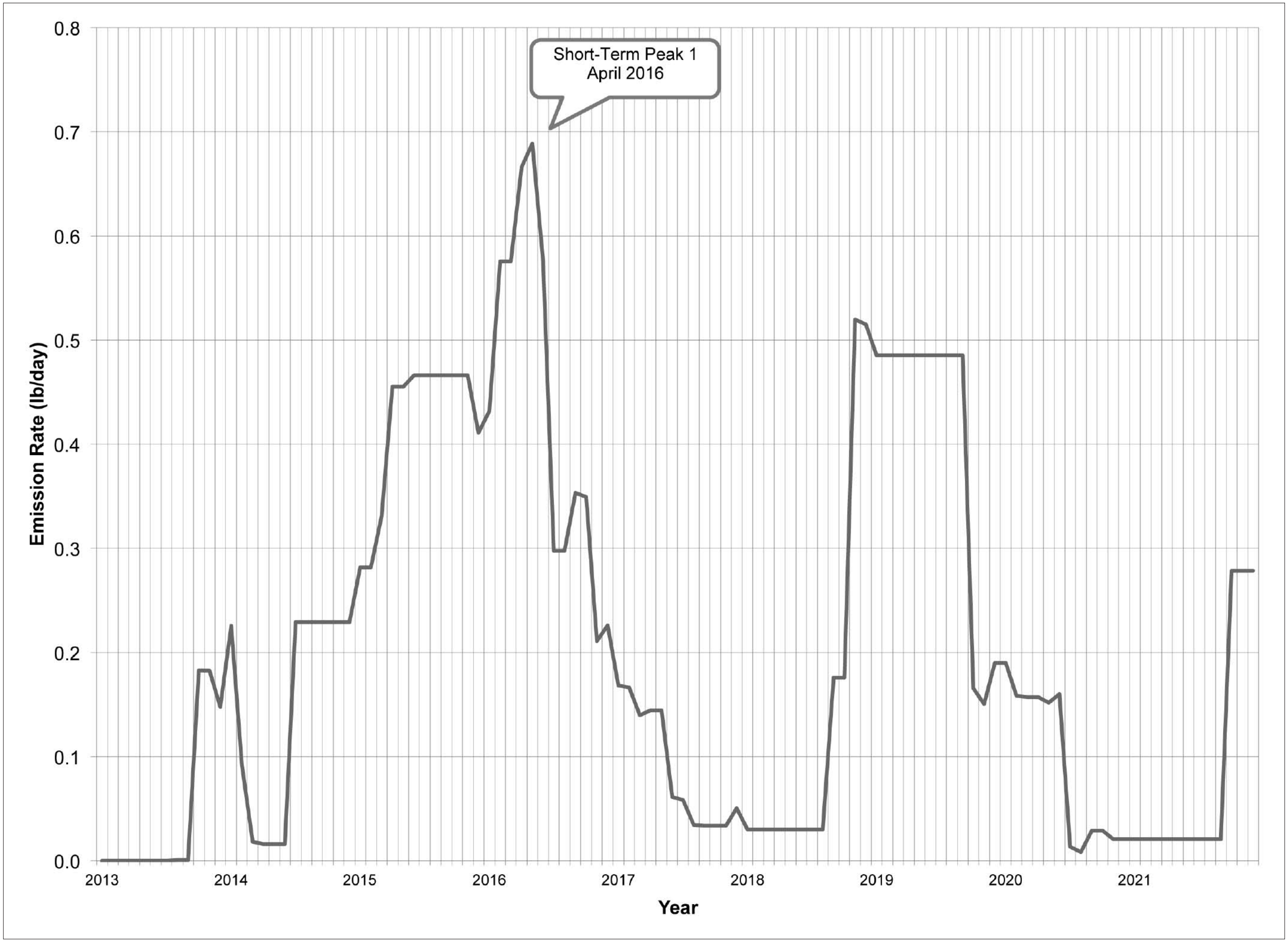


Figure 20-8
Short-Term (24-Hour Average) $PM_{2.5}$
Construction Emissions Profile, Phase 1

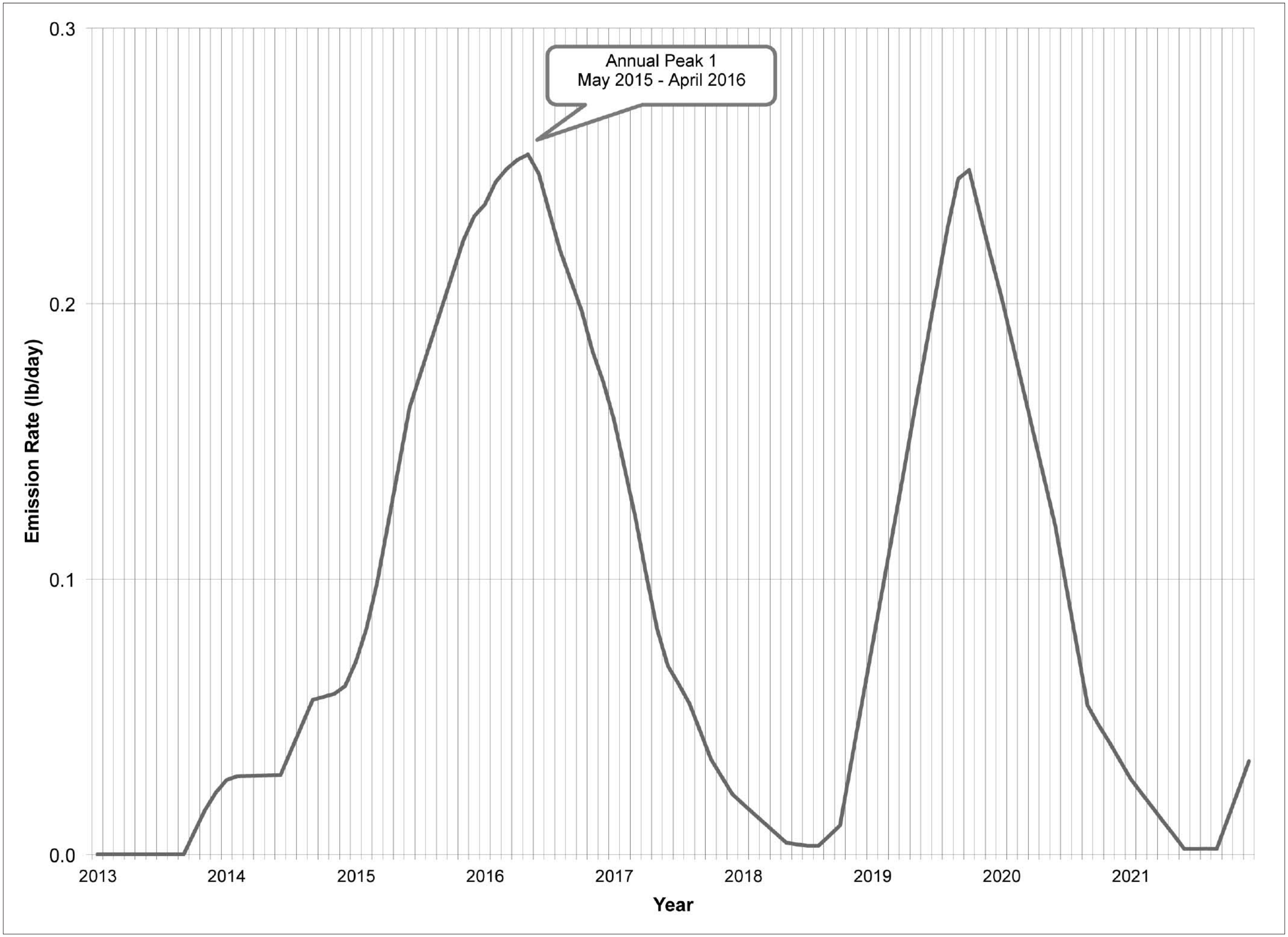


Figure 20-9
Annual (Moving 12-Month Average) $PM_{2.5}$ Construction Emissions Profile, Phase 1

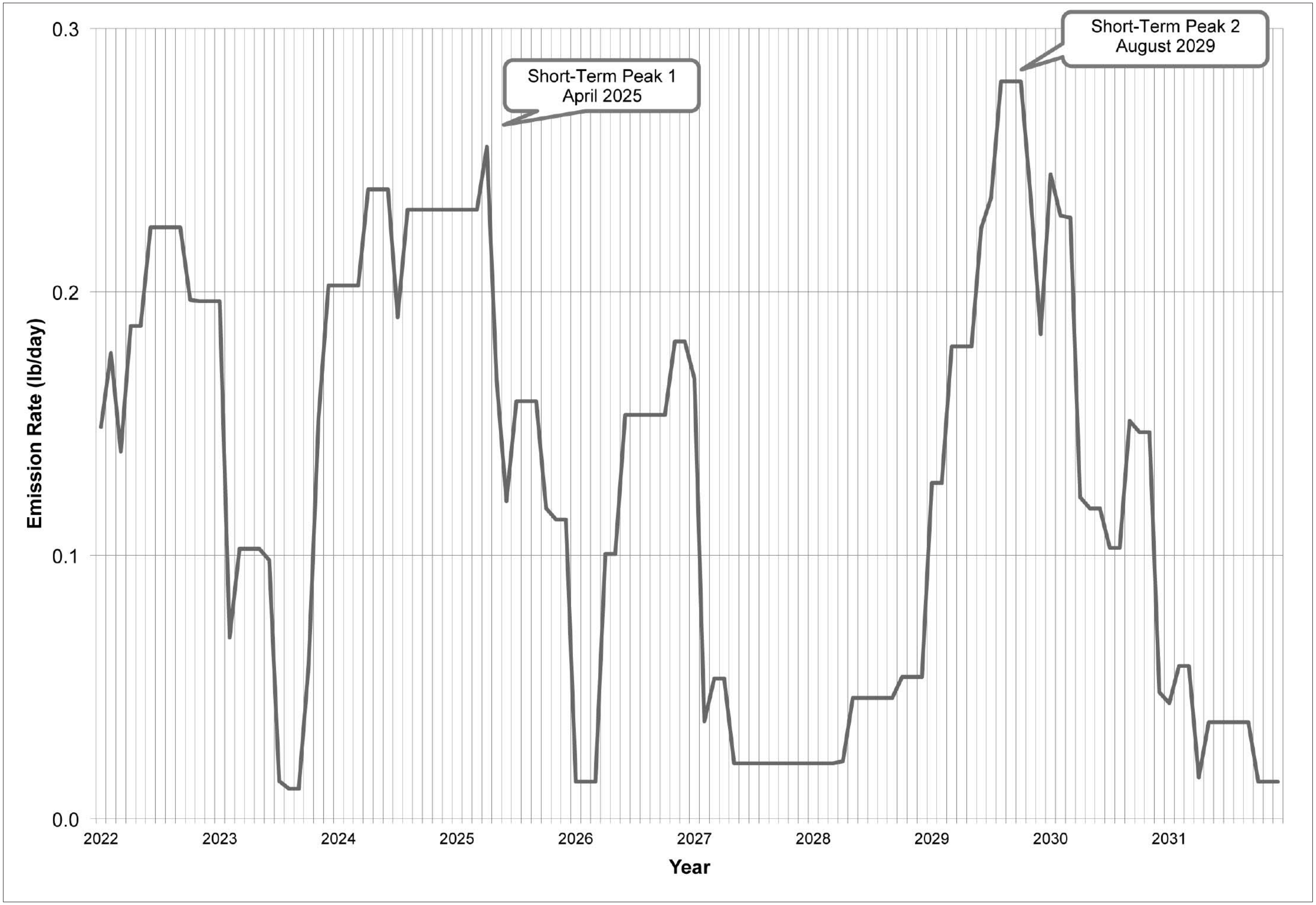


Figure 20-10

Short-Term (24-Hour Average) $PM_{2.5}$
Construction Emissions Profile, Phase 2

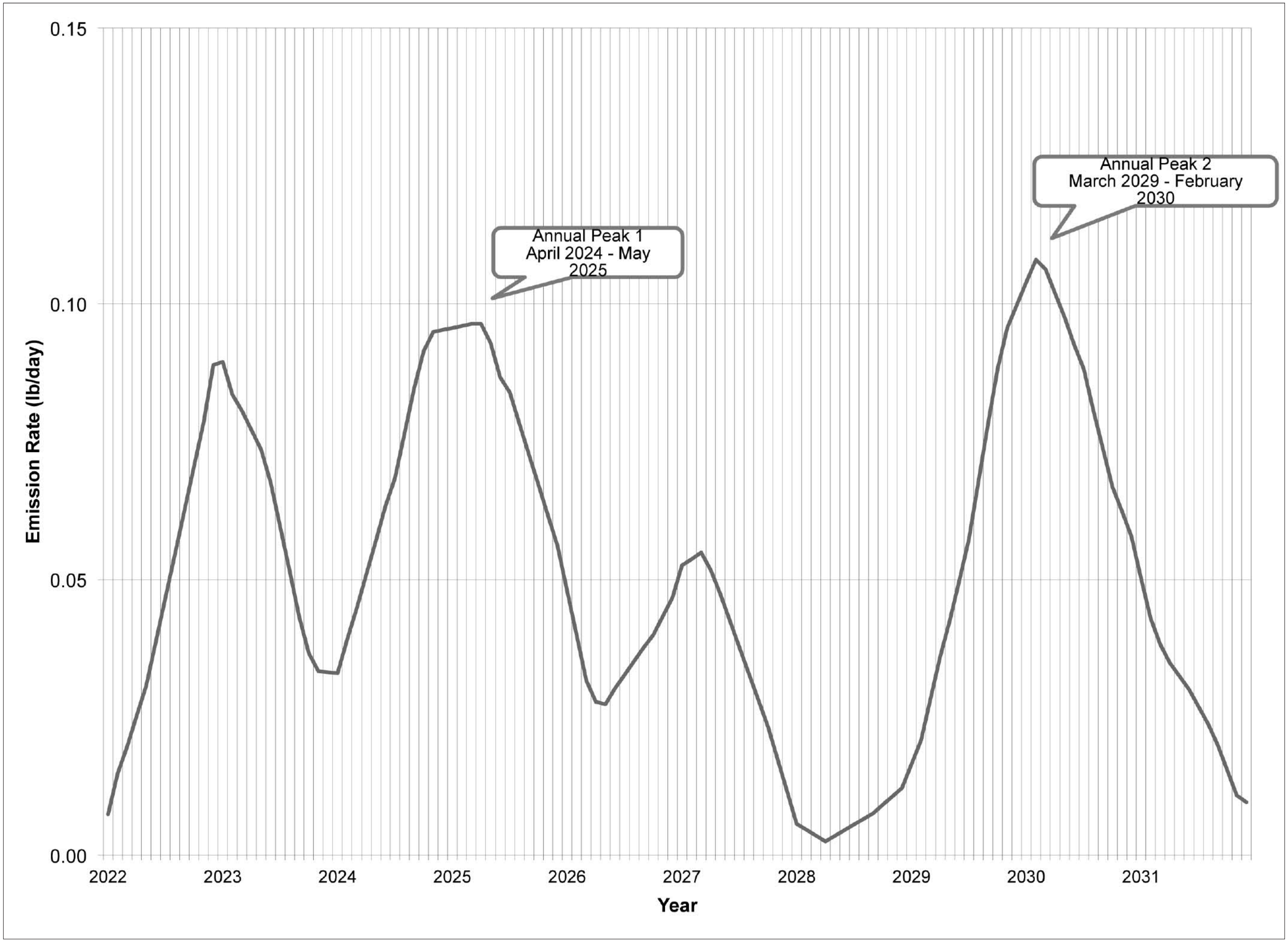


Figure 20-11
Annual (Moving 12-Month Average) $PM_{2.5}$ Construction Emissions Profile, Phase 2

phase. April 2016 and the year from May 2015 to April 2016 were identified as the worst-case short-term and annual periods for Phase 1, respectively, since the highest project-wide emissions were predicted in these periods during Phase 1 of construction, and the construction of the Zipper Building will take place in close proximity to residential locations during these periods. August 2029 and the year from March 2029 to February 2030 were identified as the worst-case short-term and annual periods for Phase 2, respectively, since the highest project-wide emissions were predicted in these periods during Phase 2 of construction, and the construction of the below-grade structure for the LaGuardia Building will take place in close proximity to all of the Washington Square Village buildings during these periods. In addition, one short-term period—April 2025, and one annual period—the year from May 2024 to April 2025, were also analyzed for Phase 2. Although overall construction emissions during this secondary period would be slightly lower than the overall Phase 2 peak periods in 2029, this period would include construction activities for the Mercer Building directly south of the Washington Square Village Buildings 1 and 2 and directly north of the Washington Square Village Building 3 and 4. The selected analysis periods are indicated in **Figures 20-8** through **20-11**.

The dispersion of pollutants during the worst-case short-term and annual periods was then modeled in detail to predict resulting maximum concentration increments from construction activity and total concentrations (including background concentrations) in the surrounding area.

Although the modeled results are based on construction scenarios for specific sample periods, conclusions regarding other periods, such as the construction of the Washington Square Village parking garage, were derived based on the fact that lower concentration increments from construction would generally be expected during periods with lower construction emissions. As presented in **Figures 20-8** through **20-11**, emissions during other periods would be lower—often much lower—than the peak emissions. However, since the worst-case short-term results may often be indicative of very local impacts, similar maximum local impacts may occur at any stage at various locations but would not persist in any single location, since emission sources would not be located continuously at any single location throughout construction. Equipment would move throughout the site as construction progresses.

For the short-term model scenarios, predicting concentration averages for periods of 24 hours or less, all stationary sources, such as compressors, pumps, or concrete trucks, which idle in a single location while unloading, were simulated as point sources. Other engines, which would move around the site on any given day, were simulated as area sources. For periods of 8 hours or less (less than the length of a shift), it was assumed that all engines would be active simultaneously. With the exception of tower cranes, all sources would move around the site throughout the year and were therefore simulated as area sources in the annual analyses.

Receptors (locations in the model where concentrations are predicted) were placed along the sidewalks surrounding the construction sites on both sides of the street at locations that would be publicly accessible, at residential and other sensitive uses at both ground-level and elevated locations (e.g., residential windows), and at open spaces. In addition, a ground-level receptor grid was placed to enable extrapolation of concentrations throughout the entire area at locations more distant from the construction sites. For the modeling of Phase 2 conditions, receptors were also placed on completed elements of the NYU development adjacent to the construction.

Mobile Source Assessment

The general methodology for mobile source modeling presented in Chapter 15 was followed for intersection modeling during the construction period. The CAL3QHC model was used to perform mobile source CO computations, while CAL3QHCR, a refined version of the CAL3QHC model, was used to determine motor vehicle generated PM concentrations.

Based on the predicted traffic conditions, the traffic scenarios for the first quarter of 2017 and the third quarter of 2026 were determined to demonstrate the highest overall volumes of construction-related vehicles and traffic disruptions, such as street or lane closures; these periods would generally represent the highest potentials for air quality impacts. These worst-case periods were also used to demonstrate the highest predicted mobile source CO and PM increments for all other construction periods when added to the concurrent on-site emissions from construction equipment and activity; this is a conservative assumption, since concentration increments from mobile sources during periods with lower vehicle increments would be lower.

Sites for mobile source analysis were selected based on the construction model scenarios and truck trip assignments analyzed for the assessment of traffic impacts during construction. The sites were chosen with the objective of capturing the highest construction-related concentration increment, the highest expected increments at locations where background concentrations were predicted to be high in the No Build condition, and the mobile source increments in areas near the project site at intersections where relatively high increments are predicted from on-site construction activity. Based on those criteria, one intersection was selected for CO and PM modeling in each construction phase, as presented in **Table 20-11** and shown in **Figure 20-12**.

Table 20-11
Mobile Source Analysis Sites

Analysis Site	Intersection
1	West Houston Street and Mercer Street
2	Bleecker Street and Mercer Street

Cumulative Assessment

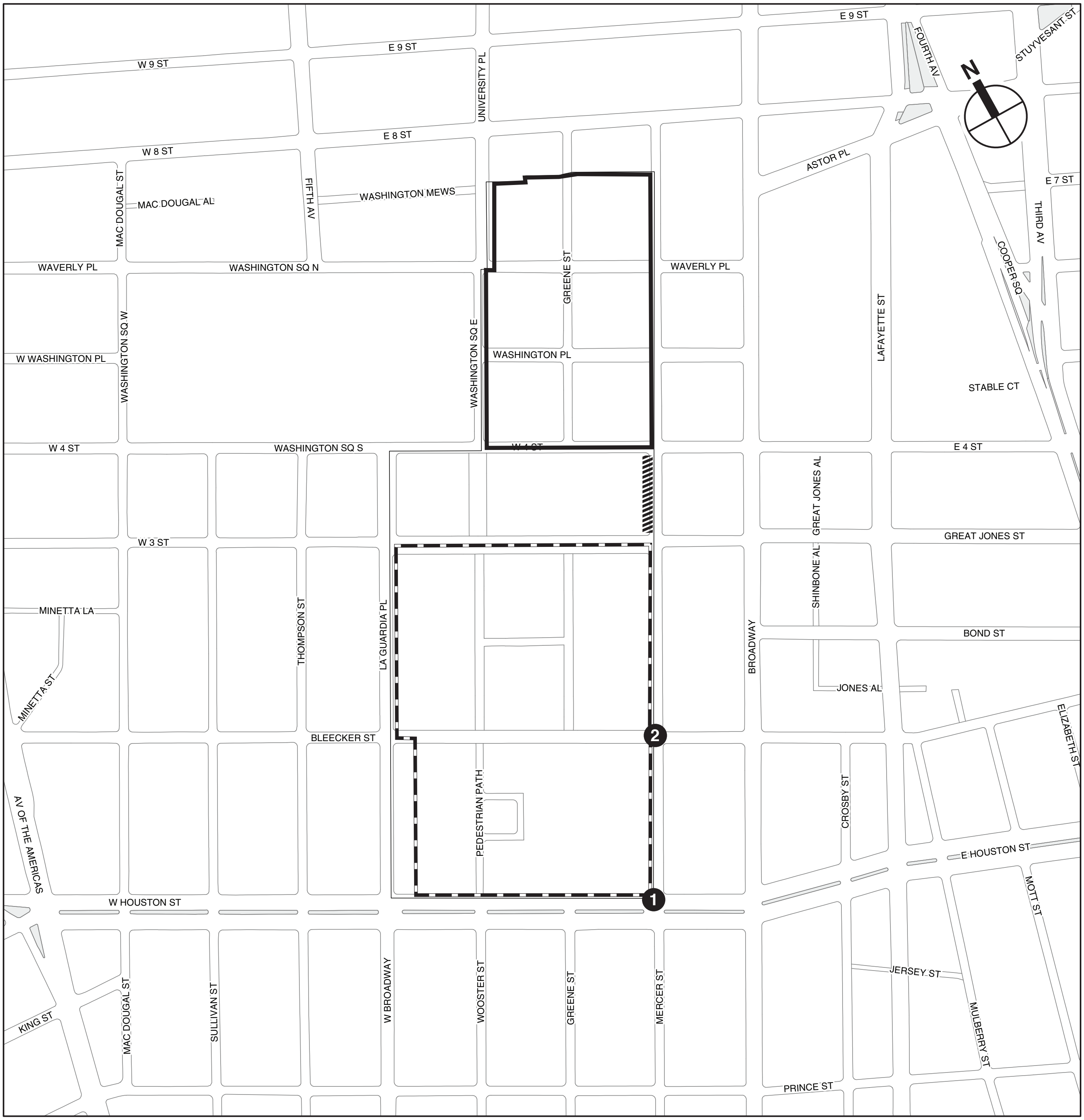
Since emissions from on-site construction equipment and on-road construction-related vehicles may contribute to concentration increments concurrently, a cumulative assessment was undertaken to determine the potential maximum effect of these sources combined. Total cumulative concentration increments were estimated by adding the highest results from the on-site construction analysis and mobile source analysis. The mobile source and stationary source analyses are performed separately with different dispersion models, as appropriate for the different types of analyses. The combination of the highest results is therefore a conservatively high estimate of potential impacts, since it is likely that the highest results from different sources would occur under different meteorological conditions (e.g., different wind direction and speed) and would not actually occur simultaneously.

FUTURE WITHOUT THE PROPOSED ACTIONS

Background Air Quality

In the future without the Proposed Actions, air quality is anticipated to be similar to that described for existing conditions. Land uses are expected to remain generally the same in this neighborhood in Manhattan. Since air quality regulations mandated by the Clean Air Act are anticipated to maintain or improve air quality in the region, it can be expected that air quality conditions in the future without the Proposed Actions would be no worse than those that presently exist.

12.7.11



Proposed Development Area Boundary

Commercial Overlay Area Boundary

Mercer Plaza Area

1 West Houston Street/Mercer Street

2 Bleecker Street/Mercer Street

0 200 500 FEET

SCALE

NYU Core

Air Quality Mobile Source Analysis Sites

Figure 20-12

Mobile Source Assessment

CO

CO concentrations without the Proposed Actions were determined using the methodology previously described. **Table 20-12** shows future maximum predicted 8-hour average CO concentrations at the analysis intersections without the Proposed Actions. The values shown are the highest predicted concentrations for the receptor locations for any of the time periods analyzed. As indicated in **Table 20-12**, the predicted 8-hour concentrations of CO, including background, are below the corresponding ambient air quality standard.

Table 20-12
Maximum Predicted Future No Build
8-Hour Average Carbon Monoxide Concentrations

Analysis Site	Location	8-Hour Concentration (ppm)	NAAQS (ppm)
1	West Houston Street and Mercer Street	3.1	9
2	Bleecker Street and Mercer Street	2.0	9
Note:	An adjusted ambient background concentration of 1.8 ppm is included in the No Build values presented above.		

PM

Concentrations of PM_{10} and $PM_{2.5}$ from mobile sources without the Proposed Actions were also determined at the intersections of West Houston Street and Mercer Street, and Bleecker Street and Mercer Street. Concentrations of PM_{10} included a 24-hour averaging period and $PM_{2.5}$ included the 24-hour and annual averaging periods. As shown in **Table 20-13**, including a background concentration of 53 $\mu g/m^3$, the maximum PM_{10} 24-hour No Build concentration is predicted to be approximately 78.3 $\mu g/m^3$ and is below the applicable NAAQS of 150 $\mu g/m^3$. Note that $PM_{2.5}$ concentrations for No Build condition are not presented, since impacts are assessed on an incremental basis.

Table 20-13
Maximum Predicted Future No Build
24-Hour Average PM_{10} Concentrations

Analysis Site	Location	24-Hour Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
1	West Houston Street and Mercer Street	78.3	150
2	Bleecker Street and Mercer Street	72.4	150
Note:	An adjusted ambient background concentration of 53 $\mu g/m^3$ is included in the No Build values presented above.		

FUTURE WITH THE PROPOSED ACTIONS

On-Site Construction Activity Assessment – Phase 1

Maximum predicted concentration increments from NYU construction during Phase 1, and overall concentrations including background concentrations, are presented in **Table 20-14**. For $PM_{2.5}$, monitored concentrations are not added to modeled concentrations from sources, since impacts are determined by comparing the predicted increment from the Proposed Actions as compared to the No Build with the interim guidance criteria. The total maximum combined concentrations, including mobile sources and construction, are presented in the “Cumulative Assessment” section, below.

Table 20-14
Maximum Predicted Pollutant Concentrations from Construction Site Sources—Phase 1 (μg/m³)

Pollutant	Averaging Period	No Build	Proposed Actions	Increment	Interim Guidance Threshold	NAAQS
Residence, Academic Buildings or Open Space						
$PM_{2.5}$	24-hour[2]	—	—	2.2 [4]	2 [3]	35 [1]
	Annual Local[2]	—	—	0.14	0.3	15
PM_{10}	24-hour	53	58	5	—	150
NO_2	Annual	68	69	1	—	100
CO	1-hour	2.3 ppm	5.7 ppm	3.4 ppm	—	35 ppm
	8-hour	1.8 ppm	2.1 ppm	0.3 ppm	—	9 ppm
Sidewalks and Covered Walkways Adjacent to Construction						
$PM_{2.5}$	24-hour[2]	—	—	3.0 [4]	2 [3]	35 [1]
	Annual Local[2]	—	—	0.24	0.3	15
PM_{10}	24-hour	53	61	8	—	150
NO_2	Annual	68	70	2	—	100
CO	1-hour	2.3 ppm	7.4 ppm	5.1 ppm	—	35 ppm
	8-hour	1.8 ppm	2.4 ppm	0.6 ppm	—	9 ppm

Notes:

Results for any other time period during Phase 2, or locations other than these sites, would be lower.

$PM_{2.5}$ concentration increments should be compared with threshold values. Total concentrations should be compared with the NAAQS.

1 EPA has reduced the 24-hour $PM_{2.5}$ standard from 65 μg/m³ to 35 μg/m³ and revoked the annual PM_{10} standard, effective December 18, 2006. A full discussion of the NAAQS can be found in Chapter 15, "Air Quality."

2 Monitored concentrations are not added to modeled $PM_{2.5}$ values.

3 DEP is currently applying threshold criteria for assessing the significance of 24-hour average $PM_{2.5}$ impacts. The significance of temporary concentration increments greater than 2 μg/m³ is assessed in the context of the magnitude, frequency, duration, location and size of area affected by the concentration increment.

4 This value exceeds the interim guidance threshold level. See text for further discussion.

The maximum predicted total concentrations of PM_{10}, CO, and annual-average NO_2 are not expected to exceed the NAAQS.

From the on-site sources related to the construction, the maximum predicted 24-hour average $PM_{2.5}$ incremental concentration occurred at a near-side sidewalk receptor location immediately adjacent to the construction, as shown in Figure AQ-1 in **Appendix E-3**. The maximum frequency of predicted concentrations above 2.0 μg/m³ at this location would be four occurrences in a single year (using five years of meteorological data). It should be noted that the maximum increments, predicted at sidewalks and covered walkways adjacent to construction, are overstated, since they do not include the effect of the solid fence and sidewalk protection on mixing. The location of the maximum 24-hour average increments would vary based on the location of the sources, which would move throughout the site over time. Therefore, 24-hour exceedances would not be likely to occur at any one location more than once. Based on the limited duration and extent of these predicted exceedances, the low frequency of occurrence, and the limited potential for exposure, this would not result in significant adverse impacts.

Maximum predicted 24-hour average $PM_{2.5}$ concentration increments at sensitive receptor locations (e.g., residential buildings or open space locations) exceeded 2 μg/m³ at only one location: the residential building located at 200 Mercer Street, as shown in Figure AQ-1 in **Appendix E-3**. The potential for 24-hour $PM_{2.5}$ concentration increments greater than 2 μg/m³ at this residential receptor location was projected on only one day in five years of meteorological data, and therefore is unlikely to occur since the probability of the peak daily activity occurring on a day with precisely those meteorological conditions is very low. Based on the limited extent, frequency, and duration of these predicted $PM_{2.5}$ levels, they are not considered to be significant adverse impacts.

These maximum increments were computed for the peak construction period; for other construction time periods with lesser emissions, the potential 24-hour increments would be less.

The maximum predicted neighborhood-scale annual average $PM_{2.5}$ concentration would be 0.01 $\mu g/m^3$—lower than the interim guidance threshold level of 0.1 $\mu g/m^3$, and the maximum predicted local annual average $PM_{2.5}$ concentration would be less than the applicable interim guidance threshold.

On-Site Construction Activity Assessment – Phase 2

Maximum predicted concentration increments from project construction during Phase 2, and overall concentrations including background concentrations, are presented in **Table 20-15**. For $PM_{2.5}$, monitored concentrations are not added to modeled concentrations from sources, since impacts are determined by comparing the predicted changes between the Proposed Actions and the No Build with the interim guidance criteria. The total maximum combined concentrations, including mobile sources and construction, are presented in the "Cumulative Assessment" section, below.

Table 20-15
Maximum Predicted Pollutant Concentrations from Construction Site Sources—Phase 2 ($\mu g/m^3$)

Pollutant	Averaging Period	No Build	Proposed Actions	Increment	Interim Guidance Threshold	NAAQS
Residence, Academic Buildings or Open Space						
$PM_{2.5}$	24-hour[2]	—	—	1.7	2 [3]	35 [1]
	Annual Local[2]	—	—	0.08	0.3	15
PM_{10}	24-hour	53	57	4	—	150
NO_2	Annual	68	70	2	—	100
CO	1-hour	2.3 ppm	3.0 ppm	0.7 ppm	—	35 ppm
	8-hour	1.8 ppm	1.9 ppm	0.1 ppm	—	9 ppm
Sidewalks and Covered Walkways Adjacent to Construction						
$PM_{2.5}$	24-hour[2]	—	—	1.3	2 [3]	35 [1]
	Annual Local[2]	—	—	0.14	0.3	15
PM_{10}	24-hour	53	59	6	—	150
NO_2	Annual	68	71	3	—	100
CO	1-hour	2.3 ppm	4.1 ppm	1.8 ppm	—	35 ppm
	8-hour	1.8 ppm	2.1 ppm	0.3 ppm	—	9 ppm

Notes:
Results for any other time period during Phase 2, or locations other than these sites, would be lower.
$PM_{2.5}$ concentration increments should be compared with threshold values. Total concentrations should be compared with the NAAQS.
1 EPA has reduced the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ and revoked the annual PM_{10} standard, effective December 18, 2006. A full discussion of the NAAQS can be found in Chapter 15, "Air Quality."
2 Monitored concentrations are not added to modeled $PM_{2.5}$ values.
3 DEP is currently applying threshold criteria for assessing the significance of 24-hour average $PM_{2.5}$ impacts. The significance of temporary concentration increments greater than 2 $\mu g/m^3$ is assessed in the context of the magnitude, frequency, duration, location and size of area affected by the concentration increment.

The maximum predicted total concentrations of PM_{10}, CO, and annual-average NO_2 are not expected to exceed the NAAQS.

From the on-site sources related to the construction in Phase 2, there were no predicted 24-hour average $PM_{2.5}$ concentration increments greater than 2 $\mu g/m^3$ at residences or other locations, where exposure for periods of 24-hours or more can be reasonably expected. Local annual average $PM_{2.5}$ concentration increments would not exceed the threshold level of 0.3 µg/m^3. The highest annual average neighborhood-scale $PM_{2.5}$ increment would potentially reach 0.003 µg/m^3, which is lower than the threshold level of 0.1 µg/m^3.

Mobile Source Assessment

A mobile source air quality analysis was conducted for the project during construction activities at the site for the peak construction traffic year of 2017. Localized pollutant impacts from the vehicles queuing at the selected intersection were analyzed for CO for the 8-hour averaging period. PM_{10} was analyzed for the 24-hour averaging period and $PM_{2.5}$ was analyzed for the 24-hour and annual averaging periods.

CO

CO concentrations with the Proposed Actions were determined using the methodology previously described. **Table 20-16** shows the future maximum predicted 8-hour average CO concentration with the Proposed Actions at the analysis intersections studied. (No 1-hour values are shown, since no exceedances of the NAAQS would occur and the *de minimis* criteria are only applicable to 8-hour concentrations; therefore, the 8-hour values are the most critical for impact assessment.) The values shown are the highest predicted concentrations for the time periods analyzed. In addition, the incremental increases in 8-hour average CO concentrations are very small, and consequently would not result in a violation of the CEQR *de minimis* CO criteria. Therefore, the Proposed Actions would not result in any significant CO air quality impacts in the Build condition.

Table 20-16
Maximum Predicted Future No Build and Build
8-Hour Average Carbon Monoxide Concentrations

Analysis Site	Location	No Build 8-Hour Concentration (ppm)	Build 8-Hour Concentration (ppm)	NAAQS (ppm)
1	West Houston Street and Mercer Street	3.1	3.1	9
2	Bleecker Street and Mercer Street	2.0	2.0	9
Note:	An adjusted ambient background concentration of 1.8 ppm is included in the No Build values presented above.			

PM

Concentrations of PM_{10} and $PM_{2.5}$ from mobile sources with the Proposed Actions were also determined at the intersections of West Houston Street and Mercer Street, and Bleecker Street and Mercer Street. **Table 20-17** shows the future maximum predicted 24-hour average PM_{10} concentrations with the Proposed Actions. The values shown are the highest predicted concentrations for all locations analyzed and include the ambient background concentrations. The results indicate that the Proposed Actions would not result in any violations of the PM_{10} standard or any significant adverse impacts on air quality.

Table 20-17
Maximum Predicted Future No Build and Build
24-Hour Average PM_{10} Concentrations

Analysis Site	Location	No Build 24-Hour Concentration (µg/m^3)	Build 24-Hour Concentration (µg/m^3)	NAAQS (µg/m^3)
1	West Houston Street and Mercer Street	78.3	78.3	150
2	Bleecker Street and Mercer Street	72.4	72.5	150
Note:	An adjusted ambient background concentration of 53 µg/m^3 is included in the No Build values presented above.			

Future maximum predicted 24-hour and annual average $PM_{2.5}$ concentration increments were calculated so that they could be compared to the interim guidance criteria that would determine the potential significance of any impacts from the Proposed Actions. Based on this analysis, the maximum predicted localized 24-hour average and neighborhood-scale annual average incremental $PM_{2.5}$ concentrations are presented in **Tables 20-18** and **20-19**, respectively. The results show that the annual and daily (24-hour) $PM_{2.5}$ increments are predicted to be well below the interim guidance criteria and, therefore, the Proposed Actions would not result in significant $PM_{2.5}$ impacts at the analyzed receptor locations.

Table 20-18
Maximum Predicted Future
24-Hour Average $PM_{2.5}$ Concentrations

Analysis Site	Location	Increment (μg/m^3)	Interim Guidance Threshold (μg/m^3)
1	West Houston Street and Mercer Street	0.02	5/2
2	Bleecker Street and Mercer Street	0.02	5/2
Note: $PM_{2.5}$ interim guidance criteria—24-hour average, 2 μg/m^3 (5 μg/m^3 not-to-exceed value).			

Table 20-19
Maximum Predicted Future
Annual Average $PM_{2.5}$ Concentrations

Analysis Site	Location	Increment (μg/m^3)	Interim Guidance Threshold (μg/m^3)
1	West Houston Street and Mercer Street	0.004	0.1
2	Bleecker Street and Mercer Street	0.003	0.1
Note: $PM_{2.5}$ interim guidance criteria—annual (neighborhood scale) 0.1 μg/m^3.			

Cumulative Assessment

A mobile source analysis of CO impacts for the intersection of West Houston and Mercer Streets indicated that a maximum predicted concentration would occur at receptors placed along the sidewalks adjacent to this intersection in Phase 1. Modeled impacts from the stationary source construction activities in Phase 1 included a maximum predicted CO concentration of 2.4 ppm (including background). Total cumulative concentrations of CO for both mobile and stationary sources (conservatively combining two different peak analysis periods) is estimated to be 3.7 ppm, which is less than the applicable air quality standard of 9 ppm. Therefore, no significant adverse air quality impacts for CO are expected to occur due to the combined impacts of mobile and construction sources during Phase 1 of construction.

Similarly, a mobile source analysis of CO impacts for the intersection of Bleecker and Mercer Streets indicated that a maximum predicted concentration would occur at receptors placed along the sidewalks adjacent to this intersection in Phase 2. Modeled impacts from the stationary source construction activities in Phase 2 included a maximum predicted CO concentration of 2.1 ppm (including background). Total cumulative concentrations of CO for both mobile and stationary sources (conservatively combining two different peak analysis periods) is estimated to be 2.3 ppm, which is less than the applicable air quality standard of 9 ppm. Therefore, no significant adverse air quality impacts for CO are expected to occur due to the combined impacts of mobile and construction sources during Phase 2 of construction.

The maximum predicted concentration of PM_{10} from stationary sources of Phase 1 construction is 61 µg/m^3, including background. The maximum predicted concentration of PM_{10} from stationary sources of Phase 2 construction is 59 µg/m^3, including background. Cumulative concentrations from mobile and stationary sources (conservatively combining two different peak analysis periods) for Phase 1 and Phase 2 of construction are estimated to be 79 µg/m^3 and 71 µg/m^3 respectively, and would not exceed the applicable air quality standard of 150 µg/m^3.

For $PM_{2.5}$, the mobile source concentrations in each construction phase were an order of magnitude or more lower than the stationary source concentrations, and would therefore have no significant affect when combined with the stationary source concentration contribution. Therefore, no significant adverse air quality impacts for either PM_{10} or $PM_{2.5}$ would occur due to the combined impacts of mobile and stationary sources.

CONCLUSIONS

A detailed analysis of the combined effects of on-site and on-road emissions determined that annual-average NO_2, CO, and PM_{10} concentrations would be below their corresponding NAAQS. Therefore, the proposed projects would not cause or contribute to any significant adverse air quality impacts with respect to these standards.

Dispersion modeling determined that the maximum predicted incremental concentrations of $PM_{2.5}$ (using a worst-case emissions scenario) would exceed the City's applicable 24-hour interim guidance criterion of 2 µg/m^3 at a few receptor locations, where the likelihood of prolonged exposure is very low. The occurrences of elevated 24-hour average concentrations for $PM_{2.5}$ would be very limited in duration, frequency, and magnitude. Therefore, after taking into account the limited duration and extent of these predicted exceedances, and the limited area-wide extent of the 24-hour impacts, it is concluded that no significant adverse air quality impacts for $PM_{2.5}$ are expected from the on-site construction sources.

Because background concentrations are not known and the analysis methodology for mobile and stationary sources has not been developed for the new 1-hour NO_2 NAAQS, exceedances of the 1-hour NO_2 standard resulting from construction activities cannot be ruled out. Therefore, measures including diesel equipment reduction, utilization of newer equipment, and source location and idling restriction, would be implemented by the proposed project to minimize NO_x emissions from construction activities.

NOISE AND VIBRATION

INTRODUCTION

Potential impacts on community noise levels during construction of the proposed project could result from noise due to construction equipment operation and from noise due to construction vehicles and delivery vehicles traveling to and from the site. Noise and vibration levels at a given location are dependent on the kind and number of pieces of construction equipment being operated, the acoustical utilization factor of the equipment (i.e., the percentage of time a piece of equipment is operating at full power), the distance from the construction site, and any shielding effects (from structures such as buildings, walls, or barriers). Noise levels caused by construction activities would vary widely, depending on the phase of construction and the location of the construction relative to receptor locations. The most significant construction noise sources are expected to be impact equipment such as jackhammers, excavators with ram hoes, drill rigs, rock drills, impact wrenches, tower cranes, and paving breakers, as well as the movements of trucks, and possible blasting.

Noise from construction activities and some construction equipment is regulated by the New York City Noise Control Code and by EPA. The New York City Noise Control Code, as amended December 2005 and effective July 1, 2007, requires the adoption and implementation of a noise mitigation plan for each construction site, limits construction (absent special circumstances as described below) to weekdays between the hours of 7:00 AM and 6:00 PM, and sets noise limits for certain specific pieces of construction equipment. Construction activities occurring after hours (weekdays between 6:00 PM and 7:00 AM, and on weekends) may be authorized in the following circumstances: (1) emergency conditions; (2) public safety; (3) construction projects by or on behalf of City agencies; (4) construction activities with minimal noise impacts; and (5) where undue hardship is demonstrated resulting from unique site characteristics, unforeseen conditions, scheduling conflicts and/or financial considerations. EPA requirements mandate that certain classifications of construction equipment meet specified noise emissions standards.

Given the scope and duration of construction activities for the proposed project, a quantified construction noise analysis was performed. The purpose of this analysis was to determine if significant adverse noise impacts would occur during construction, and if so, to examine the feasibility of implementing mitigation measures to reduce or eliminate such impacts.

CONSTRUCTION NOISE IMPACT CRITERIA

The *CEQR Technical Manual* states that significant noise impacts due to construction would occur "only at sensitive receptors that would be subjected to high construction noise levels for an extensive period of time." This has been interpreted to mean that such impacts would occur only at sensitive receptors where the activity with the potential to create high noise levels would occur continuously for approximately two years or longer. In addition, the *CEQR Technical Manual* states that the impact criteria for vehicular sources, using the No Action noise level as the baseline, should be used for assessing construction impacts. As recommended in the *CEQR Technical Manual*, this study uses the criteria to define a significant adverse noise impact as follows:

- If the No Action noise level is less than 60 dB(A) $L_{eq(1)}$, a 5 dB(A) $L_{eq(1)}$ or greater increase would be considered significant.
- If the No Action noise level is 61 dB(A) $L_{eq(1)}$, a 4 dB(A) $L_{eq(1)}$ or greater increase would be considered significant.
- If the No Action noise level is equal to or greater than 62 dB(A) $L_{eq(1)}$, or if the analysis period is a nighttime period (defined in the CEQR criteria as being between 10:00 PM and 7:00 AM), the incremental significant impact threshold would be 3 dB(A) $L_{eq(1)}$.

NOISE ANALYSIS METHODOLOGY

Construction activities for the proposed project would result in increased noise levels as a result of: (1) the movement of construction-related vehicles (i.e., worker trips, and material and equipment trips) on the surrounding roadways; and (2) the operation of construction equipment on-site. The effect of each of these noise sources was evaluated. The analysis ("cumulative analysis") examines the combined effects of construction-related vehicles and on-site construction equipment during the 7AM – 6 PM time period.

Noise from the operation of construction equipment on-site at a specific receptor location near a construction site is calculated by computing the sum of the noise produced by all pieces of equipment operating at the construction site. For each piece of equipment, the noise level at a receptor site is a function of:

- The noise emission level of the equipment;
- A usage factor, which accounts for the percentage of time the equipment is operating at full power;
- The distance between the piece of equipment and the receptor;
- Topography and ground effects; and
- Shielding.

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

- The noise emission levels of the type of vehicle (e.g., auto, light-duty truck, heavy-duty truck, bus, etc.)
- Vehicular speed;
- The distance between the roadway and the receptor;
- Topography and ground effects; and
- Shielding.

On-Site Construction Equipment Noise Modeling

Noise effects 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, etc.), transportation sources (e.g., roads, highways, railroad lines, busways, airports, etc.), and other specialized sources (e.g., sporting facilities, etc.). The model takes into account the reference sound pressure levels of the noise sources at 50 feet, attenuation with distance, ground contours, reflections from barriers and structures, and attenuation due to shielding. 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 an accepted model under CEQR.

Geographic input data used with the CadnaA model included CAD drawings that defined site 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 equipment with full-horse power is used) for each piece of construction equipment operating in the project area, as well as noise control measures, were input to the model. In addition, reflections and shielding by barriers erected on the construction site, and shielding from both adjacent buildings and project buildings as they are constructed, were accounted for in the model. 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, which showed the noise level at each receptor location, as well as the contribution from each noise source.

Traffic Noise Modeling

The Federal Highway Administration (FHWA) *Traffic Noise Model* (TNM) Version 2.5 was used to determine ground-level noise levels due to vehicular traffic at all receptor locations for the analyses that looked at the combined effects of construction equipment operation and traffic. The TNM model is a methodology recommended for mobile source analysis purposes in the 2010 *CEQR Technical Manual.*

Analysis Years

As described above, construction activities are expected to take place over a period of about nineteen years (i.e., from about 2013 through 2031). Except for unusual circumstances construction activities would occur on weekdays only. Therefore, construction noise analyses were performed only for the weekday periods.

For the DEIS, a screening analysis was performed to determine an analysis month during each year of the construction period (i.e., between 2013 and 2031) when the maximum potential for significant noise impacts would occur. The screening analysis was based on a construction schedule showing the number of workers, types and number of pieces of equipment, and number of construction vehicles anticipated to be operating during each quarter of the construction period. To be conservative, the detailed construction noise analysis assumed: the analysis quarter with the maximum potential for producing significant impacts for each year of construction; that these peak on-site construction activity conditions occurred for the entire year; and that both peak on-site construction activities and peak construction-related traffic conditions occurred simultaneously. For the FEIS, additional time periods within each year were examined to more accurately determine the duration of potential impacts and thus to refine the construction noise impact analysis conclusions presented in the DEIS.

Noise Reduction Measures

The construction noise analysis assumes that the project sponsors commit to a proactive approach to minimize noise during construction activities. This approach employs a wide variety of measures that exceed standard construction practices, but the implementation of which is deemed feasible and practicable to minimize construction noise and reduce potential noise impacts. These measures would be implemented and described in the Construction Noise Mitigation Plan required by the New York City Noise Control Code.[1] This program includes both source controls and path controls, which are described below.

In terms of source controls (i.e., reducing noise levels at the source), the analysis assumes that the following measures would be implemented:

- 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 activities, along with a wide range of equipment which produce lower noise levels than typical construction. **Table 20-20** 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.

[1] New York City Noise Control Code (i.e., Local Law 113). Citywide Construction Noise Mitigation, Chapter 28, Department of Environmental Protection of New York City, 2007.

Table 20-20
Construction Equipment Noise Emission Levels (dBA)

	Lmax at 50 feet		Reduction		
Equipment List	**CEQR & FTA Equipment[1]**	**Typical Equipment**	**Quieter Equipment**	**Path Control**	**Mandated Lmax (dBA) at 50 feet**
Acetylene Torch	73				73
Bar Bender	80				80
Backhoe	80				80
Bobcat (Skid Steer)	80				80
Compressor	58				58
Concrete Pump	82				82
Concrete Trowel (finisher)	85			10[8]	75
Concrete Truck	85				85
Concrete Vibrator	76				76
Crab for Panels	NA	75[2]			75
Crane	85			10[9]	75
Crane (Tower Crane)	85			10[9]	75
Delivery Truck	84				84
Drill Rig	85			10[8]	75
Dump Truck	84		10[6]		74
Excavator	85		10[7]		75
Fuel Truck	84				84
Generator	82			10[8]	72
Hand Tool	NA	59[3]			59
Hoist	NA	75[2]			75
Jack Hammer	73				73
Impact Wrench	85		3[10]		82
Man Lift	NA	63[4]			63
Pump	77				77
Rubbish Truck	78				78
Secant Drill Rig	NA	62[5]			62
Snorkle Lift	NA	63[4]			63
Welder	73				73

Notes:
1. Sources: Citywide Construction Noise Mitigation, Chapter 28, Department of Environmental Protection of New York City, 2007. Transit Noise and Vibration Impact Assessment, FTA, May 2006.
2. 75 dBA was assumed for electric equipment at 50 feet.
3. Noise from Construction....December 31, 1971. Bolt, Beranek and Newman. p104.
4. Lift Model JLG.
5. Giken America Corp.
6. 10 dB reduction is estimated (p15-16 on Chapter 28 "Citywide Construction Noise Mitigation").
7. 10 dB reduction is estimated (p13 on Chapter 28 "Citywide Construction Noise Mitigation").
8. 10 dB reduction is estimated (p19-20 on Chapter 28 "Citywide Construction Noise Mitigation").
9. 10 dB reduction is estimated (p17-18 on Chapter 28 "Citywide Construction Noise Mitigation").
10. 3 dB reduction for using a muffler. Jason Markesino, and.., Study of Noise Transmission from an Electric Impact Wrench, NOISE-CON 2004

- Where feasible and practicable, construction procedures and equipment (such as dump truck, excavator, and impact wrench) that produce noise levels below the requirements of the New York City Noise Control Code would be used.
- As early in the construction period as practicable, electrical-powered equipment would be selected for certain noisy equipment, such as, concrete vibrators, crabs for panels, hoists, and man lifts (i.e., early electrification).
- Where practicable and feasible, construction sites would be configured to minimize back-up alarm noise. In addition, trucks would not be allowed to idle more than three minutes at the construction site based upon New York City Local Law.

- Limit equipment on-site (only necessary equipment on-site).
- Contractors and subcontractors would be required to properly maintain their equipment and have quality mufflers installed.
- In terms of path controls (e.g., placement of equipment, implementation of barriers or enclosures between equipment and sensitive receptors), the analysis assumes that the following measures would be implemented:
- Where feasible and practicable, noisy equipment, such as cranes, concrete pumps, concrete trucks, and delivery trucks, would be located away from and shielded from sensitive receptor locations. For example, during the demolition and excavation construction phases of work, construction equipment operations would take place below grade taking advantage of shielding benefits. Noise barriers would be utilized to provide shielding (e.g., the construction sites would have a minimum 8-foot barrier, with a 15-foot barrier adjacent to residential and other sensitive locations, and, where possible, truck deliveries would take place behind these barriers once building foundations are completed).
- Path noise control measures (i.e., portable noise barriers, panels, enclosures, and acoustical tents, where feasible) were used for certain dominant noise equipment, i.e., concrete trowel, crane, drill rig, and generator.
- Acoustical curtains were assumed for internal construction activities in the buildings under construction that are adjacent to residential and other sensitive locations, to break the line-of-sight and provide acoustical shielding between noise sources and sensitive receptors.

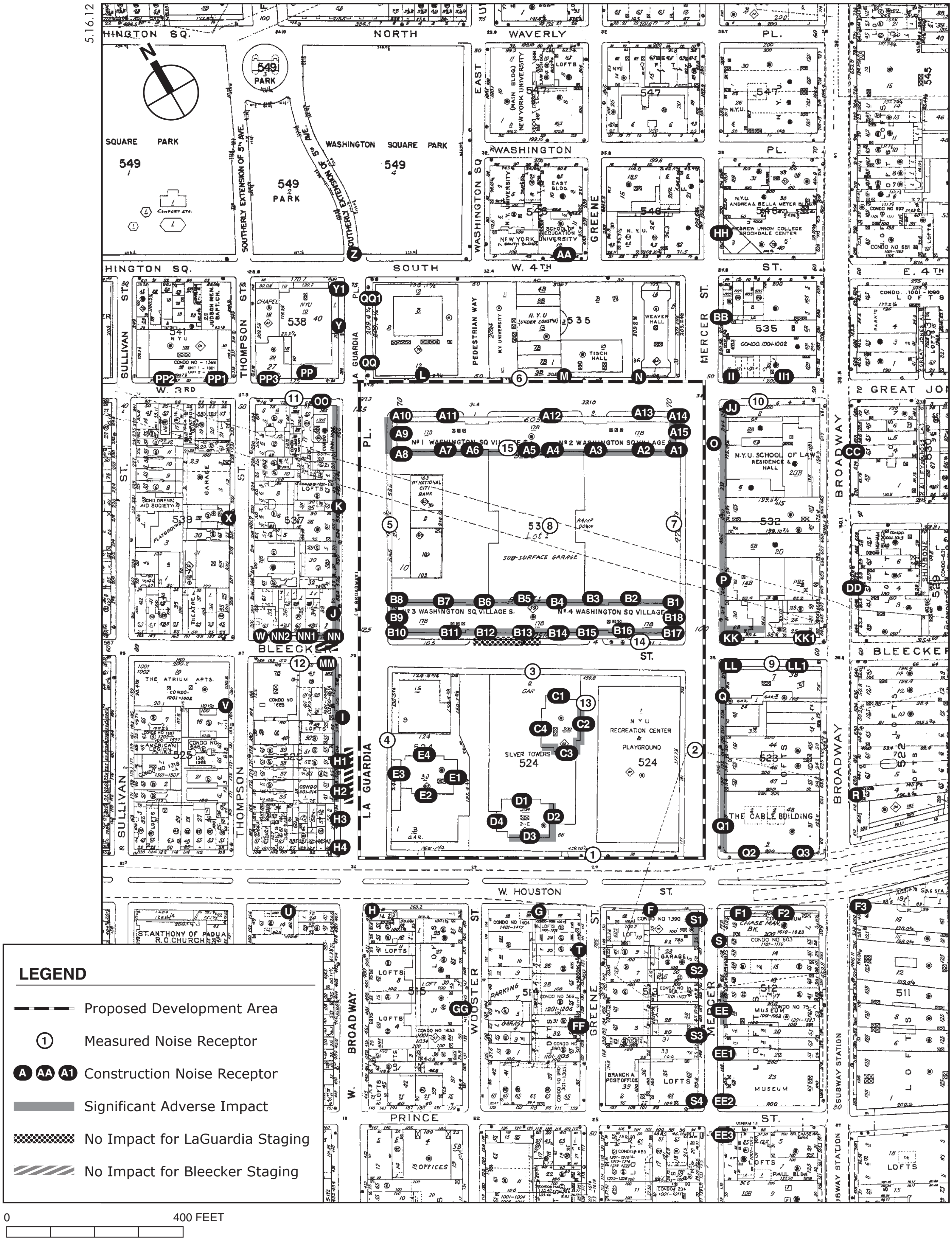
Receptor Sites

Fifteen (15) receptor locations (i.e., sites 1 to 15) were selected as the noise monitoring sites to determine the baseline existing noise levels, and one hundred and ten (110) locations (i.e., sites A1 through QQ1) were selected as discrete noise receptor sites for the construction noise analysis. These receptors are either located directly adjacent to the project area or on streets where construction-related vehicles (i.e., trucks and autos) would be passing by. Each receptor site is the location of a residence or other noise-sensitive use. At Receptor Sites 1 though 12, noise measurements were performed at ground level (approximately five feet above grade). At Receptor Sites 13 though 15 (i.e., NYU-owned Washington Square Village and Silver Tower II) noise measurements were perform at grade and on rooftop, respectively. At each of the analysis locations, noise receptors were placed at multiple elevations on buildings. **Figure 20-13** shows the location of the noise receptor sites, and **Table 20-21** lists the noise receptor sites and their associated land uses. The receptor sites initially selected for detailed analysis are representative of locations where maximum project impacts due to construction noise would be expected.

DETERMINING EXISTING AND NO BUILD NOISE LEVELS

TNM and the CadnaA model were used to determine existing and No Build noise levels at each of the receptor sites. For ground level receptor locations, existing $L_{eq(1)}$ noise levels were calculated using the TNM model based on existing traffic components and adjusted by baseline measured values at nearby monitoring receptor locations. Existing noise levels at 15 receptor sites were measured for 20-minute periods during the three peak periods—AM (7:00 – 9:00 AM), midday (MD) (12:00 – 2:00 PM), and PM (4:00 – 6:00 PM). The measured existing noise levels are provided in **Appendix E-4**. During the construction, the worst case for noise generated by construction activities would be expected at any time between 7 AM and 3 PM. To be conservative, the lowest existing $L_{eq(1)}$ values were used to calculate No Build noise levels.

5.16.12



Construction Noise Receptor Locations

Figure 20-13

NYU Core

Table 20-21
Construction Noise Receptor Locations

Receptor	Location	Associated Land Use
1	West Houston Street at Greene Street	Residential / Athletic
2	Mercer Street between Bleecker and West Houston Streets	Residential / Athletic
3	Bleecker Street between Mercer Street and LaGuardia Place	Residential
4	LaGuardia Place between West Houston and Bleecker Streets	Residential
5	LaGuardia Place between Bleecker and West 3rd Streets	Residential / Institutional
6	West 3rd Street between Mercer Street and LaGuardia Place	Residential / Commercial
7	Mercer Street between West 3rd and Bleecker Streets	Residential / Institutional
8	Courtyard of Washington Square Village	Residential / Open Space
9	Bleecker Street between Mercer Street and Broadway	Residential / Commercial
10	West 3rd Street between Mercer Street and Broadway	Institutional
11	West 3rd Street between Thompson Street and LaGuardia Place	Residential /Commercial
12	Bleecker Street between Thompson Street and LaGuardia Place	Residential / Commercial
13	Silver Tower 2	Residential
14	South Side of Washington Square Village 4	Residential
15	South Side of Washington Square Village 1	Residential
A1-A15	Washington Square Village 1 & 2	Residential
B1-B18	Washington Square Village 3 & 4	Residential
C1-C4	Silver Tower II	Residential
D1-D4	Silver Tower I	Residential
E1-E4	505 LaGuardia Place	Residential
F	Houston Street between Greene Street and Mercer Street	Residential / Commercial
F1	Houston Street between Mercer Street and Broadway	Commercial
F2	Houston Street between Mercer Street and Broadway	Commercial
F3	Houston Street and Broadway	Commercial
G	Houston Street between Wooster Street and Greene Street	Residential / Commercial
H	West Broadway at Houston Street	Residential / Commercial
H1	LaGuardia Place between Bleecker Street and Houston Street	Residential / Commercial
H2	LaGuardia Place between Bleecker Street and Houston Street	Residential / Commercial
H3	LaGuardia Place between Bleecker Street and Houston Street	Residential / Commercial
H4	LaGuardia Place between Bleecker Street and Houston Street	Residential / Commercial
I	LaGuardia Place between Bleecker Street and Houston Street	Residential / Commercial
J	LaGuardia Place at Bleecker Street	Residential / Commercial
K	LaGuardia Place between West 3rd Street and Bleecker Street	Residential / Commercial
L	West 3rd Street between LaGuardia Place and Mercer Street	Institutional
M	West 3rd Street between LaGuardia Place and Mercer Street	Institutional
N	West 3rd Street between LaGuardia Place and Mercer Street	Institutional
O	Mercer Street between Great Jones Street and Bleecker Street	Institutional
P	Mercer Street between Great Jones Street and Bleecker Street	Residential / Commercial
Q	Mercer Street between Bleecker Street and Houston Street	Residential / Commercial
Q1	Mercer Street between Houston and Bleecker Streets	Commercial
Q2	Houston Street between Mercer Street and Broadway	Commercial
Q3	Houston Street between Mercer Street and Broadway	Commercial
R	Broadway between Bleecker Street and Houston Street	Residential / Commercial
S	Mercer Street between Houston Street and Prince Street	Residential / Commercial
S1	Mercer Street between Houston Street and Prince Street	Residential / Commercial
S2	Mercer Street between Houston Street and Prince Street	Residential / Commercial
S3	Mercer Street between Houston Street and Prince Street	Residential / Commercial
S4	Mercer Street between Houston Street and Prince Street	Hotel
T	Greene Street between Houston Street and Prince Street	Residential / Commercial
U	Houston Street between Thompson Street and West Broadway	Residential
V	Thompson Street between Bleecker Street and Houston Street	Residential
W	Bleecker Street at Thompson Street	Residential / Commercial
X	Thompson Street between West 3rd Street and Bleecker Street	Residential / Commercial
Y	LaGuardia Place between Washington Square South and West 3rd Street	Institutional
Y1	LaGuardia Place between Washington Square South and West 3rd Street	Institutional
Z	Washington Square South at LaGuardia Place	Open Space

Table 20-21 (cont'd)
Construction Noise Receptor Locations

Receptor	Location	Associated Land Use
AA	Washington Square South between Washington Square East and Greene Street	Institutional
BB	Mercer Street between Washington Square South and Great Jones Street	Residential / Commercial
CC	Broadway between Great Jones Street and Bond Street	Residential / Commercial
DD	Broadway between Bond Street and Bleecker Street	Residential / Commercial
EE	Mercer Street between Houston Street and Prince Street	Residential / Commercial
EE1	Mercer Street between Houston Street and Prince Street	Residential / Commercial
EE2	Mercer Street between Houston Street and Prince Street	Commercial
EE3	Mercer Street and Prince Street	Commercial
FF	Greene Street between Houston Street and Prince Street	Residential / Commercial
GG	Wooster Street between Houston Street and Prince Street	Residential / Commercial
HH	Mercer Street between Washington Square South and Washington Place	Institutional
II	Great Jones Street between Mercer Street and Broadway	Residential / Commercial
II1	Great Jones Street between Mercer Street and Broadway	Residential / Commercial
JJ	Great Jones Street between Mercer Street and Broadway	Institutional
KK	Bleecker Street between Mercer Street and Broadway	Residential
KK1	Bleecker Street between Mercer Street and Broadway	Residential / Commercial
LL	Bleecker Street between Mercer Street and Broadway	Residential / Commercial
LL1	Bleecker Street between Mercer Street and Broadway	Residential / Commercial
MM	Bleecker Street between Thompson Street and LaGuardia Place	Residential / Commercial
NN	Bleecker Street between Thompson Street and LaGuardia Place	Residential / Commercial
NN1	Bleecker Street between Thompson Street and LaGuardia Place	Residential / Commercial
NN2	Bleecker Street between Thompson Street and LaGuardia Place	Residential / Commercial
OO	West 3rd Street between Thompson Street and LaGuardia Place	Residential /Commercial
PP	West 3rd Street between Thompson Street and LaGuardia Place	Institutional
PP1	West 3rd Street between Thompson Street and Sllivan Street	Institutional
PP2	West 3rd Street between Thompson Street and Sllivan Street	Institutional
PP3	West 3rd Street between Thompson Street and LaGuardia Place	Institutional
QQ	LaGuardia Place between Washington Square South and West 3rd Street	Institutional
QQ1	LaGuardia Place between Washington Square South and West 3rd Street	Institutional

Note: At receptor sites from 1 through 15 noise measurements were taken at grade, and at sites from 13 through 15 noise measurements were also taken on rooftops.

Existing noise levels for elevated receptor locations were calculated using the CadnaA model based on existing traffic components (calculated using TNM). The difference in noise levels between ground level and elevated receptors was used to determine elevation adjustment factors. $L_{eq(1)}$ noise levels at elevated locations were determined by adding the adjustment factors to ground level noise levels. Future No Build Noise levels were determined by adding changes due to No Build traffic increases. The predicted lowest No Build $L_{eq(1)}$ values were used to determine construction-related noise impacts. Summary tables showing the detailed calculations for existing noise levels are provided in **Appendix E-5**.

CONSTRUCTION NOISE ANALYSIS RESULTS

Cumulative Analysis

Using the methodology described above, and considering the noise abatement measures for source and path controls specified above, cumulative noise analyses were performed to determine maximum one-hour equivalent ($L_{eq(1)}$) noise levels that would be expected to occur during each year of construction.

With respect to the construction of the Bleecker Building, noise analyses were performed for two scenarios (i.e., LaGuardia Place Staging Option and Bleecker Street Staging Option). The analysis results are provided in **Appendix E-6a** (LaGuardia Place Staging Option) and **Appendix E-6b** (Bleecker Street Staging Option) for each of the 110 receptor location buildings. In addition to the predicted noise levels at receptor sites, noise contours depicting the incremental noise due to construction activities (both on-site construction equipment operation and construction-related traffic) were developed for the area surrounding the project area and are presented in **Appendix E-7**.

The noise analysis results shown in **Appendix E-6a and Appendix E-6b** show that predicted noise levels due to construction-related activities would result in increases in noise levels which would exceed the 3-5 dBA CEQR impact criteria during one or more years at fifty-seven (57) of the one hundred and ten (110) receptor sites (i.e., A1-A9, A15, B1-B18, C1-C4, D2-D4, E3, E4, F, H1, H2, I, J, K, L, N, O, P, Q, Q1, S1, S, Y, BB, EE, GG, KK, and NN).

For impact determination purposes, the significance of adverse noise impacts is determined based on whether predicted incremental noise levels at sensitive receptor locations would be greater than the impact criteria suggested in the *CEQR Technical Manual* for two consecutive years or more. While increases exceeding the CEQR impact criteria for one year or less may be noisy and intrusive, they are not considered to be significant adverse noise impacts.

The noise analysis results show that based on the conceptual construction schedule presented in Table 20-1, predicted noise levels would exceed the CEQR impact criteria during two or more consecutive years at forty-five (45) of the one hundred and ten (110) receptor sites (i.e. A1-A9, A15, B1- B18, C2, C3, D2, D3, H1, H2, I, J, K, O, P, Q, Q1, S1, EE, KK, and NN). At these locations, the exceedance of the CEQ0R impact criteria would be due principally to noise generated by on-site construction activities (rather than construction-related traffic). **Figure 20-13** shows these locations where significant adverse noise impacts are predicted to occur. **Table 20-22** shows the following analysis result for the each of the forty-five (45) noise receptor locations (Additional details of the construction analysis are presented in **Appendix E-6a and Appendix E-6b**):

- Build Information;
- Impact Façade;
- Impact duration; and
- Associated construction activity.

Based upon the analysis results, noise impacts due to construction would occur as follows:

- **Washington Square Village 1** (17-Story residential building)—at various locations on the south façade (Receptor A5) during the years 2021 through 2026 and 2029 through 2031, Receptors A6 and A7 during the years 2022 through 2026 and 2028 through 2031, and Receptor A8 during the years 2024 through 2026 and 2028 through 2031) due to noise generated by the construction of Mercer Building and LaGuardia Building, and at various locations on the west façade (Receptor A9) during the years 2028 through 2031) due to noise generated by the construction of LaGuardia Building;
- **Washington Square Village 2** (17-story residential building)—at various locations on the south façade (Receptors A1 through A3) during the years 2021 through 2027, and Receptor A4 during the years 2021 through 2026) due to noise generated by the construction of Mercer Building, and at various locations on the east façade (Receptor A15) during the years 2021 through 2014 and 2026 through 2027 due to noise generated by the construction of Mercer Building;

Table 20-22
Construction Noise Receptor Locations

Building Name	Associated Land Use	Total Stories	Façade	Associated Receptor	Impacted Floor(s)	Range of Increase(s) in dBA*	Impact Duration (year)	Associated Construction Building
Washington Square Village 1	Residential		South	A5	3rd-top	3.1-18.1	2021-2026 & 2029-2031	Mercer & LaGuardia
			South	A6 & A7	3rd-top	3.0-16.3	2022-2026 & 2028-2031	Mercer & LaGuardia
			South	A8	3rd-top	3.2-19.0	2024-2026 & 2028-2031	Mercer & LaGuardia
		17	West	A9	3rd-top	3.1-14.2	2028-2031	LaGuardia
Washington Square Village 2	Residential		South	A1&A3	1st-top	3.6-19.9	2021-2027	Mercer
			South	A2	3rd-top	3.6-21.3	2021-2027	Mercer
			South	A4	3rd-top	4.3-20.8	2021-2026	Mercer
		17	East	A15	1st-top	3.2-14.5	2021-2024 & 2026-2027	Mercer
Washington Square Village 3	Residential		North	B5	1st-top	3.2-17.5	2021-2026	Mercer
			North	B6	3rd-top	3.1-17.0	2022-2026 & 2028-2031	Mercer & LaGuardia
			North	B7-A8	3rd-top	3.5-19.6	2024-2026 & 2028-2031	Mercer & LaGuardia
			West	B9	3rd-top	3.8-15.0	2029-2031	Laguardia
			West	B9	3rd-top	3.9-12.1	2018-2020	Bleecker (LaGuardia Place Staging Option)
			South	B10	3rd-top	3.0-12.6	2018-2021	Bleecker (LaGuardia Place Staging Option)
			South	B11	5th	3.7-11.0	2018-2020	Bleecker (LaGuardia Place Staging Option)
		17	South	B10-B13	3rd-top	3.2-15.9	2018-2021	Bleecker (Bleecker Street Staging Option)
Washington Square Village 4	Residential		North	B1-B3	3rd-top	3.3-21.6	2021-2027	Mercer
			North	B4	3rd-top	3.1-20.6	2021-2028	Mercer
			South	B14	5th-top	3.1-9.7	2015-2017	Zipper
			South	B14	5th-top	3.1-7.8	2018-2021	Bleecker (Bleecker Street Staging Option)
			South	B15-B16	3rd-top	3.2-12.8	2014-2017	Zipper
			South	B15-B16	10th-top	3.0-6.9	2018-2020	Bleecker (Bleecker Street Staging Option)
			South	B17	3rd-top	3.2-14.1	2014-2018	Zipper
		17	East	B18	3rd-top	3.3-11.2	2016-2018 & 2026-2027	Zipper & Mercer
Silver Tower II	Residential		East	C2	3rd-top	4.8-10.8	2014-2017	Zipper
		30	South	C3	5th-top	3.4-9.1	2014-2016	Zipper
Silver Tower I	Residential		West	D2	10th-top	3.0-8.1	2014-2016	Zipper
		30	South	D3	20th-top	3.1-4.3	2015-2016	Zipper

Table 20-22 (cont'd)
Construction Noise Receptor Locations

Building Name	Associated Land Use	Total Stories	Façade	Associated Receptor	Impacted Floor(s)	Range of Increase(s) in dBA*	Impact Duration (year)	Associated Construction Building
510 LaGuardia Place	Residential/ Commercial	5	East	I	3rd-top	4.8-15.2	2018-2021	Bleecker (LaGuardia Place Staging Option)
					top	3.4-9.0	2018-2020	Bleecker (Bleecker Street Staging Option)
520 LaGuardia Place	Residential/ Commercial	7	East	J	3rd-top	3.2-13.3	2029-2031	LaGuardia
			East	J	3rd-top	3.4-12.7	2018-2021	Bleecker (LaGuardia Place Staging Option)
					5th-top	5.7-12.1	2018-2021	Bleecker (Bleecker Street Staging Option)
530 LaGuardia Place	Residential/ Commercial	8	East	K	3rd-top	4.7-16.9	2028-2031	LaGuardia
246 Mercer Street	Institution	20	West	O	3rd-top	3.0-14.3	2021-2027	Mercer
81 Bleecker Street	Residential	6	West	P	3rd-top	3.4-14.4	2015-2017 & 2021-2027	Zipper & Mercer
200 Mercer Street	Residential	4	West	Q	1st-top	3.0-18.0	2013-2018	Zipper
158 Mercer Street	Residential/ Commercial	12	West	EE	10th-top	5.1-5.9	2016-2017	Zipper
81 Bleecker Street	Residential	6	South	KK	top	3.7-10.7	2016-2018	Zipper
520 LaGuardia Place	Residential	7	South	NN	top	3.1-6.8	2018-2021	Bleecker (LaGuardia Place Staging Option)
18 West Houston Street	Commercial	9	West	Q1	3rd-top	3.7-12.1	2014-2018	Zipper
25 West Houston Street	Residential/ Commercial	9	East	S1	7th-top	3.3-5.8	2015-2017	Zipper
506 LaGuardia Place	Residential/ Commercial	5	East	H1	3rd-top	3.4-12.2	2018-2021	Bleecker (LaGuardia Place Staging Option)
500 LaGuardia Place	Residential/ Commercial	5	East	H2	top	3.1-7.3	2018-2021	Bleecker (LaGuardia Place Staging Option)

Note: * Range of increases values were taken from predicted noise levels compared to No Action noise levels.

- **Washington Square Village 3** (17-story residential building)—at various locations on the north façade (Receptor B5) during the years 2021 through 2026) due to noise generated by the construction of Mercer Building, at various locations on the north façade (Receptors B6 during the years 2022 through 2026 and 2028 through 2031, and Receptors B7 and B8 during the years 2024 through 2026 and 2028 through 2031) due to noise generated by the construction of Mercer Building and LaGuardia Building, at various locations on the west façade (Receptor B9) during the years 2018 through 2020) due to noise generated by the construction of Bleecker Building (for the LaGuardia Place Staging Option), at various locations on the west façade (Receptor B9) during the years 2029 through 2031) due to noise generated by the construction of LaGuardia Building, at various locations on the south façade (Receptor B10) during the years 2018 through 2021 due to noise generated by the construction of Bleecker Building (for LaGuardia Place Staging options); at 5th floor location on the south façade (Receptor B11) during the years 2018 through 2020 due to noise generated by the construction of Bleecker Building (for LaGuardia Place Staging options); and at various locations on the south façade (Receptors from B10 through B13) during the years 2018 through 2021 due to noise generated by the construction Bleecker Building (for Bleecker Place Staging options);
- **Washington Square Village 4** (17-story residential building)—at various locations on the north façade (Receptors B1-B3) during the years 2021 through 2027 due to noise generated by the construction of Mercer Building, at various locations on the north façade (Receptor B4) during the years 2021 through 2028 due to noise generated by the construction of Mercer Building, at various locations on the south façade (Receptor B14) during the years 2015 through 2017 due to noise generated by the construction of Zipper Building and during the years 2018 through 2021 due to noise generated by the construction of Bleecker Building (for Bleecker Place Staging options), at various locations on the south façade (Receptors B15 and B16) during the years 2014 through 2017 due to noise generated by the construction of Zipper Building and during the years 2018 through 2020 due to noise generated by the construction of Bleecker Building (for Bleecker Place Staging options), at various locations on the south façade (Receptor B17) during the years 2014 through 2018 due to noise generated by the construction of Zipper Building, and at various locations on the east façade (Receptor B18) during the years 2016 through 2018 due to noise generated by the construction of Zipper Building and the years 2026 through 2027 due to noise generated by the construction of Mercer Building;
- **Silver Tower II** (30-story residential building)—at various locations on the east façade (Receptor C2) during the years 2014 through 2017 due to noise generated by the construction of Zipper Building; and at various locations on the south façade (Receptor C3) during the years 2014 through 2016 due to noise generated by the construction of Zipper Building (see discussion below in Section F, “Bleecker Building Alternate Phasing Scenario,” regarding various locations on the north façade represented by Receptor C1);
- **Silver Tower I** (30-story residential building)—at various locations on the west façade (Receptor D2) during the years 2014 through 2016 due to noise generated by the construction of Zipper Building, and at various locations on the south façade (Receptor D3) during the years 2015 through 2016 due to noise generated by the construction of Zipper Building;
- **510 LaGuardia Place** (5-story residential/commercial building)—at various locations on the east façade (Receptor I) during the years 2018 through 2021 due to noise generated by the construction of Bleecker Building (for LaGuardia Place Staging Options) and at top floor

locations during the years 2018 through 2020 due to noise generated by the construction of Bleecker Building (for Bleecker Place Staging Option);

- **520 LaGuardia Place** (7-story residential/commercial building)—at various locations on the east façade (Receptor J) during the years 2018 through 2021 due to noise generated by the construction of Bleecker Building (for both Bleecker Building Staging Options), and at various locations on the east façade during the years 2029 through 2031 due to noise generated by the construction of LaGuardia Building;
- **530 LaGuardia Place** (8-story residential/commercial building)—at various locations on the east façade (Receptor K) during the years 2028 through 2031 due to noise generated by the construction of LaGuardia Building;
- **246 Mercer Street** (20-story institution building)—at various locations on the west façade during the years 2021 through 2027 due to noise generated by the construction of Mercer Building;
- **81 Bleecker Street** (6-story residential building)—at various locations on the west façade (Receptor P) during the years 2015 through 2017 due to noise generated by the construction of Zipper Building, and at various locations on the west façade during the years 2021 through 2027 due to noise generated by the construction of Mercer Building;
- **200 Mercer Street** (4-story residential building)—at various locations on the west façade (Receptor Q) during the years 2013 through 2018 due to noise generated by the construction of Zipper Building;
- **158 Mercer Street** (12-story residential/commercial building)—at various top floor locations on the west façade (Receptor EE) during the years 2016 through 2017 due to noise generated by the construction of Zipper Building;
- **81 Bleecker Street** (6-story residential building)—at top floor locations on the south façade (Receptor KK) during the years 2016 through 2018 due to noise generated by the construction of Zipper Building;
- **520 LaGuardia Street** (7-story residential building)—at top floor locations on the south façade (Receptor NN) during the years 2018 through 2021 due to noise generated by the construction of Bleecker Building (for LaGuardia Place Staging Option);
- **18 West Houston Street** (9-story residential building)—at various locations on the west façade (Receptor Q1) during the years 2014 through 2018 due to noise generated by the construction of Zipper Building;
- **25 Mercer Street** (9-story residential building)—at various locations on the east façade (Receptor S1) during the years 2015 through 2017 due to noise generated by the construction of Zipper Building;
- **506 LaGuardia Street** (5-story residential building)—at various locations on the east façade (Receptor H1) during the years 2018 through 2021 due to noise generated by the construction of Bleecker Building (for LaGuardia Place Staging Option); and
- **500 LaGuardia Street** (5-story residential building)—at top floor locations on the east façade (Receptor H2) during the years 2018 through 2021 due to noise generated by the construction of Bleecker Building (for LaGuardia Place Staging Option).

In addition, noise levels at on-site open space locations adjacent to where construction activities are taking place would increase significantly above the 3-5 dBA CEQR impact criteria. There are no additional feasible or practicable measures have been identified that would significantly reduce noise levels. Even with NYU's commitment to utilize noise barriers, quiet construction techniques, and other noise reduction measures, due to the close proximity of on-site open spaces to construction activities, construction of the proposed project would result in significant adverse noise impacts on open spaces.

Discussion of Cumulative Analysis Results

The buildings at many sensitive receptor locations where the significant noise impacts are predicted to occur have double-glazed windows and/or some form of alternative ventilation (i.e., central air conditioning, packaged terminal air conditioner [PTAC] units, or window air conditioning units). Buildings with both double-glazed windows and some form of alternative ventilation would be expected to have interior noise levels which would be approximately 25-35 dBA less than exterior noise levels. Buildings that do not have both double-glazed windows and alternative ventilation would provide less building attenuation. For example, interior noise levels for a building without alternative ventilation, during warm weather with an open window would be approximately 5-10 dBA less than exterior noise levels.

Measurements were made at various locations in NYU-owned Washington Square Village and Silver Towers buildings to determine building attenuation values. The majority of those buildings' windows are single-pane. Occasionally, windows in apartments undergoing renovation will be replaced, but throughout the buildings overall, the windows are original to the building and single-pane. Based on the measured window/wall attenuation values, attenuation values for the Washington Square Village buildings tested ranged from 17-24 dBA, and attenuation values for the Silver Tower buildings tested ranged from 19-21 dBA. To maintain an interior $L_{10(1)}$ noise level of 45 dBA (the CEQR acceptable interior noise level criteria), a minimum of 30 dBA window/wall attenuation would be required. In order to improve building window/wall attenuation, windows at the NYU-owned Washington Square Village and Silver Tower buildings would be re-caulked and storm windows would be offered. For the Washington Square Village buildings, NYU would offer to insulate/seal existing air conditioning units and provide an interior cover that improves the sound attenuation of the through-the-wall air conditions units, or NYU would offer to provide new air conditioning units. For the Silver Tower buildings, NYU would offer to replace existing PTAC units with high-attenuation PTAC units installed to fit properly/snugly in the PTAC sleeve. These steps are expected to increase window/wall attenuation values by up to approximately 5 dBA for the Washington Square Village buildings and by up to approximately 7 dBA for the Silver Towers buildings. However, these measures would not be sufficient to result in the minimum 30 dBA window/wall attenuation needed to fully mitigate project impacts. In order to achieve a window/wall attenuation value of that magnitude, in addition to re-caulking the existing windows and installing a storm window, the building HVAC systems would need to be replaced with systems that did not degrade the acoustical performance of the building façade (i.e., central air conditioning). Converting the existing HVAC systems for the Silver Towers and Washington Square Village buildings to central air conditioning is not practicable and potentially not feasible due to structural constraints, space and load requirements and tenant disruption issues.

At locations on non-NYU buildings where significant noise impacts are predicted to occur, absent the development of additional measures to mitigate project-related construction noise, the project sponsors would offer to provide storm windows and/or window air conditioning units for buildings without double-glazed windows and/or alternative ventilation to mitigate project-related construction noise impacts. With existing building attenuation measures (i.e., double-glazed windows and alternative ventilation) and the mitigation measures being provided for non-NYU owned buildings, interior noise levels during much of the time when project construction activities are taking place are expected to be below 45 dBA $L_{10(1)}$ (the CEQR acceptable interior noise level criteria**)**.

With regard to the residential terrace locations (Washington Square Village 1-4, 566 LaGuardia Place, and 214 Mercer Street), while noise levels at these terraces already exceed the acceptable CEQR range (55 dBA $L_{10(1)}$ or less) for an outdoor area requiring serenity and quiet, during the daytime analysis periods construction activities are predicted to significantly increase noise levels and would exacerbate these exceedances and result in significant adverse noise impacts. No feasible mitigation measures have been identified that could be implemented to eliminate the significant noise impacts at these terraces.

Noise levels at open space locations (i.e., LaGuardia Landscape, Washington Square Village Elevated Garden, Silver Tower Oak Grove, etc.) on the project site are currently above the 55 dBA $L_{10(1)}$ recommended in the *CEQR Technical Manual* noise level for outdoor areas. Proposed construction activities would exacerbate these exceedances of the recommended level; average $L_{10(1)}$ noise levels would be in the high 60s to high 70s dBA in these open space locations. Although the 55 dBA $L_{10(1)}$ guideline is a worthwhile goal for outdoor areas requiring serenity and quiet, this relatively low noise level is typically not achieved in parks and open space areas in New York City. More importantly, construction activities would significantly increase $L_{eq(1)}$ noise levels, for limited time periods, at most on-site open space areas. For example, at the open space area where the Washington Square Village Elevated Garden is currently located and where the proposed project's Public Lawn, Philosophy Garden, and Washington Square Village Play Garden will be located (i.e., Receptor Site 8), noise levels would increase by more than 10 dBA for several years. No practical and feasible mitigation measures have been identified that could be implemented to reduce noise levels to below the 55 dBA $L_{10(1)}$ guideline and/or eliminate project impacts. Consequently, construction activities would result in noise levels in open space locations that would result in a significant adverse noise impact.

Absent the implementation of the proposed mitigation measures, the proposed project would have significant noise impacts at the locations specified above.

Traffic Analysis

A traffic noise analysis was performed which examined impacts due to peak construction-related vehicular trips (autos and trucks), which would occur between the peak hours of 7 AM and 8 AM, prior to the start of operational construction activities. Traffic effects were examined at the 15 monitoring sites described above, where the dominant noise source is vehicular traffic. During the peak hour (7 AM – 8 AM) of construction-related vehicular trips, noise from the construction traffic would have the potential to increase ambient noise levels. The analysis was performed in two parts: first a screening analysis was performed using proportional modeling techniques to determine whether the additional trips would be sufficient to result in a significant adverse noise impact (i.e., the additional trips have the potential to result in a doubling of noise passenger car equivalents [Noise PCEs], which would result in a 3 dBA increase for more than two years); then, at locations where the proportional modeling indicated the potential for significant impacts, a detailed analysis was performed using the TNM model.

The worst-case 7 AM and 8 AM peak hours for Phase 1 and Phase 2 (i.e., 2017 and 2026) were selected for analysis. Based on the proportional modeling analysis results, two locations were identified as having the potential for significant adverse impacts—receptor sites 2 and 7 (see **Appendix E-8** for details). At these two sites, a detailed analysis was performed using the TNM model. **Table 20-23** shows predicted noise levels due to construction-related traffic at receptor sites 2 and 7. The TNM modeling results indicated that, at these two locations, construction-related traffic would not increase noise levels by more than the 3 dBA CEQR impact criteria. Consequently, no significant adverse construction traffic-related noise impacts are predicted to occur between the peak hours of 7 AM and 8 AM (see **Appendix E-8** for details).

Table 20-23
Construction Traffic Noise Analysis Results in dBA

Noise Receptor	Time)	Existing - 2011	Phase 1 - 2017			Phase 2 - 2016		
		Monitoring Leq(1)	No Build Leq(1)	Total Leq(1)	Change	No Build Leq(1)	Total Leq(1)	Change
2	7AM to 8AM	67.9	68.0	70.6	2.6	68.1	70.3	2.2
7	7AM to 8AM	65.2	65.2	67.9	2.7	65.3	67.8	2.5

Note: Predicted noise levels were calculated by TNM.

VIBRATION

Introduction

Construction activities have the potential to result in vibration levels that may in turn result in structural or architectural damage, and/or annoyance or interference with vibration-sensitive activities. In general, vibration levels at a location are a function of the source strength (which in turn is dependent upon the construction equipment and methods utilized), the distance between the equipment and the location, the characteristics of the transmitting medium, and the building construction type at the location. 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, generally construction activities 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 assess quantitatively potential vibration impacts of construction activities on structures and residences near the project area.

Construction Vibration Criteria

For purposes of assessing potential structural or architectural damage, the determination of a significant impact was based on the vibration impact criterion used by LPC of a PPV of 0.50 inches per second on historic buildings. For non-fragile buildings, vibration levels below 0.60 inches per second would not be expected to result in any structural or architectural damage.

For purposes of evaluating potential annoyance or interference with vibration-sensitive activities, vibration levels greater than 65 vibration decibels (VdB) would have the potential to result in significant adverse impacts if they were to occur for a prolonged period of time.

Analysis Methodology

For purposes of assessing potential structural or architectural damage, the following formula was used:

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

where: PPV_{equip} is the peak particle velocity in inches per second of the equipment at the receiver location;

PPV_{ref} is the reference vibration level in inches per second 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;
$L_v(ref)$ is the reference vibration level in VdB at 25 feet; and
D is the distance from the equipment to the receiver location in feet.

Table 20-24 shows vibration source levels for typical construction equipment.

Table 20-24
Vibration Source Levels for Construction Equipment

Equipment		PPV_{ref} (in/sec)	Approximate L_v (ref) (VdB)
Pile Driver (sonic)	upper range	0.734	105
	Typical	0.170	93
Hydromill (slurry wall)	In soil	0.008	66
	In rock	0.017	75
Clam shovel drop (slurry wall)		0.202	94
Vibratory Roller		0.210	94
Ram Hoe		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, May 2006.			

Construction Vibration Analysis Results

The primary source of vibration from the proposed project is expected to be short-term construction operations that include large excavation and sheet piling. To minimize the potential for high vibration levels, augers rather than impact pile driving rigs are expected to be used for the foundations of Zipper Building, Bleecker Building, Mercer Building, and LaGuardia Building. The secant wall construction technique has been used in the rebuilding of downtown Manhattan and is currently being used in sections of the Second Avenue Subway. The buildings and structures of most concern with regard to the potential for structural or architectural damage due to vibration are vicinity buildings (i.e., Washington Square Village buildings and Silver Tower II). The construction would have the most potential for producing levels which would exceed the 0.50 inches per second PPV limit at these buildings. Distances from the construction operations generating vibration to result in impacts were calculated as follows (see **Appendix E-9**):

- Pile Driver (sonic): 33 feet;
- Vibratory Roller: 15 feet;
- Clam Shovel Drop (slurry wall): 13 feet;
- Hoe Rams/Large Bulldozers/Caisson Drillings: 8 feet;
- Loaded Trucks: 8 feet; and
- Jackhammers: 5 feet.

To avoid architectural damage, a CPP would be developed to protect known architectural resources with a lateral distance of 90 feet from the proposed construction activities. The CPP would include a monitoring component to ensure that if vibration levels approach the 0.5 inches per second PPV criterion, corrective action would be taken to reduce vibration levels, thereby avoiding architectural damage and significant vibration impacts.

Use of construction equipment that would have the most potential to exceed the 65 VdB criterion within a distance of 550 feet of sensitive receptor locations (e.g., equipment used during tangent wall drilling) would be perceptible and annoying (see **Appendix E-9**). Therefore, for limited time periods, perceptible vibration levels may be experienced by occupants and visitors to all of the buildings and locations on and immediately adjacent to the construction sites. However, the operations which would result in these perceptible vibration levels would only occur for limited finite periods of time at any particular location and therefore the resulting vibration levels, while perceptible and annoying, would not result in any significant adverse impacts.

Blasting is not expected to be needed. However, if rock is encountered deep in the foundation construction, any blasting that may occur would be expected to produce vibrations less perceptible than construction of the tangent wall. In no case are significant adverse impacts from vibrations expected to occur.

OTHER TECHNICAL AREAS

HISTORIC AND CULTURAL RESOURCES

Chapter 7, "Historic and Cultural Resources," provides a detailed assessment of potential impacts on architectural and archaeological resources. This section summarizes potential impacts during construction.

In June 2011, a Phase 1A Archaeological Documentary Study of the Proposed Development Area was completed. The study concluded that portions of the Proposed Development Area have moderate to high sensitivity for historic period archaeological resources. The Phase 1A recommended a Phase 1B archaeological investigation of the areas identified as sensitive in order to determine the presence or absence of archaeological resources such as domestic shaft features (i.e., privies, cisterns, or wells) dating to the early- to mid-19th century. The conclusions from the Phase 1A study are summarized in "Existing Conditions, Archaeological Resources." The Phase 1A study has been submitted to LPC and OPRHP for review and approval. After review and approval of the Phase 1A study, a Phase 1B testing protocol would be prepared and submitted to LPC and OPRHP for review and approval before the Phase 1B survey would begin. Should any intact archaeological resources be identified during the course of the survey, they would be properly documented and evaluated in consultation with OPRHP and LPC. The Phase 1B survey would also determine the need for additional archaeological analysis (i.e., a Phase 2 survey). With this testing and compliance with any OPRHP and/or LPC directive based on the results of such testing, no significant adverse impacts to archaeological resources are expected to occur with the Proposed Actions.

The South Block contains University Village, which has been determined eligible for listing on the State and National Registers of Historic Places (S/NR-eligible) and is also a designated New York City Landmark (NYCL). The North Block contains Washington Square Village, which has also been determined S/NR-eligible. University Village and Washington Square Village are both architectural resources that would be altered with the Proposed Actions. Therefore, OPRHP and LPC are reviewing the proposed project.

To avoid any construction-related impacts on these architectural resources, including ground-borne vibration, falling debris, and accidental damage from heavy machinery, a CPP would be developed in consultation with LPC, as ensured through the proposed project's restrictive declaration. The CPP would be implemented by a professional engineer before any demolition, excavation, and construction. The CPP would follow the guidelines set forth in section 523 of the *CEQR Technical Manual*, including conforming to *New York City Landmarks Preservation Commission Guidelines for Construction Adjacent to a Historic Landmark and Protection Programs for Landmark Buildings*. The CPP would also comply with the procedures set forth in DOB's *Technical Policy and Procedure Notice (TPPN) #10/88*. With these measures in place, construction would not cause significant adverse impacts on historic or cultural resources.

HAZARDOUS MATERIALS

The potential for hazardous materials was evaluated based on a March 2011 *Phase I Environmental Site Assessment* (ESA). The tasks in the ESA included a reconnaissance of the two superblocks and surrounding neighborhood, a review of publicly available data on the geology and hydrogeology of the area, an examination of historical maps, a review of electronic New York City Department of Buildings records, and a review of pertinent federal and state environmental databases.

Existing Conditions

The Phase I ESA identified the following:

- The superblocks historically included commercial, residential and manufacturing uses, a Consolidated Edison (Con Ed) substation, garages and auto repair shops. The historical substation may have utilized polychlorinated biphenyl (PCB)-containing electrical equipment. Historical properties with gasoline underground storage tanks (USTs) and/or fuel oil tanks were identified. Most, if not all, of these historical tanks were likely removed during or prior to excavation of the basements, parking garages, and utilities associated with the current buildings. However, it is possible that historical tanks remain beneath the site.

  Residential buildings on the northern superblock were heated by four, No. 6 fuel oil 20,000-gallon USTs. Two temporary trailers containing fuel oil-fired mobile boilers were observed on the southern superblock during the Phase I ESA reconnaissance, but were no longer present in May 2011. Three closed-status No. 2 fuel oil spills reported on the southern superblock in December 2005 and June 2008 were apparently associated with mobile boilers used on-site in the past and are not likely to have affected subsurface conditions based on spill details and on-site observations.
- A spill (Spill No. 0910543) was reported to the New York State Department of Environmental Conservation (NYSDEC) in December 2009. The spill occurred on the northern superblock. No. 6 fuel oil was released from one of the two 20,000-gallon USTs in the boiler room south-adjacent to Three and Four Washington Square Village. As part of the initial response, these two USTs were emptied and cleaned, preventing potential further release. A supplemental subsurface investigation was performed and a Remedial Action Work Plan (RAWP) was prepared in May 2010. The subsurface investigations indicated that contamination was generally limited to soil above the water table, with limited impacts to groundwater. Remediation began in January 2011. By April 2011, the remedial actions were

completed in accordance with the RAWP. The final report is in draft form and will be submitted to NYSDEC.

- A geotechnical study of the southern superblock indicated the presence of urban fill material down to depths of approximately 8 to 26.5 feet below grade.
- Dental offices were located on the first floors of One and Three Washington Square Village. Interviews with dental personnel indicated that both offices captured used silver/mercury fillings in amalgam traps for pickup and recycling by private contractors.
- On-site chemical storage included household cleaning and maintenance materials and paints, generally in containers of a gallon or less. The chemicals were generally neatly stored and labeled.
- Waste requiring specialized disposal, such as used fluorescent lights and oily rags, was removed by NYU Environmental Health & Safety.
- Two approximately 180-gallon plastic tanks of sodium hypochlorite (a swimming pool disinfectant) were observed in Coles Recreation Center.
- Based on their ages, the buildings may include asbestos-containing materials (ACM). Except for Coles Building, these buildings may also contain lead-based paint and PCB-containing electrical equipment and fluorescent lighting fixtures (including capacitors and potting compounds). Additionally, fluorescent lights may include mercury-containing components. A hydraulic cardboard box baler in the Morton Williams supermarket may also utilize PCB-containing hydraulic fluid.
- NYU representatives indicated that all buildings owned by NYU are operated under university-wide environmental health and safety (EHS) plans.
- The surrounding area was also historically mixed-use with commercial, residential, manufacturing and academic uses including garages with buried gasoline tanks, a chemical store and factory, auto repair shops and filling stations.
- Underground Con Ed electrical transformer vaults were observed on Bleecker Street between the two superblocks and on adjacent sidewalks. The electrical equipment within these structures could potentially contain PCBs.

In addition, a subsurface (Phase II) investigation has been conducted to determine whether past or present, on or off-site activities have affected subsurface conditions. The Phase II investigation found soils typical of an urban environment with polycyclic aromatic hydrocarbons and metals slightly above New York State Department of Environmental Conservation's (NYSDEC) most stringent soil standards. In the Phase II investigation, laboratory results were compared to NYSDEC 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (USCOs) and Part 375 Soil Cleanup Objectives for Restricted – Residential Use (RRSCOs). The Phase II investigation found:

Soils

- No volatile organic compounds (VOCs) were detected in exceedance of their respective RRSCOs, and the detected VOCs were generally below their respective USCOs. Only acetone, which is more likely a laboratory artifact but can be associated with urban fill, exceeded its USCO in six of the 14 samples.
- Other detected VOCs included 2-butanone, naphthalene and methylene chloride, as well as several VOCs commonly associated with petroleum products. Methylene chloride was detected in a trip blank, but is likely a laboratory artifact. The remaining VOCs may be

associated with the urban fill and/or historical uses of the site and surrounding area, but in either case are not indicative of a significant spill or release.

- Semi-volatile organic compounds (SVOCs) were detected in 11 of the 14 soil samples. Eight polycyclic aromatic hydrocarbons (PAHs) [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene and/or indeno(1,2,3-cd)pyrene] exceeded the USCOs in five soil samples. The highest PAH concentrations were detected in sample SB-7 (21'-23'), with identified total SVOCs at a concentration of more than 600 ppm. PAHs are a class of compounds found in some petroleum products, in coal tar and coal ash, and in other combustion products that are commonly found in urban fill. The detected SVOC concentrations are likely due to the urban fill materials, which were noted in all borings. The higher concentrations of SVOCs detected in sample SB-7 (21'-23'), which contained fill materials and was noted to have organic matter-like odors, may be attributable to urban fill and/or the presence of organic matter, but were not indicative of a spill.
- 3-methylphenol/4-methylphenol, which may have various sources including creosote, wood, tar, solvents or disinfectants, was detected slightly above its USCO (but below its RRSCO) in SB-7 (21'-23'). Bis(2-ethylhexyl)phthalate and butyl benzyl phthalate, which are commonly found in plastics and may be present in fill materials or may be laboratory/sampling artifacts, were detected in five and one samples, respectively, but only at concentrations well below their USCOs and RRSCOs.
- Six metals (arsenic, copper, lead, mercury, nickel and zinc) exceeded their respective USCOs in one to six soil samples each. Four metals exceeded their respective RRSCOs in one to two soil samples: arsenic was detected at 130 ppm in SB-1 (0'-2') (the RRSCO is 16 ppm); copper was detected at 610 ppm in SB-7 (0.5'-2.5') (the RRSCO is 270 ppm); lead was detected at 580 ppm in SB-7 (0.5'-2.5') and at 740 ppm in SB-7 (21'-23') (the RRSCO is 400 ppm); and mercury was detected at 1.2 ppm in SB-7 (21'-23') (the RRSCO is 0.81 ppm). The detected metal concentrations are likely attributable to urban fill materials, which often contain highly variable concentrations of metals, rather than a site release.
- No pesticides were detected in exceedance of their respective RRSCOs, and the detected pesticides were generally below their respective USCOs. Four pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT and/or dieldrin) exceeded their respective USCOs in seven soil samples. The detected pesticide concentrations are most likely attributable to historical pesticide use at the site and/or urban fill materials.
- The PCB Aroclor 1254 was detected in sample SB-6 (0'-2') at a concentration of 2.92 ppm, above its USCO of 0.1 ppm and RRSCO of 1 ppm but well below the hazardous waste threshold of 50 ppm. PCBs were detected in five additional soil samples at concentrations well below USCOs and RRSCOs. Boring SB-6 was advanced near an underground electrical transformer vault in the Mercer Street sidewalk. The detected concentrations of PCBs may be attributable to a release from PCB-containing equipment in the transformer vault and/or urban fill materials.

Groundwater laboratory analysis results for groundwater were compared to NYSDEC Class GA Ambient Water Quality Standards (drinking water standards), although groundwater is not used as a source of potable water in Manhattan.

- VOCs were detected in all four groundwater samples, and included chloroform, trichloroethene (TCE), tetrachloroethene (PCE), cis-1,2-dichloroethene and/or trans-1,2-dichloroethene (DCEs). These VOCs were generally detected below their respective Class

GA standards. Chloroform was detected in samples SB-2 (GW) and SB-7 (GW) at concentrations of 9.7 and 10 parts per billion (ppb) respectively, slightly exceeding its Class GA standard of 7 ppb. Cis-1,2-dichloroethene was detected in SB-2 (GW) and SB-7 (GW) at concentrations of 5.9 and 7.9 ppb respectively, slightly exceeding its Class GA standard of 5 ppb. The detected VOCs are commonly associated with various solvents and are ubiquitous in urban groundwater; PCE is a solvent commonly used in dry cleaning operations and TCE and DCEs are its breakdown products. Since these VOCs were not detected in on-site soil samples, they are likely attributable to regional groundwater conditions associated with historical use in the surrounding area by dry cleaners or other facilities.

- SVOCs were detected in two of the four groundwater samples, SB-5 (GW) and SB-7 (GW). Six PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene and indeno(1,2,3-cd)pyrene) exceeded their respective Class GA standards in both SB-5 (GW) and SB-7 (GW). Since SVOC samples are not filtered prior to analysis, these PAHs may have become entrained in the samples from the surrounding urban fill and are likely not reflective of dissolved groundwater conditions.
- Bis(2-ethylhexyl)phthalate and diethyl phthalate were detected in SB-5 (GW), with bis(2-ethylhexyl)phthalate present at a concentration of 42 ppb, above its Class GA standard of 5 ppb. These SVOCs, which may be present in plastics as noted above, may actually be sampling/laboratory artifacts. Neither SVOC was detected in soil from boring SB-5, but bis(2-ethylhexyl)phthalate and butyl benzyl phthalate, another common component of plastics, were detected in soil in several other borings.
- Metals were detected in both the unfiltered and filtered samples, with concentrations of 12 metals (barium, beryllium, chromium, copper, iron, lead, magnesium, manganese, nickel, selenium, sodium and thallium) exceeding their respective Class GA standards in one or more unfiltered groundwater samples. Concentrations in the filtered samples were generally significantly lower, with only iron, magnesium, manganese, selenium and sodium exceeding their Class GA standards in one or more samples. Three metals detected in the unfiltered samples (arsenic, cadmium and mercury) were not detected in the filtered samples. The analytical results suggest that the higher metals concentrations in the unfiltered samples were primarily due to suspended sediments. Metals detected in the filtered samples may be naturally occurring or represent groundwater quality in the surrounding area and do not indicate an on-site spill or leak.
- The pesticide 4,4’-DDT was detected well below its Class GA standard in sample SB-6 (GW), either due to historical use at the project site and/or in the surrounding area. No other pesticides were detected in the groundwater samples.
- No PCBs were detected in the groundwater samples.

Measures to Prevent Significant Adverse Impacts

Based on the existing studies, subsurface contamination and hazardous materials in buildings (such as asbestos-containing materials [ACM] and lead-based paint) may be present. Renovation and demolition and excavation activities could disturb these hazardous materials and potentially increase pathways for human or environmental exposure. Measures during soil disturbance would, at a minimum, comply with applicable legal requirements (including NYSDEC regulations), e.g., relating to maintenance of petroleum storage tanks and handling of ACM, lead-based paint and potential PCB-containing equipment. Specifically, procedures would include:

For Renovation/Demolition:

- Any active petroleum storage tanks that would continue to be used would be operated and maintained in accordance with applicable regulatory requirements. All tanks, including any discovered unexpectedly, would be registered, if required, with NYSDEC and/or the New York City Fire Department.
- Prior to demolition activities, surveys would be conducted for ACM. Confirmed ACM would be removed and disposed of prior to demolition in accordance with all applicable regulations including the February 2, 2011 DEP regulations.
- Demolition activities would be conducted in accordance with the applicable Occupational Safety and Health Administration regulation (OSHA 29 CFR 1926.62 *Lead Exposure in Construction*).
- Unless labeling or laboratory testing data indicates that suspect PCB-containing hydraulic and electrical equipment and fluorescent lighting fixtures do not contain PCBs, and that fluorescent lights do not contain mercury, disposal would be performed in accordance with applicable regulatory requirements.
- Disposal of any chemicals would be in accordance with applicable requirements.

For Soil Disturbance:

- Since excavation would extend below the water table, dewatering would be necessary during construction and new foundations would require waterproofing, which would also act as a vapor barrier.
- Excavated soil would be screened by an environmental monitor for signs of contamination (such as odors, staining, or elevated photoionization detector readings). Any soil exhibiting signs of contamination would be removed from the site. All material that would need to be disposed of (including soil stockpiled in the basements, any contaminated soil, excess fill including demolition debris, or asbestos-containing bedrock) would be properly handled and disposed of off-site in accordance with all applicable requirements.
- In addition to Volatile Organic Compound (VOC) and methane monitoring, the construction site would be monitored by the environmental monitor for adherence with New York City regulations for dust during any soil moving activity (excavation, loading onto dump trucks for off-site disposal, managing soil stockpiles, etc.).
- A vapor barrier (or other form of vapor control) would be installed below any proposed new construction to reduce the potential for vapor intrusion from VOCs in the soil or groundwater. This barrier would also function as waterproofing.
- Prior to dewatering, testing would be performed to ensure that the groundwater would meet applicable requirements. If necessary, pretreatment would be conducted prior to discharge, as required by DEP Sewer Discharge permits.
- A Stormwater Pollution Prevention Plan (SWPPP) would be implemented to prevent contaminated sediment runoff. The SWPPP would include procedures for soil stockpiling and runoff control. Excavated soil would be stockpiled for future reuse or off-site disposal. Stormwater management measures, such as hay bales or silt fencing, would be placed around stockpiles and properly maintained to ensure that stormwater runoff complies with the applicable requirements.

Other:

- Remedial activities specified in the NYSDEC-approved RAWP were completed by April 2011. Any subsequent site management necessary would be performed in accordance with NYSDEC-approved measures.

A Remedial Action Plan (RAP) and associated Construction Health and Safety Plan (CHASP) would be prepared (and submitted to OER for review and approval) for implementation during project construction. The RAP would address requirements for items such as: soil stockpiling, soil disposal and transportation; dust control; quality assurance; and contingency measures should petroleum storage tanks or contamination be unexpectedly encountered. The CHASP would identify potential hazards that may be encountered during construction and specify appropriate health and safety measures to be undertaken to ensure that subsurface disturbance is performed in a manner protective of workers, the community, and the environment (such as personal protective equipment, air monitoring requirements and emergency response procedures).

With the implementation of these measures, which would be ensured through the proposed project’s restrictive declaration, no significant adverse impacts related to hazardous materials would result from construction activities in the project area.

NATURAL RESOURCES

Groundwater and Minetta Brook (or Creek)

Groundwater flow direction is controlled by hydraulic head (differences in water elevation), and hydraulic head is measured as the groundwater surface elevation, or the water table. Hydraulic head is a function of elevation and pressure (due to gravity), and water flows from high pressure to low pressure, or downgradient, like a stream. Placing a structure and creating a "tub effect" would not change the flow regime, or the overall force driving the groundwater flow, and water would continue to flow in the pre-construction direction as caused by the existing hydraulic head. The only change in flow direction would be the localized flow of water around the building as it contacts the foundation. A visual correlation can be understood by imagining a boulder in a slow-moving stream. The only change in the overall stream flow direction is in the immediate vicinity of the boulder as it travels around the boulder**.** The stream has a localized change of direction only in front of the boulder as it flows around the rock, then the water quickly returns to the normal state of flow. Based on the above, the foundation construction would not change the flow regime, or the overall force driving the groundwater flow, and water would continue to flow in the pre-construction direction as caused by the existing hydraulic head. The deep basements would cause groundwater to flow around the structure, but would not cause upward migration of groundwater.

Minetta Brook had been a surface water body, flowing from what is now West 16th Street and Avenue of the Americas to the Hudson River at Charlton Street. In the 1820s, Minetta Brook was diverted and forced underground to allow for the construction of Washington Square Park[1]. The surface course of Minetta Brook ran approximately 1,500 feet to the west of the site of the proposed basement under the LaGuardia Building. Therefore, the construction of the proposed project would not interfere with any flow that may remain from the underground expression of Minetta Brook.

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[1] Julia, Solis, 2005. New York Underground, the Anatomy of a City. Routledge.

OPEN SPACE

This section assesses the availability and adequacy of open space resources during the construction periods for the Proposed Actions, including consideration of the potential direct and indirect effects of construction activities. The assessment of direct effects includes estimates of the extent and timing of open space displacement during construction, whether replacement open spaces would be made available, and consideration of construction-related noise and pollutant emissions on the quality of the open spaces resources. The indirect assessment applies the methodologies of Chapter 5, “Open Space” to determine how open space ratios for the non-residential (1/4-mile) and residential (1/2-mile) study areas could change over the course of the 19-year construction period.

Analysis Assumptions

The analysis considers conditions during the construction period when there would be notable changes in the available open spaces within the Proposed Development Area (i.e., displacement of existing open spaces or the addition of new open spaces), or when a new population of open space users would be introduced as a result of the completion and operation of a project building. **Table 20-25** presents five such analysis conditions, which based on the construction schedule analyzed, would occur in 2014, 2018, 2022, 2027 and 2028, respectively.

Table 20-25
Displaced and New Publicly Accessible Open Spaces During Construction Open Space Analysis Years (Quantitative Assessment)

Analysis Condition (Years)	Publicly Accessible Open Space			
	Displaced		New	
Zipper Building Construction (2014)	Coles Plaza Coles Playground Southern portion of Mercer Playground*	3,920 sf 7,058 sf 4,375 sf	Bleecker Seating Area Temporary Mercer Entry Plaza Temporary LaGuardia Play Area	6,275 sf 17,550 sf 10,300 sf
Bleecker Building Construction (2018)**	L1 portion of Bleecker Street Strip*** (Bleecker Street Staging Option only)	4,650 sf	Greene Street Walk Toddler Playground	8,060 sf 11,020 sf
Mercer Building Construction (2022)	Remainder of Mercer Playground Temporary Mercer Entry Plaza	10,000 sf 17,550 sf	None	
North Block Below-Grade/ Open Space and Above-Grade Mercer Building Construction (2027)	None		Philosophy Garden and central portion of Public Lawn WSV Play Garden Mercer Entry Plaza	27,450 sf 15,000 sf 17,550 sf
LaGuardia Building Construction (2028)	Temporary LaGuardia Play Area Adrienne’s Garden	10,300 sf 4,500 sf	Tricycle Garden	15,200 sf

Notes:
* Southern portion of Mercer Playground would be displaced earlier in 2013.
** An alternative phasing scenario for the proposed Bleecker Building is presented in Section F, below.
*** See Figure 5-2 for location of Segment L_1. The Bleecker Street Strip is not defined as publicly accessible open space in the baseline assessment of this FEIS because it does not present “usable recreational areas” as defined by CEQR. However, in order to conservatively assess the potential displacement of a portion of the Bleecker Street Strip during certain phases of construction, it is being considered publicly accessible open space for purposes of this analysis, and the proposed improvements to the strip are described in the FEIS.

Zipper Building Construction (2014)

Study Area Population

When the Zipper Building is under construction there would be no new population introduced by the Proposed Actions.

Study Area Open Spaces

The publicly accessible open space changes expected to occur within the Proposed Development Area as a result of Zipper Building construction are illustrated in **Figure 20-14**, and are described below.

On the North Block, the southern portion of Mercer Playground and the enclosed, landscaped area south of Mercer Playground would be displaced to accommodate a new 17,550-square-foot passive publicly accessible open space, and to enable pedestrian access from Mercer Street to the proposed temporary gym. The new passive open space—the "Mercer Entry Plaza"—would contain seating, and would be surrounded by approximately 6,350 square feet of planting beds. (The planting beds are separate from the 17,550-square-foot open space and are not accounted for in the quantified analysis because they would not provide seating, nor would they be accessible.) Also on the North Block, by 2014 NYU would develop an approximately 10,300-square-foot (0.24-acre) temporary publicly accessible play area on the LaGuardia Landscape, displacing a portion of this resource. The "Temporary LaGuardia Play Area" would extend north-south from the center of the block (south of the statue of Mayor Fiorello LaGuardia) to Bleecker Street. For purposes of analysis it is assumed that the Temporary LaGuardia Play Area's programming would be 25 percent passive and 75 percent active. The temporary play area would be replaced by a new, permanent play area at the same location by 2031.

On the South Block, Coles Gymnasium would be demolished, to be replaced by a new athletic facility of comparable size within the proposed Zipper Building (once the new athletic facility is operational, the temporary gym on the North Block would be demolished). The development of the Zipper building would require the displacement of four open space resources: Coles Plaza and Coles Playground (both publicly accessible open spaces); Coles Gym and the Mercer-Houston Dog Run (private open spaces).The dog run would be relocated to a comparably-sized site along West Houston Street on the South Block—the current location of Silver Tower Playground, a private open space that would also be displaced due to the project's relocation of the dog run. The relocated dog run is expected to be operating prior to the displacement of the existing dog run. Other proposed open space and landscaping changes to the South Block would be along the Bleecker Street Strip, where there would be new trees, low plantings, and benches as part of the proposed Bleecker Seating Area immediately north of the Oak Grove along Bleecker Street (final design changes to the Bleecker Street Strip would require DPR and Public Design Commission approval).

Overall, construction activities associated with the proposed Zipper Building would displace approximately 0.352 acres of publicly accessible open space (0.090 acres passive, 0.262 acres active), and would introduce approximately 0.783 acres of publicly accessible open space (0.606 acres passive, 0.177 acres active), for a net gain of approximately 0.431 acres of publicly accessible open space (a 0.516-acre increase in publicly accessible passive open space, and a 0.085-acre decrease in publicly accessible active space).

Direct Effects Analysis

The following identifies public and private open space resources that would be displaced by construction of the proposed Zipper Building, and characterizes other potential direct effects—

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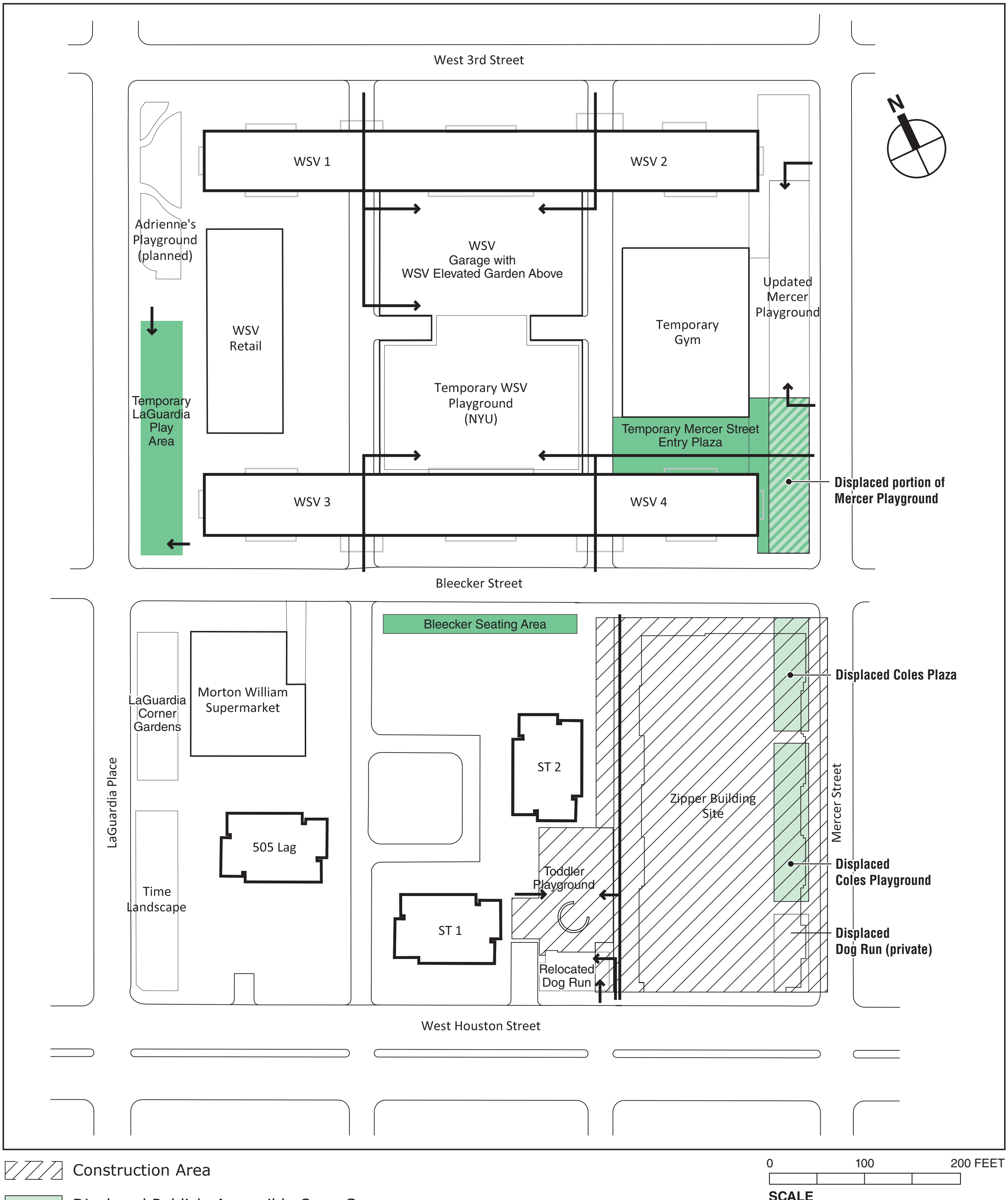


Construction Area

Displaced Publicly Accessible Open Space

New Publicly Accessible Open Space

Open Space Entry

Displaced and New Open Spaces by 2014 Construction Year

Figure 20-14

such as potential air quality, construction noise, and other safety concerns—on existing and new open spaces.

Publicly Accessible Open Spaces Directly Affected by Proposed Actions

- **Mercer Playground and adjacent landscaping** – Approximately 4,400 square feet from the southern portion of the Mercer Playground, as well as the landscaping area to the south of the playground, would be displaced by the proposed project.
- **Coles Plaza –** Coles Plaza would be displaced during construction of the proposed Zipper Building. The proposed project would provide a larger passive open space on the North Block (across Bleecker Street from Coles Plaza), and similar to Coles Plaza, this new space would contain seating and landscaping adjacent to NYU's temporary gym facility, thereby serving a similar function. The proposed project also would provide new amenities—including benches and new plantings—mid-block along Bleecker Street between Mercer Street and LaGuardia Place as part of the proposed Bleecker Seating Area, thereby offering a similar space as Coles Plaza.
- **Coles Playground** – Coles Playground would be displaced during construction of the proposed Zipper Building.

Private Open Spaces Directly Affected by Proposed Actions

- **Washington Square Village Playground** – This 23,190-square-foot private playground would be displaced by the proposed temporary gym. The playground would be relocated to a similarly-sized space (approximately 23,700 square feet) within the southern portion of the Washington Square Village Elevated Garden, which is also a private open space. Much of the existing play equipment would be relocated to the new space, and it would serve the same user base.
- **Washington Square Village Elevated Garden** – As described above, the southern portion of this private garden would be re-programmed to accommodate the relocated Washington Square Village Playground. This would result in a loss of existing private passive open spaces in this portion of the garden, although some of existing planting beds would remain.
- **Mercer-Houston Dog Run** – The 3,175-square-foot Mercer-Houston Dog Run would be displaced by the proposed Zipper Building. The proposed project would provide a similarly-sized replacement space (3,195 square feet) with similar amenities, and would be located along West Houston Street, adjacent to the Greene Street Walk.
- **Silver Tower Seating (and grassed area to the north)** – The approximately 0.6-acre Silver Tower Seating area and the grassed area to the north would be displaced in preparation for renovation and expansion to create an approximately 0.25-acre publicly accessible toddler playground to be operational by 2018 (see 2018 discussion below).
- **Silver Tower Playground** – This playground is a private open space that would be displaced due to the project's relocation of the dog run described above.
- **Coles Gymnasium –** The gymnasium will be displaced to accommodate construction of the proposed Zipper Building.

As mentioned above, the publicly accessible Coles Plaza and Coles Playground and the private Coles Gym, Mercer-Houston Dog Run, Silver Tower Seating and Silver Tower Playground would be displaced in order to accommodate the construction of the Zipper Building and the Toddler Playground on the eastern portion of the South Block. The relocated dog run would be located at the site of the existing Silver Tower Playground. During construction activities for the Zipper Building, there would be no publicly accessible open spaces available on the South

Block. However, all of the private open spaces west of the active Zipper Building construction area (including the relocated dog run) would be available for private use. As part of construction startup work, fencing along the western boundary of the Zipper Building construction area would be installed as a public safety measure to separate the usable spaces on the central and western portions of the South Block with the construction activities on the eastern portion of the block. During above-grade construction, safety netting would also be installed.

As described above under "Air Quality," during the construction of the Zipper Building, all construction engines would be located away from the west side of the construction site, so as to maintain a buffer from residential buildings and open spaces west of the Zipper Building, to the extent practicable. The results of the Phase 1 air quality analysis—which represented worst-case conditions during the construction of the Zipper Building—showed that construction activities during this phase would not result in any significant adverse air quality impacts at any sensitive receptors, which included areas such as public and private open spaces directly adjacent to construction activities.

During construction of the Zipper Building, there would be no temporary significant adverse noise impacts at any publicly accessible open spaces.

Indirect Effects Analysis

Non-residential Study Area. During construction of the proposed Zipper Building there would be no new population introduced by the Proposed Actions. The number of non-residents in the non-residential study area would remain at 95,841 persons, and the total amount of publicly accessible open space is expected to increase to 14.18 acres from conditions in the future without the Proposed Actions. As shown in **Table 20-26**, during construction of the Zipper Building the ratio of passive open space per 1,000 non-residents would be 0.102, which is below the City's guideline of 0.15 acres, but would be an improvement as compared to the 0.097 ratio in the future without the Proposed Actions. For the combined residential and non-residential population, the passive open space ratio would be 0.078 acres per 1,000 people, which is much lower than the recommended weighted average ratio of 0.23 acres per 1,000 residents and workers, but would be an improvement as compared to the 0.073 ratio for the future without the Proposed Actions.

Table 20-26
Open Space Ratios During Zipper Building Construction
2014 Analysis Condition

Ratio	DCP Guideline	Existing Ratio	Future Without the Proposed Project Ratio	Future With the Proposed Project Ratio	Percent Change (Future With vs. Future Without)
Non-Residential Study Area					
Passive/non-residents	0.15	0.101	0.097	0.102	5.6%
Passive/total population	0.24	0.076	0.073	0.078	5.6%
Residential Study Area					
Total/residents	2.5	0.243	0.229	0.233	1.9%
Passive/residents	0.5	0.138	0.129	0.134	3.9%
Active/residents	2.0	0.106	0.100	0.099	-0.8%
Passive/total population*	0.27	0.048	0.046	0.048	3.9%

Note:
* Weighted average combining 0.15 acres per 1,000 non-residents and 0.50 acres per 1,000 residents. Non-residents typically use passive spaces; therefore, for the non-residential study area, only passive open space ratios are calculated. For the residential study area, active, passive, and total park space ratios are calculated.

Residential Study Area. The combined residential and non-residential passive open space ratio within the residential study area would be 0.048 acres per 1,000 residents and non-residents, which is much lower than the recommended weighted average ratio of 0.27 acres per 1,000 residents and workers, but would be an improvement as compared to the 0.046 ratio in the future without the Proposed Actions. The active open space ratio would be 0.099 acres per 1,000 residents, which is notably less than the City's planning guideline of 2.0 acres per 1,000 residents, and represents a 0.8 percent decrease compared to the 0.100 ratio in the future without the Proposed Actions. The total open space ratio would be approximately 0.233 acres per 1,000 residents, which is well below the City's planning guideline of 2.5 acres per 1,000 residents, but would be an slight improvement (a 1.9 percent increase) as compared to the total open space ratio in the future without the Proposed Actions.

As shown in **Table 20-26**, while the active open space ratio in the residential study area would decrease by 0.8 percent during construction of the proposed Zipper Building, all other open space ratios would improve slightly as compared to future conditions without the Proposed Actions (between 1.9 and 5.6 percent increases). Therefore, during the first few years of construction, as existing open spaces are displaced to accommodate the temporary gym, Zipper Building, and project open spaces, the Proposed Actions would slightly improve passive open space ratios both in the residential and non-residential study areas, and result in a temporary decrease in the active open space ratio within the residential study area. According to the *CEQR Technical Manual*, in areas that are extremely lacking in open space, a reduction of open space ratios as small as 1 percent may be considered significant, as it may result in overburdening existing facilities or further exacerbating a deficiency in open space. Given that the Proposed Actions would not reduce the active open space ratio by 1 percent, the reduction would not be considered a significant adverse impact.

Bleecker Building Construction (2018)

Study Area Population

The approximately 1-million-gsf Zipper Building is expected to be operational at the onset of construction activities associated with the Bleecker Building. In addition, by 2018 the Proposed Actions would result in the development of up to 23,326 gsf of new ground-floor retail uses in the Commercial Overlay Area.

- *Non-residential Study Area* – The future project-generated populations for the non-residential study area analysis are based on RWCDS 1 (the Maximum Academic Scenario), which maximizes the number of workers that would be introduced by the Proposed Actions.

  Collectively, the new uses in the Proposed Development Area and Commercial Overlay Area would introduce to the non-residential study area an estimated total of 1,922 workers and up to approximately 417 residents. The 2018 combined residential and non-residential population in the ¼-mile study area is projected to be 128,298 people.

- *Residential Study Area* – The future project-generated populations for the residential study area analysis are based on RWCDS 2 (the Maximum Dormitory Scenario), which maximizes the number of residents that would be introduced by the Proposed Actions.

  Collectively, these new uses in the Proposed Development Area and Commercial Overlay Area would introduce to the Residential Study Area an estimated total of up to 1,567 residents. With the proposed project, the residential study area would contain an estimated 103,119 residents by 2018.

The proposed uses also would introduce an estimated 1,027 workers to the residential study area. The 2018 combined residential and non-residential population in the residential study area is projected to be 287,590 people.

Study Area Open Spaces

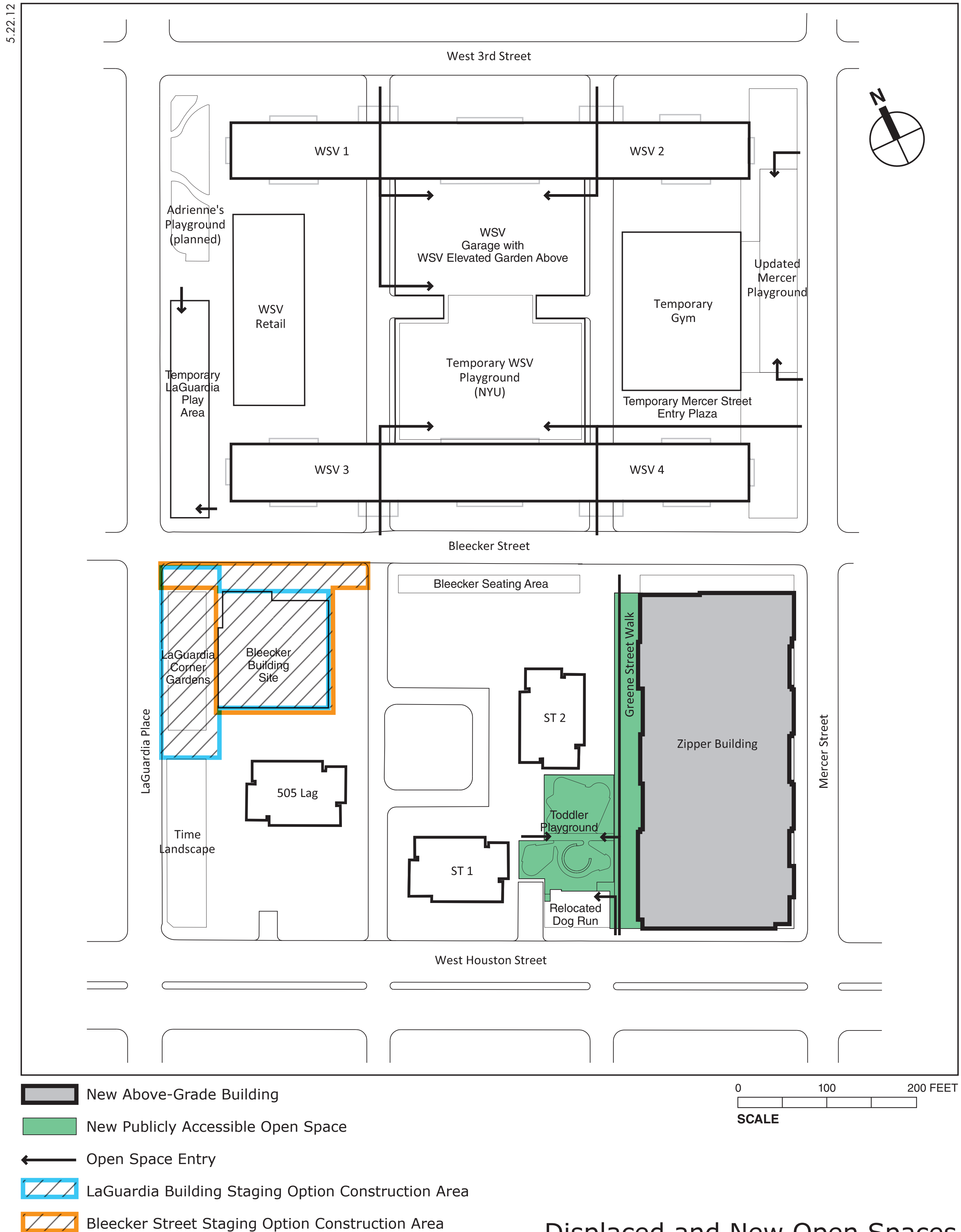
The publicly accessible open space changes expected to occur within the Proposed Development Area by 2018 are illustrated in **Figure 20-15**, and are described below.

Between 2015 and 2018, no publicly accessible open spaces in the Proposed Development Area would be displaced under the LaGuardia Place Staging Option (construction staging only along the LaGuardia Place frontage). Under the Bleecker Street Staging Option (construction staging along the Bleecker Street frontage), the portion of the Bleecker Street Strip immediately north of the construction site would be utilized for construction staging. While the Bleecker Street Strip is not considered public accessible open space in the baseline DEIS analysis because it does not present “usable recreational areas” as defined by CEQR, it is considered in an analysis of publicly accessible open spaces in **Appendix A: Alternative Quantified Open Space Assessment**. Under the analytical assumptions of that appendix, the Bleecker Street Staging Option would displace a publicly accessible open space, and therefore is considered below.

To create a more pedestrian-friendly streetscape and to better integrate the South Block into the adjacent streets and public realm, by 2018 the proposed project would modify some landscaping elements of the University Village complex, including the existing approximately six-foot-tall fences along Bleecker Street and part of West Houston Street that would be replaced with new low fences and low perimeter plantings, allowing for improved views into the site and a more pedestrian friendly perimeter. The six-foot-tall fence for 505 LaGuardia Place, along LaGuardia Place and part of West Houston Street, would remain. The Silver Towers Oak Grove, located along Bleecker Street, would receive new low plantings and would be extended eastward to align with the western boundary of the north-south pedestrian walkway, which would be improved. That passageway would be substantially widened from approximately six feet to approximately 30 feet. This modification would improve the visibility of the walkway and its openness to West Houston and Bleecker Streets and would be a significant improvement to the streetscape. The widened walkway—referred to as the Greene Street Walk—would be landscaped with trees and low shrubs, and there would be seating to create an enhanced open space and passage through the block. The new dog run would be accessed from the Greene Street Walk. The existing concrete wall along West Houston Street would remain, but the widened and landscaped walkway would open the site at this location and some fencing would be removed to improve visibility to the site.

Also on the South Block, the approximately 0.6-acre Silver Tower Seating Area would be renovated and expanded to create an approximately 0.25-acre publicly accessible toddler playground. The Toddler Playground would be located immediately north of the relocated dog run at West Houston Street, and would be adjacent to the proposed Greene Street Walk on the University Village site (between the relocated dog run and Silver Tower II). The new playground would incorporate the existing sculptural concrete components in this area of the University Village site.

Overall, by 2018 the proposed project would displace approximately 0.459 acres of publicly accessible open space (0.197 acres passive, 0.262 acres active), and would introduce approximately 1.221 acres of publicly accessible open space (0.791 acres passive, 0.430 acres



Displaced and New Open Spaces by 2018 Construction Year

Figure 20-15

active), for a net gain of approximately 0.762 acres of publicly accessible open space (a 0.594-acre increase in passive open space, and a 0.168-acre increase in active space).[1]

Direct Effects Analysis

Construction of the publicly accessible Toddler Playground would commence once the Zipper Building is enclosed, concurrent with building fit-out. While the completion of the Zipper Building would occur at the end of 2018, the Toddler Playground could be open by the end of 2017. However, since the only construction activities associated with the Zipper Building following the opening of the Toddler Playground would be occurring within an enclosed building, construction effects of noise and air quality on the playground would be minimal.

By 2018, no publicly accessible open spaces would be directly affected by the Proposed Actions in terms of displacement under the LaGuardia Place Staging Option (construction staging only along the LaGuardia Place frontage). However, under the Bleecker Street Staging Option (construction staging only along the Bleecker Street frontage), the portion of the Bleecker Street Strip north of the construction site would be utilized for construction staging and would not be publicly accessible during the 27-month period associated with the excavation/foundations and superstructure/exterior work for construction of the Bleecker Building. The portion of the Bleecker Street Strip that would be utilized for construction staging (area "L1" in Figu**re 5-2**) is an area devoid of vegetation with the exception of a few street trees (appearing similar to a typical City sidewalk). The temporary displacement of this area would not be considered a significant adverse impact on publicly accessible open space because during the same time period, the project would provide improved passive open space further east along the Bleecker Street Strip in the Bleecker Seating Area, as well as additional passive open space with the proposed Greene Street Walk.

Under the LaGuardia Place Staging Option, most, if not all of the LaGuardia Corner Gardens—a GreenThumb community garden that does not meet the *CEQR Technical Manual* guidance for consideration as a publicly accessible open space—would not be available for the approximately 39-month construction period, because it would be located inside of the construction perimeter, within an area that would be utilized for construction staging. The temporary displacement of the LaGuardia Corner Gardens would be a significant adverse impact on this resource; however, upon completion of the Bleecker Building, the community garden could be restored to its current location. Under the LaGuardia Place Staging Option the portion of the Bleecker Street Strip directly north of the construction site would remain publicly accessible. However, for an approximately 27-month period during construction that portion of the Bleecker Street Strip would be covered by a construction shed in order to provide a safe construction perimeter. Specifically, protective measures would be necessary during above-grade work on the Bleecker Building (i.e., superstructure, building envelope, and interior finishes). The construction shed would reduce the overall utility of this portion of the Bleecker Street Strip during the 27-month period.

Under the Bleecker Street Staging Option, it is expected that the primary area of LaGuardia Corner Gardens (i.e., the area west of the construction site) would remain accessible throughout Bleecker Building construction. As with the LaGuardia Place Staging Option, the smaller, stand-alone portion of LaGuardia Corner Gardens located at the corner of LaGuardia Place and

[1] These estimates conservatively assume that the Bleecker Street Strip is publicly accessible open space as defined under CEQR, and that approximately 4,650 square feet of the open space could be displaced by construction of the Bleecker Building under the Bleecker Street Staging Option.

Bleecker Street would displaced for the entire 39-month construction period. In addition, under the Bleecker Street Staging Option, for an approximately 27-month period during construction, most, if not all, of the garden would need to be covered by a construction shed in order to provide a safe construction site. Specifically, protective measures would be necessary during above-grade work on the Bleecker Building (i.e., superstructure, building envelope, and interior finishes). The construction shed would reduce the overall utility of the garden, and would block most, if not all, direct sunlight for an approximately 27-month period, thereby jeopardizing the viability of all plantings, and therefore would result in a significant adverse impact on this private resource.

As detailed in Chapter 21, "Mitigation," between the DEIS and FEIS, options were explored to relocate the LaGuardia Corner Gardens either temporarily (during construction of the Bleecker Building) or permanently, and if permanent relocation space is not identified within a ¼-mile area, to refine construction staging and logistics in order to minimize the extent and duration of disturbance (please see Chapter 21 for this discussion).

During construction of the Bleecker Building, there would be no temporary significant adverse noise impacts at any publicly accessible open spaces.

Indirect Effects Analysis

Non-residential Study Area. Under RWCDS 1, the number of non-residents in the non-residential study area is forecast to increase to 128,298 and the total amount of publicly accessible open space is expected to increase to 14.51 acres. As shown in **Table 20-27**, by 2018 the ratio of passive open space per 1,000 non-residents would be 0.101, which is below the City's guideline of 0.15 acres, but would be an improvement as compared to the 0.097 ratio in the future without the Proposed Actions. For the combined residential and non-residential population, the passive open space ratio would be 0.077 acres per 1,000 people, which is much lower than the recommended weighted average ratio of 0.23 acres per 1,000 residents and workers, but would be an improvement as compared to the 0.073 ratio for the future without the Proposed Actions.

Table 20-27
Open Space Ratios During Bleecker Building Construction
2018 Analysis Condition*

Ratio	DCP Guideline	Existing Ratio	Future Without the Proposed Project Ratio	Future With the Proposed Project Ratio	Percent Change (Future With vs. Future Without)
Non-Residential Study Area					
Passive/non-residents	0.15	0.101	0.097	0.101	4.3%
Passive/total population	0.23	0.076	0.073	0.077	4.5%
Residential Study Area					
Total/residents	2.5	0.243	0.229	0.233	1.7%
Passive/residents	0.5	0.138	0.129	0.133	3.0%
Active/residents	2.0	0.106	0.100	0.100	0.1%
Passive/total population**	0.27	0.048	0.046	0.048	3.6%

Notes:
* These estimates conservatively assume that the Bleecker Street Strip is publicly accessible open space as defined under CEQR, and that approximately 4,650 square feet of the open space would be displaced by construction of the Bleecker Building under the Bleecker Street Staging Option.
** Weighted average combining 0.15 acres per 1,000 non-residents and 0.50 acres per 1,000 residents. Non-residents typically use passive spaces; therefore, for the non-residential study area, only passive open space ratios are calculated. For the residential study area, active, passive, and total park space ratios are calculated.

Residential Study Area. The combined residential and non-residential passive open space ratio within the residential study area would be 0.048 acres per 1,000 residents and non-residents, which is much lower than the recommended weighted average ratio of 0.28 acres per 1,000 residents and workers, but would be an improvement as compared to the 0.046 ratio in the future without the Proposed Actions. The active open space ratio would be 0.100 acres per 1,000 residents, which is notably less than the City's planning guideline of 2.0 acres per 1,000 residents, and virtually the same as the 0.100 ratio in the future without the Proposed Actions. The total open space ratio would be approximately 0.233 acres per 1,000 residents, which is well below the City's planning guideline of 2.5 acres per 1,000 residents, but would be an slight improvement (a 1.7 percent increase) as compared to the total open space ratio in the future without the Proposed Actions.

As shown in **Table 20-27**, all open space ratios would improve slightly as compared to future conditions without the Proposed Actions (between 0.1 and 4.5 percent increases). Therefore, during the first five years of construction, as existing open spaces are displaced to accommodate future project buildings and project open spaces, the Proposed Actions would slightly improve open space ratios both in the residential and non-residential study areas, and there would be no significant adverse indirect open space impacts.

North Block Garage and Mercer Building Construction (2022)

Study Area Population

Between the 2019 and 2022 construction years, the Proposed Actions would introduce approximately 225,000 gsf of additional new uses to the Proposed Development Area with the completion of the Bleecker Building. Therefore, by the 2022 construction year, there would be two operational project components in the Proposed Development Area: the Zipper Building, and the Bleecker Building, totaling approximately 1.3 million gsf of new uses in the Proposed Development Area. In addition, by 2022 the Proposed Actions would result in the development of up to 23,326 gsf of new ground-floor retail uses in the Commercial Overlay Area.

- *Non-residential Study Area.* The future project-generated populations for the non-residential study area analysis are based on RWCDS 1 (the Maximum Academic Scenario), which maximizes the number of workers that would be introduced by the Proposed Actions.

  Collectively, by 2022, the new uses in the Proposed Development Area and Commercial Overlay Area would introduce to the non-residential study area an estimated total of 2,314 workers and up to approximately 600 residents. The 2022 combined residential and non-residential population in the ¼-mile study area is projected to be 128,872 people.

- *Residential Study Area.* The future project-generated populations for the residential study area analysis are based on RWCDS 2 (the Maximum Dormitory Scenario), which maximizes the number of residents that would be introduced by the Proposed Actions.

  Collectively, these new uses in the Proposed Development Area and Commercial Overlay Area would introduce to the Residential Study Area an estimated total of up to 1,750 residents. With the proposed project, the residential study area would contain an estimated 103,303 residents by 2018.

  The proposed uses also would introduce an estimated 1,281 workers to the residential study area. The 2022 combined residential and non-residential population in the residential study area is projected to be 288,027 people.

Study Area open spaces

The publicly accessible open space changes expected to occur within the Proposed Development Area by 2022 are illustrated in **Figure 20-16**, and are described below.

Between 2019 and 2022, the only publicly accessible open spaces in the Proposed Development Area to be displaced would be the remainder of the Mercer Playground and the Mercer Entry Plaza on the North Block. There would be no new open spaces developed in the Proposed Development Area between 2019 and 2022.

The proposed Bleecker Building would contain an approximately 7,680-square-foot play area on the rooftop above the seven-story public school. This play area would include an approximately 3,000-square-foot early childhood playground (for pre-K and kindergarten students), with the remaining approximately 4,680-square-foot area for other students of the public school. Both areas would be utilized exclusively by the students of the public school.

Overall, by 2022 the proposed project would displace approximately 0.582 acres of publicly accessible open space (0.09 acres passive, 0.49 acres active).

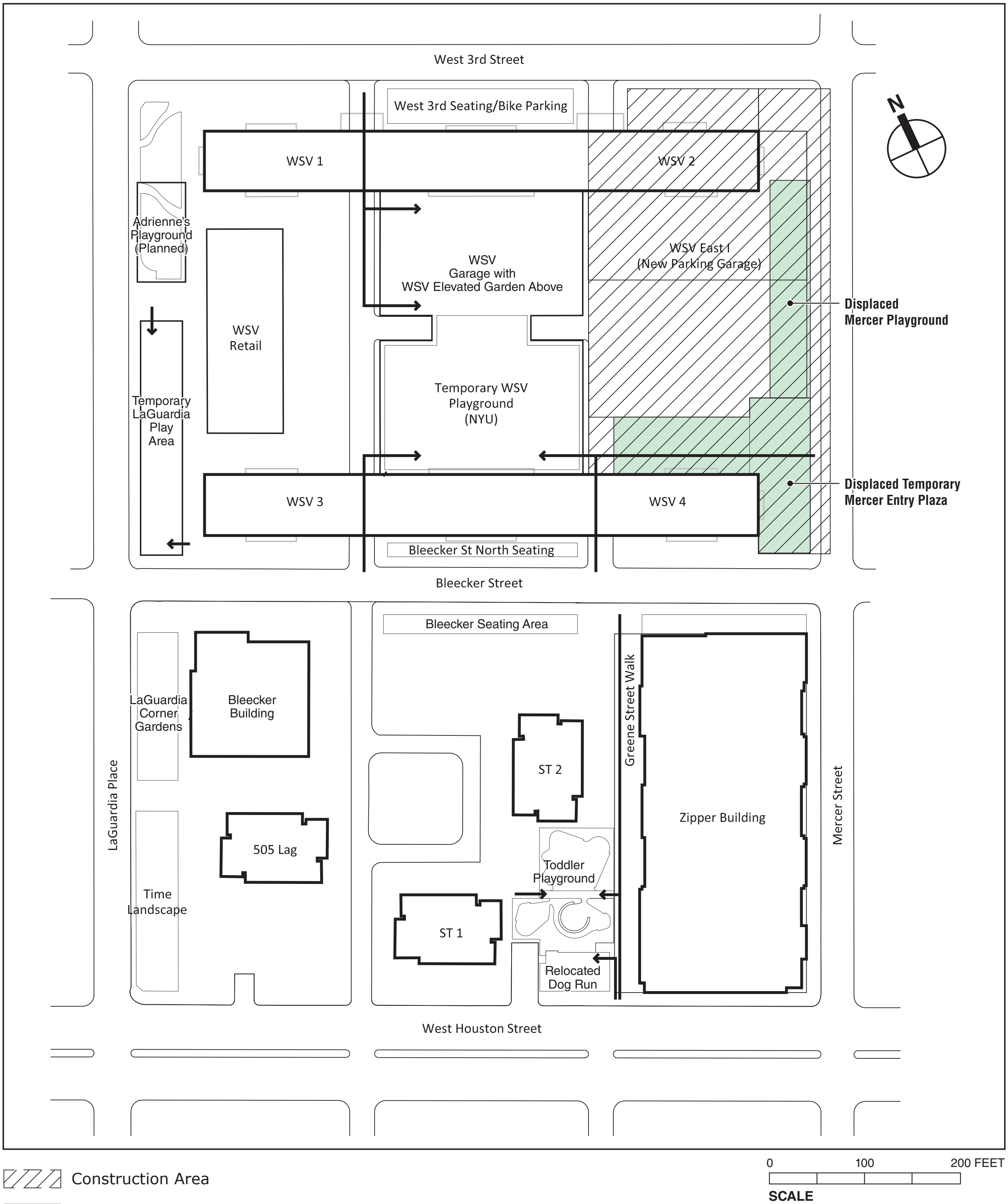
Direct Effects Analysis

As mentioned earlier, approximately 4,400 square feet from the southern portion of the Mercer Playground, as well as the landscaping area to the south of the playground, would be displaced by the proposed project by 2013. By 2022, the remaining portion of the Mercer Playground (the portion not displaced in 2013) would be displaced. However, the playground is underutilized, and the proposed project would create a new approximately 10,300-square-foot temporary playground along LaGuardia Place on the North Block. The new publicly accessible passive open space that would be created in place of the southern portion of the Mercer Playground in 2013 (the Mercer Entry Plaza) would also be displaced by 2022, to accommodate construction on the east side of the North Block.

During construction activities for the Mercer Building on the eastern side of the North Block in 2022, all of the publicly accessible and private open spaces west of the construction area would be operational, including the Temporary LaGuardia Play Area along LaGuardia Place, Adrienne's Garden, and the temporary Washington Square Village Playground located on the southern portion of the private Washington Square Village Elevated Garden. As part of startup work, fencing along the western boundary of the Mercer Building construction area would be installed as a public safety measure to separate the usable spaces on the central and western portions on North Block with the construction activities on the eastern portion. During above-grade construction, safety netting would also be installed.

As described above under "Air Quality," during the construction of the Mercer Building, all construction engines would be located at least 50 feet away from the Washington Square Village buildings, to the extent practicable. This measure would reduce potential concentration increments from on-site sources by increasing the distance between the emission sources and the sensitive locations, resulting in enhanced dispersion of pollutants. The results of the Phase 2 air quality analysis—which represented worst-case conditions during the below-grade construction of both the Mercer Building and the LaGuardia Building—showed that construction activities during this phase would not result in any significant adverse air quality impacts at any sensitive receptors, which included areas such as open spaces directly adjacent to construction activities.

Construction of the Mercer Building (prior to the opening of the central open spaces in 2027—see below), would not result in temporary significant adverse noise impacts at any publicly accessible open spaces.



Construction Area

Displaced Publicly Accessible Open Space

New Publicly Accessible Open Space

Open Space Entry

Displaced and New Open Spaces by 2022 Construction Year

Figure 20-16

Indirect Effects Analysis

Non-residential Study Area. Under RWCDS 1, the number of non-residents in the non-residential study area is forecast to increase to 98,154 and the total amount of publicly accessible open space is expected to be 13.99 acres. As shown in **Table 20-28**, by 2022 the ratio of passive open space per 1,000 non-residents would be 0.097, which is below the City's guideline of 0.15 acres, and would be virtually the same as the 0.097 ratio in the future without the Proposed Actions. For the combined residential and non-residential population, the passive open space ratio would be 0.074 acres per 1,000 people, which is much lower than the recommended weighted average ratio of 0.23 acres per 1,000 residents and workers, and would be slightly higher than the ratio for the future without the Proposed Actions.

Table 20-28
Open Space Ratios During North Block Garage and Mercer Building Construction
2022 Analysis Condition

Ratio	DCP Guideline	Existing Ratio	Future Without the Proposed Project Ratio	Future With the Proposed Project Ratio	Percent Change (Future With vs. Future Without)
Non-Residential Study Area					
Passive/non-residents	0.15	0.101	0.097	0.097	0.8%
Passive/total population	0.23	0.076	0.073	0.074	0.9%
Residential Study Area					
Total/residents	2.5	0.243	0.229	0.227	-0.7%
Passive/residents	0.5	0.138	0.129	0.130	0.5%
Active/residents	2.0	0.106	0.100	0.098	-2.3%
Passive/total population**	0.28	0.048	0.046	0.046	1.2%

Note:
* Weighted average combining 0.15 acres per 1,000 non-residents and 0.50 acres per 1,000 residents. Non-residents typically use passive spaces; therefore, for the non-residential study area, only passive open space ratios are calculated. For the residential study area, active, passive, and total park space ratios are calculated.

Residential Study Area. The combined residential and non-residential passive open space ratio within the residential study area would be 0.046 acres per 1,000 residents and non-residents, which is much lower than the recommended weighted average ratio of 0.28 acres per 1,000 residents and workers, but would be virtually the same as the 0.046 ratio in the future without the Proposed Actions. The active open space ratio would be 0.098 acres per 1,000 residents, which is notably less than the City's planning guideline of 2.0 acres per 1,000 residents, and represents a 2.3 percent decrease compared to the 0.100 ratio in the future without the Proposed Actions. The total open space ratio would be approximately 0.227 acres per 1,000 residents, which is well below the City's planning guideline of 2.5 acres per 1,000 residents, and represents a 0.7 percent decrease compared to the total open space ratio in the future without the Proposed Actions.

As shown in **Table 20-28**, all open space ratios would improve slightly as compared to future conditions without the Proposed Actions (between 0.5 and 1.2 percent increases), with the exception of the total open space ratio and the active open space ratio for the residential population in the ½-mile residential study area (which would decrease by 0.7 percent and 2.3 percent, respectively). Therefore, during the first few years of Phase 2 construction, as additional existing open spaces are displaced to accommodate future project buildings and project open spaces, the Proposed Actions would temporarily exacerbate future deficiencies in active open spaces in the residential study area. According to the *CEQR Technical Manual*, in areas that are extremely lacking in open space, a reduction of open space ratios as small as 1 percent may be considered significant, as it may result in overburdening existing facilities or further exacerbating a deficiency in open space. Given that the study areas could be considered extremely lacking in open space resources, the projected decreases in open space ratios would result in temporary significant adverse impacts to active open space resources in the residential study area. The temporary impact on active open space resources in the residential study area would not begin until the proposed Mercer Building has initiated construction, and would be eliminated by the provision of the project open spaces associated with the next stage of construction (i.e., completion of the Mercer Building and central portion of the North Block's proposed open space).

Completion of North Block Below-Grade /Central Open Space/Above-Grade Mercer Building Construction (2027)

Study Area Population

Between the 2023 and 2027 construction years, the Proposed Actions would introduce approximately 385,000 gsf of additional new uses to the Proposed Development Area with the completion of a portion of the North Block below-grade space. Therefore, by the 2027 construction year, there would be three operational project components in the Proposed Development Area; the Zipper Building, the Bleecker Building, and a portion of the North Block below-grade space, totaling approximately 1.7 million gsf of new uses in the Proposed Development Area. In addition, by 2027 the Proposed Actions would result in the development of up to 23,326 gsf of new ground-floor retail uses in the Commercial Overlay Area.

- *Non-residential Study Area.* The future project-generated populations for the non-residential study area analysis are based on RWCDS 1 (the Maximum Academic Scenario), which maximizes the number of workers that would be introduced by the Proposed Actions.

  Collectively, by 2027, the new uses in the Proposed Development Area and Commercial Overlay Area would introduce to the non-residential study area an estimated total of 3,143 workers and up to approximately 600 residents. The 2027 combined residential and non-residential population in the ¼-mile study area is projected to be 132,501 people.

- *Residential Study Area.* The future project-generated populations for the residential study area analysis are based on RWCDS 2 (the Maximum Dormitory Scenario), which maximizes the number of residents that would be introduced by the Proposed Actions.

  Collectively, by 2027, the new uses in the Proposed Development Area and Commercial Overlay Area would introduce to the Residential Study Area an estimated total of up to 1,750 residents. With the proposed project, the residential study area would contain an estimated 103,303 residents by 2027.

  The proposed uses also would introduce an estimated 2,110 workers to the residential study area. The 2027 combined residential and non-residential population in the residential study area is projected to be 291,495 people.

Study Area Open Spaces

The publicly accessible open space changes expected to occur within the Proposed Development Area by 2027 are illustrated in **Figure 20-17**, and are described below.

Between 2023 and 2027, no publicly accessible open spaces in the Proposed Development Area would be displaced. Rather, the central area of the North Block would be transformed from a space designed primarily for private use and passage into a destination for both visitors and everyday users, with pockets of space defined for particular uses within larger, more flexibly programmed spaces. The proposed public lawn in the central area (which would displace the

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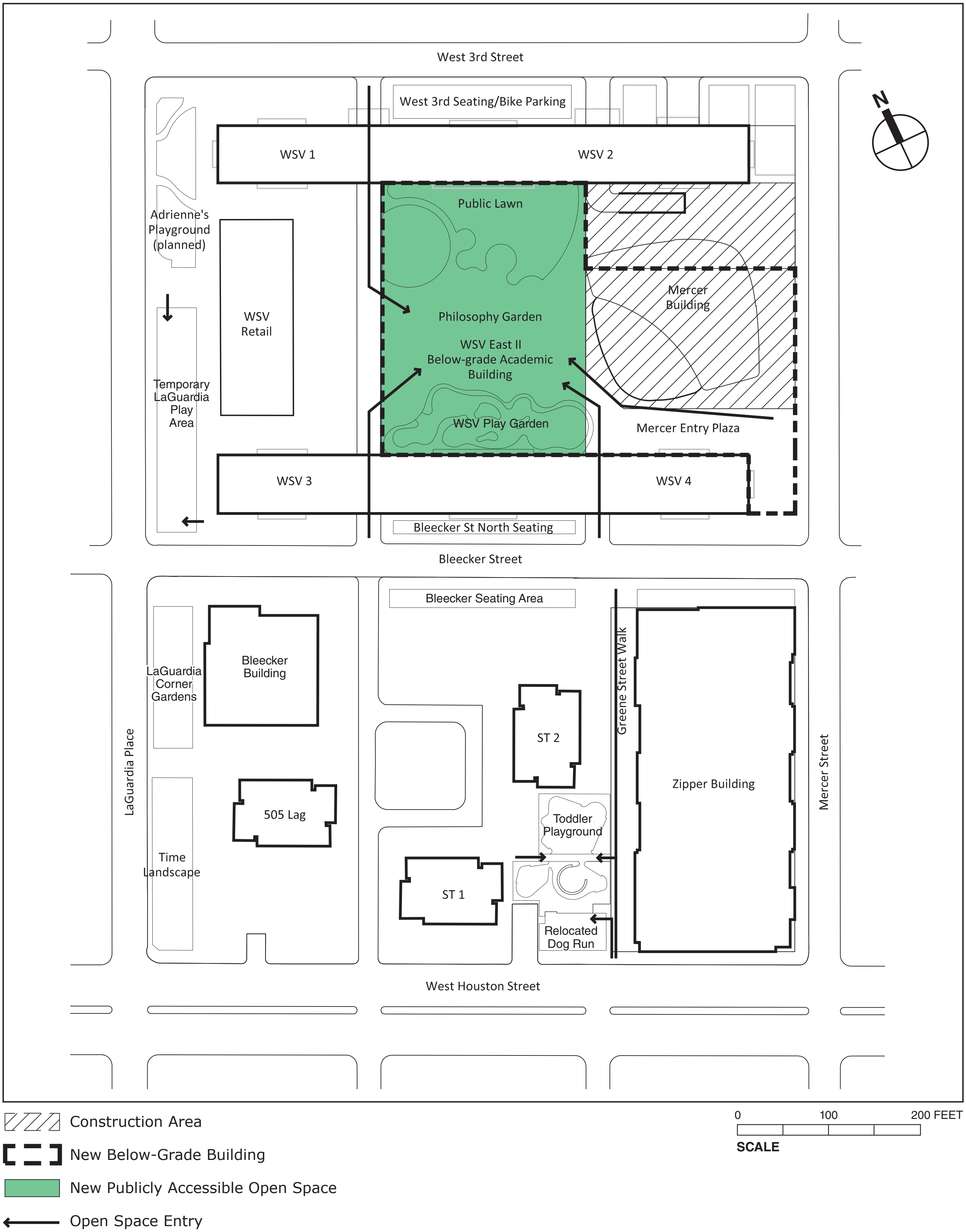


Displaced and New Open Spaces by 2027 Construction Year

Figure 20-17

NYU Core

private Washington Square Village Elevated Garden and temporary Washington Square Village Playground) is intended to serve as a counterpoint to the intensity and diversity of uses in the surrounding play gardens, and would provide flexibility for both passive enjoyment as well as more active recreation such as Frisbee. The proposed Philosophy Garden would have built-in seating and low-canopy trees aimed at creating a human-scale space, with the plantings and concave seating chosen to encourage passive recreation. The 15,000-square-foot publicly accessible Washington Square Village Play Garden ("WSV Play Garden," as shown in Figure 20-17) would be located southwest of the proposed Mercer Building. This play area currently remains flexible in its programming and age targets. Also available would be the mapped parkland on the eastern end of the block (including the new Mercer Entry Plaza which would create a welcoming entry landscape by carrying the design materials into the inner areas of the block.

Overall, by 2027 the proposed project would displace approximately 0.582 acres of publicly accessible open space (0.09 acres passive, 0.492 acres active), and would introduce approximately 1.959 acres of publicly accessible open space (1.362 acres passive, 0.597 acres active), for a net gain of approximately 1.377 acres of publicly accessible open space (a 1.272-acre increase in passive open space, and a 0.105-acre increase in active space).

Direct Effects Analysis

Between 2023 and 2027, no publicly accessible open spaces would be directly affected by the Proposed Actions in terms of displacement. As mentioned above, construction of the central publicly accessible open spaces (the Public Lawn, Philosophy Garden and Washington Square Village Play Garden) would displace the private Washington Square Village Elevated Garden and temporary Washington Square Village Playground.

In 2027, the proposed central publicly accessible open spaces and the Mercer Entry Plaza would be open for use while the above-grade portion of the Mercer Building would still be under construction.

As described above, the results of the Phase 2 air quality analysis—which represented worst-case conditions during the below-grade construction of both the Mercer Building and the LaGuardia Building—showed that construction activities during this phase would not result in any significant adverse air quality impacts at any sensitive receptors. Above-grade construction is generally less intensive in terms of air quality emissions from construction equipment than below-grade construction. Therefore, in 2027 when above-grade construction of the Mercer Building would be occurring with adjacent sensitive receptors in the central publicly accessible open space and Mercer Entry Plaza, it can be similarly concluded that there would be no significant adverse impacts from construction-related air emissions on these open spaces.

The above-grade construction of the Mercer Building would result in temporary significant adverse noise impacts on the publicly accessible central opens spaces on the North Block (the Public Lawn, Philosophy Garden and Washington Square Village Play Garden).

Indirect Effects Analysis

Non-residential Study Area. Under RWCDS 1, the number of non-residents in the non-residential study area is forecast to increase to 101,783 and the total amount of publicly accessible open space is expected to increase to 15.13 acres. As shown in **Table 20-29**, by 2027 the ratio of passive open space per 1,000 non-residents would be 0.103, which is below the City's guideline of 0.15 acres, but would be a substantial improvement as compared to the 0.094 ratio in the future without the Proposed Actions. For the combined residential and non-residential population, the passive open space ratio would be 0.079 acres per 1,000 people, which is much lower than the recommended weighted average ratio of 0.23 acres per 1,000 residents and workers, but would be a substantial improvement as compared to the 0.072 ratio for the future without the Proposed Actions.

Table 20-29
Open Space Ratios During North Block Below-Grade/Central Open Space/ Above-Grade Mercer Building Construction
2027 Analysis Condition

Ratio	DCP Guideline	Existing Ratio	Future Without the Proposed Project Ratio	Future With the Proposed Project Ratio	Percent Change (Future With vs. Future Without)
Non-Residential Study Area					
Passive/non-residents	0.15	0.101	0.094	0.103	10.2%
Passive/total population	0.23	0.076	0.072	0.079	10.5%
Residential Study Area					
Total/residents	2.5	0.243	0.229	0.238	4.1%
Passive/residents	0.5	0.138	0.129	0.139	7.9%
Active/residents	2.0	0.106	0.100	0.099	-0.7%
Passive/total population*	0.27	0.048	0.045	0.049	8.3%

Note:
* Weighted average combining 0.15 acres per 1,000 non-residents and 0.50 acres per 1,000 residents. Non-residents typically use passive spaces; therefore, for the non-residential study area, only passive open space ratios are calculated. For the residential study area, active, passive, and total park space ratios are calculated.

Residential Study Area. The combined residential and non-residential passive open space ratio within the residential study area would be 0.049 acres per 1,000 residents and non-residents, which is much lower than the recommended weighted average ratio of 0.27 acres per 1,000 residents and workers, but would be an improvement as compared to the 0.045 ratio in the future without the Proposed Actions. The active open space ratio would be 0.099 acres per 1,000 residents, which is notably less than the City's planning guideline of 2.0 acres per 1,000 residents, and which would represent a 0.7 percent decrease compared to the 0.100 ratio in the future without the Proposed Actions. The total open space ratio would be approximately 0.238 acres per 1,000 residents, which is well below the City's planning guideline of 2.5 acres per 1,000 residents, but would be an improvement (a 4.1 percent increase) as compared to the total open space ratio in the future without the Proposed Actions.

As shown in **Table 20-29**, while the active open space ratio in the residential study area would decrease by 0.7 percent by 2027, all other open space ratios would improve as compared to future conditions without the Proposed Actions (between 4.1 and 10.5 percent increases). Therefore, mid-way through Phase 2 construction, the Proposed Actions would greatly improve passive open space ratios both in the residential and non-residential study areas, and result in a marginal temporary decrease in the active open space ratio within the residential study area as compared to conditions without the proposed project. There would be no significant adverse indirect effects to study area open spaces as a result of construction activities during this period.

LaGuardia Building Construction (2028)

Study Area Population

Between the 2027 and 2028 construction years, the Proposed Actions would introduce approximately 250,000 gsf of additional new uses to the Proposed Development Area with the completion of the Mercer Building. Therefore, by the 2028 construction year, there would be four operational project components in the Proposed Development Area; the Zipper Building, the Bleecker Building, a portion of the North Block Below-Grade space and the Mercer Building, totaling approximately 1.9 million gsf of new uses in the Proposed Development Area. In addition, by 2028 the Proposed Actions would result in the development of up to 23,326 gsf of new ground-floor retail uses in the Commercial Overlay Area.

Non-residential Study Area. The future project-generated populations for the non-residential study area analysis are based on RWCDS 1 (the Maximum Academic Scenario), which maximizes the number of workers that would be introduced by the Proposed Actions.

Collectively, by 2028, the new uses in the Proposed Development Area and Commercial Overlay Area would introduce to the non-residential study area an estimated total of 4,412 workers and up to approximately 600 residents. The 2028 combined residential and non-residential population in the ¼-mile study area is projected to be 133,771 people.

Residential Study Area. The future project-generated populations for the residential study area analysis are based on RWCDS 2 (the Maximum Dormitory Scenario), which maximizes the number of residents that would be introduced by the Proposed Actions.

Collectively, by 2028, the new uses in the Proposed Development Area and Commercial Overlay Area would introduce to the Residential Study Area an estimated total of up to 1,750 residents. With the proposed project, the residential study area would contain an estimated 103,303 residents by 2028.

The proposed uses also would introduce an estimated 1,324 workers to the residential study area. The 2028 combined residential and non-residential population in the residential study area is projected to be 291,151 people.

Study Area Open Spaces

The publicly accessible open space changes expected to occur within the Proposed Development Area by 2028 are illustrated in **Figure 20-18**, and are described below.

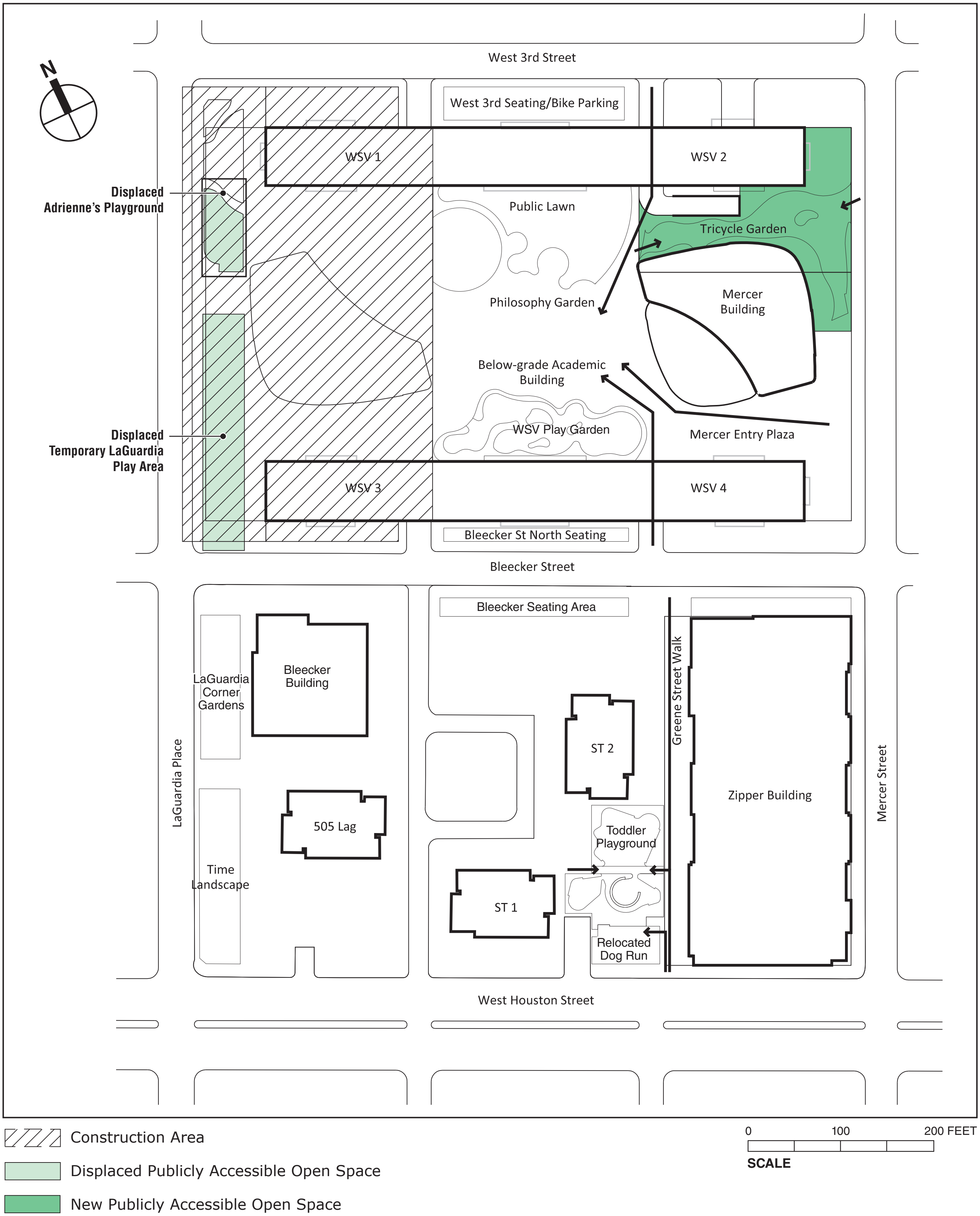
Between 2027 and 2028, the only publicly accessible open spaces in the Proposed Development Area to be displaced would be Adrienne's Garden and Temporary LaGuardia Play Area on the west side of the North Block. Also on the North Block, by 2028 the proposed project would create the 15,200-square-foot Tricycle Garden and adjacent passive areas located to the north and east of the Mercer Building. These areas currently remain flexible in their programming and age targets.

Overall, by 2028 the proposed project would displace approximately 0.685 acres of publicly accessible open space (0.09 acres passive, 0.595 acres active), and would introduce approximately 2.308 acres of publicly accessible open space (1.362 acres passive, 0.946 acres active), for a net gain of approximately 1.623 acres of publicly accessible open space (a 1.272-acre increase in passive open space, and a 0.351-acre increase in active space).

Direct Effects Analysis

In order to accommodate construction of the west side of the North Block, between 2027 and 2028 Adrienne's Garden (approximately 4,500 sf) and the Temporary LaGuardia Play Area (approximately 10,300 sf) would be displaced. These areas would be relocated and expanded to a 13,100-square-foot play area that would also be located along LaGuardia Place on the North Block.

In 2028, the proposed central publicly accessible open spaces (the Public Lawn, Philosophy Garden and Washington Square Village Play Garden) , the Mercer Entry Plaza and the Tricycle Garden would



Displaced and New Open Spaces by 2028 Construction Year

Figure 20-18

be open for use while the western portion of the North Block would be under construction. As part of construction startup work, fencing along the eastern boundary of the LaGuardia Building construction area would be installed as a public safety measure to separate the usable spaces on the central and eastern portions on North Block with the construction activities on the western portion. During above-grade construction, safety netting would also be installed.

As described above, the results of the Phase 2 air quality analysis—which represented worst-case conditions during the below-grade construction of both the Mercer Building and the LaGuardia Building—showed that construction activities during this Phase would not result in any significant adverse air quality impacts at any sensitive receptors.

During construction of the LaGuardia Building, there would be no temporary significant adverse noise impacts at any publicly accessible open spaces.

Indirect Effects Analysis

Non-residential Study Area. Under RWCDS 1, by 2028 the number of non-residents in the non-residential study area is forecast to increase to 103,053 persons, and the total amount of publicly accessible open space is expected to increase to 15.37 acres. In 2028, the ratio of passive open space per 1,000 non-residents would be approximately 0.102, substantially improving on conditions as compared to the future without the Proposed Actions, but still falling below the City's guideline of 0.15 acres (see **Table 20-30**). For the combined residential and non-residential population, the passive open space ratio would be 0.079 acres per 1,000 people, which is also a substantial improvement as compared to future conditions without the Proposed Actions, but would still fall below the recommended weighted average ratio of 0.23 acres per 1,000 residents and workers.

Table 20-30
Open Space Ratios During LaGuardia Building Construction
2028 Analysis Condition

Ratio	DCP Guideline	Existing Ratio	Future Without the Proposed Project Ratio	Future With the Proposed Project Ratio	Percent Change (Future With vs. Future Without)
Non-Residential Study Area					
Passive/non-residents	0.15	0.101	0.094	0.102	8.9%
Passive/total population	0.23	0.076	0.072	0.079	9.5%
Residential Study Area					
Total/residents	2.5	0.243	0.229	0.241	5.2%
Passive/residents	0.5	0.138	0.129	0.139	7.9%
Active/residents	2.0	0.106	0.100	0.102	1.7%
Passive/total population*	0.27	0.048	0.045	0.049	8.4%

Note:
* Weighted average combining 0.15 acres per 1,000 non-residents and 0.50 acres per 1,000 residents. Non-residents typically use passive spaces; therefore, for the non-residential study area, only passive open space ratios are calculated. For the residential study area, active, passive, and total park space ratios are calculated.

Residential Study Area. The combined residential and non-residential passive open space ratio within the residential study area would be 0.049 acres per 1,000 residents and non-residents, which is a substantial improvement as compared to conditions in the future without the Proposed Actions, but would still fall below the recommended weighted average ratio of 0.27 acres per 1,000 residents and workers. The active open space ratio would be 0.102 acres per 1,000 residents, which is notably less than the City's planning guideline of 2.0 acres per 1,000 residents, but an improvement for the study area as compared to conditions in the future without the Proposed Actions.

As shown in **Table 20-30**, even when accounting for the increased open space demands of the project-generated population, all of the open space ratios would improve as compared to future conditions without the proposed project. Some of the improvements would be substantial; most notably the 9 to 10 percent increases in the open space ratios within the ¼-mile non-residential study area. These ratios are particularly important for an area with a large working and/or student population.

Tree Replacement

A number of trees on City-owned property would remain in place and would not be impacted by the construction of the proposed project. Some of these trees include all of the trees in the Time Landscape, all of the large (~18 to 23 inches diameter at breast height [dbh]) London planetree (*Platanus* x *acerifolia*) trees located along the south side of West 3rd Street and the north side of Bleecker Street, the large (~24+ inches dbh) green ash (*Fraxinus pennsylvanica*) trees on the south side of Bleecker Street, and many of the honey locust (*Gleditisia triacnathos*) trees (~3 to 23 inches dbh) along West Houston Street. However, although NYU's landscape plans would protect many trees on City-owned property, some would be removed to facilitate the construction of the proposed project. Street trees would be removed on the south block in the vicinity of the Proposed Zipper Building along Mercer, West Houston, and Bleecker Streets including, but not limited to, species of Norway maple (*Acer plantanoides*), ornamental flowering cherry (*Prunus* sp.), and pin oak (*Quercus palustris*) ranging from approximately 3 to 17 inches dbh. Trees that would be displaced along the north block would include common street trees (e.g., honey locust, Bradford callery pear [*Pyrus calleryana* 'Bradford'], crabapple [*Malus* sp.], London planetree, etc.) along LaGuardia Place and Mercer Street ranging from approximately 3 to 24 inches dbh. Depending on construction staging activities, street trees would be removed within and surrounding the LaGuardia Corner Gardens (on the LaGuardia Place Strip south of Bleecker Street) as well as the portion of the Bleecker Street Strip north of the Morton Williams supermarket site. As stated in Chapter 9, "Natural Resources," the landscaping design for the proposed project would result in an increase of tree coverage on the overall site, including areas where street trees would be removed during construction. During the design and permitting phases for the Proposed Actions, DPR would be consulted with respect to tree evaluation for the street trees that would be planned for removal in the vicinity of the Proposed Development Area. Under Chapter 5 of Title 56 of the Rules of the City of New York and under Title 18 of the Administrative Code of the City of New York, NYU would be required to obtain a permit to remove existing street trees, which are under the jurisdiction of DPR. If such approvals were obtained, NYU would be required to post a bond with DPR to insure that within thirty days after completion of construction all trees removed, destroyed or severely damaged would be replaced at the expense of NYU. A method to calculate the number of replacement trees as per the New York City tree replacement, such as the caliper replacement method, would most likely be used to quantify the size and number of trees that would be required to replace those removed from the Proposed Development Area. Therefore, construction of the proposed project would not result in any significant adverse impacts to street trees of the region.

SOCIOECONOMIC CONDITIONS

Construction activities would temporarily affect pedestrian and vehicular access. However, lane and/or sidewalk closures would not obstruct entrances to any existing businesses, or obstruct major thoroughfares used by customers, and businesses are not expected to be significantly affected by any temporary reductions in the amount of pedestrian foot traffic or vehicular delays that could occur as a result of construction activities. Utility service would be maintained to all businesses, although very short term interruptions (i.e., hours) may occur when new equipment (e.g., a transformer, or a sewer or water line) is put into operation. Overall, construction of the proposed project would not result in any significant adverse impacts on surrounding businesses.

Construction would create direct benefits resulting from expenditures on labor, materials, and services, and indirect benefits created by expenditures by material suppliers, construction workers, and other employees involved in the direct activity. Construction also would contribute to increased tax revenues for the City and State, including those from personal income taxes.

COMMUNITY FACILITIES

No community facilities would be directly affected by construction activities for an extended duration. The construction sites would be surrounded by construction fencing and barriers that would limit the effects of construction on nearby facilities. Measures outlined in the CPP and MPT Plan would ensure that lane closures and sidewalk closures are kept to a minimum and that adequate pedestrian access is maintained to community facilities in the vicinity of the project site. Construction workers would not place any burden on public schools and would have minimal, if any, demands on libraries, child care facilities, and health care. Construction of the proposed project would not block or restrict access to any facilities in the area, and would not materially affect emergency response times significantly. New York Police Department (NYPD) and Fire Department (FDNY) emergency services and response times would not be materially affected due to the geographic distribution of the police and fire facilities and their respective coverage areas.

LAND USE AND NEIGHBORHOOD CHARACTER

No portion of the area around the Proposed Development Area would be subject to the full effects of the construction for the entire construction period. Construction is planned to be limited to the South Block during Phase 1 and to the North Block during Phase 2. For the vast majority of the time, only one building is planned to be under construction at one time. The major construction tasks would be sequential and not concurrent, which limits the area being disrupted by construction. Construction activities would adhere to the provisions of the New York City Building Code and other applicable regulations. Access to surrounding residences, businesses, and institutions, as well as access among the surrounding neighborhoods would be maintained throughout the duration of the construction period. Construction activities would be disruptive and concentrated on some blocks for an extended period of time. Throughout the construction period, measures would be implemented to control noise, vibration, and dust on construction sites, including the erection of construction fencing and in some areas fencing incorporating sound-reducing measures. This fencing would reduce potentially undesirable views of construction sites and buffer noise emitted from construction activities. Barriers would be used to reduce noise from particularly disruptive activities where practicable. Construction activity would be localized and would not alter the character of the larger neighborhoods surrounding the project site.

RODENT CONTROL

Construction contracts would include provisions for a rodent (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 the construction the contractor would carry out a maintenance program, as necessary. Signage would be posted, and coordination would be maintained with appropriate public agencies. Only EPA- and DEC-registered rodenticides would be permitted, and the contractor would be required to perform rodent control programs in a manner that avoids hazards to persons, domestic animals, and non-target wildlife.

F. BLEECKER BUILDING ALTERNATE PHASING SCENARIO

The sections above analyze a conceptual construction schedule for the proposed NYU Core project (illustrated in **Figure 20-1**) that reflects the sequencing of construction events as currently contemplated. In the conceptual construction schedule, the proposed Bleecker Building—which would include a public school—is assumed to be constructed following the proposed Zipper Building as part of Phase 1 (from Q4 2018 and Q4 2021). However, the timing of construction of the Bleecker Building could be different, depending upon the timing of the New York City School Construction Authority's (SCA's) decision on whether to move forward with the development of a public school at the project site. Specifically, if SCA does not identify a need and/or capital budget for the school during Phase 1, the Bleecker Building could be constructed during Phase 2 of the proposed project.

In order to minimize to the maximum extent practicable the potential for significant adverse impacts that could be generated by construction activities associated with the Proposed Actions, NYU would commit to restrictions on the types of concurrent construction activities. Certain construction activities have a greater potential to cause impacts than others. For example, excavation and foundations employ more large diesel engines than any other construction activity. Finishing of interiors and fit out generates the largest number of workers. However, excavation and foundation construction on one building could overlap with interior finishing of another building without having synergistic effects that would lead to greater impacts (e.g., the diesel engine emissions are not worsened by construction worker vehicle trips).

As detailed in the sections below, with the following restrictions in place, the construction activities associated with the Proposed Actions would result in significant adverse impacts that are consistent with the conclusions of the construction impact analysis performed for the conceptual construction schedule discussed above.

The demolition of the Morton Williams Associated Supermarket building, Bleecker Building excavation/foundations, and Bleecker Building super structure/foundation work would not occur during:

- excavation/foundations or super structure/exterior work associated with the temporary gymnasium (estimated 6-month cumulative duration);
- demolition of Coles Gymnasium (6 months);
- excavation/foundation or super structure/exterior work associated with the proposed Zipper Building (36 months);
- foundations, super structure/exterior, or interior work associated with the proposed Washington Square Village parking garage (21 months);
- below-grade foundations and below-grade super structure/exterior work associated with the proposed Mercer Building (27 months);
- demolition of the LaGuardia retail building (3 months); and
- excavation/foundations and super structure/exterior work associated with the proposed LaGuardia Building (18 months).

In addition, to avoid the potential for significant adverse impacts not already analyzed and identified in this DEIS, SCA would be required to exercise its option to build the public school as part of the Bleecker Building by 2025. With these restrictions in place, the DEIS analysis establishes that there would not be new or different significant adverse impacts other than those identified in this DEIS if the proposed Bleecker Building were to be constructed prior to the proposed Zipper Building (between Q1 2013 and Q2 2018); after the Zipper Building (between Q1 2018 and Q1 2023); or after completion of the below-grade construction activities associated with the parking garage and Mercer Building (between Q1 2026 and Q1 2030). While for analysis purposes a scenario within which the school is constructed by 2018 is accounted for in this DEIS, the Department of Education's current Five-Year Capital Plan, which expires on June 30, 2014, does not identify the need for the school nor allocates capital funding for the development of that school at that early date.

TRANSPORTATION

The shifting of the Bleecker Building in the construction sequence as outlined above would not result in conditions more severe than those discussed in Section E for Phase 1 construction, or result in different conclusions made for Phase 2 construction. Adjustments to the timing and sequencing of construction of the Bleecker and Zipper buildings during Phase 1 would not alter the conclusions of the analysis, because peak construction traffic during Phase 1 would occur when the Zipper Building construction is underway. Alternatively, if the Bleecker Building were to occur during Phase 2, the operational analysis reflecting full development would still represent worst-case traffic and pedestrian conditions for construction (see **Table 20-31**), and the mitigation identified for those service levels would be appropriate for addressing construction-period traffic and pedestrian impacts, if necessary. For transit, an engineering analysis to determine the feasibility of widening subway stairways was undertaken and the recommended stairway widening mitigation measures were found to be feasible. The analysis conducted for this EIS to determine the potential for significant adverse impacts was based on the RWCDS that maximizes the potential for impacts to the subway station stairways. It is possible that the actual built program will contain a mix of uses with lower transit demand, and therefore would have less potential to adversely affect these subway stairways. Accordingly, prior to implementation of the required stairway mitigation, NYU may undertake a study to determine whether the required mitigation would be unwarranted based on the then anticipated built program and service conditions in 2021 and 2031. If NYU undertakes such a study, it would be submitted to DCP and the MTA NYCT for review. NYU, in coordination with the MTA NYCT, would implement the required subway stairway mitigation measures unless DCP, in consultation with the MTA NYCT, determines, based on its review of the study and applying applicable CEQR methodologies, that the required mitigation is unwarranted. And as discussed for Phase 2 construction, the elimination of the WSV off-street public parking garage (part of the Proposed Actions) and two other nearby public parking facilities (No Build condition) in combination with the parking demand generated by Phase 1 and portions of Phase 2 of the proposed project would result in temporary parking shortfalls within ¼-mile of the project site during the peak midday hours. However, based on the magnitude of available and total parking spaces within ½-mile of the Proposed Development Area, it is anticipated that the excess demand could be accommodated with a slightly longer walking distance beyond the ¼-mile radius. Although this condition does not constitute a significant adverse parking impact, per the 2012 *CEQR Technical manual* for proposed projects located in Manhattan where there is a variety of available alternative modes of transportation, it would also occur with the construction of the Bleecker Building shifting to Phase 2.

Table 20-31
Comparison of Weekday Vehicle Trip Generation—Construction and Operational with the Bleecker Building Constructed in Phase 2

	Phase 2 Construction in 2026											
	Phase 2 Construction Trips in PCEs (Q3 2026)			2021 Phase 1 Completion Operational Trips in PCEs			Total PCEs			2031 Full Build-Out Operational Trips in PCEs		
Time	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
7-8 AM	74	38	112	21	10	31	95	48	143	45	10	55
8-9 AM	25	16	41	139	114	253	164	130	294	215	152	367
12-1 PM	16	16	32	132	127	259	148	143	291	157	147	304
4-5 PM	8	44	52	71	83	154	79	127	206	80	101	181
5-6 PM	0	7	7	109	126	235	109	133	242	142	188	330

Notes: Peak hours of operational traffic are generally 8-9 AM, 12-1 PM, and 5-6 PM.
PCEs = passenger car equivalents where 1 truck trip equals 2 PCEs.

AIR QUALITY

The construction air quality analysis reported in Section E, above, was reviewed to determine if changes in the timing of construction for the Bleecker Building would have the potential to cause significant adverse air quality impacts not identified for the conceptual construction schedule. Adjustments in the timing and sequencing of the two buildings in Phase 1 would not result in construction conditions more severe than those previously identified. Alternatively, if the Bleecker Building construction was shifted to Phase 2, the construction activities at the Bleecker Building may overlap with portions of construction at the Mercer Building. As indicated in the emissions profile, the highest air quality emissions would be generated during the excavation and foundation phases of construction, when the greatest amount of equipment with large diesel engines would be used. Finishing of interiors and fit-out would generate the lowest air quality emissions. Accounting for the limitations in construction sequencing specified above, the overlapping air quality effects from the Bleecker Building in Phase 2 would be minimal. In addition, air quality concentrations from construction activities are highly localized, i.e., almost entirely due to construction activity in close proximity to the receptor locations and not due to cumulative impacts from the larger project site. Since the construction activities at the Bleecker Building would not be immediately adjacent to the construction activities of the Mercer Building, the cumulative effects of construction activities at these two locations would be minimal and would not result in significant adverse air quality impacts. Furthermore, if the Bleecker Building were built in Phase 2, Tier 4 non-road diesel engines would be used instead of Tier 3 non-road diesel engines. The use of newer Tier 4 construction equipment would reduce NO_x and PM emissions as compared to Tier 3 construction equipment. For these reasons, no significant adverse impacts on air quality would occur from the on-site construction sources in the event the timing of the Bleecker building construction was shifted as described above.

NOISE

With the exception of one receptor location (Receptor C1), the shifting of the sequencing of the Bleecker Building is expected to result in significant noise impacts at the same locations as those predicted to occur with the conceptual construction schedule as identified in Section E, above, and the magnitude of the impacts would be comparable to those with the conceptual construction schedule. Significant noise impacts would be expected to occur at the same nearby sensitive noise receptors and would generally be of the same magnitude and duration, but may occur at different points of time if there were adjustments to the timing or sequencing of construction during Phase 1. However, if the construction of the Bleecker Building were advanced three quarters earlier in Phase 1, Receptor C1 (representing various locations on the north façade of Silver Tower II) would also experience a significant adverse construction noise impact. Alternatively, if the Bleecker Building construction was shifted to Phase 2, impacts at sensitive noise receptors adjacent to the Bleecker Building would occur later in time.

OTHER TECHNICAL AREAS

Similar to the analysis for the conceptual construction schedule reported in Section E, above, the shifting of the sequencing of the Bleecker Building would not result in significant adverse impacts to: historic and cultural resources; hazardous materials; natural resources; socioeconomic conditions; community facilities; land use and neighborhood character; and rodent control. For these areas of environmental concern, the shifting of the sequencing only alters the timing of the localized environmental effects described in Section E, above, with the exception of socioeconomic conditions and open space, which are addressed below.

SOCIOECONOMIC CONDITIONS

The shifting in timing of construction of the Bleecker Building would not alter the conclusion that lane and/or sidewalk closures would not obstruct entrances to any existing businesses, or obstruct major thoroughfares used by customers, and as with the conceptual construction schedule described in Section E, businesses are not expected to be significantly affected by any temporary reductions in the amount of pedestrian foot traffic or vehicular delays that could occur as a result of construction activities. However, if the Bleecker Building were to be constructed before completion of the Zipper Building, there would not be the continuous provision of a supermarket use on the South Block. As detailed in Chapter 3, “Socioeconomic Conditions,” in the future with the Proposed Actions it is NYU’s goal to provide a supermarket use in the proposed Zipper Building prior to demolition of the existing supermarket on the Bleecker Building site, and the sequencing of proposed construction activities under the conceptual construction schedule is planned to allow for continuous provision of a supermarket use. If the Bleecker Building were constructed before completion of the Zipper Building, the Morton Williams Supermarket would be closed prior to the availability of the new supermarket space in the Zipper Building. However, even with this interruption in supermarket services on the South Block, there would be alternative food stores within or near the study area that would be available to local residents, including Gristedes grocery stores located at Mercer and West 3rd Streets and at University Place and East Eighth Street, as well as numerous specialty food stores and bodegas. Given the availability of other grocery stores in the immediate area, the potential interruption in the provision of a supermarket use on the South Block would not be a significant adverse impact. Overall, the potential shift in construction sequencing would not result in any significant adverse impacts on surrounding businesses or the users of those businesses.

OPEN SPACE

The shifting of the timing of the proposed Bleecker Building to Phase 2 would not result in any temporary significant adverse open space impacts.

If the Bleecker Building were constructed prior to completion of the Zipper Building during Phase 1, there would be no new population introduced by the Proposed Actions during the construction of the Bleecker Building, and there would be no direct displacement of publicly accessible open spaces associated with the Bleecker Building. Therefore, the potential effects on open spaces would be limited to direct (construction noise) effects described in Section E, as well as the temporary displacement of the LaGuardia Community Garden (although not defined as publicly accessible under CEQR, this open space resource is considered in the qualitative assessment of the open space impacts of the construction activities) and the potential temporary displacement of a portion of Segment L_1 of the Bleecker Street Strip. **Appendix E-10** includes a more detailed assessment of potential direct and indirect open space effects of constructing the Bleecker Building prior to completion of the Zipper Building, and that assessment finds that there would be no new or different impacts than those already identified in Section E, above.

As described in “Air Quality,” in Section E, above, the results of the Phase 1 air quality analysis—which represented worst-case conditions during the construction of the Zipper Building—showed that construction activities during this phase would not result in any significant adverse air quality impacts at any sensitive receptors, which included areas such as public and private open spaces directly adjacent to construction activities.

As described in “Noise,” in Section E, above, noise levels at open space locations on the project site are currently above the *CEQR Technical Manual* noise level for outdoor areas, and the proposed construction activities would exacerbate these exceedances. There are no practical and feasible mitigation measures that could be implemented to reduce noise levels to below the *CEQR Technical Manual* guideline. Consequently, the above-grade construction of the Mercer Building would result in temporary significant adverse noise impacts on the publicly accessible central opens spaces on the North Block (the Public Lawn, Philosophy Garden and Washington Square Village Play Garden).. ✷