19.0 Construction

A. Introduction

This chapter assesses the potential impacts of the construction of buildings expected to result on sites in the Midtown South Mixed Use Affected Area from the Proposed Actions. The following sections discuss the potential impacts resulting from the construction of the projected development sites as described in the reasonable worst-case development scenario (RWCDS) presented in Chapter 1, "Project Description". Construction impacts, although temporary, can include noticeable and disruptive effects from an action that is associated with construction or could induce construction. As stated in the 2021 *CEQR Technical Manual*, determination of the significance of construction impacts and need for mitigation is generally based on the duration and magnitude of the impacts.

Construction impacts are usually important when construction activity could affect traffic conditions, hazardous materials, archaeological resources, the integrity of historic resources, community noise patterns, vibration, and air quality conditions.

The Proposed Actions are expected to facilitate the construction of new mixed-use development in support of greater density in an area that has strong public transit access and is well-connected to other employment nodes. The Proposed Actions are also expected to support new housing with affordable housing opportunities.

As discussed in "Chapter 1, Project Description," 68 development sites (61 projected and seven potential) have been identified in the Affected Area. These projected and potential development sites are depicted in **Figure 1-4**.

Under the RWCDS, the total development expected to occur under on the 61 projected development sites under the With-Action condition would consist of approximately 10,924,194 gross square feet (gsf) of floor area (see **Table 1-1**: 2034 RWCDS No-Action and With-Action Land Uses in Chapter 1), including 9,867,999 gsf of residential floor area (approximately 9,730 DUs), of which between 1,940 and 2,890 DUs are expected to be affordable pursuant to Mandatory Inclusionary House (MIH), 960,456 gsf of commercial uses, and 95,739 gsf of community facility uses. There would be no accessory parking spaces under the With-Action- condition.

As described in other chapters of this Environmental Impact Statement (EIS), the projected developments resulting from the Proposed Actions are expected to range from 215 to 455 feet in height. The 61 projected development sites would be completed in the 10 years following the adoption of the Proposed Actions (by the analysis year 2034). In addition, there are seven potential development sites considered less likely to be developed by the 2034 analysis year and are therefore not considered in this assessment.

According to the 2021 *CEQR Technical Manual*, construction duration is often broken down into short term (less than two years) and long term (two or more years). Where the duration

of construction is expected to be short term, any impacts resulting from such short-term construction generally do not require detailed assessment. As described below, it is estimated that several of the projected development sites would generally take less than 24 months to construct and would therefore be considered short term. However, as construction activity associated with the RWCDS would occur on multiple development sites within the same geographic area—creating the potential for several construction timelines to overlap—a preliminary assessment of potential construction impacts was prepared in accordance with the guidance of the 2021 *CEQR Technical Manual*. The preliminary assessment is presented in this chapter.

The findings of the preliminary assessment identified the need to undertake more detailed construction impact assessments for air quality, noise, and construction traffic. To conduct these detailed assessments, this chapter describes the City, state, and federal regulations and policies that govern construction, followed by the conceptual construction schedule and the types of activities likely to occur during construction of the 61 projected development sites. The types of construction equipment are also discussed, along with the expected number of workers and truck deliveries. Finally, the potential impacts from construction activity are assessed and the methods that may be employed to avoid significant adverse construction-related impacts are presented.

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 period of construction may not coincide with the heaviest construction traffic.

B. Principal Conclusions

Transportation

The second quarter of 2028 was selected as the reasonable worst-case analysis period for assessing potential cumulative traffic impacts from operational trips from completed portions of the projected developments and construction trips associated with construction activities. An assessment of transportation generated during this peak period is presented below.

Traffic

During construction, traffic would be generated by construction workers commuting via autos and by trucks making deliveries to projected development sites. Each worker vehicle was assumed to arrive in the morning and then depart in the afternoon or early evening, while truck deliveries would occur throughout the construction day. In the second quarter of 2028, construction-related traffic is expected to peak during the 6 to 7 AM and 3 to 4 PM periods. During the 6 to 7 AM peak hour, there would be 440 PCE vehicle trips, including 350 inbound trips and 90 outbound trips. During the 3 to 4 PM peak hour, there would be 278 PCE trips, including 9 inbound trips and 269 outbound trips.

It is expected that potential significant adverse traffic impacts could occur during construction and that these impacts would be within the range of impacts identified for the 2034 With-

Action conditions. The mitigation measures identified in **Chapter 21, Mitigation,** for 2034 operational traffic impacts would likely be similarly effective at mitigating any potential construction traffic impacts.

Pedestrians

During the 2028 (second quarter) peak construction period, net incremental construction and operational travel demand on area sidewalks, corners, and crosswalks is expected to total approximately 948 and 1,004 trips in the 6 to 7 AM and 3 to 4 PM peak construction hours, respectively. These trips would be widely distributed among the projected development sites that would be under construction in the second quarter of 2028 and would primarily occur outside the weekday AM and PM peak commuter periods and weekday midday and Saturday peak periods when area pedestrian facilities typically experience their greatest demand.

It is expected that potential significant adverse pedestrian impacts could occur during construction and that these impacts would be within the range of impacts identified for the 2034 With-Action conditions. The mitigation measures identified in **Chapter 21, Mitigation,** for 2034 operational pedestrian impacts would likely be similarly effective at mitigating any potential construction pedestrian impacts.

Transit

The construction sites are located in an area that is well served by public transportation with 14 subway stations or station complexes, 14 local bus routes, and 50 express bus routes, along with three commuter rail stations located on the periphery of the Affected Area.

During the construction peak period, the net incremental construction and operational travel demand is expected to generate approximately 568 and 663 subway trips in the 6 to 7 AM and 3 to 4 PM peak construction hours, respectively. By comparison, the net increase in operational subway trips with full build-out of the Proposed Actions in 2034 would be substantially greater in number, totaling approximately 987 and 992 subway trips during the weekday AM and PM commuter peak periods when overall demand on area subway facilities and services typically peaks. Transit conditions during the 6 to 7 AM and 3 to 4 PM construction peak hours are expected to be generally better than during the analyzed operational peak hours with full build-out of the Proposed Actions in 2034 as incremental demand would be lower during construction, and most construction trips would not occur during the peak hours of commuter demand. As the Proposed Actions are not expected to result in significant adverse subway impacts, the smaller numbers of subway trips that would be generated in the construction peak hours during the second quarter of 2028 peak construction period are similarly not expected to result in any significant adverse impacts to subway services.

During the construction peak period, the net incremental construction and operational travel demand is expected to generate approximately 148 and 161 rail trips in the 6 to 7 AM and 3 to 4 PM peak construction hours, respectively. As peak transit demand would not meet the 200 trips/hour *CEQR Technical Manual* analysis threshold for a detailed rail analysis, significant adverse impacts to rail services are not expected to occur in the construction peak hours during the second quarter of 2028 peak construction period.

During the construction peak period, the net incremental construction and operational travel demand is expected to generate approximately 129 and 143 bus trips in the 6 to 7 AM and 3 to 4 PM peak construction hours, respectively. Given that bus trips would be distributed among numerous bus routes in proximity to projected development sites that are located throughout the Affected Area, the number of incremental construction trips by bus are not expected to exceed the 50-trip CEQR Technical Manual analysis threshold for a bus analysis (per route, per direction) in either peak construction hour in 2028.

Parking

With full build-out of the Proposed Actions in 2034, there would be a parking demand for more than a thousand vehicles between 8 PM and 8 AM. 2028 parking conditions during the peak construction period are therefore expected to be generally better than during the analyzed operational peak hours with full build-out of the Proposed Actions in 2034. Consequently, there would be less likelihood of a parking shortfall during the peak -construction hours in the cumulative analysis year (2028) than with full build-out of the Proposed Actions in 2034. While the 2028 (second quarter) construction worker parking demand could contribute to any such shortfall in the midday, the Affected Area is located in Parking Zone 1, per 2021 CEQR Technical Manual guidance, and any potential shortfall would not be considered significant because the site is served by nearby alternative modes of transportation.

Air Quality

Measures required to reduce pollutant emissions during construction include all applicable laws, regulations, and the City's building codes. These include dust suppression measures, idling restriction, and the use of ultra-low sulfur diesel (ULSD) fuel. With the implementation of these emission reduction measures, the dispersion modeling analysis of construction-related air emissions for both on-site and on-road sources determined that particulate matter PM_{10}, annual-average nitrogen dioxide (NO_2), and carbon monoxide (CO) concentrations would be below their corresponding CEQR *de minimis* thresholds and/or National Air Quality Ambient Standards (NAAQS), respectively. Note: due to site proximity and overlap in projected construction schedules, maximum combined emissions from Sites 46 and 49 and Sites 51 and 52 were examined. $PM_{2.5}$ was shown to be below the annual and 24-hour NAAQS but would exceed the annual *de minimis* threshold for all individual and combined Sites.

The exceedance of the *de minimis* threshold could be considered a significant adverse air quality impact; Due to the temporary nature of construction activities and the modeled impacts predicted to be lower than NAAQS, the temporary exceedance of the *de minimis* criterion does not indicate adverse public health impacts.

Between the Draft and Final EIS, additional review and evaluation will be performed to determine whether the identified impacts related to Annual $PM_{2.5}$ increments will be avoided. This may include a refinement of assumptions in terms of construction equipment usage and the use of newer construction equipment with lower particulate emissions, as applicable.

Noise

Detailed construction noise modeling was performed for four representative development sites with anticipated construction durations of more than 24 months, for all construction phases. The selected representative development sites include Site 49, one of the largest projected development sites, Site 52, a relatively large projected development site, Site 46, an average projected development site, and Site 35, one of the smallest projected development sites with a 24-month or greater construction duration. These sites were selected to represent remaining sites of similar size with construction durations close to 24 months. Sites with anticipated construction durations of less than 24 months do not require detailed quantitative construction noise analysis. Characteristics considered in the selection of sites to be represented by Sites 49, 52, 46, and 35 included building size, building height, and sensitive receptor proximity and line of sight to the construction site. Construction noise analysis results evaluated from Site 49 were only used to evaluate potential noise impacts from Site 49 since no other development sites are comparable in size. Construction noise analysis results from Site 52 were used to evaluate potential noise impacts from Projected Development Sites 3, 33, 40 and 48. Construction noise analysis results from Site 46 were used to evaluate potential noise impacts from Projected Development Sites 19, 32, 47, and 53. Construction noise analysis results from Site 35 were used to evaluate potential noise impacts from Projected Development Sites 7, 15, 16, 18, 25, 31, 36, 41, 42, 43, 51, 55, and 62.

Based on the detailed analysis of Projected Development Sites 49, 52, 46, and 35, significant adverse construction noise impacts are expected to occur at several sensitive receptors in the vicinity of future construction facilitated by the Proposed Actions. A map of sensitive receptors to be significantly impacted by construction noise is provided in **Figure 19-5 and Figure 19-6.** Discussion of potential mitigation measures for the construction noise impact is included in Chapter 21, “Mitigation.”

Between Draft and Final EIS, construction noise analysis and impacts will be refined in more detail.

Vibration

Vibration-inducing activities occurring during construction of the projected development sites would include the use of pile drivers, large bulldozers, and haul trucks loaded with debris and materials. The highest vibration levels would result from impact pile drivers during building foundation work. Vibration-induced structural damage has the potential to occur if pile driving is conducted within approximately 72 feet of non-engineered timber and masonry buildings, which equates to a vibration level of 0.2012 PPV. When impact pile driving occurs further than approximately 72 feet from non-engineered timber and masonry buildings, there would be no potential for structural damage. If it is determined through field surveys that existing structures adjacent to construction sites consist of more solid materials, such as engineered concrete and masonry, structural damage from impact pile driving could potentially occur within 50 feet of this activity. In addition, vibration-induced annoyance is predicted to occur at residential and institutional land uses within approximately 30 feet from impact pile driving.

Vibrations from large bulldozers and loaded trucks are not anticipated to result in structural damage to adjacent buildings, as the highest vibration levels would generally occur within 8 feet of equipment.

Other Analyses

Construction of the 61 projected development sites would not result in significant adverse impacts on land use and neighborhood character, socioeconomic conditions, open space, or hazardous materials. Based on the RWCDS construction schedule, construction activities would be spread out over approximately 10 years, throughout an approximately 42-block rezoning area, and construction of most of the projected development sites would be short term (less than 24 months) with the exceptions of sites 3, 7, 15, 16, 18, 19, 25, 31, 32, 33, 36, 40, 41, 42, 43, 45, 47, 48, 49, 51, 53, 55, and 62 which are assumed to include multiple buildings or any single building larger than 195,000 gsf.

Additionally, while construction of the projected development sites would result in temporary increases in traffic during the construction period, access to residences, businesses, and institutions in the area surrounding the development sites would be maintained throughout the construction period (as required by City regulations). No open space resources would be located on any of the projected development construction sites, nor would any access to publicly accessible open space be impeded during construction within the proposed rezoning area. In addition, measures would be implemented to control noise, vibration, emissions, and dust on construction sites, including construction fencing that incorporates sound-reducing measures.

Further, while the construction of new buildings due to the Proposed Actions would cause temporary impacts, particularly related to noise, these impacts (in any given area) are anticipated to be relatively short term—even under worst-case construction sequencing—and therefore would not impact open space or neighborhood character.

Development at 17 projected and potential sites under the Proposed Actions could potentially result in construction-related impacts to 16 non-designated historic resources located within 90 feet of the projected/potential development sites. These 16 non-designated resources would be afforded limited protection under the New York City Department of Buildings (DOB) regulations that are applicable to all buildings located adjacent to construction sites; however, they are not afforded the added special protections under the DOB's TPPN #10/88 because they are not S/NR-listed or NYCL-designated.

Any potential construction-related hazardous materials would be avoided by the inclusion of (E) designations, or other measures comparable to such a designation, for all RWCDS development sites. In addition, the demolition of interiors, portions of buildings, or entire buildings is regulated by the DOB and requires abatement of asbestos prior to any intrusive construction activities, including demolition. The Occupational Safety and Health Administration (OSHA) regulates construction activities to prevent excessive exposure of workers to contaminants in the building materials, including lead paint. New York State Solid

Waste regulations control where demolition debris and contaminated materials associated with construction are handled and disposed of. Adherence to these existing regulations would prevent impacts from construction activities at any of the projected development sites in the Affected Area.

C. Regulatory Framework

Governmental Coordination and Oversight

The governmental oversight of construction in New York City is extensive and involves a number of City, state, and federal agencies. **Table 19-1** shows the main agencies involved in construction oversight and each agency's areas of responsibility. The primary responsibilities lie with New York City agencies. The DOB has the primary responsibility for ensuring that construction meets the requirements of the New York City Building Code and that buildings are structurally, electrically, and mechanically safe. In addition, the DOB enforces safety regulations to protect both construction workers and the public. Areas of responsibility include the enforcement of regulations pertaining to the installation and operation of construction equipment, such as cranes and lifts, sidewalk sheds, and safety netting and scaffolding.

The New York City Department of Parks and Recreation (NYC Parks) oversees, enforces, and permits the replacement of street trees that are lost due to construction. The New York City Department of Environmental Protection (DEP) enforces the New York City Noise Control Code (also known as Chapter 24 of the Administrative Code of the City of New York, or Local Law 113); enforces the DEP Notice of Adoption Rules for Citywide Construction Noise Mitigation (also known as Chapter 28); approves Remedial Action Plans and Construction Health and Safety Plans; regulates water disposal into the sewer system; and oversees dust control for construction activities.

The New York City Fire Department (FDNY) has primary oversight for compliance with the New York City Fire Code and for the installation of tanks containing flammable materials. The New York City Department of Transportation (DOT) reviews and approves any traffic lane and sidewalk closures. New York City Transit is in charge of bus stop relocations and any subsurface construction within 200 feet of a subway. The New York City LPC approves studies and testing to prevent the loss of archaeological materials and damage to fragile historic structures.

On the state level, the New York State Department of Environmental Conservation (NYSDEC) regulates the discharge of water into rivers and streams, the disposal of hazardous materials, and the construction, operation, and removal of bulk petroleum and chemical storage tanks. The New York State Department of Labor (DOL) licenses asbestos workers.

On the federal level, the U.S. Environmental Protection Agency (EPA) has wideranging authority over environmental matters, including air emissions, noise emission standards,

hazardous materials, and the use of poisons; although much of this responsibility is delegated to the state level. OSHA sets standards for work site safety.

Table 19-1: Construction Oversight in New York City

Agency	Area(s) of Responsibility
New York City	
Department of Buildings (DOB)	Primary oversight for Building Code and site safety
Department of Environmental Protection (DEP)	Noise, hazardous materials, dewatering, dust
Fire Department (FDNY)	Compliance with Fire Code, tank operation
Department of Transportation (DOT)	Traffic lane and sidewalk closures
New York City Transit	Bus stop relocation; any subsurface construction within 200 feet of a subway
Landmarks Preservation Commission (LPC)	Archaeological and historic architectural protection
New York State	
Department of Labor (DOL)	Asbestos workers
Department of Environmental Conservation	Dewatering, hazardous materials, tanks, Stormwater Pollution Prevention Plan (SPDES), Industrial SPDES, if any discharge into the Hudson River
United States	
Environmental Protection Agency (EPA)	Air emissions, noise, hazardous materials, toxic substances
Occupation Safety and Health Administration (OSHA)	Worker safety

Conceptual Construction Schedule and Activities

This chapter presents a description of the construction process solely for the purposes of quantifying environmental effect due to construction activities. The chapter is not intended to describe the precise construction methods that may ultimately be used, nor is it intended to dictate or confine the construction process. Actual construction methods and materials may vary, depending in part on how the construction contractors choose to implement their work to be most cost effective, within the requirements set forth in bid, contract, and construction documents. Construction specifications will require that construction contractors comply with applicable environmental regulations and obtain necessary permits for the duration of construction. Construction of each development site would follow applicable federal, state, and New York City laws for building and safety, as well as the New York City Construction noise code, as appropriate.

Construction Sequencing

Because the projected development sites within the Affected Area are predominantly privately owned, the timing of the development of those sites is unknown. As such, the RWCDS presented

in Chapter 1, "Project Description," does not describe which sites would be developed first nor does it assume a particular sequence of development. However, it is conservatively assumed that all projected development sites would be constructed by the end of the 2034 analysis year. Market considerations would ultimately determine the demand for development.

A reasonable worst-case for the anticipated schedule of construction activities and phases was provided by the New York City Department of City Planning (DCP) for the purposes of assessing potential construction impacts. Generally, larger projected development sites and/or sites with known plans are assumed to begin construction earlier, closer to the time of project approvals (third quarter 2025). In estimating the duration of the construction period for each site, it is generally assumed that sites accommodating less than approximately 195,000 gsf of development would take 24 months or less to complete construction (35 of the 61 sites). On the other hand, sites with a greater amount of anticipated development floor area—for example, Projected Development Sites 3, 7, 15, 16, 18, 19, 25, 31, 32, 33, 36, 40, 41, 42, 43, 45, 47, 48, 49, 51, 53, 55, and 62 —are assumed to take longer.

An anticipated construction sequencing for use in the analysis of the Proposed Actions was developed based on the above assumptions and is illustrated in **Figure 19-1**. As shown in the figure, construction of the 61 projected development sites is anticipated to begin in 2025 and would be gradual (over 10 years). It is conservatively assumed that construction of all projected development sites would be completed by the end of the 2034 analysis year.

Typical Construction Activities

The construction of various components of the projected development sites would occur over a number of years, with varying activities and intensities depending upon which components of the overall development sites are underway at a given time. A general outline of typical construction stages on the development sites follows, but the duration and extent of new construction activities would vary by site. For smaller sites (such as Sites 1 or 2), the construction process is much simpler and shorter in duration, typically lasting 24 months or less. Alternatively, construction of larger projected development sites (such as Sites 40 and 49) would be more intensive and are conservatively estimated to last for approximately 35 and 48 months, respectively.

- Months 1-4: Site clearance, excavation, and foundation. The first four months of construction would entail site clearance (including demolition of existing buildings); digging, pile-driving, pile capping, and excavation for the foundation; dewatering (to the extent required); and reinforcing and pouring of the foundation. Typical equipment used for these activities would include excavators, backhoes, tractors, pile-drivers, hydraulic hammers, and cranes. Trucks would arrive at the site to remove any excavated material and construction debris as well as trucks transporting pre-mixed concrete and other building materials.
- Months 5-13: Underground parking foundation (if any), erection of the superstructure, and facade and roof construction. Once the foundations have been completed, the construction of the building's steel framework, parking ramp (if any), and decking would take place. This process involves the installation of beams, columns and decking, and would require the use of cranes, derricks,

hoists, and welding equipment, as warranted. This stage of construction would also include the assembly of exterior walls and cladding, as well as roof construction.

- Months 13-24: Mechanical installation, interior and finishing work. This would include the installation of heating, ventilation and air conditioning equipment and ductwork; installation and checking of elevator, utility, and life safety systems; and work on interior walls and finishes. During these activities, hoists and cranes would continue to be used, and trucks would remain in use for material supply and construction waste removal. Because much of this stage of construction would occur when the building is fully enclosed, disruption to the surrounding neighborhood would be minimized.

The phases, duration, and overlap of construction activities specific to a particular development site are identified on **Figure 19-1**, but the actual duration of these activities would vary by site. For example, the time necessary for each activity would vary depending upon such factors as work hours, traffic restrictions, and the means and methods of contractors. Other factors would include the number and type of utilities requiring relocation and the location and condition of nearby surface and subsurface structures.

Estimate of Construction Workers and Construction Period Trucks

Worker and truck projections were based on representative sites of similar sizes and uses from prior EIS documents and information for similar known construction projects in the City. Projected development sites were categorized based on similar size and use, and the most intense month from each stage of construction (demolition/excavation/foundation, superstructure/exterior, interior) for each site was identified and used as a scaling factor for projections. Each of the 61 projected development sites was then assigned to the appropriate size category and the projections were scaled on a worker or truck per square foot basis.

Average daily on-site construction workers and trucks were forecast for the new construction anticipated on each of the projected development sites with the Proposed Actions. As shown in **Table 19-2**, the average number of workers would peak at an estimated 1,395 per day in the second quarter of 2028, while the average number of trucks per day would peak at an estimated 177 in the same quarter of 2028. These represent peak days of work, and other days during the construction period would have fewer construction workers and trucks on-site. Overall, the second quarter of 2028 is expected to be the peak period for total construction travel demand (worker trips and truck trips combined). During this peak construction- worker- and- -truck period, 16 of the 61 (26 percent) projected development sites are expected to be under construction (refer to **Figure 19-1**).

Table 19-2: Average Incremental Number of Daily Construction Workers and Trucks by Year and Quarter

Year	2025				2026				2027			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Workers	---	---	---	279	677	807	913	972	1,126	1,209	1,250	1,323
Trucks	---	---	---	59	121	128	142	142	143	144	147	167
Year	2028				2029				2030			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Workers	1,242	1,395	1,328	1,140	1,151	1,110	1,125	1,045	832	928	878	895
Trucks	168	177	163	143	166	159	163	143	125	144	134	132
Year	2031				2032				2033			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Workers	949	916	871	799	811	872	757	735	657	632	600	465
Trucks	133	119	125	116	114	120	104	97	93	81	74	60
Year	2034											
Quarter	1st	2nd	3rd	4th	Average				Peak			
Workers	330	231	199	58	852				1,395			
Trucks	46	31	23	6	188				177			

Determining Peak Year for Cumulative Construction and Operational Effects

According to the 2021 *CEQR Technical Manual*, if a project involves multiple development sites over varying construction timelines, there must be a preliminary assessment to determine whether the operational trips from completed portions of the project and construction trips associated with construction activities could overlap. For the purposes of establishing a reasonable worst -case for the construction assessment, based on the conceptual construction schedule presented in **Figure 19-1**, the second quarter of (2028) was selected as the peak -construction year for the transportation assessment in this chapter. As shown in **Figure 19-1**, in (2028), there would be four sites that are already completed and operational, 16 sites under construction, and 41 sites projected to be developed in the future.

Construction Work Hours

Construction activities for buildings in the City generally take place Monday through Friday, with exceptions that are discussed separately below. In accordance with City laws and regulations, construction work at the projected development sites would generally begin at 7 AM on weekdays, with workers arriving to prepare work areas between 6 and 7 AM. Construction work activities would typically finish around 3:30 PM; but on some occasions, the workday could be extended depending upon the need to complete some specific tasks beyond normal work hours, such 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 PM but only for those involved in the specific tasks requiring additional work time (not all on-site construction workers).

Occasionally, Saturday or overtime hours may be required to complete some time-sensitive tasks. Weekend work requires a permit from the DOB and, in certain instances, approval of a noise mitigation plan from DEP under the City's Noise Code. The New York City Noise Control Code, as amended in December 2005 and effective July 1, 2007, limits construction (absent special

circumstances as described below) to weekdays between the hours of 7 AM and 6 PM and sets noise limits for certain specific pieces of construction equipment. Construction activities occurring after hours (weekdays between 6 PM and 7 AM or anytime on weekends) may be permitted only to accommodate the following:

- Emergency conditions
- Public safety
- Construction projects by or on behalf of City agencies
- Construction activities with minimal noise impacts
- Undue hardship resulting from unique site characteristics, unforeseen conditions, scheduling conflicts, and financial considerations

In such cases, the number of workers and pieces of equipment in operation would be limited to those needed to complete the particular authorized task. Therefore, the level of activity for any weekend work would be less than a normal workday. The typical weekend workday would be on Saturday from 7 AM with worker arrival and site preparation to 5 PM for site cleanup.

Figure 19-1 – Conceptual Construction Schedule



Construction Staging Areas, Sidewalk and Lane Closures

Construction staging areas, also referred to as "laydown areas," are sites that would be used for the storage of materials and equipment and other construction-related activities. Work zones are those areas where the construction is occurring. Field offices for contractors and construction managers would be situated in temporary job site trailers at staging areas or existing office space near the work areas. Staging areas would typically be fenced and lit for security and would adhere to New York City Building Codes.

Staging areas of adequate size and proximity to the construction sites are essential to minimize construction traffic through the Affected Area and to provide adequate space and access for construction activities. While parcels proximate to several of the projected development sites are available and could be used for staging areas, it is anticipated that construction staging would most likely occur on the projected development sites themselves. In some cases, this staging may extend into the curbs, travel lanes, and sidewalks of public streets adjacent to the construction site.

No rerouting of traffic is anticipated during construction activities and all moving lanes on streets are expected to be available to traffic at all times. It is anticipated that some sidewalks immediately adjacent to construction sites would be closed to accommodate heavy loading areas for at least several months of the construction period for each site. Pedestrians would either use a temporary walkway in a sectioned -off portion of the street or be diverted to walk on the opposite side of the street. Detailed Maintenance and Protection of Traffic Plans for each construction site would be submitted for approval to the DOT Office of Construction Mitigation and Coordination, the office that ensures critical arteries are not interrupted, especially in peak travel periods. Builders would be required to plan and carry out noise and dust control measures during construction.

Appropriate protective measures for ensuring pedestrian safety surrounding each of the projected development sites would be implemented under these plans. Construction activities would also be subject to compliance with the New York City Noise Code and by the EPA noise emission standards for construction equipment. In addition, there would be requirements for street crossing and entrance barriers, protective scaffolding, and compliance with applicable construction safety measures.

D. Preliminary Assessment

In accordance with the guidance of the 2021 *CEQR Technical Manual*, this preliminary assessment evaluated the effects associated with the Proposed Actions construction -related activities including transportation (traffic, transit, pedestrians and parking), air quality, noise, land use and neighborhood character, socioeconomic conditions, community facilities, open space, historic and cultural resources, and hazardous materials.

Transportation

The assessment will be based on the guidance presented in the 2021 *CEQR Technical Manual* and will qualitatively consider losses in lanes, sidewalks, and other transportation services on the adjacent streets during the various phases of construction and identify the increase in vehicle trips from construction workers and equipment. A travel demand forecast for the RWCDS peak construction period will be prepared and compared to the travel demand forecast for the With-Action condition.

The Proposed Actions are anticipated to result in the construction of predominantly mixed-use developments on 61 projected development sites in the Affected Area through 2034. During construction periods, projected development sites would generate trips from workers traveling to/from the construction sites and from the movement of materials and equipment. Given typical construction hours, worker trips would be concentrated more in the early morning and mid-afternoon on weekdays as opposed to during peak travel periods.

Air Quality

A detailed dispersion analysis of construction sources was performed to determine the potential for significant air quality impacts on sensitive receptor locations. Air pollutant sources include combustion exhaust associated with non-road construction engines (such as cranes and excavators) and trucks operating on-site, construction-generated traffic on local roadways, as well as on-site activities that generate fugitive dust (such as excavation and demolition). The pollutants of concern include CO, PM, and NO_2. The potential for significant impacts was determined by comparing model-predicted total concentrations to the NAAQS or by comparing the predicted increase in concentrations to applicable guidance thresholds (CEQR de minimis criteria). The air quality analysis also includes a discussion of the strategies to reduce project-related air pollutant emissions associated with construction activities.

According to the 2021 *CEQR Technical Manual*, a quantitative assessment of air quality for construction activities is likely not warranted if the project's construction activities: (1) are considered short-term, which for air quality assessments has generally been accepted as two years or less; (2) are not located near sensitive receptors; (3) do not involve the construction of multiple buildings where there is a potential for cumulative impacts from different buildings under simultaneous construction before the final build-out; and (4) would not operate multiple pieces of diesel equipment in a single location during peak construction. If a project does not meet one or more of the criteria above, a quantitative air quality assessment could be required.

During construction, the Proposed Action may result in off-site mobile source emissions resulting from increases or the redistribution of traffic. However, peak-hour traffic increments during construction would generally be lower than the operational traffic increments for the full build-out of the Proposed Action. As a result, impacts related to mobile sources would not be significant and a stand-alone mobile-source analysis is not required. Nevertheless, on-

road truck emissions were assumed for east-bound roads adjacent to the project sites and were included with the on-site dispersion analysis to cumulatively address all local project-related emissions.

As construction of the projected development sites under the RWCDS would involve the construction of multiple buildings near sensitive receptors and the use of multiple pieces of diesel equipment, with many of the projected development sites anticipated to be under construction for more than two years, the Proposed Actions do not screen out any of these four points. As a result, a quantitative air quality assessment was performed. The methodologies and results of this analysis are described in the "Detailed Analysis" section below.

Noise and Vibration

A quantitative construction noise analysis will be prepared to examine potential noise impacts due to construction-related stationary and mobile sources. Existing noise levels will be determined by noise measurements performed at various at-grade receptor locations throughout the Affected Area. During representative worst-case periods, noise levels due to construction activities at projected development sites will be predicted for each sensitive receptor. Construction activities have the potential to result in vibration levels that may result in structural or architectural damage as well as annoyance or interference with vibration-sensitive activities. A construction vibration assessment will be performed. This assessment will determine critical distances at which various pieces of equipment may cause damage or annoyance to nearby buildings based on the type of equipment, the building construction, and applicable vibration level criteria. Should it be necessary for certain construction equipment to be located closer to a building than its critical distance, vibration mitigation options will be proposed.

According to the 2021 *CEQR Technical Manual*, an assessment of noise for construction activities is likely not warranted if the project's construction activities: (1) are considered short-term; (2) are not located near sensitive receptors; (3) do not involve the construction of multiple buildings where there is a potential for cumulative impacts from different buildings under simultaneous construction before the final build-out; and (4) would not operate multiple pieces of diesel equipment in a single location during peak construction. If a project does not meet one or more of the criteria above, a quantitative noise assessment could be required.

As construction of the projected development sites under the RWCDS would involve the construction of multiple buildings near sensitive receptors and the use of multiple pieces of diesel equipment, with 24 of the projected development sites anticipated to be under construction for more than two years, the Proposed Actions do not screen out any of these four points. As a result, a quantitative construction noise assessment was performed. The methodologies and results of this analysis are described in the "Detailed Analysis" section, below.

Other Technical Areas

In estimating the duration of the construction period for each site, it is generally assumed that sites that would accommodate less than approximately 195,000 gsf of development would take 24 months or less to complete construction, whereas projected development sites with a greater amount of anticipated development floor area, such as Sites 3, 7, 15, 16, 18, 19, 25, 31, 32, 33, 36, 40, 41, 42, 43, 45, 47, 48, 49, 51, 53, 55, and 62, are assumed to take longer.

Land Use and Neighborhood Character

According to the 2021 *CEQR Technical Manual*, a construction impact analysis for land use and neighborhood character is typically needed if construction would require continuous use of property for an extended duration, thereby having the potential to affect the nature of the land use and character of the neighborhood. A land use and neighborhood character assessment for construction impacts examines construction activities that would occur on the site (or portions of the site) and their duration. The analysis determines whether the type and duration of the activities would affect neighborhood land use patterns or neighborhood character. For example, a single property might be used for staging for several years, resulting in a "land use" that would be industrial in nature. Depending upon the nature of existing land uses in the surrounding area, the use of a single piece of property for an extended duration and its compatibility with neighboring properties may be assessed to determine whether it would have a significant adverse impact on the surrounding area.

Construction of the 61 projected development sites would be spread out over approximately 10 years and throughout an approximately 42-block rezoning area. As noted above, construction of most of the projected development sites would be short-term (less than approximately 24 months), while construction of sites 3, 7, 15, 16, 18, 19, 25, 31, 32, 33, 36, 40, 41, 42, 43, 47, 48, 49, 51, 53, 55, and 62, which are larger and may include multiple buildings, would be more intensive. Construction activity at these development sites is conservatively estimated to last as long as 48 months (Site 49).

Throughout the construction period (as required by City regulations), access to residences, businesses, and institutions in the area surrounding the development sites would be maintained. In addition, measures would be implemented to control noise, vibration, air emissions, and dust on construction sites, including construction fencing that incorporates sound-reducing measures (see Chapter 21, "Mitigation"). While construction of the new buildings resulting from the Proposed Actions would cause temporary impacts, particularly related to noise, it is expected that these impacts in any given area would be relatively short-term, even under worst-case construction sequencing. Therefore, no significant construction impacts to land use and neighborhood character are expected.

Socioeconomic Conditions

According to the 2021 *CEQR Technical Manual*, construction impacts to socioeconomic conditions are possible if the Proposed Actions would entail construction of a long duration

that could affect access to and thereby viability of a number of businesses and if the failure of those businesses has the potential to affect neighborhood character. As noted above, construction of most of the projected development sites would be short-term (up to 24 months), while construction of Sites 3, 7, 15, 16, 18, 19, 25, 31, 32, 33, 36, 40, 41, 42, 43, 45, 47, 48, 49, 51, 53, 55, and 62, which are larger and may include multiple buildings, would be more intensive. Construction activity at these development sites is conservatively estimated to last as long as 48 months. During the construction period, construction activities would be dispersed throughout the 42-block rezoning area and would not affect access to businesses over an extended duration. Therefore, construction impacts to socioeconomic conditions are not expected.

Community Facilities

According to the 2021 *CEQR Technical Manual*, construction impacts to community facilities are possible if a community facility would be directly affected by construction (for example, if construction would disrupt services provided at a facility or close a facility temporarily). While there are community facilities throughout the Affected Area, as discussed in Chapter 4, "Community Facilities and Services," the Proposed Actions would not result in the direct displacement of any community facilities, as defined in the 2021 *CEQR Technical Manual*. While construction of the projected development sites would result in temporary increases in traffic along certain routes during the construction period, access to and from any community facilities in the Affected Area would not be affected during the construction period. In addition, each construction site would be surrounded by construction fencing and barriers as required by the DOB, which would limit the effects of construction on nearby facilities. Construction workers would not place any burden on public schools and would have little (if any) needs for libraries, childcare facilities, and health care services.

The Affected Area is served by the New York City Police Department's 10th, 13th, and 14th Precincts. The Affected Area, specifically the area north of 29th Street, is served by the 14th Precinct. The 14th Precinct House is located at 357 West 35th Street, approximately 500 feet west of the northwest quadrant, between Eighth and Ninth Avenues. The area south of West 29th Street and west of Seventh Avenue is served by the 10th Precinct. The 10th Precinct House is located at 230 West 20th Street, between Seventh and Eighth Avenues. The 10th Precinct House is located approximately 0.25 miles southwest of the southwest quadrant. The area south of 29th Street and east of Seventh Avenue is within the 13th Precinct. The 13th Precinct House is located at 230 East 21st Street between Second and Third Avenues, approximately 0.6 miles southeast of the southeast quadrant.

Development on these sites would not reduce the number of travel lanes in the vicinity or otherwise impede NYPD or FDNY response times. NYPD and FDNY emergency services and response times would not be materially affected by construction at other development sites due to the geographic distribution of the police and fire facilities and their respective coverage areas. Therefore, no construction impacts would be expected to community facilities in the area, and a further preliminary assessment is not needed for the disclosure of potential construction impacts to community facilities.

Open Space

According to the 2021 *CEQR Technical Manual*, construction impacts to open space are possible if the open space is taken out of service for a period during the construction process. While several of the projected development sites are located in proximity to existing open space resources, no open space resources would be located on any of the projected development construction sites, nor would any access to publicly accessible open space be impeded during construction within the Affected Area. In addition, measures would be implemented to control noise, vibration, air emissions, and dust on construction sites, including construction fencing that incorporates sound-reducing measures. Because none of these impacts would be continuous or permanent, they would not create significant impacts on open space in the area. Therefore, while construction of the new buildings due to the Proposed Actions would cause temporary impacts, particularly related to noise, it is expected that such impacts in any given area would be relatively short-term, even under the worst-case construction sequencing. In short, no significant construction impacts on open space are expected.

Historic and Cultural Resources

According to the guidance in the 2021 *CEQR Technical Manual*, construction impacts may occur on historic and cultural resources if in-ground disturbances or vibration associated with the project's construction could undermine the foundation or structural integrity of nearby resources.

Chapter 7, "Historic and Cultural Resources," provides a detailed assessment of potential impacts on architectural resources. This section summarizes potential impacts during construction of the Proposed Actions. Mitigation measures that could minimize or reduce these impacts are discussed in Chapter 21 of this EIS.

The New York City Building Code provides some measures of protection for all properties against accidental damage from adjacent construction by requiring that all buildings, lots, and service facilities adjacent to foundation and earthwork areas be protected and supported. Additional protective measures apply to LPC-designated Landmarks and State and National Register-listed (S/NR-listed) historic buildings located within 90 linear feet of a proposed construction site. For these structures, the DOB's Technical Policy and Procedure Notice (TPPN) #10/88 applies. TPP #10/88 supplements the standard building protections afforded by the Building Code by requiring, among other things, a monitoring program to reduce the likelihood of construction damage to adjacent LPC-designated or S/NR-listed resources (within 90 feet) and to detect at an early stage the beginnings of damage so that construction procedures can be changed.

NYCL-designated or S/NR-listed historic buildings located within 90 linear feet of a projected or potential new construction site are subject to the protections of the DOB Technical Policy and Procedure Notice (TPPN) #10/88. Therefore, the Proposed Actions would not cause any significant adverse construction-related impacts to NYCL-designated or S/NR-listed historic buildings.

Development at 17 projected and potential sites under the Proposed Actions could potentially result in construction-related impacts to 16 non-designated historic resources located within 90

feet of the projected/potential development sites. These 16 non-designated resources would be afforded limited protection under DOB regulations applicable to all buildings located adjacent to construction sites; however, they are not afforded the added special protections under DOB's TPPN #10/88 because they are not S/NR-listed or NYCL-designated. Additional protective measures under DOB's TPPN #10/88 would only become applicable if the eligible resources are designated in the future prior to the initiation of construction. However, if the eligible resources listed above are not designated, they would not be subject to TPPN #10/88 and may therefore be adversely impacted by the adjacent developments resulting from the Proposed Actions.

Hazardous Materials

According to the guidance in the 2021 *CEQR Technical Manual*, any impacts from in-ground disturbance that are identified in hazardous materials studies should be identified in this chapter as well. Institutional controls, such as (E) designations or restrictive declarations should be disclosed here as well. If the impact identified in hazardous materials studies is fully mitigated or avoided, no further analysis of the effects from construction activities on hazardous materials is needed.

As stated in Chapter 9, "Hazardous Materials," the Proposed Actions are anticipated to have no significant adverse impacts related to hazardous materials. An evaluation of potential hazardous materials impacts was conducted for the 61 projected and seven potential development sites. The assessment revealed environmental concerns associated with each of these sites. Consequently, the proposed zoning map actions incorporate (E) designations for all projected and potential development sites. By implementing the (E) designation across all 68 projected and potential development sites, the potential presence of contaminated materials would be addressed and mitigated. The adoption of preventive and remedial measures outlined in the (E) designation is poised to mitigate or eliminate the potential for significant adverse impacts related to hazardous materials during construction within the Affected Area resulting from the Proposed Actions.

The (E) designation requires that the fee owner conduct a testing and sampling protocol and remediation, where appropriate, to the satisfaction of the NYC Office of Environmental Remediation before the issuance of a permit by the DOB. The environmental requirements for the (E) designation also include a mandatory construction health and safety plan, which must be approved by the NYC Office of Environmental Remediation.

In addition, demolition of interiors, portions of buildings, or entire buildings are regulated by the DOB and require abatement of asbestos prior to any intrusive construction activities, including demolition. OSHA regulates construction activities to prevent excessive exposure of workers to contaminants in the building materials, including lead paint. New York State Solid Waste regulations control where demolition debris and contaminated materials associated with construction are handled and disposed of. Adherence to these existing regulations would prevent impacts from construction activities at any of the projected development sites in the Affected Area.

E. Detailed Analyses

Transportation

It is anticipated that the Proposed Actions would result in the construction of predominantly mixed-use developments on 61 projected development sites in the Affected Area through 2034. These developments would replace existing development on the projected development sites. During construction periods, projected development sites would generate trips from workers traveling to/from the construction sites and from the movement of materials and equipment. Given typical construction hours, worker trips would be more concentrated in the early morning and mid-afternoon periods on weekdays than during peak travel periods.

In addition to the 61 projected development sites, there is also the potential for the conversion of existing nonresidential floor area to residential use that could occur in existing buildings. As discussed in Chapter 1, "Project Description", while these conversions may follow certain geographic patterns, the specific location of the area modeled for residential conversions is not known, and therefore, site-specific construction projections cannot be made. Therefore, the construction analysis considers the redevelopment of the 61 projected development sites and not the potential for the conversion of existing nonresidential floor area to residential use.

Traffic

As discussed above, average daily on-site construction workers and trucks were forecasted for new construction anticipated on each of the projected development sites with the Proposed Actions. As shown in **Table 19-2**, the average number of workers would peak at an estimated 1,395 per day in the second quarter of 2028, while the average number of trucks per day would peak at an estimated 177 in the same quarter of 2028. These represent peak days of work, and other days during the construction period would have fewer construction workers and trucks on-site. Overall, the second quarter of 2028 is expected to be the peak period for total construction travel demand (worker trips and truck trips combined).

In addition to ongoing construction during the second quarter of 2028, operational trips from completed portions of the projected developments would simultaneously occur. As such, the second quarter of 2028 was selected as the reasonable worst-case analysis period for assessing potential cumulative traffic impacts from operational trips from completed portions of the projected developments and construction trips associated with construction activities. An assessment of traffic generated during this peak period is presented below.

Peak Construction Worker Travel Demand and Truck Trips—2028 (Second Quarter)

Modal split and vehicle occupancy rates for construction workers were based on 2000 U.S. Census data for construction workers in tracts encompassing the Affected Area. Based on these data, it is anticipated that approximately 69.2 percent of construction workers would use public transportation in their commute to and from the construction sites in the Affected Area, which is well served by subway, rail, and bus transit. Approximately 28.4 percent of workers are expected

to travel by personal automobile with an average occupancy of approximately 1.22 persons per vehicle, 0.0 percent are expected to taxi, and 2.5 percent are expected to walk or bicycle. **Table 19-3** shows a forecast of incremental hourly construction worker auto and construction truck trips during the 2028 (second quarter) peak construction period. The temporal distribution for these vehicle trips was based on typical work shift allocations and conventional arrival/departure patterns for construction workers. Each worker vehicle was assumed to arrive in the morning and depart in the afternoon or early evening; whereas, truck deliveries would occur throughout the construction day. To avoid congestion and ensure that materials are on-site for the start of each shift, construction truck deliveries would often peak during the hour before the regular day shift, overlapping with construction worker arrival traffic. Each truck delivery was assumed to result in two truck trips during the same hour (one inbound and one outbound). For analysis purposes, truck trips were converted into Passenger Car Equivalents (PCEs) based on one truck being equivalent to an average of two PCEs.

As shown in **Table 19-3**, in the second quarter of 2028, construction-related traffic is expected to peak during the 6 to 7 AM and 3 to 4 PM periods. During the 6 to 7 AM peak hour there would be a total of 440 PCE vehicle trips, including 350 inbound trips and 90 outbound trips. During the 3 to 4 PM peak hour there would be a total of 278 PCE trips, including nine inbound trips and 269 outbound trips.

Table 19-3: 2028 (Second Quarter) Peak Incremental Construction Vehicle Trip Projections (in PCEs)

	Worker Vehicle Trips								Truck Trips					Total Vehicle Trips		
	%		Auto		Total	Taxi		Total	In		Out		Total	In	Out	Total
Hour	In	Out	In	Out		In	Out		%	#	%	#				
6-7 AM	80%	0%	260	0	260	0	0	0	25%	25%	90	90	180	350	90	440
7-8 AM	20%	0%	65	0	65	0	0	0	10%	10%	35	35	70	100	35	135
8-9 AM	0%	0%	0	0	0	0	0	0	10%	10%	35	35	70	35	35	70
9-10 AM	0%	0%	0	0	0	0	0	0	10%	10%	35	35	70	35	35	70
10-11 AM	0%	0%	0	0	0	0	0	0	10%	10%	35	35	70	35	35	70
11 AM-12 PM	0%	0%	0	0	0	0	0	0	10%	10%	35	35	70	35	35	70
12-1 PM	0%	0%	0	0	0	0	0	0	10%	10%	35	35	70	35	35	70
1-2 PM	0%	0%	0	0	0	0	0	0	5%	5%	18	18	36	18	18	36
2-3 PM	0%	5%	0	16	16	0	0	0	5%	5%	18	18	36	18	34	52
3-4 PM	0%	80%	0	260	260	0	0	0	2.5%	2.5%	9	9	18	9	269	278
4-5 PM	0%	15%	0	49	49	0	0	0	2.5%	2.5%	9	9	18	9	58	67
5-6 PM	0%	0%	0	0	0	0	0	0	0%	0%	0	0	0	0	0	0

Cumulative Operational Traffic—2028 (Second Quarter)

As discussed above, **Table 19-3** shows hourly worker auto trips and construction truck trips (in PCEs) in the 2028 (second quarter) analysis period. Prior years would see the completion of substantially less new development, whereas subsequent years would see a decreasing intensity of construction activity and lower levels of construction traffic. During this peak period, construction travel demand would also simultaneously overlap with operational demand from completed projected development sites. During this cumulative construction and operational

traffic analysis period, there would be four sites that are already completed and operational and 16 sites that are under construction.

Table 19-4 shows the comparison of the vehicle trips generated under the 2028 peak construction period and 2034 build year during traditional AM and PM peak hours for traffic (previously identified in Chapter 13, "Transportation") as well as the AM and PM construction peak hours. The 2028 construction trips are based on the data presented in **Table 19-3** and the 2028 operational trips are based on the planning factors outlined in Chapter 13, "Transportation" of the traffic generated as a result of the four sites that would be operational by 2028. The total vehicle trips generated under the 2028 construction period is the aggregate of the 2028 construction trips and 2028 operational trips. The net difference of these trips are compared to the 2034 operational trips, which are the trips that would be generated by the 61 sites under the 2034 build year.

Table 19-4: Comparison of 2028 Peak (Second Quarter) Incremental Construction and Operational Vehicle Trips with 2034 Operational Vehicle Trip

Peak Hour	Net Incremental Vehicle Trips				
	2028[1] Construction Trips	2028[1] Operational Trips	2028[1] Construction + Operational Trips	2034 Operational Trips	Net Difference
Construction AM	440	17	457	130	327
Operational AM	70	71	141	360	-219
Construction PM	278	57	335	360	-25
Construction PM	0	69	69	436	-367

Notes:
[1] 2028 construction trips represent the second quarter of that year.

During the AM construction peak hour in 2028, a total of 17 operational vehicle trips (in PCEs) are anticipated; during the PM construction peak hour, a total of 57 operational trips are anticipated. By comparison, construction vehicle trips during the AM operational peak hour would total approximately 70 and 0 during the PM operational peak hour.

As shown in **Table 19-4**, combined with the operational trips generated by completed projected developments, there would be a total of approximately 457 vehicle trips during the AM construction peak hour and a total of 335 trips during the PM construction peak hour in 2028 (Second Quarter). During the AM and PM operational peak hours, combined operational and construction vehicle trips would total approximately 141 and 69, respectively. During these operational peak hours, construction trips would account for only 70 of the combined trips in the AM and 0 in the PM.

As peak construction and operational activity in 2028 would result in 219 and 367 fewer incremental vehicle trips during the traditional AM and PM peak hours, respectively, than would full build-out of the projected development sites under the Proposed Actions, it is expected that any significant adverse traffic impacts during the 2028 construction analysis year would be within the range of impacts identified for the 2034 operational analysis year. Furthermore, no new

intersections are likely to experience significant adverse traffic impacts during the AM and PM peak rush hour periods in the 2028 construction analysis year.

Peak construction and operational activity would generate 327 more incremental vehicle trips during the AM construction peak hour in 2028 and 25 fewer incremental vehicle trips during the PM construction peak hour in 2028 compared with operation of the Proposed Actions in 2034. Based on traffic counts that were collected in the study area over a 24-hour period, overall traffic volumes on the study area street network are, in general, lower during the AM and PM construction peak hours than during the operational commuter peak hours. As such, traffic conditions during the construction peak hours are expected to be generally better than during the operational commuter peak hours. For example, automatic traffic recorder (ATR) count data indicates that in the aggregate, existing 6 to 7 AM traffic volumes on study area streets are approximately 30 percent lower than during the operational AM peak hour, and existing 3 to 4 PM traffic volumes on study area streets are approximately three percent lower than during the operational PM peak hour. Traffic conditions in 2028 during the 6 to 7 AM and the 3 to 4 PM construction peak hours are therefore expected to be generally better than during the analyzed operational AM and PM peak hours with full build-out of the Proposed Actions in 2034. Consequently, there would be less likelihood of significant adverse traffic impacts during the construction peak hour in the Proposed Actions' peak construction period than with the full build-out during operational peak hours analyzed in the EIS. It is expected that the mitigation measures identified in Chapter 21, "Mitigation," for 2034 operational traffic impacts would also be effective at mitigating potential impacts during the peak construction periods.

Street Lane and Sidewalk Closures

Temporary curb lane and sidewalk closures are anticipated adjacent to construction sites, similar to other construction projects in New York City, and these would be expected to have dedicated gates, driveways, and/or ramps for access by trucks making deliveries. Truck movements would be spread throughout the workday between 6 AM and 5 PM, depending on the stage of construction. Flaggers are expected to be present during construction to manage the access and movement of trucks. Detailed Maintenance and Protection of Traffic (MPT) plans for each construction site would also need to be submitted for approval to DOT's Office of Construction Mitigation and Coordination (OCMC) that would detail the measures that would need to be implemented at each construction site to ensure the safe and efficient maintenance of vehicular and pedestrian traffic flows.

Transit

As previously discussed and shown in **Table 19-2**, in the 2028 peak (second) quarter for construction travel demand, there would be a net increase of approximately 1,1395 construction workers traveling to and from projected development sites each day under the Proposed Actions. Approximately 69.2 percent of these construction workers are expected to travel to and from the Affected Area by public transit (subway, bus, and/or commuter rail). The RWCDS construction sites are located in a neighborhood that is well served by public transportation, with a total of 14 subway stations or station complexes, 14 local bus routes,

and 50 express bus routes, along with three commuter rail stations located in proximity to the Affected Area.

As noted above, it is estimated that approximately 80 percent of all construction workers would arrive and depart in the peak hour before and after each shift. Therefore, in the second quarter of 2028, construction worker travel demand is expected to generate a total of approximately 774 transit trips (508 by subway, 140 by rail, and 126 by bus) in each of the 6 to 7 AM and 3 to 4 PM construction peak hours. Given that construction worker transit trips would be distributed among numerous subway stations, bus routes, and commuter rail stations, in proximity to projected development sites that are located throughout the Affected Area, the number of incremental construction trips by transit are not expected to exceed the 200-trip *CEQR Technical Manual* analysis threshold for any individual subway station or the 50-trip threshold for a bus analysis (per route, per direction) in either construction peak hour in 2028. In addition, as stated above construction worker transit trips are primarily outside of the peak AM and PM commuter periods when area transit facilities and services typically experience their greatest demand.

In addition, as shown in **Table 19-2**, during the 2028 (second quarter) analysis period, cumulative construction and operational travel demand would simultaneously utilize the transit network as a result of projected development sites under construction and those completed with occupancy. Based on the planning factors outlined in Chapter 13, "Transportation," the operational subway trips generated as a result of the four completed project developments sites would total approximately 60 and 155 during the AM and PM construction peak hours, respectively, while operational rail trips would increase by 8 and 21 and operational bus trips would increase by 3 and 17 during the same periods. Therefore, in the peak construction period, the increase in transit demand (construction and operational) during the 6 to 7 AM and 3 to 4 PM construction peak hours would total 568 and 663 subway trips, respectively, 148 and 161 rail trips, respectively, and 129 and 143 bus trips, respectively.

As discussed above, in the construction peak period, it is estimated that there would be an increase of approximately 568 and 663 subway trips during the construction AM and PM peak hours, respectively. By comparison, the net increase in operational subway trips with full build-out of the Proposed Actions in 2034 would be substantially greater in number, totaling approximately 987 and 992 subway trips during the weekday AM and PM commuter peak periods when overall demand on area subway facilities and services typically peaks. Therefore, 2032 subway conditions during the 6 to 7 AM and the 3 to 4 PM construction peak hours are expected to be generally better than during the analyzed commuter peak hours with full build-out of the Proposed Actions in 2034. As the Proposed Actions are not expected to result in significant adverse subway impacts, the smaller numbers of subway trips that would be generated in the construction peak hours during the second quarter of 2028 peak construction period are similarly not expected to result in any significant adverse impacts to subway services.

As discussed above, in the construction peak period, it is estimated that there would be an increase of approximately 148 and 161 rail trips during the construction AM and PM peak hours, respectively. As peak transit demand would not meet the 200 trips/hour *CEQR Technical Manual analysis* threshold for a detailed rail analysis, significant adverse impacts to rail services are not expected to occur in the construction peak hours during the second quarter of 2028 peak construction period.

As discussed above, in the construction peak period, it is estimated that there would be an increase of approximately 129 and 143 bus trips during the construction AM and PM peak hours, respectively. Approximately 14 local NYC Transit bus routes operate within ¼-mile of projected development sites (the M1, M2, M3, M4, M5, M7, M11, M20, M23 SBS, M34A SBS, M42, M55, M104, and Q32) and 50 NYC express bus routes, and the number of incremental trips in one direction on any one of these routes is not expected to reach the 50-trip *CEQR Technical Manual* analysis threshold for a detailed bus analysis. Therefore, significant adverse impacts to bus services are not expected to occur in the construction peak hours during the second quarter of 2028 peak construction period.

Pedestrians

As discussed above, during the 2028 (second quarter) peak construction travel period it is estimated that there would be a net increment of approximately 1,395 construction workers on site daily under the Proposed Actions, approximately 69.2 percent of whom are expected to travel to/from the Affected Area by transit, walking to and from area subway stops, rail stations, and bus stops. Up to an additional 2.5 percent are expected to walk to or from the Affected Area. As approximately 80 percent of construction worker trips are expected to occur during any one peak hour, net incremental travel demand on area sidewalks, corners, and crosswalks is expected to total approximately 802 trips in the 6 to 7 AM and the 3 to 4 PM construction peak hours. These trips would be widely distributed among the projected development sites that would be under construction in the second quarter of 2028 and would primarily occur outside of the weekday AM and PM commuter peak periods and weekday midday and Saturday peak periods when area pedestrian facilities typically experience their greatest demand. It should be noted that at locations where temporary sidewalk closures are required during construction activities, adequate protection or temporary sidewalks and appropriate signage would be provided in accordance with DOT requirements.

During the 2028 peak (second) quarter for analysis, construction and operational travel demand would occur simultaneously in the pedestrian network as a result of projected development sites under construction and those completed with occupancy. Based on the planning factors outlined in Chapter 13, “Transportation,” as a result of the four completed project developments sites, pedestrian trips (transit walk trips, bike trips, and walk-only trips combined) from completed projected development sites would total approximately 146 in the AM and 1,004 in the PM construction peak hours in 2028. When combined with construction pedestrian trips (transit plus walk-only) from projected development sites under construction (802 trips in each period), the Proposed Actions would result in a net total of approximately 948 and 1,806 pedestrian trips during these periods, respectively, in 2028. By comparison,

incremental pedestrian trips with full build-out of the Proposed Actions in 2034 would be substantially greater in number, totaling 5,336, 3,501, 6,992, and 10,498 during the analyzed weekday AM, midday, PM, and Saturday midday operational peak hours, respectively. Therefore, it is expected that any significant adverse pedestrian impacts during the 2028 cumulative construction analysis year would be within the range of impacts identified for the 2034 operational analysis year. Furthermore, no new pedestrian elements are likely to experience significant adverse impacts during the AM and PM peak rush hour periods in the 2028 construction analysis year. It is expected that the mitigation measures identified for 2034 operational pedestrian impacts in Chapter 21, "Mitigation," would be similarly effective at mitigating any potential impacts from construction pedestrian trips during the 2028 analysis period for cumulative construction and operational travel demand.

Parking

During the 2028 peak construction traffic period it is estimated that there would be approximately 1,395 construction workers on site daily, approximately 28.4 percent of whom would be expected to travel to the Affected Area by private auto. Based on an average vehicle occupancy of 1.22 persons per vehicle, the maximum daily parking demand from project site construction workers would total approximately 325 spaces (see **Table 19-5**). These workers are expected to park on-street and in off-street public parking facilities in proximity to projected development sites throughout the Affected Area. During the 2028 (second quarter) construction peak analysis period, simultaneous operational parking demand would be generated by four completed projected development sites. Based on the planning factors outlined in Chapter 13, "Transportation," parking demand from completed projected development sites would peak during weekday overnight period (12 to 5 AM) with approximately 95 vehicles. In summation, construction and operational parking would total up to approximately 420 vehicles during the peak construction period. However, comparatively, with full build-out of the Proposed Actions in 2034, there would be a parking demand of over a thousand vehicles between 8 PM and 8 AM during the weekday overnight period. 2028 parking conditions during the construction peak period are therefore expected to be generally better than during the analyzed operational peak periods with full build-out of the Proposed Actions in 2034. Consequently, there would be less likelihood of a parking shortfall during the construction peak hours in the cumulative analysis year (2032) than with full build-out of the Proposed Actions in 2034. While the 325 spaces of 2028 (second quarter) construction worker parking demand would potentially contribute to any such shortfall in the midday, the project site is located in Parking Zone 1, per *CEQR Technical Manual* guidelines, and any potential shortfall would not be considered significant as the site is served by alternative modes of transportation near the Affected Area.

Table 19-5: 2028 (Second Quarter) Construction Worker Parking Accumulation

Hour	2028 (Q2)		
	In	Out	Total
6-7 AM	260	0	260
7-8 AM	65	0	325
8-9 AM	0	0	325
9-10 AM	0	0	325
10-11 AM	0	0	325
11 AM-12 PM	0	0	325
12-1 PM	0	0	325
1-2 PM	0	0	325
2-3 PM	0	16	309
3-4 PM	0	260	49
4-5 PM	0	49	0
5-6 PM	0	0	0

Air Quality

Emissions from on-site construction equipment, on-road construction vehicles, and dust-generating construction activities all have the potential to affect air quality. The analysis of potential construction air quality impacts included both on-site and on-road sources of air emissions, and the combined impact of both sources, where applicable.

In general, much of the heavy equipment used in construction is powered by diesel engines that have the potential to produce relatively high levels of nitrogen oxides (NOx) and particulate matter (PM) emissions. Fugitive dust generated by construction activities is also a source of PM. Gasoline engines produce relatively high levels of carbon monoxide (CO). Because the EPA mandates the use of ULSD fuel for all highway and nonroad diesel engines, sulfur oxides (SOx) emitted from the Proposed construction activities would be negligible. Therefore, the pollutants analyzed for the construction period are NO_2 (a component of NOx that is a regulated pollutant), 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. These pollutants and averaging periods are shown in **Table 19-6**.

Table 19-6: Pollutants for Analysis and Averaging Periods

Pollutant	Averaging Period
$PM_{2.5}$	24-hour
	Annual Local
PM_{10}	24-hour
NO_2	Annual
CO	1-hour
	8-hour

Concentrations were predicted using dispersion models to determine the potential for air quality impacts during on-site construction activities and due to construction-generated traffic on local roadways. Concentrations for each pollutant of concern due to construction activities at each sensitive receptor were predicted during the most representative worst-case period. The potential for significant adverse impacts were determined by comparing modeled PM_{10}, $PM_{2.5}$, NO_2, and CO concentrations to NAAQS, and modeled $PM_{2.5}$ to applicable *de minimis* thresholds.

The detailed approach for assessing the effect of construction activities resulting from the Proposed Actions on air quality is discussed further below.

On-Site Construction Activity Assessment

For a detailed analysis, Projected Development Sites 46, 49, 51 and 52 were selected for detailed analysis. Since sites 46 and 49 are in the same quadrant, with overlapping construction schedules they were modeled as one cluster; similarly, sites 51 and 52, also located in the same quadrant, were modeled as another cluster to determine cumulative impacts. Both clusters represent site groupings, which are adjacent to one another and have construction periods that overlap.

Based on DCP guidance, $PM_{2.5}$ emission profiles were developed for all individual Sites as well as combined Sites. Additionally, on-site air pollutant emission intensities were calculated for each evaluated criteria pollutant in a format that corresponded with the pollutant's averaging period(s). For short-term averaging periods, maximum daily emissions were calculated; For annual averaging periods a maximum 12-month rolling average was used. **Figures 19-2** and **19-3** show emission profiles for $PM_{2.5}$ intensities over the duration of the project, for the two combined site groupings selected for the air quality construction assessment.

Tables 19-7 through **19-11**, identify worst-case short-term emission periods (calculated per month) and maximum 12-month rolling annual emission periods selected for analysis.

Figure 19-2. Maximum 24-Hour and Rolling 12-month Average $PM_{2.5}$ Construction Emissions Profile for Development Sites 46 & 49

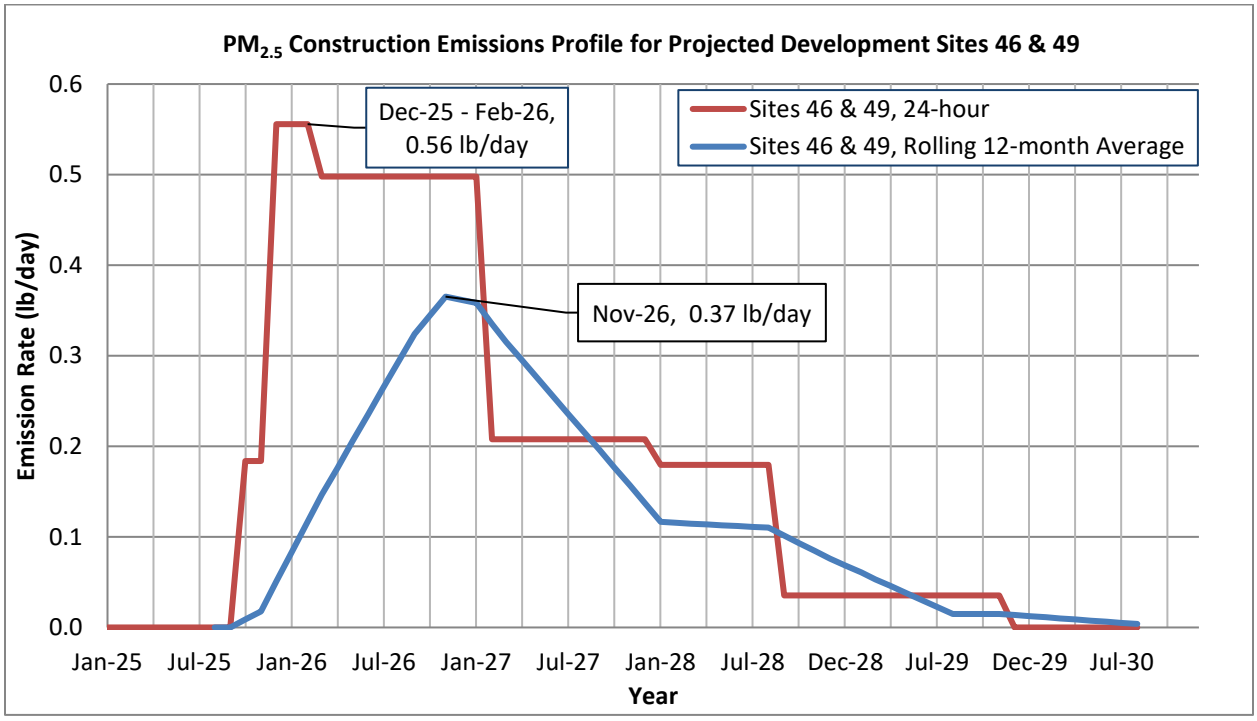


Figure 19-3. Maximum 24-Hour and Rolling 12-month Average $PM_{2.5}$ Construction Emissions Profile for Development Sites 51 & 52

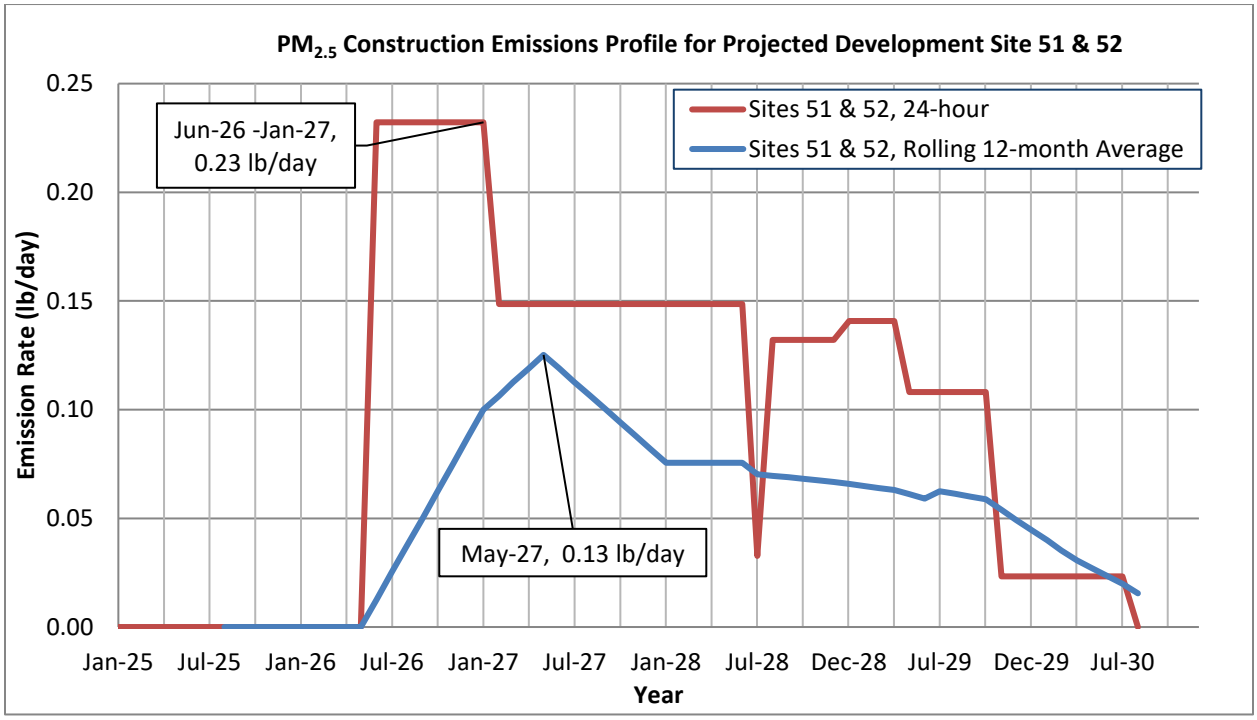


Table 19-7: Short-term Project Emission Intensity for $PM_{2.5}$ (lb/day)

Development Site(s)	Pollutant	Averaging Period	Worst-case Emission Intensity (lb/day)	Dates of Maximum Emission Intensity
46	$PM_{2.5}$	24-Hour	0.18	October 2025 – February 2026
49			0.37	December 2025 – January 2027
51			0.11	August 2028 – December 2028
52			0.23	June 2026 - January 2027
46 & 49			0.56	December 2025 - February 2026
51 & 52			0.23	June 2026 - January 2027

Table 19-8: Short-term Project Emission Intensity for PM_{10} (lb/day)

Development Site(s)	Pollutant	Averaging Period	Worst-case Emission Intensity (lb/day)	Dates of Maximum Emission Intensity
46	PM_{10}	24-Hour	0.64	October 2025 – February 2026
49			1.88	December 2025 – January 2027
51			0.31	August 2028 – December 2028
52			0.87	June 2026 - January 2027
46 & 49			2.52	December 2025 - February 2026
51 & 52			0.87	June 2026 - January 2027

Table 19-9: Rolling 12-month Annual Project Emission Intensity for $PM_{2.5}$ (lb/day)

Development Site(s)	Pollutant	Averaging Period	Worst-case Emission Intensity (lb/day)	Dates of Maximum Emission Intensity
46	$PM_{2.5}$	Annual	0.08	September 2026
49			0.29	November 2026 – January 2027
51			0.05	July 2029
52			0.13	May 2027
46 & 49			0.37	November 2026
51 & 52			0.13	May 2027

Table 19-10: Rolling 12-month Annual Project Emission Intensity for NO_2 (lb/day)

Development Site(s)	Pollutant	Averaging Period	Worst-case Emission Intensity (lb/day)	Dates of Maximum Emission Intensity
46	NO_2	Annual	2.48	September 2026
49			5.17	November 2026 – January 2027
51			1.45	October 2029
52			3.61	May 2027
46 & 49			7.51	November 2026
51 & 52			3.61	May 2027

Table 19-11: Short-term Project Emission Intensity for CO (lb/hour)

Development Site(s)	Pollutant	Averaging Period	Worst-case Emission Intensity (lb/day)	Dates of Maximum Emission Intensity
46	CO	1-Hour	0.45	October 2025 – February 2026
49			0.65	December 2025 – January 2027
51			0.19	August 2028 – December 2028
52			0.49	June 2026 - January 2027
46 & 49			1.09	December 2025 - February 2026
51 & 52			0.49	June 2026 - January 2027

Engine Emissions

The sizes, types, and number of units of construction equipment were estimated based on the construction activity schedule developed for the Proposed Actions. Emission rates for NOx, CO, PM_{10}, and $PM_{2.5}$ from truck engines were developed using the EPA Motor Vehicle Emission Simulator (MOVES4)[1] emission model. Emission factors for NOx, CO, PM_{10}, and $PM_{2.5}$ from on-site construction engines were developed using the NONROAD emission module included in the MOVES4 emission model. Emission factors were calculated accounting for emissions reduction measures required for the projected development sites. Diesel construction equipment engines greater than 50 horsepower would meet Tier 3+ emissions standards for CO and NOx and Tier 3+ with diesel particulate filter (DPF) for PM

[1] EPA. Motor Vehicle Emission Simulator (MOVES4), https://www.epa.gov/moves/moves-versions-limited-current-use#information4

(effectively Tier 4+ since Tier 3+ with DPF achieves Tier 4). Electric and air equipment would not generate criteria air pollutant emissions.

On-Site Dust Emissions

In addition to engine emissions, dust emissions from operations (for example, excavating and transferring materials into dump trucks) were calculated based on EPA procedures defined in AP-42 13.2.4 Aggregated Handling and Storage Piles for material transfer and AP-42 13.2.2 Unpaved Road for on-site truck movement. Because construction is required to follow the New York City Air Pollution Control Code regarding construction-related dust emissions, a 50 percent reduction in particulate emissions from fugitive dust was conservatively assumed in the calculation (dust control methods such as wet suppression would often provide at least a 50 percent reduction in particulate emissions). Additionally, to account for dust attributed to both soil disturbance (digging up the soil) and soil transfer to trucks, a factor of two (2) was applied to fugitive dust emission rates.

Analysis Periods

The construction periods with activities closest to sensitive receptors, with the most intense activities, and the highest emissions were selected as the worst-case periods for analysis. The dispersion analysis included modeling of the worst-case 12-month rolling annual emission rate for $PM_{2.5}$ and NO_2, 24-hour $PM_{2.5}$ and PM_{10}, and 1-hour and 8-hour CO.

Tables 19-7 through **19-11** show predicted maximum construction intensity as well as the time periods when maximum construction intensity is expected to occur. For combined Projected Development Sites 46 and 49 as well as Development Sites 51 and 52, analysis periods coincide with cumulative worst-case emission intensity attributed to both sites.

Dispersion Modeling

Potential impacts from the Proposed Actions construction sources were evaluated using the refined EPA/AMS AERMOD dispersion model, version 23132. AERMOD is a state-of-the-art dispersion model, applicable to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including point, area, and volume sources). AERMOD is a steady-state plume model that incorporates current concepts about flow and dispersion in complex terrain and includes updated treatments of the boundary layer theory, understanding of turbulence and dispersion, and handling of terrain interactions.

Source Simulation

All stationary sources were simulated as area sources. For periods of eight hours or less (less than the length of a shift), it was assumed that all engines would be active simultaneously.

Meteorological Data

The meteorological data set consists of five consecutive years of latest available meteorological data: surface data collected at the nearest representative National Weather

Service Station (LaGuardia Airport) from 2017 to 2021, and concurrent upper air data collected at Brookhaven, New York. The meteorological data provide hour-by-hour wind speeds and directions, stability states, and temperature inversion elevation over the five years. These data were processed using the EPA AERMET program to develop data in a format which can be readily processed by the AERMOD model.

Receptor Locations

Receptors were placed at the following locations: publicly accessible locations, such as open spaces and sidewalks; residential and other sensitive use locations at both ground-level and higher elevations (for example, residential windows); and adjacent sidewalks locations.

To ensure adequate coverage of areas where public exposure was a possibility, buildings on each block with a proposed construction site were contained by model receptors with the following spacing: Every 8 meters horizontally (building footprint) and every 3.05 meters vertically (approx. 10 feet) up to 40 meters. This includes receptors at ground-level and at a flagpole height of 1.8 meters. Additionally, receptors were placed every five meters on sidewalk areas surrounding each active block and that were adjacent to construction. These receptors were placed at ground-level and at a flagpole height of 1.8 meters.

On-Road Sources

As presented above under "Transportation," the traffic increments during construction are lower than the operational traffic increments for the full build-out with the Proposed Actions. In addition, construction worker commutes and construction truck deliveries would generally occur during off-peak hours. Furthermore, when distributed over the transportation network, the construction trip increments would not be concentrated at any single location. Nevertheless, because emissions from on-site construction equipment and on-road construction-related vehicles may contribute to concentration increments concurrently, on-road emissions adjacent to the construction sites were included with the on-site dispersion analysis (in addition to on-site truck and non-road engine activity) to address all local project-related emissions cumulatively.

On-Road Vehicle Emissions

Vehicular engine emission factors were computed using the EPA mobile source emissions model, MOVES4. This emissions model can calculate engine emission factors for various vehicle types, based on the fuel type (gasoline, diesel, or natural gas), meteorological conditions, vehicle speeds, vehicle age, roadway type and grade, number of starts per day, engine soak time, and various other factors that influence emissions, such as inspection maintenance programs. The inputs and use of MOVES incorporate the most current guidance available from the NYSDEC.

On-Road Fugitive Dust

PM_{10} and $PM_{2.5}$ emission rates were determined with the addition of fugitive road dust to account for their impacts. Road dust emission factors were calculated according to Equation

1a from Section 13.2.1 of USEPA's AP-42. An average weight of 17.8 tons was assumed for construction trucks and a silt loading factor of 0.16 g/m^2 was used[2]. Worker vehicles were not included in the analyses.

Traffic Data

Truck trips for the air quality analysis were estimated based on construction schedule, activities and other information developed as part of the construction analysis for the Proposed Actions.

Impact Criteria

The 2021 *CEQR Technical Manual* states that the significance of a predicted consequence of a project (that is, whether it is material, substantial, large, or important) should be assessed in connection with its setting (urban or rural), probability of occurrence, duration, irreversibility, geographic scope, magnitude, and the number of people affected.[3] In terms of the magnitude of air quality impacts, any action predicted to increase the concentration of a criteria air pollutant to a level that would exceed the concentrations defined by the NAAQS would be deemed to have a potential significant adverse impact. In addition, to maintain concentrations lower than the NAAQS in attainment areas, or to ensure that concentrations will not be significantly increased in non-attainment areas, CEQR *de minimis* threshold levels have been defined for certain pollutants; any action predicted to increase the concentrations of these pollutants above the thresholds would be deemed to have a potential significant adverse impact, even in cases where violations of the NAAQS are not predicted.

Emission Control Measures

Measures are expected to be taken to reduce pollutant emissions during construction under the Proposed Actions in accordance with all applicable laws, regulations, and building codes. These required measures include dust suppression measures as specified in the DEP *Construction Dust Rules*, diesel- and gas-powered equipment reduction, the use of ULSD fuel, and truck idling restrictions. Overall, these emission control measures are expected to reduce air pollutant emissions during construction under the Proposed Actions.

Analysis Results

Maximum predicted concentration increments from proposed construction activities and overall concentrations including background concentrations, are presented in **Table 19-12** and **Table 19-13** for individual Development Sites 46 and 49. **Table 19-14** and **Table 19-15** present results for combined Development Sites 46 and 49, and combined Development Sites 51 and 52. Note that combined development site results represent periods associated with maximum construction emissions; both combined sites have overlapping construction schedules.

[2] As specified in *CEQR Technical Manual* Chapter 17, Air Quality for collector type roadways.
[3] New York City. 2021 *CEQR Technical Manual*. Chapter 1, section 222. March 2021; and New York State Environmental Quality Review Regulations, 6 NYCRR § 617.7

For $PM_{2.5}$, monitored background concentrations are not added to modeled concentrations from sources, because impacts are determined by comparing the predicted increment from construction activities to the CEQR *de minimis* criteria. The maximum predicted concentration increments include both on-site construction sources and on-road construction sources.

Table 19-12: Maximum Pollutant Concentrations Resulting from Construction Activities on Projected Development Site 46

Pollutant	Averaging Period	Units	Modeled Concentration	Background Concentration	Total Concentration	De Minimis Criteria[1]	NAAQS
PM2.5	24-Hour	$\mu g/m^3$	3.71	17.6	21.3	8.7	35
	Annual	$\mu g/m^3$	0.63	7.1	7.7	0.3	9
PM10	24-Hour	$\mu g/m^3$	15.98	44.0	60.0	-	150
NO_2	Annual	$\mu g/m^3$	19.55	29.8	49.3	-	100
CO	1-Hour	ppm	0.47	1.6	2.1	-	35
	8-Hour	ppm	0.26	1.2	1.5	-	9

Notes:
Results for any other period/locations are expected to be comparable or lower.
[1]$PM_{2.5}$ concentration increments were compared with the applicable de minimis criteria. Total concentrations were compared with the NAAQS.

Table 19-13: Maximum Pollutant Concentrations Resulting from Construction Activities on Projected Development Site 49

Pollutant	Averaging Period	Units	Modeled Concentration	Background Concentration	Total Concentration	De Minimis Criteria[1]	NAAQS
PM2.5	24-Hour	$\mu g/m^3$	3.14	17.6	20.7	8.7	35
	Annual	$\mu g/m^3$	1.20	7.1	8.3	0.3	9
PM10	24-Hour	$\mu g/m^3$	19.62	44.0	63.6	-	150
NO_2	Annual	$\mu g/m^3$	21.29	29.8	51.1	-	100
CO	1-Hour	ppm	0.31	1.6	1.9	-	35
	8-Hour	ppm	0.15	1.2	1.3	-	9

Notes:
Results for any other period/locations are expected to be comparable or lower.
[1]$PM_{2.5}$ concentration increments were compared with the applicable de minimis criteria. Total concentrations were compared with the NAAQS.

Table 19-14: Maximum Pollutant Concentrations Resulting from Construction Activities on Combined Projected Development Sites 46 and 49

Pollutant	Averaging Period	Units	Modeled Concentration	Background Concentration	Total Concentration	De Minimis Criteria[1]	NAAQS
PM2.5	24-Hour	$\mu g/m^3$	4.05	17.6	21.7	8.7	35
	Annual	$\mu g/m^3$	1.22	7.1	8.3	0.3	9
PM10	24-Hour	$\mu g/m^3$	19.62	44.0	63.6	-	150
NO_2	Annual	$\mu g/m^3$	21.99	29.8	51.8	-	100
CO	1-Hour	ppm	0.52	1.6	2.1	-	35
	8-Hour	ppm	0.27	1.2	1.5	-	9

Notes:
Results for any other period/locations are expected to be comparable or lower.
[1]$PM_{2.5}$ concentration increments were compared with the applicable de minimis criteria. Total concentrations were compared with the NAAQS.

Table 19-15: Maximum Pollutant Concentrations Resulting from Construction Activities on Combined Projected Development Sites 51 and 52

Pollutant	Averaging Period	Units	Maximum Modeled Concentration	Background Concentration	Total Concentration	De Minimis Criteria[1]	NAAQS
PM2.5	24-Hour	$\mu g/m^3$	4.70	17.6	22.3	8.7	35
	Annual	$\mu g/m^3$	1.06	7.1	8.2	0.3	9
PM10	24-Hour	$\mu g/m^3$	22.60	44.0	66.6	-	150
NO_2	Annual	$\mu g/m^3$	30.86	29.8	60.6	-	100
CO	1-Hour	ppm	0.47	1.6	2.1	-	35
	8-Hour	ppm	0.26	1.2	1.5	-	9

Notes:
Results for any other period/locations are expected to be comparable or lower.
[1]$PM_{2.5}$ concentration increments were compared with the applicable de minimis criteria. Total concentrations were compared with the NAAQS.

As shown in **Table 19-12, Table 19-13**, **Table 19-14,** and **Table 19-15**, the maximum predicted total concentrations of PM_{10}, $PM_{2.5}$, CO, and annual-average NO_2 are below their respective NAAQS, and the maximum predicted $PM_{2.5}$ incremental concentrations are below the applicable CEQR *de minimis* criterion of 8.7 $\mu g/m^3$ in the 24-hour average period. At individual and combined Sites 46 and 49 and combined Sites 51 and 52, the maximum annual incremental $PM_{2.5}$ concentration is predicted to exceed the *de minimis* criteria of 0.3 $\mu g/m^3$.

Between the Draft and Final EIS, additional review and evaluation will be performed to determine whether the identified impacts related to the Annual $PM_{2.5}$ increments will be avoided. This may include use of less conservative assumptions in terms of construction equipment usage, and the use of newer construction equipment with lower particulate emissions, as applicable.

Conclusions

Measures would be taken to reduce pollutant emissions during construction in accordance with all

applicable laws, regulations, and building codes, as well as New York City Local Law 77. These include dust suppression measures, idling restriction, utilization of newer equipment, and the use of ULSD fuel and best available tailpipe reduction technologies. With the implementation of these emission reduction measures, the dispersion modeling analysis of construction-related air emissions for both on-site and on-road sources determined that 24-hour PM_{10}, annual-average NO_2, and 1-hour and 8-hour CO concentrations would be below their corresponding *de minimis* thresholds or NAAQS, respectively; $PM_{2.5}$ would be below both its 24-hour and annual NAAQS for all analyzed sites but would exceed the annual *de minimis* threshold for both combined and individual sites. An exceedance of the annual *de minimis* threshold could be considered a significant adverse construction air quality impact. It should be noted that the annual $PM_{2.5}$ concentrations used to represent temporary construction activities were based on a rolling maximum 12-month average and are not representative of day-to-day emissions. Additionally, predicted impacts from construction activities would be lower than the NAAQS. Based on this understanding, a temporary exceedance of the *de minimis* criterion does not indicate an adverse public health impact.

Noise and Vibration

Impacts on community noise levels during construction under the Proposed Actions could result from noise from construction equipment operation and from construction and delivery vehicles traveling to and from the construction site. Noise levels caused by construction activities vary widely and depend on the stage of construction and the location of the construction relative to receptor locations. The most significant construction noise sources are expected to be the operation of impact equipment such as pile rigs and tower cranes as well as movements of trucks to and from each project site. Noise from construction activities and some construction equipment is regulated by the New York City Noise Control Code and by the EPA. The New York City Noise Control Code requires the adoption and implementation of a noise mitigation plan for each construction site, limits construction (absent special approvals) to weekdays between the hours of 7:00 AM and 6:00 PM and sets noise limits for certain specific pieces of construction equipment.

Given the scope and duration of construction activities for the Proposed Actions, a quantified construction noise analysis was performed. The purpose of this analysis was to determine whether significant adverse noise impacts would occur during construction.

This section documents the results of the analyses and identifies potential noise and vibration impacts from the project on noise-sensitive land use. Noise and vibration analyses were performed in accordance with the 2021 edition of the New York City *CEQR Technical Manual* and the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018), which are the best guidance available for assessing construction-related vibration impacts.

Noise Terminology

Noise levels are presented on a logarithmic scale to account for the large pressure response range of the human ear. This logarithmic scale is expressed in units of decibels (dB). A dB is defined as the ratio between a measured value and a reference value usually corresponding to the lower threshold of human hearing. The lower threshold of human hearing is defined as 20 micro pascals. Typically, a noise analysis examines 11 octave (or 33 1/3 octave) bands

ranging from 16 hertz (low) to 16,000 hertz (high). This octave band encompasses the human audible frequency range. Because the human ear does not perceive every frequency with equal loudness, spectrally varying sounds are often adjusted with a weighting filter. The A -weighted filter is applied to compensate for the frequency response of the human auditory system, known as a dBA.

An inherent property of the logarithmic dB scale is that the sound pressure levels of two separate sources are not directly additive. For example, if a sound of 50 dBA is added to another proximate sound of 50 dBA, the result is a 3 dB increase, which is a total of 53 dBA and not an arithmetic doubling to 100 dBA. The human ear perceives changes in sound pressure level relative to changes in “loudness.”

Noise levels can be measured, modeled, and presented in various formats. The noise metrics that were employed in this analysis have the following definitions:

- The most common descriptors used in environmental noise assessments are (i) time-equivalent level (Leq); (ii) day-night level (Ldn); (iii) percentile level (Lx); (iv) sound exposure level (SEL); and (v) maxi-mum instantaneous level (SPL). Each is typically based upon A-weighted measurements and described briefly below.

- Leq is the continuous equivalent sound level, defined as the single SPL that, if constant over a stated measurement period, would contain the same sound energy as the actual monitored sound that is fluctuating in level over the measurement period. Leq is widely recognized as the descriptor of choice for most environmental noise assessments. In addition to its simplicity, it is easy to combine with other readings or predictions to derive a total noise level. Leq is an energy-average quantity that must be contrasted with an average or median sound level. Leq must be qualified in terms of a time period to have meaning. The normal representation for the time period is placing it in parentheses in terms of hours (e.g., Leq(1) refers to a 1-hour measurement and Leq(24) refers to a 24-hour measurement).

- Ldn is the day-night equivalent sound level, defined as a 24-hour continuous Leq with a 10 dB adjustment added to all hourly noise levels recorded between the hours of 10 PM and 7 AM. This 10 dB addition accounts for the extra sensitivity people have to noise during typical sleeping hours. Aircraft noise around airports is usually mapped out in terms of Ldn contours (note that the Federal Aviation Administration (FAA) maps refer to Ldn as DNL), which are constant lines of Ldn mapped similarly to elevations on topographical maps.

- Lx is the percentile level, where x is any number from 0 to 100. Here x is percentage of the measurement time that the stated sound level has been exceeded. For example, L10 = 80 dBA means that SPL measurements exceeded 80 dBA 10 percent of the time during the measurement period. As with Leq, the measurement time period must be specified and is denoted in parentheses (e.g., L10(1) corresponds to the SPL exceeded 10 percent of the time during a one-hour period).

- The most commonly used Lx values are L1, L10, L50, and L90. L1, the SPL exceeded 1 percent of the time, is usually regarded as the average maximum noise level when readings are an hour or less in duration. L10 is usually regarded as an indication of traffic noise exposure with a steady flow of evenly spaced vehicles. L50 provides an indication of the median sound level. L90 is usually regarded as the residual level, or the background noise level without the source in question or discrete events.

- SEL is the sound exposure level, defined as a single number rating indicating the total energy of a discrete noise-generating event (e.g., an aircraft flyover) compressed into a 1-second time duration. This level is handy as a consistent rating method that may be combined with other SEL and Leq readings to provide a complete noise scenario for measurements and predictions. However, care must be taken in the use of these values since they may be misleading because their numeric value is higher than any sound level which existed during the measurement period.

Vibration Terminology

As noted in the FTA's Noise and Vibration Impact Assessment Manual (FTA 2018), both train operations and construction activities can be a source of ground-borne vibration. As discussed above, the Federal Railroad Administration (FRA) has adopted FTA's procedures and guidance for assessing vibration impacts. During the construction phase, activities such as driving piles and operating heavy equipment may cause ground-borne vibration. Due to the weight of train equipment, the operation of trains can also cause ground-borne vibration. Vibration is an oscillatory motion, which can be described in terms of displacement, velocity, or acceleration. Velocity or acceleration is typically used to describe vibration. The following two descriptors are frequently used when discussing quantification of vibration:

- Peak particle velocity (PPV): the maximum instantaneous positive or negative peak of the vibration signal

- Root mean square (RMS): the square root of the average of the squared amplitude of the vibration signal, which is typically calculated over a 1 second period.

Methodology

Construction of the projected development sites, made possible by the Proposed Actions, is anticipated to last for more than two years. Therefore, a quantitative assessment of construction-related noise and vibration was conducted. Construction-related noise and vibration would result from the operation of stationary on-site construction equipment as well as construction-generated vehicle trips (worker trips and material, equipment, truck haul trips) on the surrounding roadways.

The following subsections provide the noise and vibration impact criteria and methodology for assessing impacts related to construction of the Proposed Actions.

Construction Noise Impact Criteria

DCP has adopted a set of construction noise impact criteria for land use applications under the CEQR process. The determination of significant adverse construction noise impacts are based on the intensity and duration of elevated noise levels. Significant adverse construction-related noise impacts are considered if: 1) a noise level increment of 15 dBA or more (which is considered objectionable) occurs for a prolonged period of 12 months or more, or 2) a noise level increment of 20 dBA or more (which is considered very objectionable) occurs for a prolonged period of 3 months or more.

Construction Vibration Impact Criteria

The FTA *Noise and Vibration Impact Assessment Manual* (FTA 2018) includes criteria for evaluating vibration-induced structural damage and human annoyance. Both sets of criteria were used to identify potential vibration impacts from construction activities associated with the Proposed Actions.

As shown in Table 19-16, structural damage criteria are based on the PPV in inches per second (in/sec) and are separated by building category.

As shown in Table 19-17, vibration-induced annoyance criteria are based on land use type and the frequency of events. For purposes of this analysis, vibration annoyance was focused on residential and other land uses where people generally sleep (Vibration Category 2) as well as institutional land uses (Vibration Category 3), which include land use with only daytime use and sensitivity (e.g., schools, churches, quiet offices, etc.). Vibration Category 1 is generally focused on highly sensitive land use such as labs with sensitive equipment, hospitals, and vibration-sensitive research and manufacturing operations. Construction events such as pile strikes generated by an impact pile driver or passage of loaded trucks and bulldozers may be considered anywhere from occasional to infrequent. The FTA defines occasional events as 30 to 70 events of the same kind per day and infrequent events as less than 30 events of the same kind per day. The vibration impact assessment was based on an assumption of infrequent construction vibration events of the same kind per day (i.e., 80 VdB for residential land use and 83 VdB for institutional land use.

Table 19-16: FTA Construction Vibration Damage Criteria

Building Category	PPV ("in/sec" or "ips")	Approximate L_v (VdB)
I. Reinforced concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
I. Reinforced concrete, steel or timber (no plaster)	0.2	94
II. Engineered concrete and masonry (no plaster)	0.12	90

Source: U.S. DEPARTMENT OF TRANSPORTATION, FTA, TRANSIT NOISE AND VIBRATION IMPACT ASSESSMENT MANUAL, SEPTEMBER 2018.
Notes:
PPV=peak particle velocity
1 Root Mean Square (RMS) velocity in decibels (VdB) RE 1 micro-in/sec

Table 19-17: FTA Construction Vibration Annoyance Criteria

Building Category	**Ground-Borne Vibration Impact Levels (VdB)[1]**		
	Frequent Events[2]	Occasional Events[3]	Infrequent Events[4]
1 – High Sensitivity Buildings	65	65	65
2 – Residential	72	75	80
3 – Institutional	75	78	83

SOURCE: U.S. Department Of Transportation, FTA, *Transit Noise And Vibration Impact* Assessment Manual, September 2018.
NOTES:
PPV=PEAK PARTICLE VELOCITY
ROOT MEAN SQUARE (RMS) VELOCITY IN DECIBELS (VDB) RE 1 MICRO-IN/SEC.
FREQUENT EVENTS – MORE THAN 70 VIBRATION EVENTS OF THE SAME KIND PER DAY.
OCCASIONAL EVENTS – BETWEEN 30 AND 70 VIBRATION EVENTS OF THE SAME KIND PER DAY.
INFREQUENT EVENTS – LESS THAN 30 VIBRATION EVENTS OF THE SAME KIND PER DAY.

Construction Noise Reduction Measures

Construction noise is regulated by the requirements of the *New York City Noise Control Code* (also known as Local Law 113). These requirements mandate that the construction equipment and construction related motor vehicles meet specified noise emission standards, that construction activities be limited to weekdays between 7 AM and 6 PM, and that construction materials be managed and transported in such a manner as not to create unnecessary noise and annoyance to people living in the nearby community. Specific noise control measures would be incorporated in noise mitigation plan(s) required under the NYC Noise Control Code. These measures could include a variety of source and path controls.

In terms of source controls (i.e., reducing noise levels at the source or during the most sensitive time periods), the following measures, under New York regulations, would be implemented:

- Equipment that meets the sound level standards specified in Subchapter 5 of the NYC Noise Control Code would be utilized from the start of construction. **Table 19-18**, "Typical Construction Equipment Noise Emission Levels (dBA)," shows the noise levels for typical construction equipment that would be used for construction under the Proposed Actions.

- As early in the construction period as logistics would allow diesel- or gas-powered equipment would be replaced with electrical-powered equipment such as welders, water pumps, bench saws, and table saws (i.e., early electrification) to the extent feasible and practicable.

- Where feasible and practicable, construction sites would be configured to minimize back-up alarm noise. In addition, all trucks, other than those whose engine is used to operate a loading, unloading or processing device, would not be allowed to idle more than three minutes at the construction site based upon Title 24, Chapter 1, Subchapter 7, Section 24-163 of the NYC Administrative Code.
- Contractors and subcontractors would be required to properly maintain their equipment and mufflers.

Table 19-18: Typical Construction Equipment Noise Emission Levels (dBA)

Equipment Description	**L_{max} at 50 Feet[1]**
All Other Equipment > 5 HP	85
Concrete (Drum) Mixer	80
Concrete Pumps Truck	82
Concrete Mixer Truck	85
Concrete Vibratory Mixer	80
Crane	85
Crawl Crane	85
Dozer	85
Excavator	85
Fork Lift	64[2]
Front End Loader	80
Generator	82
Hoist	75[3]
Jackhammer	85
Impact Pile Driver	95
Pump	77
Rebar Bender	80
Scissor Lift	63
Trowel	76
Welder	73

Notes:
1 2021 *CEQR Technical Manual* Table 22-1, except where noted.
2 Dantruck.com.
3 "Noise Control for Construction Equipment…" Report for Hydro Quebec, 1985

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

- Where logistics allow, noisy equipment, such as cranes, concrete pumps, concrete trucks, and delivery trucks, would be located away from and shielded from sensitive receptor locations.
- Noise barriers constructed from plywood or other materials would be erected to provide shielding; and

- Path noise control measures (i.e., portable noise barriers, panels, enclosures, and acoustical tents, where feasible) for certain dominant noise equipment would be employed to the extent feasible and practical based on the results of the construction noise calculations. The details to construct portable noise barriers, enclosures, tents, etc. are shown in DEP's Rules for Citywide Construction Noise Mitigation.

Construction Noise

Construction noise levels were evaluated in accordance with the 2021 edition of the *CEQR Technical Manual*. When evaluating noise impacts from construction, factors such as construction duration, type of equipment, and location of construction relative to sensitive receptors were considered in the analysis. The analysis was based on the conceptual schedule of construction phases and activities prepared by the DCP for the Reasonable Worst-Case Development Scenario (RWCDS). The conceptual construction schedule illustrates how development may proceed, but since projected development sites are predominantly privately owned, the timing and exact sequencing of sites is unknown. The conceptual schedule conservatively accounts for overlapping construction activities at development sites in proximity to one another. The conceptual construction schedule is presented in **Figure 19-1**. The construction phases evaluated included: Phase 1: Demolition/Excavation/Foundation, Phase 2: Building Superstructure/Exterior, and Phase 3: Interior Fit-Out.

On-Site Construction Noise Analysis Methodology

Detailed construction noise modeling was performed to evaluate potential effects of construction activities on existing noise-sensitive receptors surrounding projected development sites with construction durations of 24 months or longer. Construction noise levels were calculated at four representative development sites for all construction phases. Results of the detailed construction noise analyses at the four selected development sites were used to draw conclusions regarding the effects of construction activities at other, non-analyzed projected development sites with construction durations of 24 months or longer. Predicted construction noise levels were subsequently used to identify the intensity and duration of construction noise at receptors and identify potential significant adverse construction noise impacts.

The construction noise analysis involved the following steps:

1. Select cumulative on-site and off-site (construction truck and worker trips) analysis hours. Daily construction worker and truck trip projections by mode were prepared by quarter for the duration of construction as part of the transportation assessment. Peak construction-generated truck and worker trips would occur in the second quarter of 2028. Construction traffic volumes during the hour with the most truck trips coinciding with on-site construction activities (7 AM to 8 AM) were assigned to roadways adjacent

to each development site to evaluate cumulative off-site and on-site construction noise levels.

2. Select representative construction sites for detailed analysis. In general, sites that would take less than 24 months to complete do not require quantitative construction noise assessments. The selected representative development sites include Site 49, one of the largest projected development sites, Site 52, a relatively large projected development site, Site 46, an average projected development site, and Site 35, one of the smallest projected development sites with a 24-month or greater construction duration. These sites were selected to represent remaining sites of similar size with construction durations close to 24 months. Characteristics considered in the selection

of sites to be represented by Sites 49, 52, 46, and 35 included building size, building height, and sensitive receptor proximity and line of sight to the construction site. Construction noise analysis results from Site 49 were used to evaluate potential construction noise impacts only from Site 49, as no other development sites are comparable in size. Construction noise analysis results from Site 52 were used to evaluate potential noise impacts from Projected Development Sites 3, 33, 40 and 48. Construction noise analysis results from Site 46 were used to evaluate potential noise impacts from Projected Development Sites 19, 32, 47, and 53. Construction noise analysis results from Site 35 were used to evaluate potential noise impacts from Projected Development Sites 7, 15, 16, 18, 25, 31, 36, 41, 42, 43, 51, 55, and 62.

3. Select analysis time period. The construction phases evaluated at the four representative Projected Development sites included: Phase 1: Demolition/Excavation/Foundation, Phase 2: Building Superstructure/Exterior, and Phase 3: Interior Fit-Out.

4. Select receptor locations. Receptors were placed on existing noise-sensitive buildings surrounding each of the four detailed analysis sites. In addition, receptor rings were placed at 5 feet, 10 feet, 50 feet, and 100 feet in an evenly spaced grid to form "receptor rings" beginning at 5 feet above ground level and up to ten stories (assuming 10 feet per floor, equating to approximately 95 feet).

5. Establish existing noise levels along receptors. Per DCP guidance, noise measurements conducted as part of the operational noise assessment for the Proposed Actions were used to define existing noise levels and determine the construction noise increment at noise-sensitive receptors during each phase. The lowest measured L_{eq} during the weekday AM and MD measurement periods was conservatively used to identify background noise levels and determine construction noise increments. Each noise-sensitive receptor was assigned a representative noise measurement location. **Figure 19-4** shows the noise measurement locations conducted as part of the operational noise assessment as well as the boundaries depicting the assignments for receptors around the Proposed Actions.

6. Calculate construction noise levels at receptors. The cumulative noise levels from all equipment types (except concrete pump and mixer trucks) and quantities for each construction phase were applied to area sources within SoundPLAN. Cumulative noise levels were converted to sound power levels. Each detailed analysis site was evaluated with a perimeter construction barrier. Concrete pump and mixer trucks were modeled as point sources outside the perimeter construction barrier since there is no guarantee that these trucks would operate within the site behind the barrier. The ground type was modeled as a hard, reflective surface (i.e., G = 0). Off-site sources (construction truck and worker vehicles) were modeled using the Federal Highway Administration's (FHWA) TNN2.5 module within SoundPLAN.

7. Determine total noise levels and noise level increments during construction at each receptor. For each construction phase, construction noise levels were logarithmically added to background noise levels to yield total noise levels. The background noise levels were then arithmetically subtracted from total noise levels to identify the predicted noise level increase during each construction phase.

8. Compare total noise levels and noise increases with "Construction Noise Impact Criteria" described above to determine the magnitude of construction noise at noise sensitive receptors surrounding the four representative analysis sites.

9. Establish the magnitude of construction noise at sensitive receptors that would be affected by other projected development sites with construction durations of 24 months or longer. The background noise levels at noise-sensitive receptors surrounding each non-analyzed site were identified and used to calculate objectionable and very objectionable noise level thresholds at each non-analyzed site. For example, existing noise-sensitive land use around non-analyzed Site 15 was assigned background noise levels from noise measurement sites M01 and M02. An increase of 15 dB was added to the minimum M01 and M02 background L_{eq} noise levels from the AM and MD weekday measurement periods, and an increase of 20 dB was added to minimum M01 and M02 background L_{eq} noise levels to identify objectionable and very objectionable noise level thresholds, respectively. Then, the maximum distances to these thresholds were identified from the detailed analyses conducted at the representative analysis sites. For example, if the objectionable noise level threshold around Site 15 was calculated to be 80 dBA for any receptors with M01 background noise levels, the maximum distance to 80 dBA from detailed analyses conducted at representative Site 35 was identified. That distance was then used to create a buffer in GIS from non-analyzed Site 15 to identify locations of objectionable noise level increases. This methodology was implemented for each non-analyzed site.

10. Establish construction noise duration. Predicted noise level increments and the conceptual construction schedule were reviewed to determine the potential duration of elevated noise levels. The conceptual schedules for each representative site were used to determine construction duration at each non-analyzed site.

11. Identify and describe potential significant adverse construction noise impacts. The magnitude and duration of predicted noise level increases during construction were used to determine whether the Proposed Actions would have the potential to result in significant adverse construction noise impacts. Locations of objectionable and very objectionable noise levels at noise-sensitive receptors around each non-analyzed construction site were reviewed in conjunction with the conceptual schedule to determine if the noise level increases would be considered significant adverse construction noise impacts.

Construction Noise Modeling

Noise levels from both on-site (demolition, excavation, foundation work) and off-site sources of construction noise (haul and delivery trucks, construction worker vehicles) were determined using the SoundPLAN model. This model is a state-of-the-art analytic tool for determining noise exposure from various types of noise generating transportation and construction activities. SoundPLAN is a three-dimensional, ray-tracing model in which noise sources can be modeled as point, line, and area source components. The model can account for distance attenuation, elevation differences, ground absorption, building shielding, and noise reduction achieved by sound barriers and enclosures. The resultant noise levels can be predicted at any number of receptor locations of interest. Use of SoundPLAN for construction noise modeling is acceptable per 2021 *CEQR Technical Manual* guidance.

SoundPLAN inputs were developed in GIS using project site plans and existing building footprints[4] and roadway center lines[5] obtained from NYC Open Data. Construction equipment types and quantities were provided by the DCP for each construction phase. Equipment quantities are based on size of development. Reference sound levels for construction equipment as well as acoustic usage factors that affect the L_{eq} were based on values provided in Table 22-1 of the 2021 *CEQR Technical Manual*, the FTA manual, and source noise levels provided by the DCP from previous projects. Area sources for each phase were generated from the footprints of the four representative analysis sites in GIS. The same footprint was used to develop the area source modeled for each construction phase; however, the sound level applied to the area source differed for each phase based on differences in equipment types and quantities. All construction vehicles were conservatively placed on roadways directly adjacent to the representative construction sites and modeled at a speed of 25 mph.

The predicted construction noise levels were then compared to existing levels to determine impact significance. The determination of significant adverse construction noise impact is based on the intensity and duration, as described above.

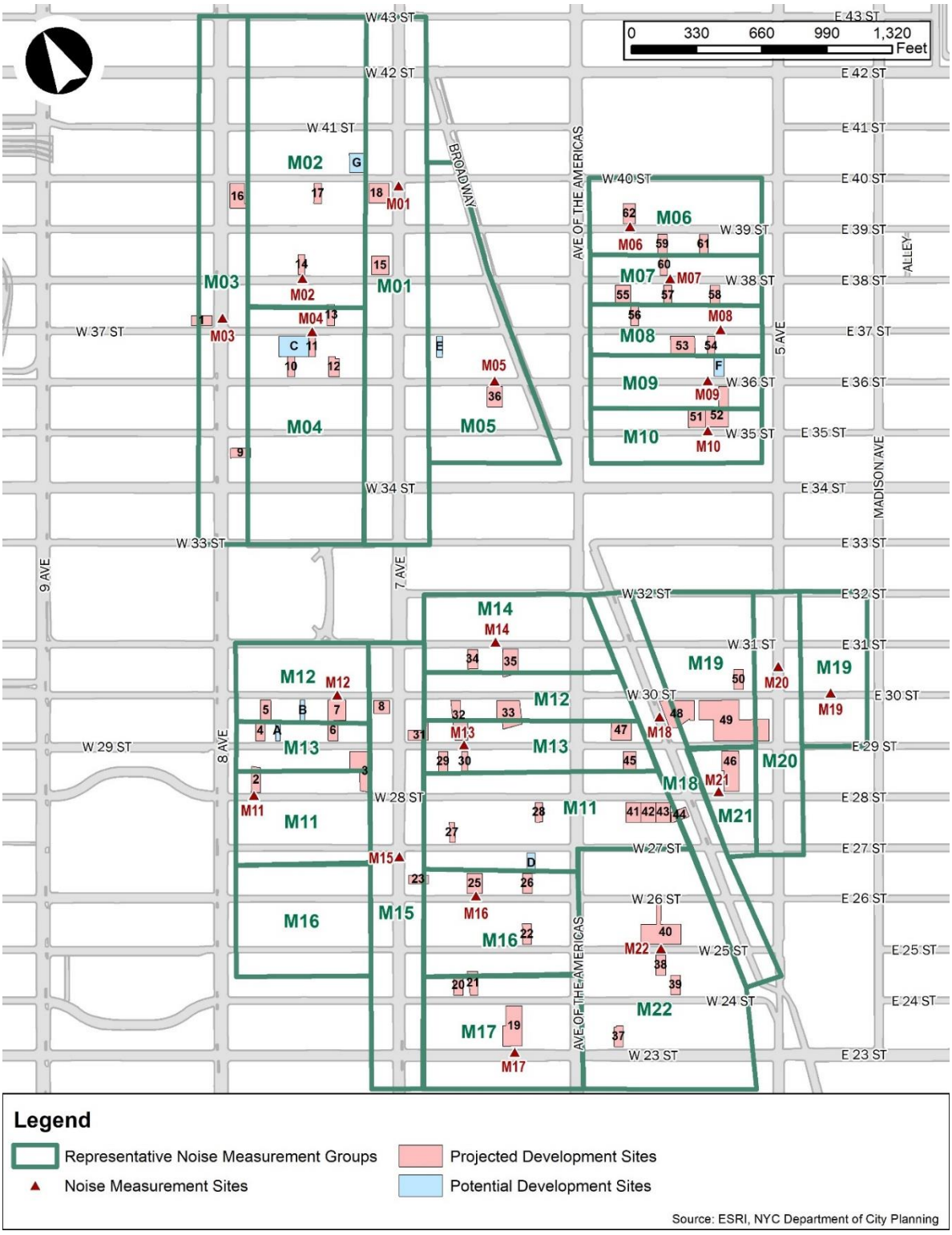
Off-Site Construction Noise Analysis

Off-site construction noise sources include construction-generated haul and delivery trucks transporting and delivering materials and employee vehicles arriving to and departing from work shifts along local roads adjacent to the projected development sites. Peak construction-generated traffic will occur during the hour prior to startup of on-site construction activities (6 AM to 7 AM). Noise level increases from construction-generated traffic during the 6 AM to 7 AM hour would not cause objectionable noise increases for 12 consecutive months or very objectionable noise increases for three consecutive months, and therefore, would not result in significant adverse construction noise impacts. Construction vehicles traveling to and from construction sites throughout the workday are included in the detailed modeling analyses in SoundPLAN.

[4] Building Footprints | NYC Open Data (cityofnewyork.us)

[5] NYC Street Centerline (CSCL) | NYC Open Data (cityofnewyork.us)

Figure 19-4: Noise Measurement Locations and Representative Noise Measurement Assignments for Determining Impact Criteria


0 330 660 990 1,320 Feet
W 43 ST
W 42 ST
W 41 ST
W 40 ST
W 39 ST
W 38 ST
W 37 ST
W 36 ST
W 35 ST
W 34 ST
W 33 ST
W 32 ST
W 31 ST
W 30 ST
W 29 ST
W 28 ST
W 27 ST
W 26 ST
W 25 ST
W 24 ST
W 23 ST
E 43 ST
E 42 ST
E 41 ST
E 40 ST
E 39 ST
E 38 ST
E 37 ST
E 36 ST
E 35 ST
E 34 ST
E 33 ST
E 32 ST
E 31 ST
E 30 ST
E 29 ST
E 28 ST
E 27 ST
E 26 ST
E 25 ST
E 24 ST
E 23 ST
9 AVE
8 AVE
7 AVE
6 AVE
5 AVE
BROADWAY
AVE OF THE AMERICAS
MADISON AVE
ALLEY
M01
M02
M03
M04
M05
M06
M07
M08
M09
M10
M11
M12
M13
M14
M15
M16
M17
M18
M19
M20
M21
M22
Legend
Representative Noise Measurement Groups
Noise Measurement Sites
Projected Development Sites
Potential Development Sites
Source: ESRI, NYC Department of City Planning

Construction Vibration

The 2021 *CEQR Technical Manual* does not include a methodology for the evaluation of construction-induced vibration. However, certain heavy construction activities, such as pile driving, demolition, and excavation, may result in vibration-induced annoyance and structural damage. Therefore, potential vibration impacts from construction were assessed using the methodology outlined in Section 7.2 of the FTA *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).

Vibration source levels for a variety of typical construction equipment types are outlined in Table 7-4 of the FTA manual in terms of PPV in inches per second (ips or in/sec) and velocity in decibels (VdB), both at a reference distance of 25 feet from the source. The project construction equipment types that would generate the highest vibration levels include impact pile drivers, large bulldozers, and loaded trucks. **Table 19-19** summarizes the vibration source levels for equipment used in the construction vibration assessment.

The FTA calculation method is dependent on the equipment vibration source level and the distance between the equipment and the vibration-sensitive receptor. Using equations from Section 7.2 of the FTA manual, PPV and vibration velocity were calculated in 1-foot increments for an impact pile driver, a large bulldozer, and loaded trucks to determine the distance beyond which there would no longer be a potential for structural damage or vibration annoyance during each construction phase in which these pieces of equipment are anticipated to be used. In general, properties more than 300 feet away do not experience elevated vibration levels unless significant pile driving occurs.

Table 19-19. FTA Construction Equipment Vibration Source Levels

Equipment	PPV At 25 Feet (In/Sec)	Approximate L_v[1] At 25 Feet (Vdb)
Pile driver (impact)	0.644	104
Large bulldozer	0.089	87
Loaded trucks	0.076	86

SOURCE: U.S. Department of Transportation, FTA, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

NOTES:

PPV=PEAK PARTICLE VELOCITY

1. ROOT MEAN SQUARE (RMS) VELOCITY IN DECIBELS (VDB) RE 1 MICRO-IN/SEC

Construction Impact Analysis Results

Using the methodology described above, cumulative noise levels from both on- and off-site construction sources were predicted at receptors to identify maximum hourly L_{eq} noise levels for each phase of construction. The highest noise levels would be experienced by noise-sensitive receptors immediately adjacent to the construction site and during periods when the noisiest equipment is operating (for example, impact pile drivers). Noise-sensitive receptors located further from the construction site would experience lower noise levels.

Appendix H includes construction noise analysis results for each phase of construction at each modeled noise-sensitive receptor point.

Projected Development Site 49

Results of the detailed construction noise analysis for Projected Development Site 49 are summarized in **Table 19-20** "Projected Development Site 49 Noise Analysis Results L_{eq} (dBA)."

Table 19-20. Projected Development Site 49 Noise Analysis Results L_{eq} (dBA)

ADDRESS	EXISTING LEQ		TOTAL LEQ		INCREMENT	
	MIN	MAX	MIN	MAX	MIN	MAX
4 WEST 28 STREET	67	67	67	75	0	8
8 WEST 28 STREET	67	67	67	76	0	9
10 WEST 28 STREET	67	67	67	76	0	9
1177 BROADWAY	65	65	65	65	0	0
1179 BROADWAY	65	65	65	66	0	1
1181 BROADWAY	65	65	65	66	0	1
1180 BROADWAY	65	67	65	68	0	2
1178 BROADWAY	65	67	65	72	0	5
13 WEST 28 STREET	67	67	67	82	0	15
254 5 AVENUE	67	72	67	77	0	5
256 5 AVENUE	67	72	67	77	0	5
1186 BROADWAY	65	67	65	84	0	17
1195 BROADWAY	65	66	65	74	0	9
1204 BROADWAY	65	65	65	67	0	2
1200 BROADWAY	65	66	65	84	0	18
11 WEST 29 STREET	66	66	76	91	10	25
8 WEST 30 STREET	66	66	73	91	7	25
16 WEST 30 STREET	0	0	0	0	0	0
18 WEST 30 STREET	0	0	0	0	0	0
20 WEST 30 STREET	0	0	0	0	0	0
1212 BROADWAY	65	65	65	67	0	2
24 WEST 30 STREET	66	66	66	91	0	25
29 WEST 30 STREET	66	66	66	79	0	13
11 WEST 30 STREET	66	66	66	86	0	20
3 WEST 30 STREET	66	66	66	83	0	17
284 5 AVENUE	66	72	68	80	0	14
1158 BROADWAY	67	67	67	67	0	0
242 5 AVENUE	67	72	67	72	0	0
244 5 AVENUE	67	72	67	74	0	7
246 5 AVENUE	67	72	67	74	0	3
6 WEST 28 STREET	67	67	67	76	0	9
1164 BROADWAY	65	67	65	75	0	8

ADDRESS	EXISTING LEQ		TOTAL LEQ		INCREMENT	
	MIN	MAX	MIN	MAX	MIN	MAX
7 WEST 28 STREET	67	67	68	81	1	14
258 5 AVENUE	72	72	72	83	0	11
262 5 AVENUE	67	67	69	82	2	15
2 WEST 29 STREET	67	67	69	87	2	20
12 WEST 29 STREET	67	67	69	87	2	20
14 WEST 29 STREET	67	67	69	85	2	18
1182 BROADWAY	65	67	65	77	0	10
250 FIFTH AVENUE	67	72	67	76	0	5
35 WEST 28TH STREET	65	66	65	75	0	10
13 WEST 29 STREET	66	66	67	90	1	24
3 WEST 29 STREET	0	0	0	0	0	0
276 5 AVENUE	66	72	67	91	2	25
22 WEST 30 STREET	0	0	0	0	0	0
28 WEST 30 STREET	66	66	67	82	1	16
1214 BROADWAY	65	66	65	76	0	10
7 WEST 30 STREET	66	66	66	85	0	19
5 WEST 30 STREET	66	66	66	84	0	18
286 5 AVENUE	66	72	66	74	0	6
290 5 AVENUE	72	72	72	76	0	4
243 5 AVENUE	72	72	72	76	0	4
251 5 AVENUE	72	72	72	78	0	6
267 5 AVENUE	66	72	66	82	0	10
271 5 AVENUE	72	72	73	82	1	10
273 5 AVENUE	72	72	72	80	0	8
275 5 AVENUE	72	72	73	81	1	9
277 FIFTH AVENUE	72	72	72	79	0	7
255 5 AVENUE	72	72	72	78	0	6
259 5 AVENUE	72	72	73	82	1	10
3 EAST 29 STREET	66	66	66	70	0	4
5 FEET	66	66	70	93	4	27
10 FEET	66	66	69	88	3	22
50 FEET	66	72	66	89	0	22
100 FEET	65	72	66	86	0	19

NOTE: CONSTRUCTION NOISE LEVELS ARE BASED ON CONSERVATIVELY ASSUMING ALL EQUIPMENT NECESSARY FOR EACH PHASE WILL OPERATE CONCURRENTLY.

Site 49 would commence in the fourth quarter of 2025 with Phase 1: Demolition/Excavation/Foundation, which would last approximately 14 months. The

maximum predicted increment during this construction phase would be 27 decibels, which would be considered very objectionable. The highest noise level increases are predicted to occur at noise-sensitive receptors directly adjacent to and overlooking the construction site within approximately 5 feet. Very objectionable noise level increases (i.e., 20 dB or greater increase over background) are predicted to occur within approximately 71 feet of the construction site during Phase 1 at Projected Development Site 49. Objectionable noise levels are predicted to occur within approximately 174 feet of the construction site. Noise levels would decrease further from the construction site and would be significantly less for noise-sensitive receptors with obstructed line of sight.

During Phase 2, the maximum predicted increment would be 21 decibels, which would be considered very objectionable. The highest noise level increases are predicted to occur at noise-sensitive receptors directly adjacent to and overlooking the construction site within approximately 5 feet. Very objectionable noise level increases are predicted to occur within approximately 50 feet of the construction site during Phase 2 at Projected Development Site 49. Objectionable noise levels are predicted to occur within approximately 100 feet of the construction site. According to the conceptual schedule, Phase 2 construction at Projected Development Site 49 would last approximately 19 months. Noise levels would decrease further from the construction site and would be significantly less for noise-sensitive receptors with obstructed line of sight.

During Phase 3, the maximum predicted increment would be 14 decibels. The highest noise level increases are predicted to occur at noise-sensitive receptors directly adjacent to and overlooking the construction site. According to the conceptual schedule, Phase 3 construction at Projected Development Site 49 would last approximately 15 months. Noise levels would decrease further from the construction site and would be significantly less for noise-sensitive receptors with obstructed line of sight.

The maximum predicted noise levels were conservatively estimated, assuming all equipment necessary to complete each phase would operate concurrently during each workday and hour when the construction site is active. However, impact pile drivers (for example) typically operate intermittently throughout the workday including preparation time between each pile. In addition, it is unlikely for pile driving to occur throughout the 14-month period of Phase 1, particularly because pile driving would only be necessary during foundation work. Less noisy equipment, including excavators and bulldozers, would operate more consistently throughout the workday and during most of Phase 1, except during foundation work when their use would be more limited. The noisiest pieces of equipment in Phase 2 would likely be concrete pump and mixer trucks outside the perimeter construction barrier along with troweling machines and concrete vibrators, which will be used intermittently throughout the day. Under Phase 3, the noisiest pieces of equipment will be multiple manlifts and a couple of cranes. However, manlifts run intermittently throughout the workday, with the engine operating only when the lift is being raised and lowered and when the lift is moving around the site. While a contractor is working, the manlift engine is typically throttled down to an idle.

Projected Development Site 52

Results of the detailed construction noise analysis for Projected Development Site 52 are summarized in **Table 19-21** "Projected Development Site 52 Noise Analysis Results L_{eq} (dBA)."

Table 19-21. Projected Development Site 52 Noise Analysis Results L_{eq} (dBA)

ADDRESS	EXISTING LEQ		TOTAL LEQ		INCREMENT	
	MIN	MAX	MIN	MAX	MIN	MAX
400 5 AVENUE	72	72	72	78	0	6
3 WEST 36 STREET	68	68	68	83	0	15
11 WEST 36 STREET	68	68	68	86	0	18
372 5 AVENUE	66	72	67	80	0	8
23 WEST 35 STREET	66	66	67	85	1	19
21 WEST 35 STREET	66	66	70	88	4	22
27 WEST 35 STREET	66	66	67	82	1	16
36 WEST 35 STREET	66	66	66	78	0	12
34 WEST 35 STREET	66	66	66	78	0	12
29 WEST 36 STREET	68	68	68	73	0	5
25 WEST 36 STREET	68	68	68	76	0	8
23 WEST 36 STREET	68	68	68	77	0	9
19 WEST 36 STREET	68	68	68	78	0	10
15 WEST 36 STREET	68	68	68	82	0	14
13 WEST 36 STREET	68	68	68	85	0	17
7 WEST 36 STREET	68	68	68	85	0	17
38 WEST 36 STREET	68	68	68	70	0	2
46 WEST 36 STREET	0	0	0	0	0	0
35 WEST 35 STREET	66	68	66	79	0	12
36 WEST 36 STREET	68	68	68	72	0	4
34 WEST 36 STREET	68	68	68	75	0	7
28 WEST 36 STREET	68	68	68	85	0	17
20 WEST 36 STREET	68	68	68	83	0	15
16 WEST 36 STREET	68	68	68	80	0	12
9 WEST 35 STREET	66	68	75	98	7	30
8 WEST 36 STREET	68	68	69	96	1	28
386 5 AVENUE	68	72	68	91	0	23
3 WEST 35 STREET	66	66	67	95	1	29
384 5 AVENUE	68	72	68	73	0	3
29 WEST 35 STREET	66	66	66	79	0	13
25 WEST 35 STREET	66	66	67	84	1	18
17 WEST 34 STREET	66	66	66	83	0	17
7 WEST 34 STREET	66	66	66	90	0	24

ADDRESS	EXISTING LEQ		TOTAL LEQ		INCREMENT	
	MIN	MAX	MIN	MAX	MIN	MAX
366 5 AVENUE	66	72	66	82	0	10
6 WEST 35 STREET	66	66	67	78	1	12
LARGER - 5 FEET	66	68	72	96	4	30
LARGER - 10 FEET	66	68	71	96	5	30
LARGER - 50 FEET	66	68	67	92	1	26
LARGER - 100 FEET	66	68	67	86	0	20

NOTE: CONSTRUCTION NOISE LEVELS ARE BASED ON CONSERVATIVELY ASSUMING ALL EQUIPMENT NECESSARY FOR EACH PHASE WILL OPERATE CONCURRENTLY.

Site 52 would commence in the second quarter of 2026 with Phase 1: Demolition/Excavation/Foundation, which would last approximately 8 months. The maximum predicted increment during this construction phase would be 30 decibels, which would be considered very objectionable. The highest noise level increases would occur directly adjacent to and overlooking the construction site within 10 feet. Very objectionable noise level increases are predicted to occur within approximately 68 feet of the construction site during Phase 1 at Projected Development Site 52. Objectionable noise levels would occur with approximately 145 feet of the construction site. Noise levels would decrease further from the construction site and would be significantly less for noise-sensitive receptors with obstructed line of sight.

During Phase 2, the maximum predicted increment would be 24 decibels, which would be considered very objectionable. The highest noise level increases would occur directly adjacent to and overlooking the construction site within 10 feet. Very objectionable noise level increases are predicted to occur within approximately 50 feet of the construction site during Phase 2 at Projected Development Site 52. Objectionable noise levels are predicted to occur within approximately 100 feet of the construction site during Phase 2. According to the conceptual schedule, Phase 2 construction at Projected Development Site 52 would last approximately 17 months. Noise levels would decrease further from the construction site and would be significantly less for noise-sensitive receptors with obstructed line of sight.

During Phase 3, the maximum predicted increment would be 18 decibels, which would be considered objectionable. Objectionable noise level increases are predicted to occur within approximately 10 feet of the construction site during Phase 3. According to the conceptual schedule, Phase 3 construction at Projected Development Site 52 would last approximately 10 months. Noise levels would decrease further from the construction site and would be significantly less for noise-sensitive receptors with obstructed line of sight.

The maximum predicted noise levels were conservatively estimated, assuming all equipment necessary to complete each phase would operate concurrently during each workday and hour when the construction site is active. However, impact pile drivers (for example) typically operate intermittently throughout the workday including preparation time between each pile. In addition, it is unlikely for pile driving to occur throughout the 8-month period of Phase 1,

particularly because pile driving would only be necessary during foundation work. Less noisy equipment, including excavators and bulldozers, would operate more consistently throughout the workday and during most of Phase 1, except during foundation work when their use would be more limited. The noisiest pieces of equipment in Phase 2 would likely be concrete pump and mixer trucks outside the perimeter construction barrier along with troweling machines and concrete vibrators, which will be used intermittently throughout the day. Under Phase 3, the noisiest pieces of equipment will be multiple manlifts and a couple of cranes. However, manlifts run intermittently throughout the workday, with the engine operating only when the lift is being raised and lowered and when the lift is moving around the site. While a contractor is working, the manlift engine is typically throttled down to an idle.

Projected Development Site 46

Results of the detailed construction noise analysis for Projected Development Site 46 are summarized in **Table 19-22** "Projected Development Site 46 Noise Analysis Results L_{eq} (dBA)."

Table 19-22. Projected Development Site 46 Noise Analysis Results L_{eq} (dBA)

ADDRESS	EXISTING LEQ		TOTAL LEQ		INCREMENT	
	MIN	MAX	MIN	MAX	MIN	MAX
4 WEST 28 STREET	67	67	67	86	0	19
8 WEST 28 STREET	67	67	71	87	4	20
10 WEST 28 STREET	67	67	67	87	0	20
1177 BROADWAY	65	65	65	66	0	1
1179 BROADWAY	65	65	66	71	1	6
1181 BROADWAY	65	65	65	72	0	7
1180 BROADWAY	65	67	65	70	0	4
1178 BROADWAY	65	67	65	85	0	18
13 WEST 28 STREET	67	67	67	96	0	29
254 5 AVENUE	67	72	67	75	0	3
256 5 AVENUE	67	72	67	78	0	6
1186 BROADWAY	65	67	65	77	0	10
1195 BROADWAY	65	66	65	71	0	6
1204 BROADWAY	65	65	65	66	0	1
1200 BROADWAY	65	66	65	80	0	14
11 WEST 29 STREET	66	66	69	84	3	18
270 5 AVENUE	66	72	69	84	0	18
8 WEST 30 STREET	66	66	69	83	3	17
16 WEST 30 STREET	66	66	68	81	2	15
18 WEST 30 STREET	66	66	66	77	0	11
20 WEST 30 STREET	66	66	66	68	0	2
1212 BROADWAY	65	65	65	66	0	1

ADDRESS	EXISTING LEQ		TOTAL LEQ		INCREMENT	
	MIN	MAX	MIN	MAX	MIN	MAX
24 WEST 30 STREET	66	66	66	79	0	13
29 WEST 30 STREET	66	66	66	71	0	5
11 WEST 30 STREET	66	66	66	79	0	13
3 WEST 30 STREET	66	66	66	76	0	10
284 5 AVENUE	66	72	66	73	0	2
1158 BROADWAY	67	67	67	68	0	1
242 5 AVENUE	67	72	67	73	0	2
244 5 AVENUE	67	72	67	82	0	15
246 5 AVENUE	67	72	67	82	0	15
6 WEST 28 STREET	67	67	67	87	0	20
1164 BROADWAY	65	67	65	86	0	19
7 WEST 28 STREET	67	67	78	96	11	29
258 5 AVENUE	72	72	72	80	0	8
262 5 AVENUE	67	67	67	70	0	3
2 WEST 29 STREET	67	67	69	96	2	29
12 WEST 29 STREET	67	67	69	96	2	29
14 WEST 29 STREET	67	67	67	76	0	9
1182 BROADWAY	65	67	65	81	0	14
250 FIFTH AVENUE	67	72	67	82	0	15
35 WEST 28TH STREET	65	66	65	74	0	9
13 WEST 29 STREET	66	66	66	85	0	19
3 WEST 29 STREET	66	66	70	86	4	20
276 5 AVENUE	66	72	66	73	0	1
22 WEST 30 STREET	66	66	66	70	0	4
28 WEST 30 STREET	66	66	66	68	0	2
1214 BROADWAY	65	66	65	67	0	1
7 WEST 30 STREET	66	66	66	81	0	15
5 WEST 30 STREET	66	66	66	77	0	11
286 5 AVENUE	66	72	66	72	0	4
290 5 AVENUE	72	72	72	74	0	2
243 5 AVENUE	72	72	72	77	0	5
251 5 AVENUE	72	72	72	76	0	4
7 EAST 28 STREET	67	67	67	71	0	4
267 5 AVENUE	66	72	66	78	0	6
271 5 AVENUE	72	72	72	76	0	4
273 5 AVENUE	72	72	72	73	0	1
275 5 AVENUE	72	72	72	74	0	2

ADDRESS	EXISTING LEQ		TOTAL LEQ		INCREMENT	
	MIN	MAX	MIN	MAX	MIN	MAX
277 FIFTH AVENUE	72	72	72	75	0	3
255 5 AVENUE	72	72	72	76	0	4
259 5 AVENUE	72	72	72	77	0	5
3 EAST 29 STREET	66	66	66	70	0	4
LARGE - 5 FEET	67	67	70	95	3	28
LARGE - 10 FEET	67	72	70	94	1	27
LARGE - 50 FEET	66	67	67	91	0	25
LARGE - 100 FEET	65	72	66	88	0	22

NOTE: CONSTRUCTION NOISE LEVELS ARE BASED ON CONSERVATIVELY ASSUMING ALL EQUIPMENT NECESSARY FOR EACH PHASE WILL OPERATE CONCURRENTLY.

Site 46 would commence in the fourth quarter of 2025 with Phase 1: Demolition/Excavation/Foundation, which would last approximately 5 months. The maximum predicted increment during this construction phase would be 29 decibels, which would be considered very objectionable. The highest noise level increases would occur within 5 feet of the construction site. Very objectionable noise levels are predicted to occur within approximately 105 feet of the construction site during Phase 1 at Projected Development Site 46. Objectionable noise levels are predicted to occur within approximately 321 feet of the construction site. Noise levels would decrease with distance and for noise-sensitive receptors with blocked line of sight to construction activities.

During Phase 2, the maximum predicted increment would be 23 decibels, which would be considered very objectionable. The highest noise level increases would occur within 50 feet of the construction site. Very objectionable noise levels are predicted to occur within approximately 50 feet of the construction site during Phase 2 at Projected Development Site 46. Objectionable noise levels are predicted to occur within approximately 119 feet of the construction site. According to the conceptual schedule, Phase 2 construction at Projected Development Site 46 would last approximately 11 months. Noise levels would decrease further from the construction site and would be significantly less for noise-sensitive receptors with obstructed line of sight.

During Phase 3, the maximum predicted increment would be 17 decibels, which would be considered objectionable. Objectionable noise levels are predicted to occur within approximately 10 feet of the construction site during Phase 3. According to the conceptual schedule, Phase 3 construction at Projected Development Site 46 would last approximately 11 months. Noise levels would decrease further from the construction site and would be significantly less for noise-sensitive receptors with obstructed line of sight.

The maximum predicted noise levels were conservatively estimated, assuming all equipment necessary to complete each phase would operate concurrently during each workday and hour when the construction site is active. However, impact pile drivers (for example) typically operate intermittently throughout the workday including preparation time between each pile.

In addition, it is unlikely for pile driving to occur throughout the 5-month period of Phase 1, particularly because pile driving would only be necessary during foundation work. Less noisy equipment, including excavators and bulldozers, would operate more consistently throughout the workday and during most of Phase 1, except during foundation work when their use would be more limited. The noisiest pieces of equipment in Phase 2 would likely be concrete pump and mixer trucks outside the perimeter construction barrier along with troweling machines and concrete vibrators, which will be used intermittently throughout the day. Under Phase 3, the noisiest pieces of equipment will be multiple manlifts and a couple of cranes. However, manlifts run intermittently throughout the workday, with the engine operating only when the lift is being raised and lowered and when the lift is moving around the site. While a contractor is working, the manlift engine is typically throttled down to an idle.

Projected Development Site 35

Results of the detailed construction noise analysis for Projected Development Site 35 are summarized in **Table 19-23** "Projected Development Site 35 Noise Analysis Results L_{eq} (dBA)."

Table 19-23. Projected Development Site 35 Noise Analysis Results L_{eq} (dBA)

ADDRESS	EXISTING LEQ		TOTAL LEQ		INCREMENT	
	MIN	MAX	MIN	MAX	MIN	MAX
115 WEST 30 STREET	68	68	68	93	0	25
142 WEST 31 STREET	67	67	67	71	0	4
855 AVENUE OF THE AMER	67	68	68	84	0	17
119 WEST 31 STREET	67	67	67	88	0	21
875 AVENUE OF THE AMER	67	67	67	80	0	13
109 WEST 31 STREET	67	67	67	82	0	15
115 WEST 31ST STREET	67	67	67	85	0	18
135 WEST 30 STREET	68	68	68	68	0	0
116 WEST 31 STREET	67	67	71	96	4	29
124 WEST 31 STREET	67	67	73	96	6	29
128 WEST 31 STREET	67	68	67	89	0	21
140 WEST 31 STREET	67	67	67	76	0	9
143 WEST 31 STREET	67	67	67	74	0	7
137 WEST 31 STREET	67	67	67	78	0	11
133 WEST 31 STREET	67	67	67	82	0	15
132 WEST 32 STREET	67	67	67	89	0	22
SMALL - 5 FEET	67	68	70	96	3	29
SMALL - 10 FEET	67	68	73	94	6	26
SMALL - 50 FEET	67	67	69	91	2	24
SMALL - 100 FEET	67	68	68	86	0	19

NOTE: CONSTRUCTION NOISE LEVELS ARE BASED ON CONSERVATIVELY ASSUMING ALL EQUIPMENT NECESSARY FOR EACH PHASE WILL OPERATE CONCURRENTLY.

Site 35 would commence in the second quarter of 2027 with Phase 1: Demolition/Excavation/Foundation, which would last approximately 5 months. The maximum predicted increment during this construction phase would be 29 decibels, which would be considered very objectionable. The highest noise level increases would occur within 5 feet of the site at noise-sensitive receptors directly adjacent to and overlooking the construction site. Very objectionable noise levels are predicted to occur within approximately 68 feet of the construction site during Phase 1 at Projected Development Site 35. Objectionable noise levels are predicted to occur within approximately 139 feet of the construction site. Noise levels would decrease further from the site and for noise-sensitive receptors with blocked line of sight.

During Phase 2, the maximum predicted increment would be 22 decibels, which would be considered very objectionable. Very objectionable noise levels are predicted to occur within approximately 5 feet of the construction site during Phase 2 at Projected Development Site 35. Objectionable noise levels are predicted to occur within approximately 67 feet of the construction site during Phase 2. According to the conceptual schedule, Phase 2 construction at Projected Development Site 35 would last approximately 10 months. Noise levels would decrease further from the site and for noise-sensitive receptors with blocked line of sight.

During Phase 3, the maximum predicted increment would be 17 decibels, which would be considered objectionable. Objectionable noise levels are predicted to occur within approximately 5 feet of the construction site during Phase 3. According to the conceptual schedule, Phase 3 construction at Projected Development Site 35 would last approximately 10 months. Noise levels would decrease further from the site and for noise-sensitive receptors with blocked line of sight.

The maximum predicted noise levels were conservatively estimated, assuming all equipment necessary to complete each phase would operate concurrently during each workday and hour when the construction site is active. However, impact pile drivers (for example) typically operate intermittently throughout the workday including preparation time between each pile. In addition, it is unlikely for pile driving to occur throughout the 5-month period of Phase 1, particularly because pile driving would only be necessary during foundation work. Less noisy equipment, including excavators and bulldozers, would operate more consistently throughout the workday and during most of Phase 1, except during foundation work when their use would be more limited. The noisiest pieces of equipment in Phase 2 would likely be concrete pump and mixer trucks outside the perimeter construction barrier along with troweling machines and concrete vibrators, which will be used intermittently throughout the day. Under Phase 3, the noisiest pieces of equipment will be multiple manlifts and a couple of cranes. However, manlifts run intermittently throughout the workday, with the engine operating only when the lift is being raised and lowered and when the lift is moving around the site. While a contractor is working, the manlift engine is typically throttled down to an idle.

Construction Noise Analysis Results – Other Projected Development Sites

The results of the detailed construction noise analyses performed for representative Development Sites 49, 52, 46, and 35 were used to estimate anticipated construction noise

impacts from other projected development sites with construction durations of 24 months or longer. As discussed above, Site 49 was used to evaluate potential significant adverse construction noise impacts from the largest development site. Since no other development sites are comparable in size, analysis at Site 49 was not used to represent construction noise levels at any other development site. Site 52 was used to represent larger development sites and therefore estimate construction noise impacts from Projected Development Sites 3, 33, 40 and 48. Site 46 was used to represent average development sites and therefore estimate construction noise impacts from Projected Development Sites 19, 32, 47, and 53. Site 35 was used to represent smaller development sites and therefore estimate construction noise impacts from Projected Development Sites 7, 15, 16, 18, 25, 31, 36, 41, 42, 43, 45, 51, 55, and 62. **Figures 19-5 and 19-6** illustrates the receptor locations predicted to experience noise level increases during construction that would constitute significant impacts based on the criteria described above. Figure 19-5 illustrates locations that would experience very objectionable noise level increases for 3 consecutive months, while Figure 19-6 illustrates locations that would experience objectionable noise levels for 12 consecutive months.

As previously discussed, the noise analysis conservatively assumes all equipment operating concurrently throughout each construction phase. Therefore, predicted significant noise level increases are also conservative. Typically, the loudest hourly noise level would not be sustained throughout the entire month or duration of the construction phase. In addition, the analysis is based on conceptual site plans and construction schedules. Therefore, it is possible that construction on adjacent development sites will not overlap, and actual construction may be of less magnitude, in which case noise would be less intense than the analysis predicts. It should be noted that the identified impacts in Figures 19-5 and 19-6 are conservatively assumed using the maximum distance at which exceedance of impact criteria may occur. When implementing these maximum distances onto the below Figures, consideration for line of sight was limited and, as a result, actual resultant construction noise levels may be greatly reduced if any building were to completely block the line of sight between receptor and construction noise sources.

Between Draft and Final EIS, construction noise analysis will be refined in more detail.

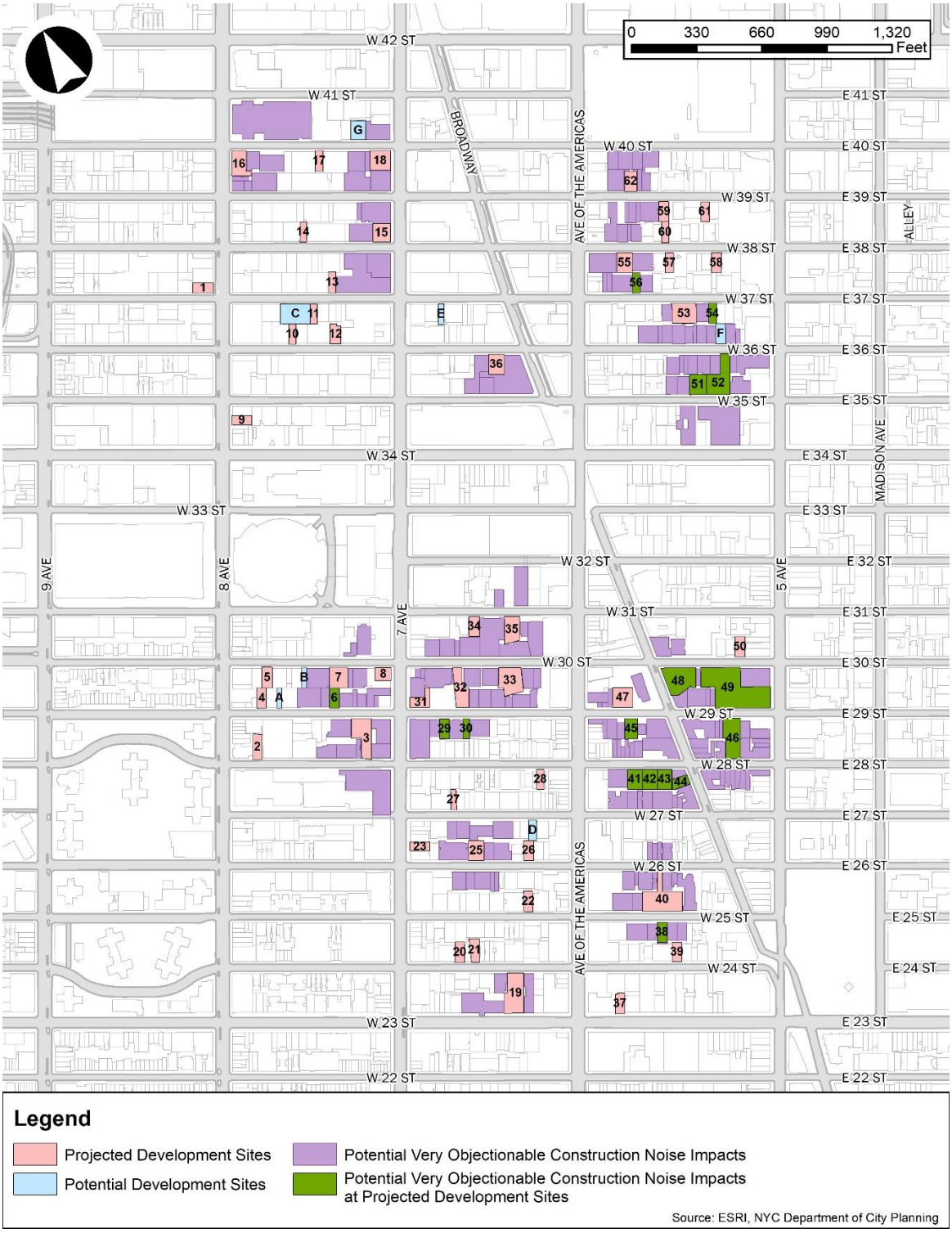
Construction Noise at Completed and Occupied Development Sites

Since certain projected development sites are expected to include noise-sensitive uses (e.g., residential, community facility) that may be exposed to construction noise (i.e., when a building is completed and occupied, but other development assumed under the Proposed Actions would still be under construction), there is the potential that all of the projected development sites within **Figures 19-5 and 19-6**, could experience significant construction noise impacts due to the potential for construction to occur in a sequencing other than the conceptual schedule assumed for the purposes of the construction noise analysis.

As with the existing receptors, the predicted exceedances of acceptable noise levels at the completed and occupied projected development sites would be due principally to noise generated by on-site construction activities (rather than construction-related traffic). As previously discussed, this noise analysis examined the reasonable worst-case peak hourly

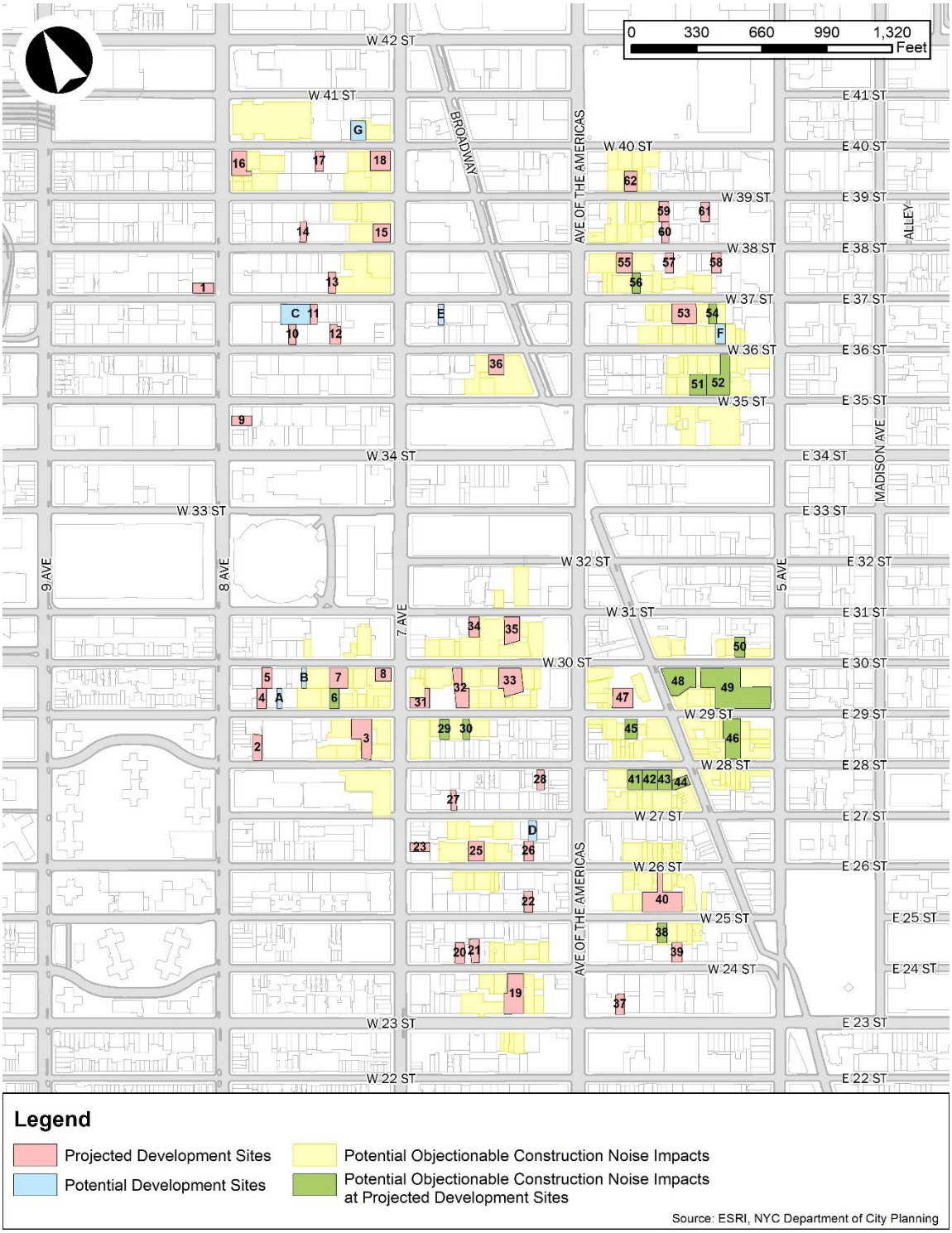
noise levels that would result from construction and consequently is conservative in predicting significant increases in noise levels.

Figure 19-5: Potential Very Objectionable Construction Noise Impacts



Note: Above impacts are conservatively assumed using the maximum distance at which exceedance of impact criteria may occur. When implementing these maximum distances onto above Figure, consideration for line of sight was limited and, as a result, actual resultant construction noise levels may be greatly reduced if any building were to completely block the line of sight between receptor and construction noise sources.

Figure 19-6: Potential Objectionable Construction Noise Impacts



Note: Above impacts are conservatively assumed using the maximum distance at which exceedance of impact criteria may occur. When implementing these maximum distances onto above Figure, consideration for line of sight was limited and, as a result, actual resultant construction noise levels may be greatly reduced if any building were to completely block the line of sight between receptor and construction noise sources.

Vibration

Construction Vibration

The vibration-induced structural damage analysis conservatively assumes that most structures surrounding the projected development sites are FTA Category III structures. These are structures made of non-engineered timber and masonry buildings. For vibration annoyance, land use that is most sensitive to construction vibration includes places where people typically sleep, such as residences.

Vibration-inducing activities occurring during construction of the projected development sites would include the use of pile drivers, large bulldozers, and haul trucks loaded with debris and materials. The highest vibration levels would result from impact pile drivers during building foundation work. Vibration-induced structural damage has the potential to occur if pile driving is conducted within approximately 72 feet of non-engineered timber and masonry buildings, which equates to a vibration level of 0.2012 PPV. When impact pile driving occurs further than approximately 72 feet from non-engineered timber and masonry buildings, there would be no potential for structural damage. If it is determined through field surveys that existing structures adjacent to construction sites consist of more solid materials, such as engineered concrete and masonry, structural damage from impact pile driving could potentially occur within 50 feet of this activity. In addition, vibration-induced annoyance is predicted to occur at residential and institutional land uses within approximately 30 feet from impact pile driving. Vibrations from large bulldozers and loaded trucks are not anticipated to result in structural damage to adjacent buildings, as the highest vibration levels would generally occur within 8 feet of equipment. Construction vibration calculations are included within **Appendix H**.

Summary and Mitigation

Construction noise is anticipated to result in significant increases in noise levels, especially during the demolition/excavation/foundation phase when pile driving would be necessary. To minimize and reduce noise during construction, the contractor would be required to comply with the New York City Noise Code, which requires the adoption of a noise control mitigation plan prior to commencement of construction activities. The following noise control measures defined in Title 15, Chapter 28: Citywide Construction Noise Mitigation of The Rules of the City of New York are examples of mitigation strategies that may be incorporated into the noise control mitigation plans for each site:

- All construction equipment operating on a site shall be equipped with the appropriate manufacturer’s noise reduction devices, including a manufacturer’s muffler (or equivalently rated material) that is free of rust, holes, and exhaust leaks.
- Noise from construction devices with internal combustion engines shall be mitigated by ensuring that the engine's housing doors are kept closed, and by using noise-insulating material mounted on the engine housing that does not interfere with the manufacturer's guidelines for engine operation or exhaust.
- Portable compressors, generators, pumps and other such devices shall be covered with noise-insulating fabric to the maximum extent possible that does not

interfere with the manufacturer's guidelines for engine operation or exhaust, and shall further reduce noise by operating the device at lower engine speeds during the work to the maximum extent possible.

- Vehicle engine idling on-site shall be limited to no longer than 3 minutes while parking, standing, or stopping as per New York City Administrative Code § 24-163.
- Quieter back-up alarms on construction equipment shall be used whenever practical.
- Strategically positioning construction vehicles as to minimize operation near receptors and avoiding tailgate slamming to the extent possible.
- Noise pathway controls, including noise barriers and enclosures free from gaps and holes, should be placed as close as possible to construction areas. Construction of noise barriers and enclosures should follow rules and guidelines detailed within Title 15, Chapter 28; Citywide Construction Noise Mitigation.

The last bullet may be the most useful for reducing construction noise, and these temporary barriers are most effective if deployed either close to operating equipment or close to noise-sensitive properties. For example, to reduce construction noise occurring at the lower levels of the buildings, the contractor could position temporary sound curtains close to operating equipment and between the construction activity and impacted receptors. However, receptors located at higher floors and above the work would not receive much benefit from noise mitigation at the ground level.

Based on the construction-related vibration assessment, there may be a potential for structural damage at buildings immediately adjacent to construction sites during impact pile driving. In addition, vibration-sensitive land use may experience annoyance during this activity. Vibration minimization measures may be incorporated into contract documents requiring the construction contractor to:

- Establish construction vibration structural damage response action and stop-work levels.
- Conduct a pre-construction survey of all buildings adjacent to operations requiring vibratory or impact pile driving equipment and identify existing cracks and building conditions.
- Develop and implement a vibration control and mitigation plan that documents anticipated vibration levels and methods to control vibration.
- Implement third-party construction vibration compliance monitoring.
- Repair any damages resulting from construction operations.

Refer to Chapter 21, “Mitigation,” for further discussion of potential mitigation measures.