A. INTRODUCTION

This chapter assesses the potential impacts of the construction of buildings expected to result on sites in the East New York rezoning 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 2014 *City Environmental Quality Review* (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, and air quality conditions.

The Proposed Actions consist of zoning map and text amendments, an amendment to the Dinsmore-Chestnut Urban Renewal Plan (URP), and disposition approval, as well as other actions not subject to Uniform Land Use Review Procedure (ULURP). The Proposed Actions are expected to facilitate the construction of new predominantly multi-unit residential buildings with ground floor retail, community facility, and light industrial uses, as well as the conversion and/or enlargement of a few existing buildings. As discussed in Chapter 1, "Project Description," a total of 81 projected development site have been identified for analysis purposes. Under the RWCDS, the Proposed Actions would result in a total of approximately 7,042 residential units, 1,283,989 sf of commercial uses, 98,851 sf of industrial uses, and 614,842 sf of community facility uses on the 81 projected development sites, distributed over 190 blocks in the East New York, Cypress Hills, and Ocean Hill neighborhoods of Brooklyn.

As described in other chapters of this EIS, the projected developments resulting from the Proposed Actions are expected to range from 55 to 145 feet in height. The 81 projected development sites would be completed in the 15 years following the adoption of the Proposed Actions, i.e., by the analysis year of 2030. In addition, there are 105 potential development sites considered less likely to be developed by the 2030 analysis year and are therefore not considered in this assessment.

According to the *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 most of the projected development sites would generally take less than 24 months to complete construction, and would therefore be considered short-term. However, as construction activity associated with the RCWDS would occur on multiple development sites within the same geographic area, such that there is the potential for several construction timelines to overlap, a preliminary assessment of potential construction impacts was prepared in accordance with the guidelines of the *CEQR Technical Manual*, and is presented in this chapter.

The findings of the preliminary assessment identified the need to undertake more detailed construction impact assessments for air quality and noise. 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 81 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 part of construction may not be at the same time as the heaviest construction traffic.

B. PRINCIPAL CONCLUSIONS

Transportation

Construction travel demand is expected to peak in the first quarter of 2018, and the third quarter of 2023 was selected as a reasonable worst-case analysis period for assessing potential cumulative transportation impacts from operational trips from completed portions of the project and construction trips associated with construction activities. Both of these periods are therefore analyzed for potential transportation impacts during construction.

Traffic

During construction, traffic would be generated by construction workers commuting via autos and by trucks making deliveries to projected development sites. In both 2018(Q1) and 2023(Q3), traffic conditions during the 6-7 AM and 3-4 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 2030. Consequently, there would be less likelihood of significant adverse traffic impacts during both the 2018(Q1) peak construction period and the 2023(Q3) cumulative analysis period than with full build-out of the Proposed Actions in 2030. Any significant adverse traffic impacts during peak construction activity in 2018(Q1) would be most likely to occur at intersections in the immediate proximity of projected development sites 66 and 67 which are two of the largest proposed developments and would generate the majority of construction traffic during this period. It is expected that the mitigation measures identified for 2030 operational traffic impacts would also be effective at mitigating any potential impacts from construction traffic during both the 2018(Q1) period for peak construction activity and the 2023(Q3) construction and operational cumulative analysis period.

Transit

The construction sites are located in an area that is well served by public transportation, with a total of 13 subway stations, ten bus routes, and one commuter rail station located in the vicinity of the rezoning area. In both 2018(Q1) and 2023(Q3), transit conditions during the 6-7 AM and 3-4 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 2030. As the Proposed Actions are not expected to result in any significant subway station impacts, no subway station impacts are expected during construction. The Proposed Actions' significant adverse bus impact would also be less likely to occur during construction than with full build-out of the Proposed Actions in 2030 as incremental demand would be lower during construction and would not occur during the peak hours of commuter demand. It is expected that the mitigation measures identified for 2030 operational transit impacts in Chapter 20, "Mitigation," would also be effective at mitigating any potential impacts from construction transit trips during both the 2018(Q1) and the 2023(Q3) construction periods.

Pedestrians

In 2018(Q1), pedestrian trips by construction workers would be widely distributed among the 14 projected development sites that would be under construction in this period and would primarily occur outside of the weekday AM and PM commuter peak periods and weekday midday peak period when area pedestrian facilities typically experience their greatest demand. No single sidewalk, corner or crosswalk is expected to experience 200 or more peak-hour trips (the threshold below which significant adverse pedestrian impacts are considered unlikely to occur based on *CEQR Technical Manual* guidelines). Consequently, significant adverse pedestrian impacts in the 2018(Q1) peak construction period are not anticipated.

In 2023(Q3), pedestrian conditions during the 6-7 AM and 3-4 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 2030. The Proposed Actions' significant adverse sidewalk, corner area and crosswalk impacts would therefore be less likely to occur during this construction period than with full build-out of the Proposed Actions in 2030. It is expected that mitigation measures identified for 2030 operational pedestrian impacts in Chapter 20, "Mitigation," would also be effective at mitigating any potential impacts from construction pedestrian trips during the 2023(Q3) construction period.

Parking

Based on the extent of available on-street parking spaces within ¼-mile of the rezoning area, there would be sufficient on-street parking capacity to accommodate all of the projected construction worker parking demand during the 2018(Q1) peak construction period. There would also be sufficient on-street parking capacity to accommodate the cumulative construction and operational parking demand during the 2023(Q3) period. Therefore, significant adverse parking impacts during construction are not anticipated.

Air Quality

Measures would be taken to reduce pollutant emissions during construction in accordance with all applicable laws, regulations, and building codes. These include dust suppression measures, idling restriction, and the use of ULSD. In addition to the required laws and regulations, an emissions reduction program, including the use of best available tailpipe reduction technologies and utilization of newer equipment would be implemented for projected development sites with construction durations of more than two years and construction start times of 2022 or earlier. Construction under the Proposed Actions in future years (i.e., past 2022) is expected to meet these emissions reduction requirements as there would be an increasing percentage of newer and cleaner engines, irrespective of any project specific commitments. With the implementation of these emission reduction measures, the dispersion modeling analysis of construction-related air emissions for both on-site and off-site sources determined that $PM_{2.5}$, PM_{10}, annual-average NO_2, and CO concentrations would be below their corresponding *de minimis* thresholds or NAAQS, respectively. Therefore, construction under the Proposed Actions would not result in significant adverse air quality impacts due to construction sources.

Noise and Vibration

Noise

For projected development site 46 and projected development sites 66 and 67, construction noise was analyzed for a representative two year time period, including both peak and off-peak construction periods. The noise analysis results show that predicted noise levels would exceed the noise impact threshold criteria during two or more years on one or more floors at 31 of the 241 analyzed receptor locations due to construction of projected development sites 66 and 67 and projected development site 46. Affected locations include residential, institutional and open space areas adjacent to the projected development sites.

For all smaller individual projected development sites, construction noise was analyzed, including both peak and off-peak construction periods for each year of the conceptual construction schedule. The noise analysis results show that the predicted noise levels could exceed the *CEQR Technical Manual* impact criteria at several receptors throughout the rezoning area.

Affected locations include residential, institutional and open space areas adjacent to the projected development sites. This analysis is conservative, based on a conceptual site plan and construction schedule. It is possible that the actual construction may be of less magnitude, or that construction on multiple projected development sites may not overlap, in which case construction noise would be less intense than the analysis predicts.

Vibration

The buildings and structures of most concern with regard to the potential for structural or architectural damage due to vibration would be buildings immediately adjacent to a projected development site. Vibration levels at all of these buildings and structures would be expected to be below the 0.50 inches/second PPV limit. At locations further from projected development sites, the distance between construction equipment and receiving buildings or structures is large enough to avoid vibratory levels that would approach the levels that would have the potential to result in architectural or structural damage.

In terms of potential vibration levels that would be perceptible and annoying, the pieces of equipment that would have the most potential for producing levels that exceed the 65 VdB limit are pile drivers. They would produce perceptible vibration levels (i.e., vibration levels exceeding 65 VdB) at receptor locations within a distance of approximately 230 feet. However, the operation would only occur for limited periods of time at a particular location and, therefore, would not result in any significant adverse impacts. In no case are significant adverse impacts from vibrations expected to occur.

Other Analysis Areas

Construction of the 81 projected development sites would not result in significant adverse impacts in the areas of 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 a period of approximately 15 years, throughout an approximately 190-block rezoning area, and construction of most of the projected development sites would be short-term (i.e., lasting up to 24 months), with the exceptions of sites 40, 46, 66, and 67, which are assumed to include multiple buildings. 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 publically 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 the erection of construction fencing incorporating sound reducing measures. 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, and therefore would not create an open space or neighborhood character impact.

None of the lots comprising projected and potential development sites expected to be developed as a result of the Proposed Actions have any archaeological significance. As such, the Proposed Actions are not expected to result in any significant adverse impacts to archaeological resources during construction, and a detailed analysis is not warranted. Construction period impacts on any designated historic resources would be minimized, and the historic structures would be protected, by ensuring that adjacent development projected as a result of the Proposed Actions adheres to all applicable construction guidelines and follows the requirements laid out in TPPN #10/88. This would apply to construction activities on one projected development site: site 17, which is located within 90 feet of the S/NR-listed 75th Police Precinct Station House. In addition, there are 12 eligible historic resources located within 90 feet of one or more projected or potential development sites: the Empire State Dairy Building, St. Michael's R.C. Church, Our Lady of Loreto R.C. Church, Grace Baptist Church, the Magistrates Court, the Church of the Blessed Sacrament, 1431 Herkimer Street, Prince Hall Temple, New Lots Town Hall, William H. Maxwell School, the Ninth Tabernacle, and Firehouse Engine 236.[1] Development under the Proposed Actions could potentially result in

[1] While potential development site A73 is adjacent to the S/NR- and NYCL-eligible Holy Trinity Russian Orthodox Church, the site is anticipated to be redeveloped in the future without the Proposed Actions, and therefore, any redevelopment of this site under With-Action conditions would not result in significant adverse construction-related impacts as a consequence of the Proposed Actions.

construction-related impacts to these non-designated resources, as these resources are not afforded the added special protections under the New York City Department of Buildings' (DOB's) TPPN #10/88. Additional protective measures afforded 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. If the eligible resources listed above are not designated, however, they would not be subject to TPPN #10/88, and may therefore be adversely impacted by the adjacent and nearby developments resulting from the Proposed Actions.

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, demolition of interiors, portions of buildings, or entire buildings are regulated by 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 rezoning 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 New York City Department of Buildings (DOB) has the primary responsibility for ensuring that the construction meets the requirements of the New York City Building Code and that buildings are structurally, electrically, and mechanically safe. In addition, DOB enforces safety regulations to protect both construction workers and the public. The 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 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) and the DEP Notice of Adoption Rules for Citywide Construction Noise Mitigation (also known as Chapter 28), approves Remedial Action Plans (RAPs) and Construction Health and Safety Plans (CHASPs), 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 (NYCT) is in charge of bus stop relocations, and any subsurface construction within 200 feet of a subway. The New York City Landmarks Preservation Commission (LPC) approves studies and testing to prevent loss of archaeological materials and to prevent damage to fragile historic structures.

On the state level, the New York State Department of Environmental Conservation (NYSDEC) regulates discharge of water into rivers and streams, disposal of hazardous materials, and 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 wide ranging authority over environmental matters, including air emissions, noise emission standards, hazardous materials, and the use of poisons. Much of the responsibility is delegated to the state level. The U.S. Occupational Safety and Health Administration (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 (NYCT)	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 (NYSDEC)	Dewatering, hazardous materials, tanks, Stormwater Pollution Prevention Plan, Industrial SPDES, if any discharge into the Hudson River
United States	
Environmental Protection Agency (EPA)	Air emissions, noise, hazardous materials, toxic substances
Occupational Safety and Health Administration (OSHA)	Worker safety

D. CONCEPTUAL CONSTRUCTION SCHEDULE AND ACTIVITIES

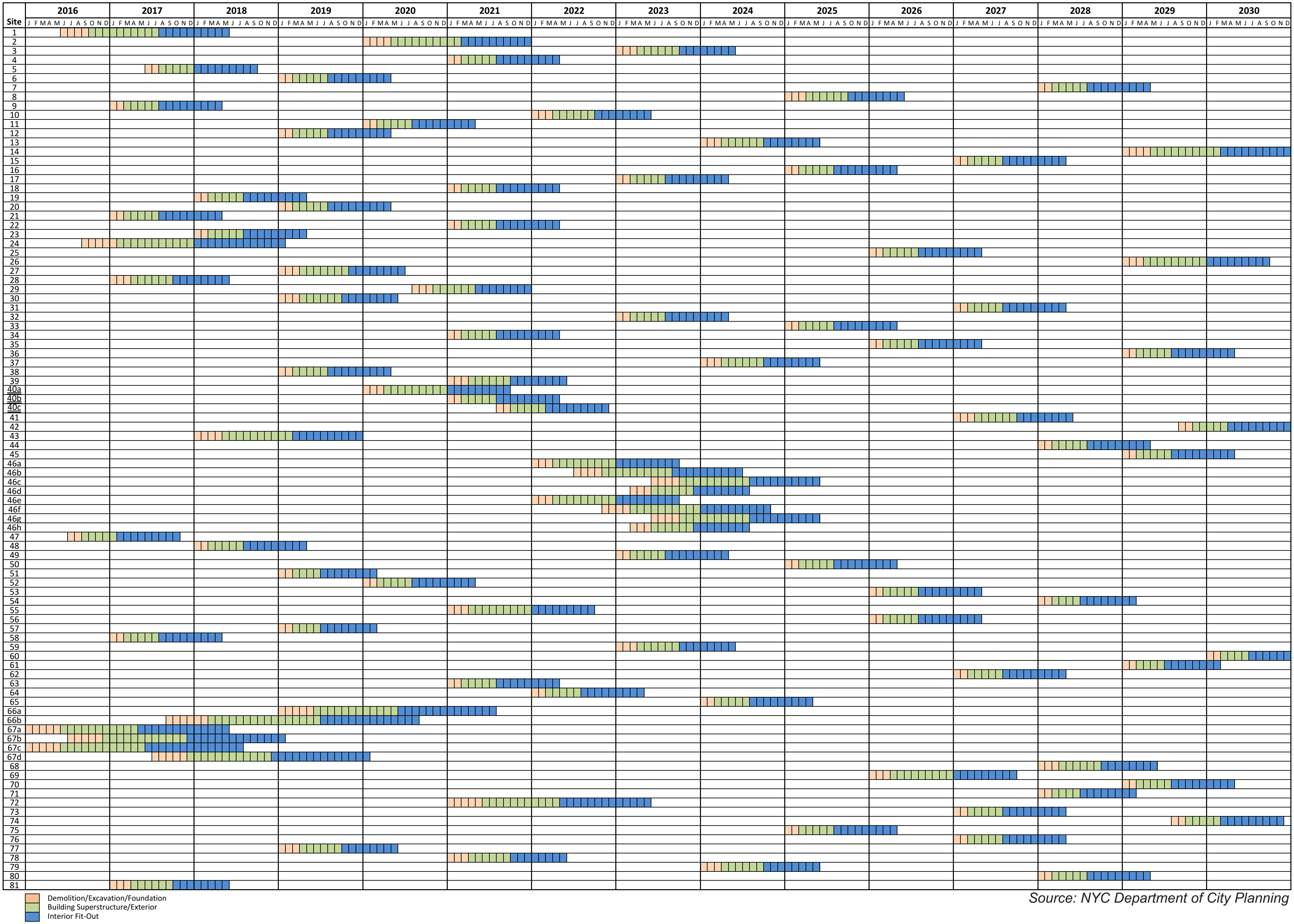
This chapter presents a description of the construction process for the purposes of quantification of environmental-effect causing activities only. It is not intended to describe the precise construction methods that may ultimately be used, nor is it intended to dictate or confine the construction process. 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 local laws for building and safety, as well as local noise ordinances, as appropriate.

Construction Sequencing

Because the projected development sites within the area to be rezoned are predominantly in private ownership, the timing of the development of those sites is unknown. As such, the RWCDS presented in Chapter 1, "Project Description," does not describe which of the sites would be developed first or assume a particular sequence of development. However, it is conservatively assumed that construction of all projected development sites would be completed by the end of the 2030 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, the most underutilized land near transit was weighted greater for redevelopment, with earlier construction dates. In addition, the larger projected development sites where there are known plans are assumed to begin construction earlier, closer to the time of project approvals (i.e., soon after the beginning of 2016). In estimating the duration of the construction period for each site, it is generally assumed that sites that would accommodate less than 250,000 sf of development would take 24 months or less to complete construction, whereas sites with a greater amount of anticipated development floor area (e.g., projected development sites 24, 40, 46, 66, 67, and 72) 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 81 projected development sites is anticipated to begin in 2016 and would be gradual, taking place over a 15-year period. It is



Source: NYC Department of City Planning

East New York Rezoning Proposal

This figure has been updated for the FEIS.

Figure 19-1
Assumed Construction Schedule for Assessment of Construction Impacts

conservatively assumed that construction of all projected development sites would be completed by the end of the 2030 analysis year.

Typical Construction Activities

Construction of various components of the projected development sites would occur over a number of years, with construction activities and intensities varying, depending upon which components of the overall development sites are underway at a given time. Following is a general outline of typical construction stages on the development sites. It should be noted, however, that the duration and extent of new construction activities would vary based on which site is being developed. For smaller sites, the construction process is much simpler and shorter in duration, typically lasting 24 months or less, while construction of projected development sites 40, 46, 66, and 67, which are assumed to include multiple buildings, would be more intensive, and is conservatively estimated to last for approximately 35 to 48 months.

- 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, hammers, and cranes. Trucks would arrive at the site with pre-mixed concrete and other building materials and would remove any excavated material and construction debris.
- Months 5-14: Underground parking foundation (if any), erection of the superstructure, and façade 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 15-24: Mechanical installation, interior and finishing work. This would include the installation of heating, ventilation and air conditioning (HVAC) 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. It should be noted that since 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. It should be noted that the actual duration of such activities could vary based upon which site is developed. For example, the time necessary for each activity would vary depending upon such factors as work hours, traffic restrictions, and contractors' means and methods. 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.[2] 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, and interior) for each site was identified and used as a scaling factor for projections. Each of the 81 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.

[2] For purposes of this analysis, construction data from the 2013 *Halletts Point Rezoning FEIS* were used.

A similar methodology was applied to projected development sites that are assumed to undergo construction in the RWCDS for No-Action conditions. The change in square footage in the No-Action was identified for the 81 projected development sites, and the sites were grouped into three categories: no change to existing structure/no construction; new development on part of site, some existing structures remain; and full new development of site. The construction duration was based on similarly-sized projected development sites from the With-Action construction schedule.

The No-Action construction worker and truck estimates were then subtracted from the With-Action estimates, so as not to overestimate the construction effects associated with the Proposed Actions. The resultant estimate of the number of trucks and workers per quarter are summarized in Table 19-2. As indicated in the table, the number of workers and trucks would peak in the first quarter of 2018, with an estimated 1,048 workers and 147 trucks per day. During this peak construction worker and truck period, 14 of the 81 projected development sites are expected to be under construction (refer to Figure 19-1).

TABLE 19-2
Estimated Total Number of Construction Workers and Construction Trucks On-Site Per Day
(81 Projected Development Sites)

Year	**2016**				**2017**				**2018**				**2019**				**2020**			
Quarter	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*
Construction Workers	172	218	478	597	754	821	872	865	1,048	1,014	821	743	763	722	738	727	679	636	440	398
Construction Trucks	30	32	63	74	97	92	112	113	147	125	94	86	115	92	86	89	92	74	47	44
Year	**2021**				**2022**				**2023**				**2024**				**2025**			
Quarter	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*
Construction Workers	559	663	555	419	307	265	152	139	179	259	252	183	224	259	218	189	220	198	78	68
Construction Trucks	91	83	77	67	66	41	32	31	50	54	54	44	69	59	43	38	52	36	16	19
Year	**2026**				**2027**				**2028**				**2029**				**2030**			
Quarter	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*
Construction Workers	139	167	125	120	170	177	145	92	146	140	89	82	189	210	196	211	187	155	146	85
Construction Trucks	44	28	25	27	48	30	29	25	44	24	20	22	45	29	27	30	27	20	19	12

	Project Total	
	Peak	**Average**
Construction Workers	1,048	364
Construction Trucks	147	56

Determining Peak Year for Cumulative Construction and Operational Effects

According to the *CEQR Technical Manual*, if a project involves multiple development sites over varying construction timelines, a preliminary assessment must be undertaken to determine if 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 third quarter of 2023 was selected as the construction peak year for the transportation assessment in this chapter. As shown in Figure 19-1, in 2023, there would be 41 sites that are already completed and operational (projected development sites 1, 2, 4, 5, 6, 9, 10, 11, 12, 18, 19, 20, 21, 22, 23, 24, 27, 28, 29, 30, 34, 38, 39, 40, 43, 46 [partial], 47, 48, 51, 52, 55, 57, 58, 63, 64, 66, 67, 72, 77, 78, and 81), and six sites that are under construction (3, 17, 32, 46, 49, and 59). Any prior year would not have sufficient operational sites in close proximity to one another for assessment purposes, whereas subsequent years would not have an adequate number of sites under construction.

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 and would not include all construction workers on-site, but just those involved in the specific tasks requiring additional work time.

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 1st, 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 on weekends) may be permitted only to accommodate: (i) emergency conditions; (ii) public safety; (iii) construction projects by or on behalf of City agencies; (iv) construction activities with minimal noise impacts; and (v) undue hardship resulting from unique site characteristics, unforeseen conditions, scheduling conflicts, and/or 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.

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 East New York rezoning area and to provide adequate space and access for construction activities. While vacant parcels are available within close proximity to several of the projected development sites that could be used for staging areas, it is anticipated that construction staging would most likely occur on the projected development sites themselves and may in some cases, extend within the curb and 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 (MPT) plans for each construction site would be submitted for approval to the DOT Office of Construction Mitigation and Coordination (OCMC), the entity that insures 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.

E. PRELIMINARY ASSESSMENT

In accordance with the guidelines of the *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 Proposed Actions would result in the construction of predominantly mixed-use developments on 81 projected development sites in the rezoning area over a 15-year period. These developments would replace vacant land, as well as existing and anticipated No-Action uses on the development sites. During construction periods, projected development sites would generate trips by workers traveling to/from the construction sites, as well as trips associated with the movement of materials and equipment. Given typical construction hours, worker trips would be concentrated in the early morning and mid-afternoon periods on weekdays and are generally not expected to represent a substantial increment during the area's peak travel periods.

Traffic

As discussed above, average daily on-site construction workers and trucks were forecast for new construction anticipated on each of the projected development sites under both the No-Action and With-Action condition. The No-Action construction worker and truck estimates were then subtracted from the With-Action estimates to determine the net incremental demand attributable to construction associated with the Proposed Actions. As shown in Table 19-2, above, the number of workers and trucks would peak in the first quarter of 2018, with an estimated 1,048 workers and 147 trucks per day. These represent peak days of work, and many days during the construction period would have fewer construction workers and trucks on-site.

Although construction traffic is expected to peak in the first quarter of 2018, as noted above, the third quarter of 2023 was selected as the reasonable worst-case analysis period for assessing potential cumulative traffic impacts from operational trips from completed portions of the project and construction trips associated with construction activities. An assessment of traffic generated during these two peak periods is presented below.

PEAK CONSTRUCTION WORKER TRAVEL DEMAND AND TRUCK TRIPS – 2018(Q1)

Modal split and vehicle occupancy rates for construction workers were based on a 2006 survey at the construction site of the Marriott Hotel, located at 350 Jay Street in Downtown Brooklyn (2006 *Atlantic Yards Arena and Redevelopment Project FEIS*). Based on data from this survey, it is anticipated that approximately 44.2 percent of construction workers would use public transportation in their commute to and from the construction sites in the rezoning area. (Both the Marriott Hotel site and the rezoning area are well served by subway and bus transit.) The remaining 55.8 percent of workers are expected to travel by personal automobile at an average occupancy rate of approximately 1.89 persons per vehicle.

Table 19-3 shows a forecast of hourly construction worker auto and construction truck trips during the 2018(Q1) 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 first quarter of 2018, construction-related traffic is expected to peak during the 6-7 AM and 3-4 PM periods. During the 6-7 AM peak hour there would be a total of 396 PCE vehicle trips, including 322 inbound trips and 74 outbound trips. During the 3-4 PM peak hour there would be a total of 263 PCE trips, including eight inbound trips and 255 outbound trips.

TABLE 19-3
2018(Q1) Peak Incremental Construction Vehicle Trip Projections (in PCEs)

Hour	Auto Trips					Truck Trips					Total Vehicle Trips		
	In		Out		Total	In		Out		Total	In	Out	Total
	%	#	%	#		%	#	%	#				
6-7 AM	80	248	0	0	248	25	74	25	74	148	322	74	396
7-8 AM	20	62	0	0	62	10	29	10	29	58	91	29	120
8-9 AM	0	0	0	0	0	10	29	10	29	58	29	29	58
9-10 AM	0	0	0	0	0	10	29	10	29	58	29	29	58
10-11 AM	0	0	0	0	0	10	29	10	29	58	29	29	58
11 AM-12 PM	0	0	0	0	0	10	29	10	29	58	29	29	58
12-1 PM	0	0	0	0	0	10	29	10	29	58	29	29	58
1-2 PM	0	0	0	0	0	5	15	5	15	30	15	15	30
2-3 PM	0	0	5	16	16	5	15	5	15	30	15	31	46
3-4 PM	0	0	80	247	247	2.5	8	2.5	8	16	8	255	263
4-5 PM	0	0	15	47	47	2.5	8	2.5	8	16	8	55	63

Table 19-4 presents a comparison of 2018(Q1) peak construction vehicle trips with the numbers of operational trips that would be generated with full build-out of the project in 2030. Included are vehicle trips during the AM and PM peak hours for both construction and operational traffic. As shown in Table 19-4, during the 7:30-8:30 AM and 5-6 PM peak hours for operational traffic and the 3-4 PM construction peak hour, the number of 2018(Q1) construction vehicle trips would be substantially less than the number of 2030 operational vehicle trips (i.e., 1,482, 1,699, and 593 fewer trips, during each of these periods, respectively). During the 6-7 AM construction peak hour, 2018(Q1) construction vehicle trips would exceed 2030 operational trips by 177. It is important to note, however, that overall traffic volumes on the study area street network are, in general, substantially lower during the 6-7 AM construction peak hour than during the 7:30-8:30 AM operational peak hour. For example, automatic traffic recorder (ATR) count data indicate that in the aggregate, existing 6-7 AM traffic volumes on study area streets are 27 percent lower than during the 7:30-8:30 AM period.

TABLE 19-4
Comparison of 2018(Q1) Peak Incremental Construction Vehicle Trips with 2030 Operational Vehicle Trips (in PCEs)

Peak Hour	Net Incremental Vehicle Trips in Passenger Car Equivalents (PCEs)		
	2030 Operational Trips	2018(Q1) Construction Trips[1]	Net Difference
6-7 AM	219	396	177
7:30-8:30 AM[2]	1,571	89	(1,482)
3-4 PM	857	263	(594)
5-6 PM	1,699	0	(1,699)

Notes:
[1] There would be relatively few operational vehicle trips in 2018(Q1) as only one projected development site is expected to be operational at this time.
[2] Construction trips during this period based on the average for the 7-8 AM and 8-9 AM periods.

As peak construction activity in 2018(Q1) would result in 1,482 and 1,699 fewer incremental vehicle trips during the 7:30-8:30 AM and 5-6 PM operational peak hours, respectively, than would full build-out of the proposed development sites under the Proposed Actions, there would be substantially fewer intersections with potential significant adverse traffic impacts during the 2018(Q1) construction analysis year compared with the 2030 operational analysis year, and no new intersections are expected to experience significant adverse traffic impacts in these peak hours. Similarly, peak construction activity would generate 593 fewer incremental vehicle trips during the 3-4 PM construction peak hour in 2018(Q1) compared to operation of the Proposed Actions in 2030, and there would be less likelihood of significant adverse impacts during this peak construction year than with full build-out of the Proposed Actions.

Although peak construction activity in 2018(Q1) would result in 177 more incremental vehicle trips than the fully built-out project during the 6-7 AM construction peak hour, as noted above, overall traffic volumes on the study area street network are substantially lower during the 6-7 AM construction peak hour than during the 7:30-8:30 AM operational peak hour. Therefore, 2018(Q1) traffic conditions during the 6-7 AM peak hour are expected to be generally better than during the analyzed 7:30-8:30 AM operational peak hour with full build-out of the Proposed Actions in 2030. Consequently, there would be less likelihood of significant adverse traffic impacts during the 6-7 AM peak hour in this peak construction year than with full build-out of the Proposed Actions in 2030.

Any significant adverse traffic impacts during peak construction activity in 2018(Q1) would be most likely to occur at intersections in the immediate proximity of projected development sites 66 and 67 which are two of the largest proposed developments and would generate the majority of construction traffic during this period. It is expected that the mitigation measures identified for 2030 operational traffic impacts in Chapter 20, “Mitigation,” at intersections in proximity to projected development sites 66 and 67 would also be effective at mitigating any potential impacts from construction traffic during the 2018(Q1) period for peak construction activity.

CUMULATIVE CONSTRUCTION AND OPERATIONAL TRAFFIC – 2023(Q3)

Table 19-5 shows hourly worker auto trips and construction truck trips (in PCEs) in the third quarter of 2023, when construction travel demand would overlap with operational demand from completed projected development sites. As noted above, during this cumulative construction and operational traffic analysis period, there would be 41 sites that are already completed and operational and six sites that are under construction. Prior years are unlikely to see completion of substantial concentrations of new development, whereas subsequent years would see a decreasing intensity of construction activity and lower levels of construction traffic. Construction auto and truck trips in the 2023 analysis period were based on the same travel demand assumptions utilized for the 2018 forecast presented above.

As shown in Table 19-5, during the 6-7 AM construction peak hour in the 2023(Q3), a total of 113 vehicle trips (in PCEs), including 86 inbound trips and 27 outbound trips, are anticipated; during the 3-4 PM construction peak hour, a total of 65 trips, including three inbound trips and 62 outbound trips, are anticipated. By comparison, construction vehicle trips during the 7:30-8:30 AM operational peak hour would total approximately 30 (averaging the 7-8 AM and 8-9 AM totals). Few, if any, construction-related vehicle trips are anticipated in the 5-6 PM operational peak hour.

As shown in Table 19-6, combined with the operational trips generated by completed With-Action developments, there would be a net increase of 245 vehicle trips during the 6-7 AM construction peak hour and a net increase of 687 trips during the 3-4 PM construction peak hour. During the 7:30-8:30 AM and 5-6 PM operational peak hours, combined operational and construction vehicle trips would total 1,117 and 1,104, respectively. During these operational peak hours, construction trips would account for only 30 of the combined trips in the AM and none in the PM.

TABLE 19-5
2023(Q3) Peak Incremental Construction Vehicle Trip Projections (in PCEs)

Hour	Auto Trips			Truck Trips			Total Vehicle Trips		
	In	Out	Total	In	Out	Total	In	Out	Total
6-7 AM	59	0	59	27	27	54	86	27	113
7-8 AM	15	0	15	11	11	22	26	11	37
8-9 AM	0	0	0	11	11	22	11	11	22
9-10 AM	0	0	0	11	11	22	11	11	22
10-11 AM	0	0	0	11	11	22	11	11	22
11 AM-12 PM	0	0	0	11	11	22	11	11	22
12-1 PM	0	0	0	11	11	22	11	11	22
1-2 PM	0	0	0	5	5	10	5	5	10
2-3 PM	0	4	4	5	5	10	5	9	14
3-4 PM	0	59	59	3	3	6	3	62	65
4-5 PM	0	11	11	2	2	4	2	13	15

TABLE 19-6
2023(Q3) Peak Hour Construction and Operational Traffic Volumes (in PCEs)

Hour	Construction Trips	Operational Trips[1]	Total Trips
6-7 AM	113	132	245
7:30-8:30[2] AM	30	1,087	1,117
3-4 PM	65	622	687
5-6 PM	0	1,104	1,104

Notes:
[1] Operational trips reflect the net increment of With-Action developments expected to be completed by the 2023(Q3) cumulative analysis period less the demand from No-Action developments on projected development sites that have undergone, or are expected to be undergoing, construction by the 2023(Q3) cumulative analysis period.
[2]Construction trips during this period based on the average for the 7-8 AM and 8-9 AM periods.

Table 19-7 presents a comparison of 2023(Q3) combined construction and operational vehicle trips with the operational trips that would be generated with full build-out of the project in 2030. Trips (in PCEs) are shown for the AM and PM peak hours for both construction and operational traffic. As shown in Table 19-7, during the 7:30-8:30 AM and 5-6 PM operational peak hours and the 3-4 PM construction peak hour, the number of 2023(Q3) construction and operational vehicle trips would be substantially less than the number of 2030 operational vehicle trips (i.e., 454, 595, and 170 fewer trips, during each of these periods, respectively). During the 6-7 AM construction peak hour, 2023(Q3) cumulative vehicle trips would exceed 2030 operational trips by a relatively small amount (26 trips). As noted above, however, aggregate ATR count data show that overall traffic volumes on the study area street network are approximately 27 percent lower during the 6-7 AM construction peak hour than during the 7:30-8:30 AM operational peak hour. Therefore, 2023(Q3) traffic conditions during the 6-7 AM peak hour are expected to be generally better than during the analyzed 7:30-8:30 AM operational peak hour with full build-out of the Proposed Actions in 2030. Consequently, there would be less likelihood of significant adverse traffic impacts during the 6-7 AM peak hour in the cumulative analysis year than with full build-out of the Proposed Actions in 2030. It is expected that the mitigation measures identified for 2030 operational traffic impacts in Chapter 20, "Mitigation," would also be effective at mitigating any potential impacts from construction auto and truck trips during the 2023(Q3) peak quarter for cumulative construction and operational traffic.

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 day and would generally occur between 6 AM and 5 PM, depending on the stage of construction. As noted above, 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. Flaggers are also expected to be present during construction to manage the access and movement of trucks. As also noted above, detailed MPT plans for each construction site would be submitted for approval to DOT's OCMC.

TABLE 19-7
Comparison of 2023(Q3) Peak Incremental Construction Vehicle Trips with 2030 Operational Vehicle Trips (in PCEs)

Peak Hour	Net Incremental Vehicle Trips in Passenger Car Equivalents (PCEs)		
	2030 Operational Trips	2023(Q3) Construction + Operational Trips	Net Difference
6-7 AM	219	245	26
7:30-8:30 AM[1]	1,571	1,117	(454)
3-4 PM	857	687	(170)
5-6 PM	1,699	1,104	(595)

Notes:
[1] Construction trips during this period based on the average for the 7-8 AM and 8-9 AM periods.

Transit

As previously discussed and shown in Table 19-2, in the 2018(Q1) peak quarter for construction travel demand, up to approximately 1,048 construction workers would travel to and from projected development sites each day. Approximately 44.2 percent of these construction workers are expected to travel to and from the rezoning area by public transit (subway, bus and/or commuter rail). The construction sites are located in an area that is well served by public transportation, with a total of 13 subway stations, ten bus routes, and one commuter rail station located in the vicinity of the rezoning 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, construction worker travel demand is expected to generate a total of approximately 370 transit trips in both the 6-7 AM and 3-4 PM construction peak hours. Given that these transit trips would be distributed among multiple subway stations and bus routes in proximity to projected development sites throughout the rezoning area, it is unlikely that this number of incremental trips would exceed the 200-trip *CEQR Technical Manual* analysis threshold for a subway station or the 50-trip threshold for a bus analysis (per route, per direction) in either construction peak hour. In addition, as noted previously the construction worker transit trips would primarily occur outside of the AM and PM commuter peak periods when area transit facilities and services typically experience their greatest demand. As such, significant adverse transit impacts are not anticipated in the 2018(Q1) peak construction period.

As shown in Table 19-2, above, during the 2023(Q3) analysis period for cumulative construction and operational travel demand, it is estimated that there would be approximately 252 workers on-site daily. Based on the same mode choice and temporal factors utilized for the 2018(Q1) analysis, construction worker transit trips are expected to total approximately 89 in both the 6-7 AM and 3-4 PM construction peak hours in 2023(Q3). During these same periods, operational transit trips from completed projected development sites would total approximately 262 and 1,707, respectively. By comparison, transit trips with full build-out of the Proposed Actions in 2030 would be substantially greater in number, totaling 4,315 and 5,447 during the analyzed weekday 7:15-8:15 AM and 5-6 PM commuter peak periods when overall demand on area transit facilities and services typically peaks. Therefore, 2023(Q3) transit conditions during the 6-7 AM and 3-4 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 2030. As the Proposed Actions are not expected to result in any significant subway station impacts, no subway station impacts are expected during construction in 2023(Q3). The Proposed Actions' significant adverse bus impact would also be less likely to occur in the cumulative analysis year than with full build-out of the Proposed Actions in 2030. It is expected that the mitigation measures identified for 2030 operational transit impacts in Chapter 20, "Mitigation," would also be effective at mitigating any potential impacts from construction transit trips during the 2023(Q3) peak quarter for cumulative construction and operational travel demand.

Pedestrians

As discussed above, during the 2018(Q1) peak construction traffic period it is estimated that there would be approximately 1,048 workers on-site daily, approximately 44.2 percent of whom would be expected to travel to the rezoning area by transit, walking to and from area subway stations and bus stops. As approximately 80 percent of these trips are expected to occur during any one peak hour, construction worker travel demand on area sidewalks and crosswalks is expected to total approximately 370 trips in both the 6-7 AM and 3-4 PM construction peak hours. These trips would be widely distributed among the 14 projected development sites that would be under construction in 2018(Q1) and would primarily occur outside of the weekday AM and PM commuter peak periods and weekday midday peak period when area pedestrian facilities typically experience their greatest demand. It is therefore unlikely that any single sidewalk, corner or crosswalk would experience 200 or more peak-hour trips (the threshold below which significant adverse pedestrian impacts are considered unlikely to occur based on *CEQR Technical Manual* guidelines). Consequently, significant adverse pedestrian impacts in the 2018(Q1) peak quarter for construction worker travel demand are not anticipated. 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.

As shown in Table 19-2, above, during the 2023(Q3) peak quarter for cumulative construction and operational travel demand, it is estimated that there would be approximately 252 workers on-site daily. Based on the same mode choice and temporal factors utilized for the 2018(Q1) analysis, construction worker pedestrian trips are expected to total approximately 89 in both the 6-7 AM and 3-4 PM construction peak hours in 2023(Q3). During these same periods, operational pedestrian trips from completed projected development sites would total approximately 269 and 4,259, respectively. By comparison, pedestrian trips with full build-out of the Proposed Actions in 2030 would be substantially greater in number, totaling 6,780, 12,141, and 10,324 during the analyzed weekday 7:30-8:30 AM, 1-2 PM midday and 5-6 PM operational peak hours, respectively. Therefore, 2023(Q3) pedestrian conditions during the 6-7 AM and 3-4 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 2030. Consequently, there would be less likelihood of significant adverse pedestrian impacts during the construction peak hours in the cumulative analysis year than with full build-out of the Proposed Actions in 2030. It is expected that the mitigation measures identified for 2030 operational pedestrian impacts in Chapter 20, “Mitigation,” would also be effective at mitigating any potential impacts from construction pedestrian trips during the 2023(Q3) analysis period for cumulative construction and operational travel demand.

Parking

As discussed above, during the 2018(Q1) peak construction traffic period it is estimated that there would be approximately 1,048 workers on-site daily, approximately 55.8 percent of whom would be expected to travel to the rezoning area by private auto. Based on an average vehicle occupancy of 1.89 persons per vehicle, the maximum daily parking demand from project site construction workers would total approximately 310 spaces (see Table 19-8, below). As there are relatively few off-street public parking facilities in proximity to projected development sites, the majority of workers are expected to park on-street. As discussed in Chapter 13, “Transportation,” within a ¼-mile radius of the rezoning area, there are approximately 8,634 available on-street parking spaces in the overnight period under existing conditions, and there would be approximately 7,449 and 6,736 available spaces during the overnight period in the 2030 No-Action and 2030 With-Action operational conditions. Based on the extent of available parking spaces, there would be sufficient off-street parking capacity to accommodate all of the projected demand. As such, construction activities during the 2018(Q1) peak construction traffic period would not result in a significant adverse parking impact.

TABLE 19-8
2018(Q1) and 2023(Q3) Construction Worker Parking Accumulation

Hour	2018 (Q1)			2023 (Q3)		
	In	Out	Total Accumulation	In	Out	Total Accumulation
6-7 AM	248	0	248	59	0	59
7-8 AM	62	0	310	15	0	74
8-9 AM	0	0	310	0	0	74
9-10 AM	0	0	310	0	0	74
10-11 AM	0	0	310	0	0	74
11 AM-12 PM	0	0	310	0	0	74
12-1 PM	0	0	310	0	0	74
1-2 PM	0	0	310	0	0	74
2-3 PM	0	16	294	0	4	70
3-4 PM	0	247	47	0	59	11
4-5 PM	0	47	0	0	11	0

As shown in Table 19-2, above, during the 2023(Q3) peak quarter for cumulative construction and operational traffic, it is estimated that there would be approximately 252 workers on-site daily. Based on the same mode choice and vehicle occupancy factors utilized for the 2018(Q1) analysis, and as presented in Table 19-8, the maximum daily parking demand from project site construction workers in 2023(Q3) would total approximately 74 spaces, with the majority of this demand expected to park on-street. Given the number of available on-street parking spaces within ¼-mile of the rezoning area in the existing, 2030 No-Action, and 2030 With-Action conditions (8,634, 7,449, and 6,736, respectively, during the weekday overnight period), there would be sufficient off-street parking capacity to accommodate all of the projected cumulative construction operational demand. As such, construction activities during the 2023(Q3) peak construction traffic period would not result in a significant adverse parking impact.

Air Quality

According to the *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.

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 five 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

According to the *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 five 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

Land Use and Neighborhood Character

According to the *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 81 projected development sites would be spread out over a period of approximately 15 years, throughout an approximately 190-block rezoning area. As noted above, construction of most of the projected development sites would be short-term (i.e., lasting up to 24 months), while construction of sites 40, 46, 66, and 67, which are assumed to include multiple buildings, would be more intensive, and is conservatively estimated to last for approximately 35 to 48 months. 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, emissions, and dust on construction sites, including the erection of construction fencing incorporating sound reducing measures. Since none of these impacts would be continuous or ultimately permanent, they would not create significant impacts on land use patterns or neighborhood character in the area. Therefore, while construction of the new buildings resulting from 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 and, therefore, would not create a neighborhood character impact. Therefore, no significant construction impacts to land use and neighborhood character are expected.

Socioeconomic Conditions

According to the *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 (i.e., lasting up to 24 months), while construction of sites 40, 46, 66, and 67, which are assumed to include multiple buildings, would be more intensive, and is conservatively estimated to last for approximately 35 to 48 months. During the construction period, construction activities would be dispersed throughout the 190-block rezoning area and would not affect access to particular businesses over an extended duration. Therefore, construction impacts to socioeconomic conditions are not expected.

Community Facilities

According to the *CEQR Technical Manual*, construction impacts to community facilities are possible if a community facility would be directly affected by construction (e.g., if construction would disrupt services provided at the facility or close the facility temporarily, etc.). While there are community facilities throughout the rezoning 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 *CEQR Technical Manual*. While construction of the projected development sites would result in temporary increases in traffic during the construction period, access to and from any community facilities in the rezoning 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 DOB, which would limit the effects of construction on nearby facilities. Construction workers would not place any burden on public schools and would have minimal, if any, demands on libraries, child care facilities, and health care services. New York City Police Department (NYPD) and FDNY emergency services and response times would not be materially affected by construction 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 *CEQR Technical Manual*, construction impacts to open space are possible if the open space is taken out of service for a period of time during the construction process. While several of the projected development sites are located in close 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 publically 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 the erection of construction fencing incorporating sound reducing measures. Since none of these impacts would be continuous or ultimately 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, and therefore would not create an open space impact. Therefore, no significant construction impacts to open space are expected.

Historic and Cultural Resources

According to the guidelines in the *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 and archaeological resources. This section summarizes potential impacts during construction. As discussed in Chapter 7, none of the lots comprising projected and potential development sites expected to be developed as a result of the Proposed Actions have any archaeological significance. As such, the Proposed Actions are not expected to result in any significant adverse impacts to archaeological resources during construction, and a detailed analysis is not warranted.

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.

Adjacent historic resources, as defined in the procedure notice, only include designated New York City Landmarks (NYCLs), properties within NYCL historic districts, and listed S/NR properties that are within 90 feet of a lot under development or alteration. They do not include S/NR-eligible, NYCL-eligible, potential, or unidentified architectural resources. Construction period impacts on any designated historic resources would be minimized, and the historic structures would be protected, by ensuring that adjacent development projected as a result of the Proposed Actions adheres to all applicable construction guidelines and follows the requirements laid out in TPPN #10/88. This would apply to construction activities on one projected development site: site 17, which is located within 90 feet of the S/NR-listed 75th Police Precinct Station House.

In addition, there are several eligible resources in the rezoning area that would not be afforded the protections of TPPN #10/88 because they are not designated or calendared for landmark designation by the LPC or SHPO. These eligible resources located within 90 feet of projected and potential development sites are summarized in Table 19-9. As indicated in the table, 12 eligible historic resources are located within 90 feet of one or more projected or potential development sites: the Empire State Dairy Building, St. Michael's R.C. Church, Our Lady of Loreto R.C. Church, Grace Baptist Church, the Magistrates Court, the Church of the Blessed Sacrament, 1431 Herkimer Street, Prince Hall Temple, New Lots Town Hall, William H. Maxwell School, the Ninth Tabernacle, and Firehouse Engine 236.[3] Development under the Proposed Actions on the sites listed in Table 19-9 could potentially result in construction-related impacts to these non-designated resources.

TABLE 19-9
Eligible Historic Resources Located within 90 Feet of a Projected/Potential Development Site(s)

Eligible Historic Resource	Sites within 90 Linear Feet	
	Projected Development Sites	**Potential Development Sites**
S/NR- and NYCL-Eligible Prince Hall Temple	7 (adjacent)	-
S/NR- and NYCL-Eligible Magistrates Court	13 (adjacent)	A18 (adjacent)
S/NR- and NYCL-Eligible Empire State Dairy Building	35, 38 (adjacent)	A40, A41, A82, A86
S/NR- and NYCL-Eligible St. Michael's R.C. Church	39 (adjacent), 49	A50, A86, A87
S/NR- Eligible Firehouse Engine 236	74 (adjacent)	-
S/NR- and NYCL-Eligible Our Lady of Loreto R.C. Church	-	A3
S/NR- and NYCL-Eligible 1431 Herkimer Street	-	A7 (adjacent), A8
S/NR-Eligible New Lots Town Hall	-	A14
S/NR-Eligible William H. Maxwell School	-	A25
S/NR-Eligible Ninth Tabernacle	-	A102
S/NR- and NYCL-Eligible Grace Baptist Church	-	A65
S/NR- and NYCL-Eligible Church of the Blessed Sacrament	-	A95

Note: *This table has been updated for the FEIS.*

These resources would be afforded limited protection under DOB regulations applicable to all buildings located adjacent to construction sites; however, as the resources are not S/NR-listed or NYCL-designated, they are not afforded the added special protections under DOB's TPPN #10/88. Additional protective measures afforded 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. If the eligible resources listed above are not designated, however, they would not be subject to TPPN #10/88, and may therefore be adversely impacted by the adjacent and nearby developments resulting from the Proposed Actions.

Hazardous Materials

According to the guidelines in the *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

[3] While potential development site A73 is adjacent to the S/NR- and NYCL-eligible Holy Trinity Russian Orthodox Church, the site is anticipated to be redeveloped in the future without the Proposed Actions, and therefore, any redevelopment of this site under With-Action conditions would not result in significant adverse construction-related impacts as a consequence of the Proposed Actions.

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 hazardous materials assessment identified that each of the projected and potential development sites has some associated concern regarding environmental conditions. 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. As detailed in Chapter 9, (E) designations or other comparable measures would be mapped on all 81 projected development sites and 105 potential development sites as part of the Proposed Actions. An (E)-designated site is designated on a zoning map within which no change of use or development requiring a DOB permit may be issued without approval of the Mayor's Office of Environmental Remediation (OER). These sites require OER's review to ensure the protection of human health and the environment from any known or suspected hazardous materials associated with the site. The (E) designation requires that the fee owner conduct a testing and sampling protocol and remediation, where appropriate, to the satisfaction of OER before the issuance of a permit by DOB. The environmental requirements for the (E) designation also include a mandatory CHASP, which must be approved by OER.

In addition, demolition of interiors, portions of buildings, or entire buildings are regulated by 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 rezoning area.

F. DETAILED ANALYSES

Air Quality

Emissions from on-site construction equipment and on-road construction-related vehicles, as well as dust generating construction activities, have the potential to affect air quality. The analysis of potential impacts of the construction activities under the Proposed Actions includes a quantitative analysis of both on-site and on-road sources of air emissions, and the overall combined impact of both sources, where applicable.

In general, 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 (NO_x) and particulate matter (PM). Fugitive dust generated by construction activities is also a source of PM. Gasoline engines produce relatively high levels of carbon monoxide (CO). Since ultra-low-sulfur diesel (ULSD)[4] fuel would be used for all diesel engines used in the construction under the Proposed Actions, sulfur oxides (SO_x) emitted from those construction activities would be negligible. Chapter 14, "Air Quality," contains a review of these pollutants; applicable regulations, standards, and benchmarks; and general methodology for stationary source air quality analyses. The general methodology for stationary source modeling (regarding model selection, receptor placement, and meteorological data) presented in Chapter 14, "Air Quality" was followed for modeling dispersion of pollutants from on-site sources during the construction period. Additional details relevant only to the construction air quality analysis methodology are presented in the following sections.

[4] The Environmental Protection Agency (EPA) required a major reduction in the sulfur content of diesel fuel intended for use in locomotive, marine, and non-road engines and equipment, including construction equipment. As of 2015, the diesel fuel produced by all large refiners, small refiners, and importers must be ULSD fuel sulfur levels in non-road diesel fuel are limited to a maximum of 15 parts per million.

Emissions Control Measures

As is typical with construction projects, construction activities have the potential to adversely affect air quality as a result of diesel emissions. Measures would be taken to reduce pollutant emissions during construction in accordance with all applicable laws, regulations, and building codes. These include the following dust suppression measures and the idling restriction for on-road vehicles:

- *Dust Control.* All necessary measures will be implemented to ensure that the New York City Air Pollution Control Code regulating construction-related dust emissions is followed. For example, truck routes within the site would be watered as needed to avoid the re-suspension of dust. All trucks hauling loose material will be equipped with tight-fitting tailgates and their loads securely covered prior to leaving the construction site. Water sprays will be used to ensure that materials are dampened as necessary to avoid the suspension of dust into the air.
- *Idling Restriction.* In addition to adhering to the local law restricting unnecessary idling on roadways, on- site vehicle idle time will also be restricted to three minutes for all equipment and vehicles that are not using their engines to operate a loading, unloading, or processing device (e.g., concrete mixing trucks) or otherwise required for the proper operation of the engine.

Additional emissions reduction measures are available to minimize air pollutant emissions during construction In addition to the required laws and regulations, for projected development sites with construction durations of more than two years and construction start times of 2022 or earlier, an emissions reduction program for all construction activities would be implemented to the extent practicable, consisting of the following components (commitments relating to the items set forth below will be included as part of construction contract specifications):

- *Utilization of Newer Equipment.* The United States Environmental Protection Agency (EPA)'s Tier 1 through 4 standards for nonroad engines regulate the emission of criteria pollutants from new engines, including PM, CO, NO_x, and hydrocarbons (HC)., all nonroad construction equipment with a power rating of 50 hp or greater would meet at least the Tier 3 emissions standard to the extent practicable. Tier 3 NO_x emissions range from 40 to 60 percent lower than Tier 1 emissions and considerably lower than uncontrolled engines. All nonroad engines in the project rated less than 50 hp would meet at least the Tier 2 emissions standard.
- *Best Available Tailpipe Reduction Technologies.* Non-road diesel engines with a power rating of 50 horsepower (hp) or greater and controlled truck fleets (i.e., truck fleets under long-term contract with the project) including but not limited to concrete mixing and pumping trucks would utilize the best available tailpipe (BAT) technology for reducing DPM emissions. Diesel particulate filters (DPFs) have been identified as being the tailpipe technology currently proven to have the highest reduction capability. Construction contracts would specify that all diesel nonroad engines rated at 50 hp or greater would utilize DPFs, either installed by the original equipment manufacturer (OEM) or retrofitted. Retrofitted DPFs must be verified by EPA or the California Air Resources Board (CARB). Active DPFs or other technologies proven to achieve an equivalent reduction may also be used.

Overall, the proposed emission reduction measures described above are expected to greatly reduced air pollutant emissions related to construction activities.

Methodology

To determine which construction periods constitute the worst-case periods for the pollutants of concern (PM, CO, NO_2), construction-related emissions were calculated throughout the duration of construction from all of the projected development sites on an annual average and peak day average basis for $PM_{2.5}$ for the entire study period (2016-2030). $PM_{2.5}$ was selected for determining the worst-case periods, because the ratio of predicted $PM_{2.5}$ incremental concentrations to impact criteria due to construction activities is higher than for other pollutants. Therefore, initial estimates of $PM_{2.5}$ emissions throughout the construction years were used for determining the worst-case periods for the analysis of all pollutants. Generally, emission patterns of PM_{10} and NO_2 would follow $PM_{2.5}$ emissions, since their emission rates are related to the sizes of diesel engines CO emissions may have a somewhat different pattern but generally would also be highest during periods when the most construction activity would occur.

As discussed above in "Introduction," a total of 81 projected development sites have been identified for analysis purposes. However, only five of the projected development sites are anticipated to be under construction for more than two years. In general, where the construction is expected to be short-term, any impacts resulting from such short-term construction generally do not require detailed assessment. However, as construction activities associated with the Proposed Actions may occur on multiple development sites in proximity with each other, there is a potential for cumulative construction impacts. Therefore, emissions profiles were generated for those development sites with construction durations of more than two years (Projected Development Sites 40, 46, 66, and 67) as well as for all projected development sites, to determine the construction periods with the highest potential to affect air quality.

Based on the resulting multi-year profiles of annual average and peak day average emissions of $PM_{2.5}$, and the proximity of the construction activities at each projected development site to each other and to nearby sensitive receptor locations (i.e., residences, publicly accessible open spaces, etc.), worst-case short-term and annual periods for construction were identified for dispersion modeling of annual and short-term (i.e., 24-hour, eight-hour, and one-hour) averaging periods, including annual and 24-hour $PM_{2.5}$, 24-hour PM_{10} , one-hour and eight-hour CO, and annual NO_2 average periods. Dispersion of the relevant air pollutants from the construction sites during these periods was then analyzed, and the highest resulting concentrations are presented in the following sections. Broader conclusions regarding potential pollutant concentrations during other periods, which were not modeled, are presented as well, based on the multi-year emissions profiles and the reasonable worst-case period results.

ENGINE EMISSIONS

The sizes, types, and number of units of construction equipment were estimated based on the construction activity schedule. Emission factors for NO_x, CO, PM_{10}, and $PM_{2.5}$ from on-site construction engines were developed using the EPA's NONROAD2008 emission model (NONROAD). Since emission factors for concrete pumps are not available from either the EPA Motor Vehicle Emission Simulator (MOVES) emissions model or NONROAD, emission factors specifically developed for this type of application were used.[5] With respect to trucks, emission rates for NO_x, CO, PM_{10}, and $PM_{2.5}$ for truck engines were developed using the EPA MOVES emission model.

FUGITIVE DUST

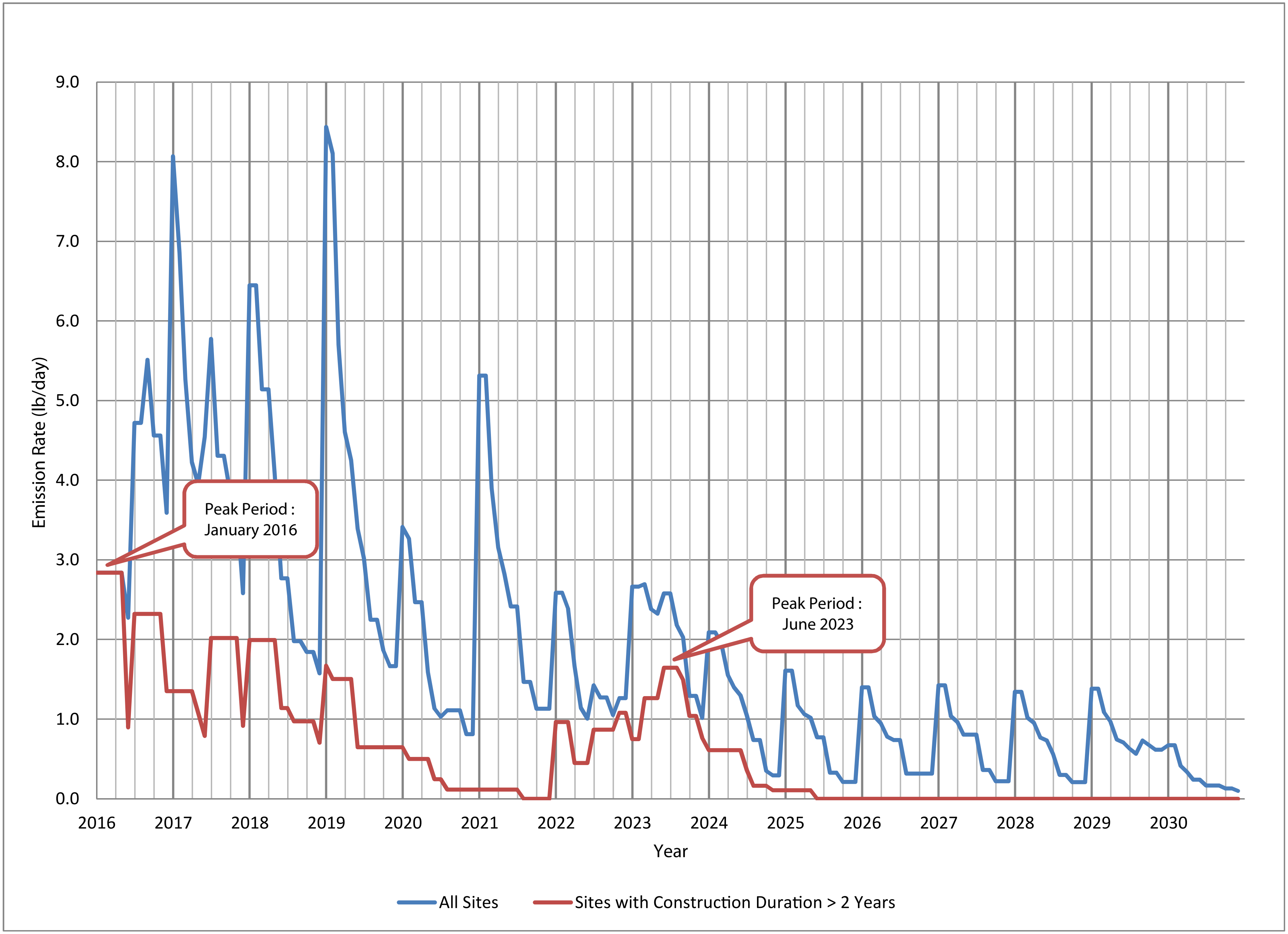
Fugitive dust emissions from construction operations (e.g., excavation, grading, and transferring of excavated materials into dump trucks) were calculated based on EPA procedures delineated in AP-42 Table 13.2.3-1. As discussed above in "Emissions Control Measures," all necessary measures would be implemented to ensure that the New York City Air Pollution Control Code regulating construction-related dust emissions are followed. It was estimated that the planned control of fugitive emissions would reduce PM emissions from such operations by 50 percent.

ANALYSIS PERIODS

The resulting emission factors were used for the emissions and dispersion analyses. Average annual (running 12-month averages) and peak-day $PM_{2.5}$ engine emissions profiles were prepared by multiplying the emission rates for each piece of equipment by the number of engines, the work hours per day, and fraction of the day each engine would be expected to work during each month of construction. The resulting overall peak day and annual average emission profiles are presented in Figures 19-2 and 19-3.

As shown in Figure 19-2, based on the short-term $PM_{2.5}$ construction emissions profile, December 2017 and December 2019 were identified as the short-term periods with the highest project-wide emissions. However, the activities anticipated for these two periods would mostly occur at projected development sites that are anticipated to have construction durations of two years or less. In addition, the construction activities during these periods

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



East New York Rezoning Proposal

This figure has been updated for FEIS.

Figure 19-2

Short Term (24-Hour Average) PM2.5 Construction Emissions Profile

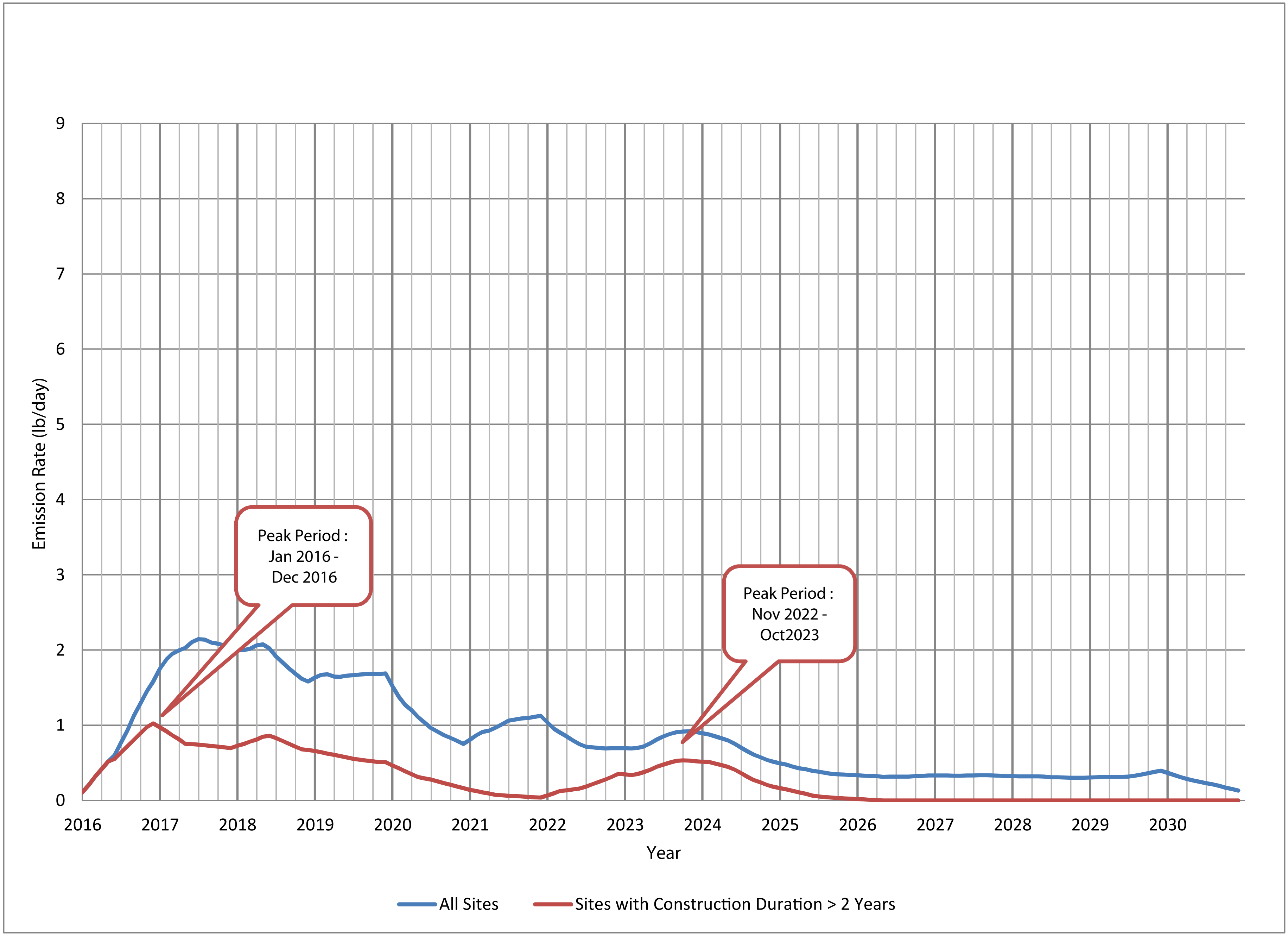


Figure 19-3
Annual (Moving 12-Month Average) PM2.5 Construction Emissions Profile

would occur at projected development sites that are scattered throughout the rezoning area and therefore would have minimal cumulative effects. Therefore, these periods are not considered representative of the overall worst-case analysis periods and were therefore not selected for analysis. Instead, January 2016 and June 2023 were identified as the worse-case short-term analysis periods because activities during these periods would occur at development sites that are in close proximity with each other and would include projected development sites that are anticipated to have construction durations of more than two years (i.e., the January 2016 peak period would include activities at projected development sites 67a and 67c and the June 2023 peak period would include activities at projected development sites 46a through 46h). For the same reasons, the year 2016 and 12-month period from November 2022 to October 2023 were selected as worst-case annual analysis periods.

The dispersion of pollutants during the worst-case short-term and annual periods was then modeled in detail to predict resulting maximum concentration increments from construction activities and total concentrations (including background concentrations) in the surrounding area. Although the modeled results are based on construction scenarios for specific sample periods, conclusions regarding other periods can be derived based on the fact that lower pollutant concentration increments from construction activities would generally be expected during periods with lower construction emissions. However, since the worst-case short-term pollutant concentrations are often indicative of very localized construction activities, similar maximum local concentrations may occur at any stage at various locations but would not persist in any single location, since emission sources would not be located continuously at any single location throughout construction, but rather construction equipment would move throughout the site as construction work progresses. Overall, the modeled peak construction periods are considered representative of worst-case construction activities associated with the Proposed Actions.

SOURCE SIMULATION

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

RECEPTOR LOCATIONS

Receptors (locations in the model where concentrations are predicted) were placed along sensitive uses at both ground-level and elevated locations (e.g., residential windows), at publically accessible open spaces, and at completed and occupied project buildings where applicable. In addition, a ground-level receptor grid was placed to enable extrapolation of concentrations throughout the project area.

EMISSIONS CONTROLS

As discussed above, an emissions reduction program, including the use of best available tailpipe reduction technologies and utilization of newer equipment would be implemented for projected development sites with construction durations of more than two years and construction start times of 2022 or earlier. Therefore, emission factors for the 2016 construction peak period modeling analysis (when projected development site 67 is anticipated to be constructed) were calculated assuming diesel engines of minimum Tier 3 certification and the application of DPFs on all nonroad diesel engines 50 hp or greater.

OFF-SITE SOURCES

As discussed above in “Transportation” the traffic increments during construction would generally be lower than the operational traffic increments for the full build-out of the proposed project. In addition, construction worker commuting trips 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. Therefore, construction of the projected development sites would not result in significant adverse air quality impacts related to vehicular traffic, and a standalone mobile-source analysis is not required. Nevertheless, since 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) in order to address all local project-related emissions cumulatively.

Future with the Proposed Actions (Analysis Results)

Maximum predicted concentration increments from construction under the Proposed Actions, and maximum overall concentrations including background concentrations, are presented in Table 19-10 and Table 19-11, respectively, for the construction peak periods analyzed. For $PM_{2.5}$, monitored background concentrations are not added to modeled concentrations from sources, since impacts are determined by comparing the predicted increment from construction activities to the CEQR *de minimis* criteria. The maximum predicted concentration increments include both construction stationary sources and construction mobile sources.

TABLE 19-10
Maximum Predicted Pollutant Concentrations from Construction Site Sources—2016 Peak Analysis Period

Pollutant	Averaging Period	Background	Maximum Modeled Increment	Total Concentration	*De Minimis* Criteria	NAAQS
$PM_{2.5}$	24-hour[1]	—	—	2.2 μg/m³	5.8 μg/m³ [2]	—
	Annual Local[1]	—	—	0.11 μg/m³	0.3 μg/m³	—
PM_{10}	24-hour	48.0 μg/m³	11.8 μg/m³	59.8 μg/m³	—	150 μg/m³ [5]
NO_2	Annual	40.6 μg/m³	11.6 μg/m³	52.2 μg/m³	—	100 μg/m³
CO	One-hour	3.4 ppm	0.6 ppm	4.0 ppm	—	35 ppm
	Eight-hour	1.7 ppm	0.2 ppm	1.9 ppm	—	9 ppm

Notes:
Results for any other time period would be lower.
$PM_{2.5}$ concentration increments were compared with the applicable *de minimis* criteria. Total concentrations were compared with the NAAQS.
1 Monitored concentrations are not added to modeled $PM_{2.5}$ values.
2 $PM_{2.5}$ *de minimis* criteria — 24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 μg/m³.

As described above under "Analysis Periods," based on the $PM_{2.5}$ construction emissions profiles, the following worst-case periods were analyzed: January 2016 and the calendar year 2016 were identified as the first short-term and annual peak periods, respectively, to capture the effects of peak construction activities at projected development site 67; and June 2023 and the 12-month period from November 2022 to October 2023 were identified as the second short-term and annual peak periods, respectively, to capture the effects of peak at projected development site 46.

As shown in Table 19-10, the maximum predicted total concentrations of PM_{10}, CO, and annual-average NO_2 for the 2016 peak periods are below the applicable NAAQS. The maximum predicted 24-hour average $PM_{2.5}$ incremental concentration (2.2 μg/m³) would occur at a residential location to the west of projected development site 67 across Chestnut Street, and the maximum predicted annual average $PM_{2.5}$ incremental concentration (0.11 μg/m³) would occur at a residential location to the east of projected development site 67 across Euclid Avenue. The maximum predicted $PM_{2.5}$ incremental concentrations would not exceed the applicable CEQR *de minimis* criterion of 5.8 μg/m³ in the 24-hour average period or 0.3 μg/m³ in the annual average period.

TABLE 19-11
Maximum Predicted Pollutant Concentrations from Construction Site Sources—2022/2023 Peak Analysis Period

Pollutant	Averaging Period	Background	Maximum Modeled Increment	Total Concentration	*De Minimis* Criteria	NAAQS
$PM_{2.5}$	24-hour[1]	—	—	2.0 μg/m^3	5.8 μg/m^3 [2]	—
	Annual Local[1]	—	—	0.14 μg/m^3	0.3 μg/m^3	—
PM_{10}	24-hour	48.0 μg/m^3	7.2 μg/m^3	55.2 μg/m^3	—	150 μg/m^3 [5]
NO_2	Annual	40.6 μg/m^3	3.5 μg/m^3	44.1 μg/m^3	—	100 μg/m^3
CO	One-hour	3.4 ppm	21.2 ppm	24.6 ppm	—	35 ppm
	Eight-hour	1.7 ppm	3.9 ppm	5.6 ppm	—	9 ppm

Notes:
Results for any other time period would be lower.
$PM_{2.5}$ concentration increments were compared with the applicable *de minimis* criteria. Total concentrations were compared with the NAAQS.
1 Monitored concentrations are not added to modeled $PM_{2.5}$ values.
2 $PM_{2.5}$ *de minimis* criteria — 24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 μg/m^3.

As shown in Table 19-11, the maximum predicted total concentrations of PM_{10}, CO, and annual-average NO_2 for the 2022/2023 peak periods are below the applicable NAAQS. The maximum 24-hour and annual average $PM_{2.5}$ incremental concentrations were predicted to be 0.20 μg/m^3 and 0.14 μg/m^3, respectively, and would occur at projected development site 55 to the south of projected development site 46 across Liberty Avenue. The maximum predicted 24-hour average and annual $PM_{2.5}$ incremental concentrations were predicted to be below the $PM_{2.5}$ *de miminis* criteria.

Conclusions

Measures would be taken to reduce pollutant emissions during construction in accordance with all applicable laws, regulations, and building codes. These include dust suppression measures, idling restriction, and the use of ULSD. In addition to the required laws and regulations, an emissions reduction program, including the use of best available tailpipe reduction technologies and utilization of newer equipment would be implemented for projected development sites with construction durations of more than two years and construction start times of 2022 or earlier. Construction under the Proposed Actions in future years (i.e., past 2022) is expected to meet these emissions reduction requirements as there would be an increasing percentage of newer and cleaner engines, irrespective of any project specific commitments. With the implementation of these emission reduction measures, the dispersion modeling analysis of construction-related air emissions for both on-site and off-site sources determined that $PM_{2.5}$, PM_{10}, annual-average NO_2, and CO concentrations would be below their corresponding *de minimis* thresholds or NAAQS, respectively. Therefore, construction under the Proposed Actions would not result in significant adverse air quality impacts due to construction sources.

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 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 if significant adverse noise impacts would occur during construction, and if so, to examine the feasibility of implementing mitigation measures to reduce or eliminate such impacts.

Construction Noise Impact Criteria

The *CEQR Technical Manual* divides construction duration into "short-term (less than two years) and long-term (two or more years)" and states that impacts resulting from short-term construction generally do not require detailed assessment. This has typically been interpreted to mean that construction noise would generally only have a significant impact on sensitive receptors only when the activity with the potential to create high noise levels (the "intensity") would occur continuously for two or more years (the "duration"). The *CEQR Technical Manual* states that the impact criteria for vehicular sources, using the No-Action noise level as the baseline, should be used for assessing construction noise impacts. As recommended in the *CEQR Technical Manual*, this study uses the following criteria to define a significant adverse noise impact from mobile and on-site construction activities:

- If the No-Action noise level is less than 60 dBA $L_{eq(1)}$, a 5 dBA $L_{eq(1)}$ or greater increase would be considered significant.
- If the No-Action noise level is between 60 dBA $L_{eq(1)}$ and 62 dBA $L_{eq(1)}$, a resultant $L_{eq(1)}$ of 65 dBA or greater would be considered a significant increase.
- If the No-Action noise level is equal to or greater than 62 dBA $L_{eq(1)}$, or if the analysis period is a nighttime period (defined in the CEQR criteria as being between 10:00 p.m. and 7:00 a.m.), the incremental significant impact threshold would be three dBA $L_{eq(1)}$.

As discussed below, the presence of window/wall attenuation measures at noise receptor sites, such as double-glazed windows and alternate means of ventilation, is considered when evaluating locations predicted to experience noise level increments from construction in excess of *CEQR Technical Manual* impact criteria.

Noise Analysis Methodology

Construction activities for the Proposed Actions would be expected to result in increased noise levels as a result of: the operation of construction equipment on-site; and (2) the movement of construction-related vehicles (i.e., worker trips, and material and equipment trips) on the surrounding roadways. The effect of each of these noise sources was evaluated. The results presented below show the effects of construction activities (i.e., noise due to both on-site construction equipment and construction-related vehicle operation) and the total cumulative impacts due to operational effects (caused by project-generated vehicular trips) and construction effects (as construction proceeds on uncompleted components of the Proposed Actions).

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

- The noise emission level of the equipment;
- A usage factor[6], which accounts for the percentage of time the equipment is operating at full power;

[6] Usage factors for each piece of equipment were based on values shown in Section 28-109 of New York City Department of Environmental Protection's Rules for Citywide Construction Noise Mitigation document.

- The distance between the piece of equipment and the receptor;
- Topography and ground effects; and
- Shielding.

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

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

Construction Noise Modeling

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

Geographic input data used with the CadnaA model included CAD drawings that defined site work areas, adjacent building footprints and heights, locations of streets, and locations of sensitive receptors. For each analysis period, the geographic location and operational characteristics—including equipment usage rates (percentage of time operating at full power) for each piece of construction equipment operating at the projected development sites, as well as noise control measures—were input to the model. In addition, reflections and shielding by barriers erected on the construction site, and shielding from both adjacent buildings and project buildings as they are constructed, were accounted for in the model. In addition, construction-related vehicles were assigned to the adjacent roadways. The model produced A-weighted $L_{eq(1)}$ noise levels at each receptor location for each analysis period, as well as the contribution from each noise source.

In general, the Cadna methodology involved the following process:

For Large Development Sites (Projected Site 46, 66 and 67)

1. Establish noise level increments at receptors in study area using the CadnaA model for the following development sites and analysis periods:
   a. Projected development sites 66 and 67 (3 peak construction periods and 2 off-peak construction periods)
   b. Projected development site 46 (2 peak construction periods and 2 off-peak construction periods)
2. Receptors were either located directly adjacent to the construction site or streets where construction trucks would pass. Each receptor was the located at a residence or other noise-sensitive use. The receptors are representative of other noise receptors in the immediate area;
3. , The construction duration is determined by the conceptual schedule;
4. Based on the CadnaA model, determine receptor locations that would experience noise levels that exceed the noise impact threshold criteria during each analysis period;

5. Determine receptor locations where noise level increases could last longer than 24 months from the larger development sites;

Other Individual Projected Development Sites

1. Select a typical-size development site (i.e., projected development site 61) undergoing each of the three major construction stages (i.e., excavation/foundation work, superstructure/façade work, and interior finishing work)
2. Determine the distance from a typical-size development site (i.e., projected development site 61) that would result in noise level increases greater than three to five dB(A) at nearby receptors for each construction stage analyzed;
3. From the conceptual schedule, select one peak construction month per year and one off-peak construction month per year for the entire construction period for analysis;
4. For each of the selected analysis periods, based on the expected stage of construction during that period at each development site according to the conceptual construction schedule, determine the area of receptor locations that would experience noise levels that exceed the noise impact threshold criteria during the analysis period;
5. A spreadsheet was used to determine which lots would or would not experience construction noise levels that exceed the noise impact threshold criteria for each analysis period described above in Item 4, and;
6. Determine area where noise level increases that exceed the noise impact threshold criteria could last longer than 24 months from the typical-size development sites.

The analysis for the typical-sized development site was refined between the DEIS and FEIS. The DEIS did not utilize the conceptual construction schedule, but instead focused on residential receptors that were adjacent to two or more projected development sites. Based on this more simplified approach, the DEIS analysis concluded that any residential receptors that had line-of-sight to two or more projected development sites were shown as having the potential to experience a significant adverse construction noise impact should those two sites be developed consecutively. A land use map with the projected development sites shown was used to determine potential construction noise impact locations.

The refined FEIS analysis utilized the conceptual construction schedule to select the peak construction month per year and an off-peak construction month per year as analysis periods. The peak and off-peak months were determined by the number of projected development sites predicted to be under construction and the corresponding stage of construction during that month (see Cadna analysis results for projected development site 61 in Appendix H). For each of the selected periods, this analysis determined which lot(s) would experience noise levels that exceed the noise impact threshold criteria based on their proximity and line of sight to projected development sites that would be under construction. This is in contrast to the DEIS analysis, which evaluated potential construction noise impacts based on proximity and line of sight but did not consider the timing and sequence of development as presented in the conceptual construction schedule. Lots that were predicted to experience noise levels that exceed the noise impact threshold criteria for two or more consecutive years (i.e., both the peak and off-peak months of two or more consecutive years) were determined to have the potential to experience a significant adverse construction noise impact. Due to this refined and more detailed analysis methodology, some receptors are identified in the FEIS as having the potential to experience a significant adverse construction noise impact that were not identified in the DEIS as having the potential to experience significant adverse construction noise impacts, and vice-versa.

Additionally, the predicted distances of noise impact threshold exceedance for each construction phase are considered to be conservative. The distances for construction noise levels were determined for projected development site 61 on Glenmore Avenue, and then applying those distances to other projected development sites. While the distances determined above for construction noise levels exceeding the noise impact threshold criteria are typical for quiet areas (such as along Glenmore or Pitkin Avenues), they are very conservative for areas that experience greater noise levels (such as Atlantic Avenue or Fulton Street). As shown in Chapter 16, “Noise,” measured noise levels along Glenmore and Pitkin Avenues range from the low 60s to low 70s dBA and measured noise levels along Atlantic Avenue and Fulton Street are higher, ranging from the low 70s to low 80s dBA, due to greater vehicular traffic and rail noise. Because of the higher ambient noise levels, the distance from the projected development sites along these corridors where construction noise levels would exceed the noise impact threshold criteria would be shorter than those determined in the analysis. At location with high ambient noise level, the extent of the noise impact would be lesser than what is presented in this analysis.

Determination of No-Action and Non-Construction Noise Levels

Noise generated by construction activities is added to noise generated by non-construction traffic on adjacent roadways in order to determine the total noise levels at each receptor location. Existing noise levels were conservatively used as the baseline noise levels for determining construction-generated noise level increases. Existing noise levels at the analysis receptors were determined by:

- Performing noise measurements at various at-grade locations;
- Calculating noise levels at the receptor sites and measurement locations using the CadnaA model with existing site geometry and existing traffic on adjacent roadways as inputs;
- Determining adjustment factors based on the difference between the measured and calculated existing noise levels at the measurement locations; and
- Applying the adjustment factors to the calculated existing noise levels at the construction noise receptors.

Analysis Periods

Construction activity associated with the Proposed Action would be spread out over an approximately 15-year period and be dispersed throughout the rezoning area. The construction activities would take place between 2016 and 2030. A screening analysis was performed to determine the analysis periods with the greatest construction activity and therefore, the loudest construction periods. The screening analysis was based on an anticipated construction activity schedule shown in Figure 19-1. The number of workers, types and number of pieces of equipment and number of construction vehicles anticipated to be operating during each month of the construction period was determined. To be conservative, the construction activity screening analysis for each analysis period assumed that both on-site construction activities and off-site construction related traffic movements occurred simultaneously.

Between the DEIS and the FEIS, the construction noise analysis was refined by calculating construction noise levels at the analyzed receptor locations during both peak months and off-peak months for a representative two year construction period. The off-peak month represents the month within a given year with the minimum potential for noise impacts based on the number and type of equipment expected to be in use according to the conceptual construction schedule. Analysis of the peak month and the off-peak month provided a range of peak hourly construction noise levels for each year of the representative two year construction period. The additional months analyzed between the DEIS and FEIS made it possible to more precisely determine the duration of any predicted exceedances of the noise impact threshold criteria as defined under Chapter 19, "Noise" section 410 of the *CEQR Technical Manual.*

The screening analysis determined that the peak construction periods would occur during the construction of projected development sites 66 and 67 and construction of projected development site 46. Five months during the construction period of projected development sites 66 and 67 (i.e., three peak construction periods and two off-peak construction periods between July 2017 and June 2019) were selected for analysis based on the construction schedule and equipment list. Four months during the construction period of projected development site 46 (i.e., two peak construction periods and two off-peak construction periods between January 2022 and December 2023) were selected for analysis based on the construction schedule and equipment list. These analysis periods represent construction of the largest sites in the rezoning area.

An additional analysis period was selected to determine noise level increases from a smaller construction site more typical of most of the projected and potential development sites in the rezoning area. Construction noise resulting from this single representative construction site (projected development site 61) was analyzed for three construction stages (excavation and foundation work, superstructure work, and interior fit-out work). The approximate length of construction for each projected development site was determined using the conceptual construction schedule and the geographic extent of construction noise levels that would result in exceedances of the noise impact threshold criteria was determined. During each analysis period, this distance was used to determine the extent of potential impact that would experience construction noise levels that would exceed the noise impact threshold criteria. The construction schedule was used to determine which receptors would experience construction noise levels exceeding the noise impact threshold criteria for two or more consecutive years.

Noise Reduction Measures

Construction associated with the Proposed Action would be required to follow the requirements of the New York City Noise Control Code (NYC Noise Code) for construction noise control measures. Specific noise control measures will be described in a noise mitigation plan required under the NYC Noise Code. These measures could include a variety of source and path controls.

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

- Equipment that meets the sound level standards specified in Subchapter 5 of the New York City Noise Control Code would be utilized from the start of construction. Table 19-12 shows the noise levels for typical construction equipment and the mandated noise levels for the equipment that would be used for construction of the Proposed Actions.
- As early in the construction period as logistics will 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 practical.
- Where feasible and practical, construction sites would be configured to minimize back-up alarm noise. In addition, all trucks would not be allowed to idle more than three minutes at the construction site based upon New York City Local Law.
- Contractors and subcontractors would be required to properly maintain their equipment and mufflers.
- A properly secured impact cushion (either a commercially available model or one fabricated from scrap wood, leather, or rubber at the job site) shall be installed on top of piles that are being driven by an impact hammer.

In terms of path controls (e.g., placement of equipment, implementation of barriers or enclosures between equipment and sensitive receptors), the following measures for construction, which go beyond typical construction techniques, would be implemented to the extent feasible and practical:

- 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. Once building foundations are completed, delivery trucks would operate behind construction fences, where possible;
- Noise barriers constructed from plywood or other materials would be utilized to provide shielding (e.g., the construction sites would have a minimum eight-foot barrier and, where logistics allow, truck deliveries would take place behind these barriers once building foundations are completed); and
- Path noise control measures (i.e., portable noise barriers, panels, enclosures, and acoustical tents, where feasible) would be required for certain dominant noise equipment to the extent feasible and practical, i.e., generators, jack hammers, pile drivers and pumps. These barriers were assumed based on guidance from NYCDEP's *Rules for Citywide Construction Noise Mitigation* to offer a ten dBA reduction in noise levels for each piece of equipment to which they are applied, as shown in Table 19-12. The details to construct portable noise barriers, enclosures, tents, etc. are also shown in NYCDEP's *Rules for Citywide Construction Noise Mitigation*.

TABLE 19-12
Typical Construction Equipment Noise Emission Levels (dBA)

Equipment List	DEP & FTA Typical L_{max} Noise Level at 50 feet[1]	L_{max} Noise Level with Path Controls at 50 feet[1,2]
Backhoe/Loader	80	
Concrete Trowel	67[3]	
Concrete Vibrator	80	
Cranes (Crawler Cranes)	85	
Dozer	85	
Excavator	85	
Forklift	64[4]	
Generators	82	72
Circular Saw	59	
Hoist	75[5]	
Jack Hammer	85	75
Lift	85	
Portable Cement Mixer	80	
Pile Driving Rig (Impact)	95	85
Pump	77	67
Rebar Bender	80	
Saw	76[6]	
Scissor Lift	63[7]	
Welding Machines	73	

Notes:
1 Sources: Citywide Construction Noise Mitigation, Chapter 28, Department of Environmental Protection of New York City, 2007. Transit Noise and Vibration Impact Assessment, FTA, May 2006.
2 Path controls include portable noise barriers, enclosures, acoustical panels, and curtains, whichever feasible and practical.
3 Based on noise certifications for Columbia Manhattanville Construction project.
4 Based on product literature.
5 Based on “Noise Control for Construction Equipment and Construction Sites” for Hydro Quebec, 1985.
6 Based on FTA Manual.
7 Based on product literature.

Receptor Sites

PROJECTED DEVELOPMENT SITES 66 AND 67 AND PROJECTED DEVELOPMENT SITE 46

Eight noise measurement locations (i.e., sites 8 to 12, 17, 18 and 21) were selected to determine the baseline existing noise levels, and 241 receptor locations (i.e., sites A001to B129) close to the projected development sites were selected as discrete noise receptor sites for the construction noise analysis. Noise measurement locations match the existing noise level measurement locations in Chapter 16, “Noise.” These receptors were either located directly adjacent to the one of the projected development sites included in the detailed construction analysis or along streets where construction trucks would pass. Each receptor site was the location of a residence or other noise-sensitive use. At some buildings, multiple building façades and elevations were analyzed. At open space locations, receptors were selected at street level. Figure 19-4 shows the locations of the 241 noise receptor sites. The receptor sites selected for detailed analysis are representative of other noise receptors in the immediate area and are the locations where maximum With-Action impacts due to construction would occur.

INDIVIDUAL PROJECTED DEVELOPMENT SITES

Receptor locations close to projected development site 61 were used to represent any sensitive noise receptor adjacent to any projected development site. Noise level increases were predicted for these representative noise receptor locations, and the geographic extent of potential noise impacts was determined. The geographic extent of potential noise impacts was used to determine the lots that would experience construction noise levels that exceed the noise impact threshold criteria. The conceptual construction schedule was used to determine duration of the construction noise levels and aided in determining which receptors would experience construction noise levels that exceed the noise impact threshold criteria for two consecutive years or more.

Figure 19-4
Noise Receptor Locations

5/27/2015

• Noise Receptor

● Noise Receptor

Construction Noise Analysis Results

PROJECTED DEVELOPMENT SITES 66 AND 67 AND PROJECTED DEVELOPMENT SITE 46

Using the methodology described above and considering the noise abatement measures for source and path controls to satisfy DEP's *Rules for Citywide Construction Noise Mitigation* specified above, cumulative noise analyses were performed to determined maximum one-hour equivalent ($L_{eq(1)}$) noise levels that would be expected to occur during the three peak construction periods and two off-peak construction periods for projected development sites 66 and 67, and the two peak construction periods and two off-peak construction periods for projected development site 46. This resulted in predicted ranges of hourly construction noise levels over the course of the respective representative two-year time periods for both projected development sites 66 and 67 and projected development site 46.

The noise analysis results in Appendix H show that predicted noise levels due to construction-related activities would result in increases in noise levels that would exceed the noise impact threshold criteria during one or more months at 149 of the 241 receptor locations (i.e., A001-A021, A033, A034, A039-A042, A044, A051, A052, A057-A059, A061-A063, A065, A067-A069, A074, A076, A078, A080, A084-A087, A090, A095, A096, A099-A101, A103-A112, B001-B005, B007-B016, B019-B032, B035-B041, B044, B046-B064, B068-B070, B072, B074, B075, B077, B079, B085-B096, B101, B104, B110, B112-B114, B116, B120, B128, B129).

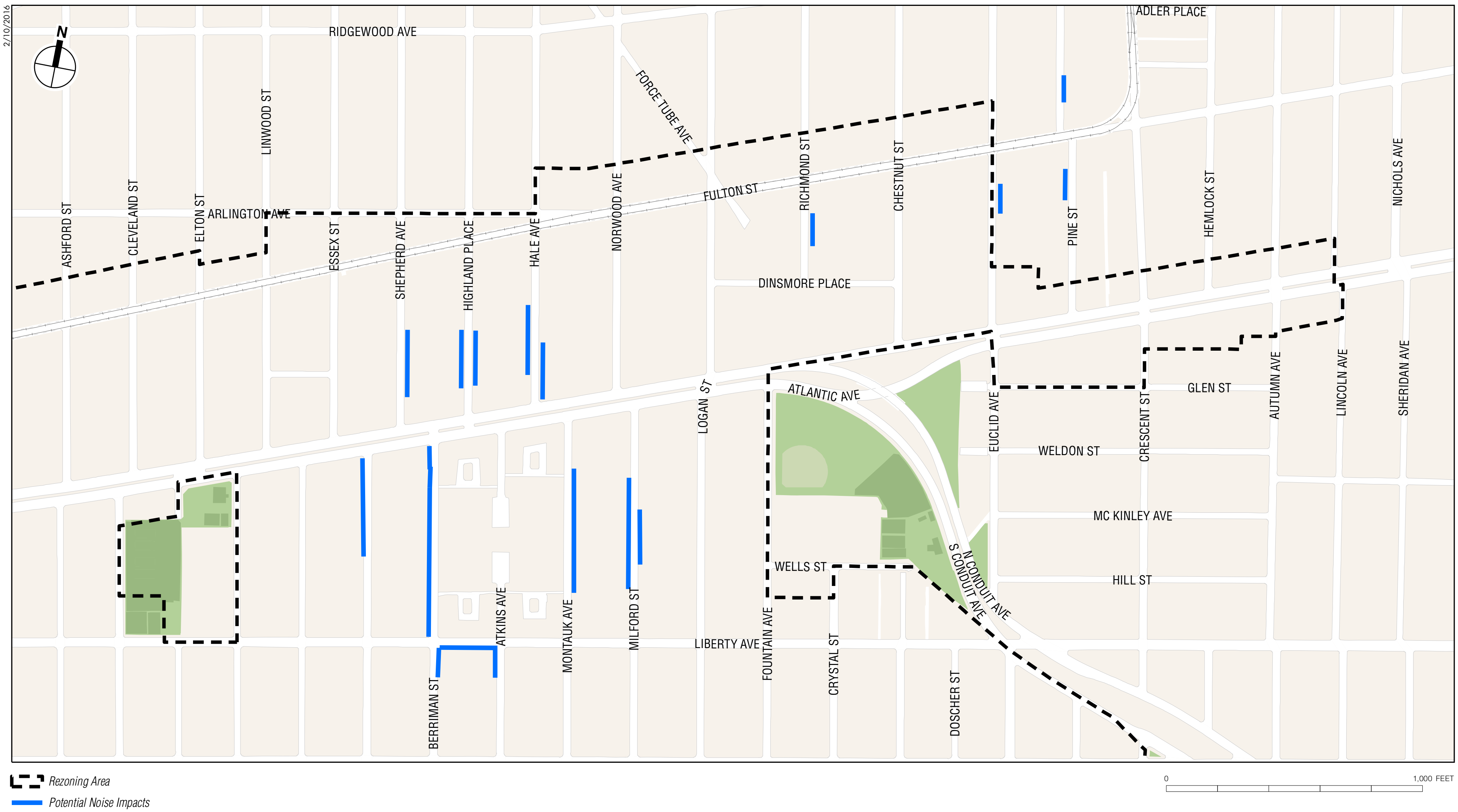
For impact determination purposes, the significance of adverse noise impacts is determined based on whether predicted incremental noise levels at sensitive receptor locations would be greater than the noise impact threshold criteria for two consecutive years or more. While increases exceeding the noise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

The noise analysis results show that predicted noise levels would exceed the noise impact threshold criteria during two or more years on one or more floors at 31 of the 241 receptor locations (i.e., A014, A015, A020, A086, A087, B001, B008, B012, B022-B029, B037, B048-B057, B060, B061, B074 and B075). Figure 19-5 shows the locations and Table 19-13 summarizes analysis results where predicted noise level increases exceed the noise impact threshold criteria for two or more consecutive years.

As described above in the "Analysis Periods" section, the refined analysis, which included analyzing additional peak and off-peak months between the DEIS and FEIS, made it possible to more precisely determine the duration of the predicted exceedances of the noise impact threshold criteria. The refined analysis showed that at some analyzed receptor locations, exceedances of the noise impact threshold criteria that may occur in two or more consecutive years would not occur *continuously* for two or more consecutive years. While these receptor locations may experience construction noise levels that are readily noticeable and even intrusive, these noise level increases would be temporary and would not be considered a significant impact according to CEQR criteria. If the refined analysis showed that a receptor location would not experience an exceedance of the noise impact threshold criteria during an off-peak month between two peak months, then the exceedance of the noise impact threshold criteria would not be expected to occur continuously for two or more consecutive years and the receptor locations would not be expected to experience a significant impact.

INDIVIDUAL PROJECTED DEVELOPMENT SITES

Using the methodology described above and considering the noise abatement measures for source and path controls to satisfy DEP's *Rules for Citywide Construction Noise Mitigation* specified above, cumulative noise analyses were performed to determined maximum one-hour equivalent ($L_{eq(1)}$) noise levels that would be expected to occur during each of the excavation/foundation, superstructure, and interior fit-out construction stages of projected development site 61.



East New York Rezoning Proposal

This figure has been updated for the FEIS.

Figure 19-5

Potential Noise Impact Locations - Large Development Sites

Table 19-13
Locations Where Noise Increases Exceed CEQR Criteria for Two or More Consecutive Years

Building/Location	Associated Land Use	Total Stories	Façade	Associated Receptor(s)	Impacted Floor(s)	Range of Increase(s) in dBA*	Impact Duration (year)	Associated Development Site(s)
229 Richmond Street	Residential	3	East	A014	2	5.6-13.9	January 2016 to July 2021	66 and 67
223 Richmond Street	Residential	3	East	A015	1 to 2	5.6-14.0	January 2016 to July 2021	66 and 67
241 Euclid Avenue	Residential	3	South	A020	1	3.1-7.7	January 2016 to July 2021	66 and 67
148 Pine Street	Residential	3	West	A086	1	5.7-15.0	January 2016 to July 2021	66 and 67
116 Pine Street	Residential	2	West	A087	1	5.5-11.1	January 2016 to July 2021	66 and 67
787 Liberty Avenue	Residential	3	East	B001	1 to 3	3.1-15.2	January 2022 to May 2025	46
111 Berriman Street	Institutional	3	North, East	B008	1 to 3	3.3-20.0	January 2022 to May 2025	46
275 Shepherd Avenue	Church	4	North, East, West	B012	1 to 4	5.6-25.5	January 2022 to May 2025	46
87 Montauk Avenue	Church	4	West	B022	1 to 3	4.5-18.8	January 2022 to May 2025	46
73 Montauk Avenue	Residential	3	West	B023	1 to 3	6.9-22.2	January 2022 to May 2025	46
59 Montauk Avenue	Residential	3	West	B024	1 to 3	7.4-23.7	January 2022 to May 2025	46
47 Montauk Avenue	Residential	3	West	B025	1 to 3	8.7-22.8	January 2022 to May 2025	46
41 Montauk Avenue	Residential	3	West	B026	1 to 3	9.6-22.2	January 2022 to May 2025	46
31 Montauk Avenue	Residential	3	West	B027	1 to 3	11.0-22.0	January 2022 to May 2025	46
46 Milford Street	Residential	3	West	B028	1 to 3	5.9-21.6	January 2022 to May 2025	46
72 Milford Street	Residential	3	East, West	B029	3	5.2-22.1	January 2022 to May 2025	46
55 Milford Street	Residential	3	West	B037	3	5.7-14.4	January 2022 to May 2025	46
234 Highland Place	Residential	3	East, South	B048	1 to 3	3.7-13.8	January 2022 to May 2025	46
216 Highland Place	Residential	3	East	B049	1 and 3	3.3-10.8	January 2022 to May 2025	46
219 Highland Place	Residential	3	East	B050	1 to 3	6.1-15.3	January 2022 to May 2025	46
229 Highland Place	Residential	3	South	B051	1 to 3	3.8-13.3	January 2022 to May 2025	46
218 Hale Avenue	Residential	3	South	B052	1 to 3	4.1-12.1	January 2022 to May 2025	46
208 Hale Avenue	Residential	3	West	B053	1 to 3	5.6-15.1	January 2022 to May 2025	46
219 Hale Avenue	Residential	2	West	B054	1 to 2	3.6-9.1	January 2022 to May 2025	46
227 Hale Avenue	Commercial/Residential	1	West	B055	1	3.3-9.0	January 2022 to May 2025	46
223 Shepherd Avenue	Residential	1	East	B056	1	10.6-13.1	January 2022 to May 2025	46
207 Shepherd Avenue	Residential	3	West	B057	1 to 3	6.7-18.1	January 2022 to May 2025	46
285 Shepherd Avenue	Residential	3	East	B060	2 to 3	8.6-23.3	January 2022 to May 2025	46
297 Shepherd Avenue	Residential	3	East	B061	2 to 3	9.1-16.0	January 2022 to May 2025	46
260 Shepherd Avenue	Church	3	East	B074	1 to 3	4.1-12.4	January 2022 to May 2025	46
3080 Atlantic Avenue	Medical	2	East	B075	1 to 2	6.3-14.0	January 2022 to May 2025	46

Note: *This table is new to the FEIS.*

For projected development site 61, and consequently for all of the smaller individual projected development sites throughout the rezoning area, cumulative noise analyses determined that maximum $L_{eq(1)}$ noise levels would exceed noise impact threshold criteria within three blocks, or approximately 800 feet, with noise level increases up to 26.0 dBA and total construction noise levels of 82.2 dBA L_{eq} during the excavation and foundation stage of construction. The analysis also found that maximum $L_{eq(1)}$ noise levels would exceed noise impact threshold criteria within two blocks, or approximately 500 feet, with noise level increases up to 11.8 dBA and total construction noise levels of 73.0 dBA L_{eq} during the superstructure stage of construction, and maximum $L_{eq(1)}$ noise levels would exceed noise threshold impact criteria within one block, or approximately 225 feet, with noise level increases up to 10.4 dBA and total construction noise levels of 73.0 dBA L_{eq} during the interior fit-out stage of construction. Appendix H shows the Cadna analysis results for projected development site 61.

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

Based on the construction stage predicted to occur at each development site (see Cadna analysis results for projected site 61 in Appendix H) according to the conceptual construction schedule during each of the selected analysis periods, the areas expected to experience exceedance of the *CEQR Technical Manual* noise impact threshold was determined for each period. One peak construction period and one off-peak construction period per year were analyzed, from 2016 to 2030. Based on these determinations, receptors where noise level increases are predicted to exceed the noise impact threshold criteria for two or more consecutive years were identified.

As described above in the “Analysis Periods” section, analyzing peak and off-peak months made it possible to more precisely determine the duration of the predicted exceedances of the noise impact threshold criteria. The analysis showed that at some analyzed receptor locations, exceedances of the noise impact threshold criteria that may occur in two or more consecutive years would not occur *continuously* for two or more consecutive years. While these receptor locations may experience construction noise levels that are readily noticeable and even intrusive, these noise level increases would be temporary and would not be considered a significant impact according to CEQR criteria. If the analysis showed that a receptor location would not experience an exceedance of the noise impact threshold criteria during an off-peak month between two peak months, then the exceedance of the noise impact threshold criteria would not be expected to occur continuously for two or more consecutive years and the receptor locations would not be expected to experience a significant impact.

CONCLUSIONS

At locations predicted to experience an exceedance of the noise impact threshold criteria, the exceedances 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 in an analyzed month, and consequently is conservative in predicting significant increases in noise levels. Typically, the loudest hourly noise level during each month of construction would not persist throughout the entire month. Furthermore, this analysis is based on a conceptual site plan and construction schedule. It is possible that the actual construction may be of less magnitude, or that construction on multiple projected development sites may not overlap, in which case construction noise would be less intense than the analysis predicts.

Vibration

INTRODUCTION

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

CONSTRUCTION VIBRATION CRITERIA

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

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

ANALYSIS METHODOLOGY

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

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

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

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

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

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

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

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

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

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

Table 19-14 shows vibration source levels for typical construction equipment.

TABLE 19-14
Vibration Source Levels for Construction Equipment

Equipment	PPVref (in/sec)	Approximate Lv (ref) (VdB)
Pile Driver (Impact)	0.644-1.518	104-112
Bulldozer	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79

Source: *Transit Noise and Vibration Impact Assessment*, FTA-VA-90-1003-06, May 2006.

CONSTRUCTION VIBRATION ANALYSIS RESULTS

The buildings and structures of most concern with regard to the potential for structural or architectural damage due to vibration would be buildings immediately adjacent to a projected development site. Vibration levels at all of these buildings and structures would be expected to be below the 0.50 inches/second PPV limit. At locations further from projected development sites, the distance between construction equipment and receiving buildings or structures is large enough to avoid vibratory levels that would approach the levels that would have the potential to result in architectural or structural damage.

In terms of potential vibration levels that would be perceptible and annoying, the pieces of equipment that would have the most potential for producing levels that exceed the 65 VdB limit are pile drivers. They would produce perceptible vibration levels (i.e., vibration levels exceeding 65 VdB) at receptor locations within a distance of approximately 230 feet. However, the operation would only occur for limited periods of time at a particular location and, therefore, would not result in any significant adverse impacts. In no case are significant adverse impacts from vibrations expected to occur.