Chapter 19: Noise

A. INTRODUCTION

Noise pollution in an urban area comes from many sources. Some sources are activities essential to the health, safety, and welfare of a city's inhabitants, such as noise from emergency vehicle sirens, garbage collection operations, and construction and maintenance equipment. Other sources, such as traffic, are essential to the viability of a city as a place to live and do business. Although these and other noise-producing activities are necessary to a city, the noise they produce is undesirable. Urban noise detracts from the quality of the living environment, and there is increasing evidence that excessive noise represents a threat to public health.

The noise analysis presented in this chapter focuses on the traffic-generated changes in noise that would result from the operation of the proposed actions (i.e., when construction of the proposed actions' buildings and other features on the project sites is completed in 2017). Noise effects during construction are discussed qualitatively in Chapter 20, "Construction."

PRINCIPAL CONCLUSIONS

The analysis concludes that the proposed actions would cause a significant adverse noise impact at one location along a roadway used by traffic traveling to and from the project sites. Specifically, noise levels from project-generated traffic would exceed the 2001 *City Environmental Quality Review (CEQR) Technical Manual* impact criteria and result in a significant noise impact during the weekday PM time period on a portion of 51st Avenue west of Vernon Boulevard. (Fifty-First Avenue is one of the principal feeder streets for vehicles to the project sites during the weekday PM time period.) At this location, existing and No Build traffic volumes are relatively low, and project-generated traffic would be sufficient to result in a significant increase in noise levels on the street. However, the noise levels on 51st Avenue would still fall within CEQR's "marginally acceptable" range, which is not unusual for New York City residential areas.

The *CEQR Technical Manual* has set noise attenuation values for new buildings based on exterior noise levels. To achieve these interior noise levels, a Memorandum of Understanding (MOU) for Site A (or Restrictive Declaration should portions of Site A be disposed of to a private entity) and an (E) Designation for Site B will require that at least 30 dBA of building attenuation is provided for residential and school uses.

In addition, noise levels within the new open space areas that would be created on-site as part of the proposed actions would be above the 55 dBA $L_{10(1)}$ noise level, recommended in the *CEQR Technical Manual* noise exposure guidelines for outdoor areas requiring serenity and quiet. While noise levels in these new areas would be above the 55 dBA $L_{10(1)}$ guideline noise level, they would be comparable to noise levels in a number of open spaces and parks in New York City, including Hudson River Park, Riverside Park, Bryant Park, Fort Greene Park, and other urban open space areas, and would not result in a significant noise impact.

B. NOISE FUNDAMENTALS

Quantitative information on the effects of airborne noise on people is well documented. If sufficiently loud, noise may interfere with human activities such as sleep, speech communication, and tasks requiring concentration or coordination. It may also cause annoyance, hearing damage, and other physiological problems. Several noise scales and rating methods are used to quantify the effects of noise on people, taking into consideration such factors as loudness, duration, time of occurrence, and changes in noise level with time. However, it must be noted that all the stated effects of noise on people vary greatly with each individual.

"A"-WEIGHTED SOUND LEVEL (dBA)

Noise is typically measured in units called decibels (dB), which are 10 times the logarithm of the ratio of the sound pressure squared to a standard reference presence squared. Because loudness is important in the assessment of the effects of noise on people, the dependence of loudness on frequency must be taken into account in the noise scale used in environmental assessments. One of the simplified scales that accounts for the dependence of perceived loudness on frequency is the use of a weighting network, known as "A"-weighting, in the measurement system to simulate the response of the human ear. For most noise assessments, the A-weighted sound pressure level in units of dBA is used in view of its widespread recognition and its close correlation with perception. In this study, all measured noise levels are reported in A-weighted decibels (dBA). Common noise levels in dBA are shown in **Table 19-1**.

Table 19-1
Common Noise Levels

Sound Source	(dBA)
Military jet, air raid siren	130
Amplified rock music	110
Jet takeoff at 500 meters	100
Freight train at 30 meters	95
Train horn at 30 meters	90
Heavy truck at 15 meters	80–90
Busy city street, loud shout	80
Busy traffic intersection	70–80
Highway traffic at 15 meters, train	70
Predominantly industrial area	60
Light car traffic at 15 meters, city or commercial areas, or residential areas close to industry	50–60
Background noise in an office	50
Suburban areas with medium-density transportation	40–50
Public library	40
Soft whisper at 5 meters	30
Threshold of hearing	0

Note: A 10 dBA increase in level appears to double the loudness, and a 10 dBA decrease halves the apparent loudness.

Sources: Cowan, James P. *Handbook of Environmental Acoustics,* Van Nostrand Reinhold, New York, 1994. Egan, M. David, Architectural Acoustics. McGraw-Hill Book Company, 1988.

ABILITY TO PERCEIVE CHANGES IN NOISE LEVELS

The average ability of an individual to perceive changes in noise levels is well documented (see **Table 19-2**). Generally, changes in noise levels of less than 3 dBA are barely perceptible to most listeners, whereas changes in noise levels of 10 dBA are normally perceived as doubling (or halving) of noise loudness. These guidelines permit direct estimation of an individual's probable perception of changes in noise levels.

Table 19-2
Average Ability to Perceive Changes in Noise Levels

Change (dBA)	Human Perception of Sound
2–3	Barely perceptible
5	Readily noticeable
10	A doubling or halving of the loudness of sound
20	A "dramatic change"
40	Difference between a faintly audible sound and a very loud sound

Source: Bolt, Beranek and Newman, Inc., *Fundamentals and Abatement of Highway Traffic Noise*, Report No. PB-222-703. Prepared for Federal Highway Administration, June 1973.

NOISE DESCRIPTORS USED IN IMPACT ASSESSMENT

Because the sound pressure level unit of dBA describes a noise level at just one moment, and because very few noises are constant, other ways of describing noise over more extended periods have been developed. One way is to describe the fluctuating noise heard over a specific period as if it had been a steady, unchanging sound. For this condition, a descriptor called the "equivalent sound level," L_{eq}, can be computed. L_{eq} is the constant sound level that, in a given situation and period (e.g., 1 hour, denoted by $L_{eq(1)}$, or 24 hours, denoted by $L_{eq(24)}$), conveys the same sound energy as the actual time-varying sound. Statistical sound level descriptors, such as L_1, L_{10}, L_{50}, L_{90}, and L_x, are sometimes used to indicate noise levels that are exceeded 1, 10, 50, 90, and x percent of the time, respectively. Discrete event peak levels are given as L_{01} levels.

For the analysis of the proposed actions, the maximum 1-hour equivalent sound level ($L_{eq(1)}$) has been selected as the noise descriptor to be used in this noise impact evaluation. $L_{eq(1)}$ is the noise descriptor recommended for use in the *CEQR Technical Manual* for vehicular traffic noise impact evaluation, and is used to provide an indication of highest expected sound levels. The 1-hour L_{10} is the noise descriptor used in the *CEQR Technical Manual* noise exposure guidelines for City environmental impact review classification.

C. NOISE STANDARDS AND CRITERIA

Noise levels associated with the construction and operation of the proposed actions would be subject to the emission source provisions of the New York City Noise Control Code and to noise criteria set for the CEQR process. Other standards and guidelines promulgated by Federal agencies do not apply to project noise control, but are useful to review in that they establish measures of impacts.

NEW YORK CITY NOISE CONTROL CODE

The New York City Noise Control Code, amended in December 2005, contains prohibitions regarding unreasonable noise and specific noise standards, including plainly audible criteria for specific noise sources. In addition, the amended code specifies that no sound source operating in connection with any commercial or business enterprise may exceed the decibel levels in the designated octave bands shown in **Table 19-3** at the specified receiving properties.

Table 19-3
New York City Noise Codes

Octave Band Frequency (Hz)	Maximum Sound Pressure Levels (dB) as Measured Within a Receiving Property	
	Residential receiving property for mixed-use building and residential buildings[1]	Commercial receiving property[2]
31.5	70	74
63	61	64
125	53	56
250	46	50
500	40	45
1000	36	41
2000	34	39
4000	33	38
8000	32	37

Notes:
1. As measured within any room of the residential portion of the building with windows open, if possible.
2. As measured within any room containing offices within the building with windows open, if possible.

Source: Section §24-232 of the Administrative Code of the City of New York, as amended December 2005.

NEW YORK CEQR NOISE CRITERIA

The *CEQR Technical Manual* contains noise exposure guidelines for use in City environmental impact review and required attenuation values to achieve acceptable interior noise levels. These values are shown in **Tables 19-4** and **19-5**. Noise exposure is classified into four categories: "acceptable," "marginally acceptable," "marginally unacceptable," and "clearly unacceptable." The *CEQR Technical Manual* criteria are based on maintaining an interior noise level for the worst-case hour $L_{10(1)}$ less than or equal to 45 A-weighted decibels (dBA) (for commercial uses it would be the worst-case hour $L_{10(1)}$ less than or equal to 50 dBA).

D. IMPACT DEFINITION

As recommended in the *CEQR Technical Manual*, this study uses the following criteria to define a significant adverse noise impact:

- An increase of 5 dBA or more in Build $L_{eq(1)}$ noise levels at sensitive receptors (including residences, play areas, parks, schools, libraries, and houses of worship) over those calculated for the No Build condition, if the No Build levels are less than 60 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 4 dBA or more in Build $L_{eq(1)}$ noise levels at sensitive receptors over those calculated for the No Build condition, if the No Build levels are 61 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.

- An increase of 3 dBA or more in Build $L_{eq(1)}$ noise levels at sensitive receptors over those calculated for the No Build condition, if the No Build levels are greater than 62 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 3 dBA or more in Build $L_{eq(1)}$ noise levels at sensitive receptors over those calculated for the No Build condition, if the analysis period is a nighttime period (defined by the *CEQR Technical Manual* criteria as being between 10 PM and 7 AM).

Table 19-4
Noise Exposure Guidelines For Use in City Environmental Impact Review[1]

Receptor Type	Time Period	Acceptable General External Exposure	Airport[3] Exposure	Marginally Acceptable General External Exposure	Airport[3] Exposure	Marginally Unacceptable General External Exposure	Airport[3] Exposure	Clearly Unacceptable General External Exposure	Airport[3] Exposure
Outdoor area requiring serenity and quiet[2]		$L_{10} \leq 55$ dBA	---------- Ldn ≤ 60 dBA ----------	**NA**	**NA**	**NA**	(i) 65 < Ldn ≤ 70 dBA, (II) 70 ≤ Ldn	**NA**	---------- Ldn ≤ 75 dBA ----------
Hospital, nursing home		$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 65$ dBA	---------- 60 < Ldn ≤ 65 dBA ----------	$65 < L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
Residence, residential hotel, or motel	7 AM to 10 PM	$L_{10} \leq 65$ dBA		$65 < L_{10} \leq 70$ dBA		$70 < L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
	10 PM to 7 AM	$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 70$ dBA		$70 < L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, outpatient public health facility		Same as Residential Day (7 AM-11 PM)		Same as Residential Day (7 AM-11 PM)		Same as Residential Day (7 AM-11 PM)		Same as Residential Day (7 AM-11 PM)	
Commercial or office		Same as Residential Day (7 AM-11 PM)		Same as Residential Day (7 AM-11 PM)		Same as Residential Day (7 AM-11 PM)		Same as Residential Day (7 AM-11 PM)	
Industrial, public areas only[4]	Note 4	Note 4		Note 4		Note 4		Note 4	

Notes:
(i) In addition, any new activity shall not increase the ambient noise level by 3 dBA or more; (ii) *CEQR Technical Manual* noise criteria for train noise are similar to the above aircraft noise standards: the noise category for train noise is found by taking the L_{dn} value for such train noise to be an L^{y}_{dn} (L_{dn} contour) value.

Table Notes:
1 Measurements and projections of noise exposures are to be made at appropriate heights above site boundaries as given by American National Standards Institute (ANSI) Standards; all values are for the worst hour in the time period.
2 Tracts of land where serenity and quiet are extraordinarily important and serve an important public need, and where the preservation of these qualities is essential for the area to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks, or open spaces dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet. Examples are grounds for ambulatory hospital patients and patients and residents of sanitariums and nursing homes.
3 One may use FAA-approved L_{dn} contours supplied by the Port Authority, or the noise contours may be computed from the federally approved INM Computer Model using flight data supplied by the Port Authority of New York and New Jersey.
4 External Noise Exposure standards for industrial areas of sounds produced by industrial operations other than operating motor vehicles or other transportation facilities are spelled out in the New York City Zoning Resolution, Sections 42-20 and 42-21. The referenced standards apply to M1, M2, and M3 manufacturing districts and to adjoining residence districts (performance standards are octave band standards).

Source: New York City Department of Environmental Protection (adopted policy 1983).

Table 19-5
Required Attenuation Values to Achieve Acceptable Interior Noise Levels

	Marginally Acceptable	Marginally Unacceptable		Clearly Unacceptable		
Noise level with proposed action	$65<L_{10}\leq70$	$70<L_{10}\leq75$	$75<L_{10}\leq80$	$80<L_{10}\leq85$	$85<L_{10}\leq90$	$90<L_{10}\leq95$
Attenuation[1]	25 dB(A)	30dB(A)	35 dB(A)	40 dB(A)	45 dB(A)	50 dB(A)

Note: [1] The above composite window-wall attenuation values are for residential dwellings. Commercial office spaces and meeting rooms would be 5 dB(A) less in each category. All the above categories require a closed window situation and hence an alternate means of ventilation.

Source: New York City Department of Environmental Protection.

E. NOISE PREDICTION METHODOLOGY

GENERAL METHODOLOGY

At all of the receptor sites in the study area, the dominant operational noise source is vehicular traffic on adjacent and nearby streets and roadways. Noise from other sources, including local industrial uses, the nearby LIRR train yards, is limited and does not contribute significantly to local ambient noise levels. To calculate noise from traffic on adjacent and nearby streets and roadways, the Federal Highway Administration (FHWA) *Traffic Noise Model* (TNM, version 2.5) was used. The noise analysis examined three weekday conditions: AM, midday, and PM time periods. The selected time periods are when the proposed actions would result in maximum traffic generation and/or the maximum potential for significant adverse noise impacts, based on the traffic studies presented in Chapter 16, "Traffic and Parking." The TNM procedures used for analysis are described below.

TRAFFIC NOISE MODEL

The TNM is a computerized model developed for the FHWA that calculates the noise contribution of each roadway segment to a given noise receptor. The noise from each vehicle type is determined as a function of the reference energy-mean emission level, corrected for vehicle volume, speed, roadway grade, roadway segment length, and source-receptor distance. Further considerations included in modeling the propagation path include identifying the shielding provided by rows of buildings, analyzing the effects of different ground types, identifying source and receptor elevations, and analyzing the effects of any intervening noise barriers.

ANALYSIS PROCEDURE

The following procedure was used in performing the noise analysis:

- A screening level procedure was performed to identify locations where there was the potential for a significant increase in noise levels. These locations were selected at noise-sensitive land uses (i.e., residential, church, school, etc.) located on the predicted traffic routes that project generated traffic would use to access and egress the project sites.
- Existing noise levels were determined at each mobile source analysis receptor site identified using the screening procedure listed above, for each analysis time period, by performing field measurements.
- Existing noise levels were determined at two additional receptor sites located on Site A for use in determining appropriate building attenuation for the new buildings proposed there.
- Existing noise levels were calculated at each mobile source analysis receptor site, for each analysis time period, using the TNM and traffic data for existing conditions.
- Calculated TNM existing noise levels at each mobile source analysis receptor site, for each analysis time period, were subtracted from measured existing noise levels. The remainder was assumed to be a correction factor (to account for noise from parking lots, street noise, noise from manufacturing operations, model inaccuracies, etc.).
- Future noise levels for No Build and Build conditions, for each mobile source analysis receptor site and for each analysis time period, were determined as the sum of calculated TNM results and the calculated correction factor based on projected traffic conditions.

- The level of building attenuation to satisfy CEQR requirements was determined for the proposed actions' buildings based on the noise monitoring results at the building attenuation analysis receptor sites.

Summary tables showing the specific components of the noise analysis are provided in **Appendix 19**, "Noise."

F. EXISTING CONDITIONS

SITE DESCRIPTION

As described in detailed in Chapter 1, "Project Description," the project sites consist of Sites A and B, which are located along the Hunter's Point waterfront, in Queens, New York (see Figures 1-1 and 1-3 in Chapter 1). Combined, the two sites cover more than 37.5 acres. Site A is generally bounded by 50th Avenue to the north, 2nd Street to the east, Newtown Creek to the south, and the U.S. Pierhead line of the East River to the west. Site X is currently partially occupied by the Tennisport tennis facility and associated parking; the New York Water Taxi landing, associated parking, and Water Taxi Beach; and a temporary storage area for a construction contractor. Site Y is bounded by 54th Avenue to the north, Newtown Creek to the south, the western side of the elongation of 5th Street to the east, and 2nd Street to the west. This site is currently occupied by low-rise industrial buildings used by Anheuser-Busch for distribution purposes and by NBC for storage, office, and studio-related uses. The current land uses at Sites A and B are commercial, transportation and utility, and industrial and manufacturing (see Figure 2-1 in Chapter 2, "Land Use, Zoning, and Public Policy").

SELECTION OF NOISE RECEPTOR LOCATIONS

Six receptor sites in the area of the project sites were selected for the analysis. Receptor sites 1, 2, 3, and 4 were selected to assess the proposed actions' impacts. Receptor sites X and Y were selected to analyze building attenuation. **Table 19-6** presents the locations of each noise receptor site and their associated existing surrounding land uses. **Figure 19-1** shows the receptor site locations. Receptor sites 1, 2, 3, and 4 include representative noise-sensitive locations, principally locations with residential and open space land uses, and locations where maximum project impacts would be expected. At other locations, particularly locations farther from the project sites, project-generated traffic would be less and/or would constitute a small portion of the existing and/or No Build traffic volume and, consequently, would not have the potential to cause a significant increase in noise levels.

Table 19-6
Noise Receptor Locations

Receptor	Location	Associated Land Use
1	Jackson Avenue between 50th and 51st Avenues	Residential
2	Vernon Boulevard between 48th and 49th Avenues	Residential/open space
3	50th Avenue between Vernon Boulevard and 5th Street	Residential
4	51st Avenue between Vernon Boulevard and 5th Street	Residential
X	2nd Street across from the Anheuser-Busch facility	Vacant/transportation and utility
Y	Proposed project site adjacent to parking lot	Industrial and manufacturing

3.28.08

Site A

Not Included In Site A

Site B

1 *Noise Receptor Location (mobile source analysis)*

X *Noise Receptor Location (building attenuation analysis)*

0 1000 FEET

SCALE

Noise Receptor Locations

NOISE MONITORING

At each receptor location, 20-minute noise measurements were made for three time periods to determine existing noise levels. Measurements were taken on May 22, 2007, and January 8 and January 17, 2008.

EQUIPMENT USED DURING NOISE MONITORING

Measurements were performed using Brüel & Kjær Noise Level Meters Type 2260, Brüel & Kjær Sound Level Calibrators Type 4231, and Brüel & Kjær ½-inch microphones Type 4189. The Brüel & Kjær meters are Type 1 noise meters. The instruments were mounted on a tripod at a height of 5 feet above the ground. The meters were calibrated before and after readings using Brüel & Kjær Type 4231 sound level calibrators with the appropriate adaptors. The data were digitally recorded by the sound meters and displayed at the end of the measurement period in units of dBA. Measured quantities included L_{eq}, L_1, L_{10}, L_{50}, and L_{90}. Windscreens were used during all sound measurements except for calibration. All measurement procedures conformed to the requirements of ANSI Standard S1.13-2005.

RESULTS OF BASELINE MEASUREMENTS

Table 19-7 summarizes the results of the baseline measurements for the weekday AM, midday, and PM analysis hours. Values are shown for specific monitored weekday time periods. In general, noise levels are moderate to relatively high and reflect the level of vehicular activity on the adjacent streets.

In terms of CEQR noise exposure guidelines (shown in **Table 19-4**), during the hour with the highest measured noise levels, existing noise levels at receptor site 3 are in the "acceptable" category, existing noise levels at receptor site 4 are in the "marginally acceptable" category, and existing noise levels at receptor sites 1 and 2 are in the "marginally unacceptable" category. These values are based on the measured $L_{10(1)}$ values (regarding CEQR noise exposure guidelines for receptor sites X and Y, see note 4 in **Table 19-4**).

G. THE FUTURE WITHOUT THE PROPOSED ACTIONS

Using the methodology previously described, future noise levels without the proposed actions were calculated for the four mobile source analysis receptor sites for the 2017 analysis year. These No Build values are shown in **Table 19-8**.

In 2017, at most locations and during most time periods, the increase in $L_{eq(1)}$ noise levels would be less than 1.0 dBA, an imperceptible change. The maximum increase in $L_{eq(1)}$ noise levels, comparing 2017 No Build noise levels with existing noise levels, would be 1.7 dBA. This would occur at receptor site 2 (Vernon Boulevard between 48th and 49th Avenues) during the weekday midday time period. A change of this magnitude would not be perceptible.

In terms of CEQR noise exposure guidelines, future 2017 noise levels without the proposed actions would remain in the "acceptable" category for receptor site 3, in the "marginally acceptable" category for receptor site 4, and in the "marginally unacceptable" category for receptor sites 1 and 2. These values are based on the calculated $L_{10(1)}$ values (see **Appendix 19**, **"Noise"**).

Table 19-7
Measured Existing Noise Levels (in dBA)

Receptor	Location	Day	Time	$L_{eq(1)}$	L_1	L_{10}	L_{50}	L_{90}
1	Jackson Avenue between 50th and 51st Avenues	Weekday	AM	67.5	77.7	70.5	63.7	59.9
			MD	67.4	75.7	70.6	65.0	61.4
			PM	66.8	77.4	69.5	63.3	60.1
2	Vernon Boulevard between 48th and 49th Avenues	Weekday	AM	67.0	76.8	70.0	63.4	59.3
			MD	68.6	78.9	72.0	63.0	59.1
			PM	67.2	76.5	70.5	64.1	61.0
3	50th Avenue between Vernon Boulevard and 5th Street	Weekday	AM	58.3	68.8	61.0	55.2	52.5
			MD	57.1	67.1	59.5	54.5	52.3
			PM	58.6	65.3	60.2	57.5	56.2
4	51st Avenue between Vernon Boulevard and 5th Street	Weekday	AM	64.5	74.8	65.5	61.6	58.9
			MD	63.0	69.3	63.1	59.8	58.0
			PM	63.1	73.1	64.7	59.3	56.4
X	2nd Street across from the Anheuser-Busch facility	Weekday	AM[1]	75.0	83.9	77.5	61.3	56.9
			MD	58.0	68.9	60.5	53.4	50.8
			PM	61.3	71.3	65.4	56.5	52.0
Y	Proposed project site adjacent to parking lot	Weekday	AM	56.2	66.1	58.5	53.7	52.7
			MD	56.9	64.4	58.1	56.1	54.5
			PM[2]	-	-	-	-	-

Notes: Field measurements were performed by AKRF, Inc. on May 22, 2007, and January 8 and 17, 2008.

[1] The relatively high weekday AM peak period noise measurement was due to truck activity at the Anheuser-Busch facility. Independent of the proposed actions, the Anheuser-Busch facility is relocating to a more modern facility in Hunts Point, the Bronx. Therefore, noise levels without the Anheuser-Busch facility in the weekday AM peak period at Receptor X would be expected to be comparable to noise levels at Receptor X in the weekday PM peak period.

[2] The PM noise measurement was unable to be performed due to rain.

Table 19-8
2017 No Build Noise Levels (in dBA)

Receptor	Location	Day	Time	Existing $L_{eq(1)}$	No Build $L_{eq(1)}$	Increase
1	Jackson Avenue between 50th and 51st Avenues	Weekday	AM	67.5	68.0	0.5
			MD	67.4	68.0	0.6
			PM	66.8	67.7	0.9
2	Vernon Boulevard between 48th and 49th Avenues	Weekday	AM	67.0	68.3	1.3
			MD	68.6	70.3	1.7
			PM	67.2	68.4	1.2
3	50th Avenue between Vernon Boulevard and 5th Street	Weekday	AM	58.3	59.2	0.9
			MD	57.1	57.5	0.4
			PM	58.6	59.4	0.8
4	51st Avenue between Vernon Boulevard and 5th Street	Weekday	AM	64.5	64.9	0.4
			MD	63.0	63.6	0.6
			PM	63.1	64.0	0.9

H. PROBABLE IMPACTS OF THE PROPOSED ACTIONS

Using the methodology described earlier, future noise levels with the proposed actions were calculated for the four mobile source analysis receptor sites for the 2017 analysis year. These Build values are shown in **Table 19-9**. Values that exceed *CEQR Technical Manual* impact criteria are shown in bold.

Table 19-9
2017 Build Noise Levels (in dBA)

Receptor	Location	Day	Time	No Build $L_{eq(1)}$	Build $L_{eq(1)}$	Increase
1	Jackson Avenue between 50th and 51st Avenues	Weekday	AM	68.0	68.8	0.8
			MD	68.0	68.7	0.7
			PM	67.7	68.6	0.9
2	Vernon Boulevard between 48th and 49th Avenues	Weekday	AM	68.3	68.8	0.5
			MD	70.3	70.6	0.3
			PM	68.4	69.4	1.0
3	50th Avenue between Vernon Boulevard and 5th Street	Weekday	AM	59.2	61.3	2.1
			MD	57.5	61.8	4.3
			PM	59.4	61.4	2.0
4	51st Avenue between Vernon Boulevard and 5th Street	Weekday	AM	64.9	66.5	1.6
			MD	63.6	65.2	1.6
			PM	64.0	67.1	**3.1**

Note: Values that exceed *CEQR Technical Manual* impact criteria are shown in **bold**.

At most locations and during most time periods, the increase in $L_{eq(1)}$ noise levels in 2017 would be less than 2.1 dBA, an imperceptible change. However, comparing 2017 Build noise levels with 2017 No Build noise levels, the proposed actions would result in a significant noise impact at receptor site 4, on 51st Avenue between Vernon Boulevard and 5th Street. At this location, the increase in $L_{eq(1)}$ noise level would be 3.1 dBA during the weekday PM time period. Although a change of this magnitude would be barely perceptible, it is considered significant based on *CEQR Technical Manual* impact criteria. This noise level increase would be due to project-generated vehicles that would use 51st Avenue, which is a lightly trafficked street in existing and No Build conditions, to travel to the project sites.

The maximum increase in $L_{eq(1)}$ noise levels, comparing 2017 Build noise levels with 2017 No Build noise levels, would be 4.3 dBA. This increased noise level would occur during the weekday midday time period at receptor site 3, on 50th Avenue between Vernon Boulevard and 5th Street. Although a change of this magnitude would be perceptible, it is not considered significant based on *CEQR Technical Manual* impact criteria (because of the low No Build and Build noise levels). The increase in noise level at receptor site 3 would result from the project-generated truck deliveries that would use 50th Avenue, which is a lightly trafficked street in existing and No Build conditions, to travel from the project sites.

Noise levels within the new open space areas that would be created on-site as part of the proposed actions would be above 55 dBA $L_{10(1)}$. This would exceed the noise level for outdoor areas requiring serenity and quiet recommended in the *CEQR Technical Manual* noise exposure guidelines (see **Table 19-4**). One-hour L_{10} noise levels at open space areas adjacent to Center Boulevard would be in the high 60 to low 70 dBA range. These moderate to relatively high

predicted noise levels would result principally from the noise generated by traffic on newly created roadway segments that are part of the proposed actions, including extensions of Center Boulevard, Borden Avenue, and 2nd Street on Site A. One-hour L_{10} noise levels at the open spaces would decrease as the distance from adjacent roadways increases. However, based on *CEQR Technical Manual* criteria, the noise levels at these new open space areas would result in potentially significant noise impacts on their users.

There are no practical and feasible mitigation measures that could be implemented to reduce noise levels to below the 55 dBA $L_{10(1)}$ guideline within the new open space areas that would be created on-site as part of the proposed actions. Although noise levels in these new areas would be above the 55 dBA $L_{10(1)}$ guideline noise level, they would be comparable to noise levels in a number of New York City open space areas that are also located adjacent to roadways, including Hudson River Park, Riverside Park, Bryant Park, Fort Greene Park, and other urban open space areas. The 55 dBA $L_{10(1)}$ guideline is a worthwhile goal for outdoor areas requiring serenity and quiet. However, due to the level of activity in most New York City open spaces and parks (except for areas far away from traffic and other typical urban activities), this relatively low noise level is often not achieved. Consequently, noise levels in the proposed actions' new open space areas, while exceeding the 55 dBA $L_{10(1)}$ CEQR guideline value, would not result in a significant noise impact.

In terms of CEQR noise exposure guidelines, future 2017 noise levels with the proposed actions would remain in the "acceptable" category at receptor site 3, in the "marginally acceptable" category at receptor site 4, and in the "marginally unacceptable" category at receptor sites 1 and 2. These values are based on the calculated L_{10} values (see **Appendix 19**, **"Noise"**).

I. BUILDING ATTENUATION FOR PROJECT BUILDINGS

The *CEQR Technical Manual* also requires an analysis of the effect of introducing a sensitive use, such as a residential building, into an urban environment. As shown in **Table 19-5** earlier in this chapter, the *CEQR Technical Manual* has set noise attenuation values for new buildings that are to be constructed as part of the proposed actions, based on exterior noise levels. Recommended noise attenuation values for residential and school buildings are designed to maintain interior noise levels of 45 dBA $L_{10(1)}$ (50 dBA $L_{10(1)}$ for commercial uses) or lower and are determined based on exterior $L_{10(1)}$ noise levels.

Currently, noise levels at the project sites are a result of the manufacturing and industrial operations that currently exist in the area. When the new development is built, such uses that currently exist on Sites A and B would be replaced with residential, school, and retail uses. Consequently, the noise environment, which currently consists of truck activity associated with the manufacturing and industrial operations, would be transformed so that it is a function of project-generated traffic utilizing new roads that would be built as part of the proposed actions. While the remaining industrial and manufacturing uses and the LIRR train yards would contribute to the overall ambient noise levels in the area, vehicular traffic noise would be the dominant contributing source of noise to the total ambient noise level in the future with the proposed actions. The building attenuation measures that would be implemented as part of the proposed project design to account for vehicular traffic noise would also be sufficient to account for noise sources such as the remaining industrial and manufacturing uses and the LIRR train yards.

The proposed actions' buildings would be required to include both double-glazed windows and an alternate means of ventilation (e.g., central air-conditioning or PTAC units) in order to

provide approximately 30 dBA of attenuation for all facades of the proposed buildings. With these measures, interior levels should be below 45 dBA $L_{10(1)}$ for all residential and school buildings and below 50 dBA $L_{10(1)}$ for all commercial buildings. To ensure that these measures are implemented, the Memorandum of Understanding (or the Restrictive Declaration should portions of Site A be disposed of to a private entity) will state that on Site A, at least 30 dBA of building attenuation must be provided for residential and school uses on these parcels. On Site B, an (E) Designation would be placed to ensure that CEQR requirements for building attenuation are met. The text of the (E) Designation for Site B is as follows:

> In order to ensure an acceptable interior noise environment, any future uses on Lot 1 of Block 11, must be designed to provide a closed window condition with a minimum of 30 dBA window/wall attenuation on all facades in order to maintain an interior noise level of 45 dBA $L_{10(1)}$ for residential and school uses, and 25 dBA window/wall attenuation on all facades in order to maintain an interior noise level of 50 dBA $L_{10(1)}$ for commercial uses. In order to maintain a closed-window attenuation, an alternate means of ventilation must also be provided. Alternate means of ventilation include, but are not limited to, central air conditioning or air conditioning sleeves containing air conditioners or fans approved by the United States' Department of Housing and Urban Development (HUD).

With these design measures, the window/wall attenuation at both Sites A and B would be more than 30 dBA for all façades of the buildings and CEQR requirements for building attenuation would be satisfied.

J. MECHANICAL SYSTEMS

Design and specifications for mechanical equipment, such as heating, ventilation, and air conditioning, and elevator motors have not yet been developed. This equipment would be designed to incorporate sufficient noise reduction devices to comply with applicable noise regulations and standards, and to ensure that this equipment does not result in any significant increases in noise levels by itself or cumulatively with other project noise sources. ✷