3.6 NOISE

INTRODUCTION

The proposed action would result in significant adverse impacts related to noise. As described in Chapter 2.0, "Project Description," it would generate new residential and commercial development along the 161st street corridor in the civic heart of the Bronx. As part of the proposed action, (E) designations would be placed on the zoning map for all projected and potential development sites where there is the potential for significant adverse noise impacts. Residential and community facility development on lots mapped with an (E) designation would be required to provide sufficient noise attenuation to maintain interior noise levels of 45 dBA or lower.

An analysis was therefore performed to evaluate the potential effect of the proposed action on noise levels at existing and potential future noise sensitive locations in the surrounding area. Future noise sensitive locations include areas that may be redeveloped for residential and commercial facility uses.

In order to assess the potential for significant adverse noise impacts, an analysis was conducted that considered traffic-induced noise on non-game day and traffic-induced noise during the time periods on game day for two analysis years 2008 and 2018. The predicted increase in noise levels would potentially affect the proposed introduction of sensitive receptors into an area with existing ambient noise levels classified as "Marginally Unacceptable" and "Clearly Unacceptable," as defined in the *CEQR Technical Manual.* The noise analysis addresses two factors: 1) the change in noise levels in the year 2008 and in the year 2018 on non-game days and on game days from the No action conditions in the area as a result of the proposed action; and 2) the location of new sensitive receptors and the degree to which window/wall attenuation would provide acceptable interior noise levels.

3.6.1 NOISE FUNDAMENTALS

Noise is "unwanted sound" and, by this definition, the perception of noise is a subjective process. Noise in our environment can be characterized by three distinguishing characteristics: loudness, pitch, and time variation.

- The loudness or magnitude of noise is a measure of its intensity, and it is measured in units called decibels (dB). The decibel unit is based on a logarithmic scale, and it compresses a large range of sound pressures into manageable numbers. For example, on the decibel scale, environmental noise ranges from 40 dB from the rustling of leaves to over 80 dB from a truck passage and up to 100 dB at the front rows of a rock concert. The louder the sound, the greater is its decibel value.

- Pitch describes the character and frequency content of noise. Measured in Hertz (Hz), the pitch is used to identify annoying characteristics of noise and help in determining appropriate mitigation to minimize annoyance. The human ear is sensitive to noise frequencies between 20 Hz (low-pitched noise) and 20,000 Hz (high-pitched noise). For example, a noise may be

characterized as a low-pitched "rumble" from stereo sub-woofers or a high-pitched "whine" from a train whistle or a train wheel squeal.

- Time variation describes the pattern of the sound over the observation period. Time variation of environmental noise can be characterized as: 1) continuous, such as noise from a building ventilation fan; 2) intermittent, such as noise from a train passage; or 3) impulsive, like noise from a car backfire. Time variation is used in combination with loudness and pitch to determine the sound energy exposure from a particular noise during a period of time, such as a 24-hour day.

3.6.2 HUMAN PERCEPTION OF NOISE AND NOISE DESCRIPTORS

Since the human ear does not respond equally to all frequencies, measured sound levels (in decibel units at standard frequency bands) are often adjusted or weighted to correspond to the frequency response of human hearing. The weighted sound level is expressed in units called "A"-weighted decibels (dBA) and is measured with a calibrated noise meter. A 10 dBA increase in noise level is generally perceived as a doubling of loudness, while a 3 dBA increase in noise is just barely perceptible to the human ear. Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived. A change in sound level of 5 dBA is subjectively noticeable. Typical A-weighted noise levels in the environment lie in the range of 0 dBA (approximate threshold of hearing) to 120 dBA (jet aircraft at 500 feet) (Fig.1).

The following A-weighted noise descriptors (noise metrics) are typically used to determine impacts from noise sources.

- L_{eq} represents the level of a constant noise containing the same acoustical energy as a fluctuating noise (e.g., highway traffic) observed during a given interval, typically one hour. The L_{eq} is commonly used to describe energy average levels at places with primarily daytime uses such as offices, schools, and churches. L_{eq} (1 h) represents the cumulative noise exposure from all events averaged over one hour.

- L_{90}: Noise level in dBA exceeded 90 percent of the observation time. L_{90} is often considered to represent the "background" noise in a community.

- L_{10}: Noise level in dBA exceeded 10 percent of the observation time. This unit is used in CEQR regulations and establishes threshold levels for acceptable noise exposure.

- L_1: Noise level in dBA exceeded 1 percent of the observation time. This unit is often taken to approximate the "maximum" noise level in the community over a period of time, since it is likely to be more representative than a singe, instantaneous maximum level.

Outdoor A-weighted sound levels were used in the measurements and analysis of the noise effects from the proposed action, as dBA correlates well with the human perception of noise. The one-hour equivalent continuous noise level ($L_{eq\ (1h)}$ in dBA), and the noise level exceeded 10 percent of the time (L_{10} in dBA), which represents average of maximum levels, were selected as the noise descriptors for this analysis.

1. Criteria

The NYCDEP, Division of Noise Abatement, sets standards for external noise exposure. These standards are classified into four main categories: "Acceptable"; "Marginally Acceptable"; "Marginally Unacceptable"; and "Clearly Unacceptable" (see Table 3.6-1). The *CEQR Technical Manual* provides guidance for assessing project-generated noise impacts at sensitive receptors based on the category of external noise exposure at these receptor sites. These guidelines are used in this analysis to determine the applicable interior noise levels of sensitive uses, including potential future residential sites based on external noise exposure. For example, at proposed residential sites located within areas with "Marginally Unacceptable" external noise levels, a minimum of 30 to 35 dBA reduction below daytime external noise level would be required according to *CEQR Technical Manual* guidelines to satisfy the interior noise level criteria.

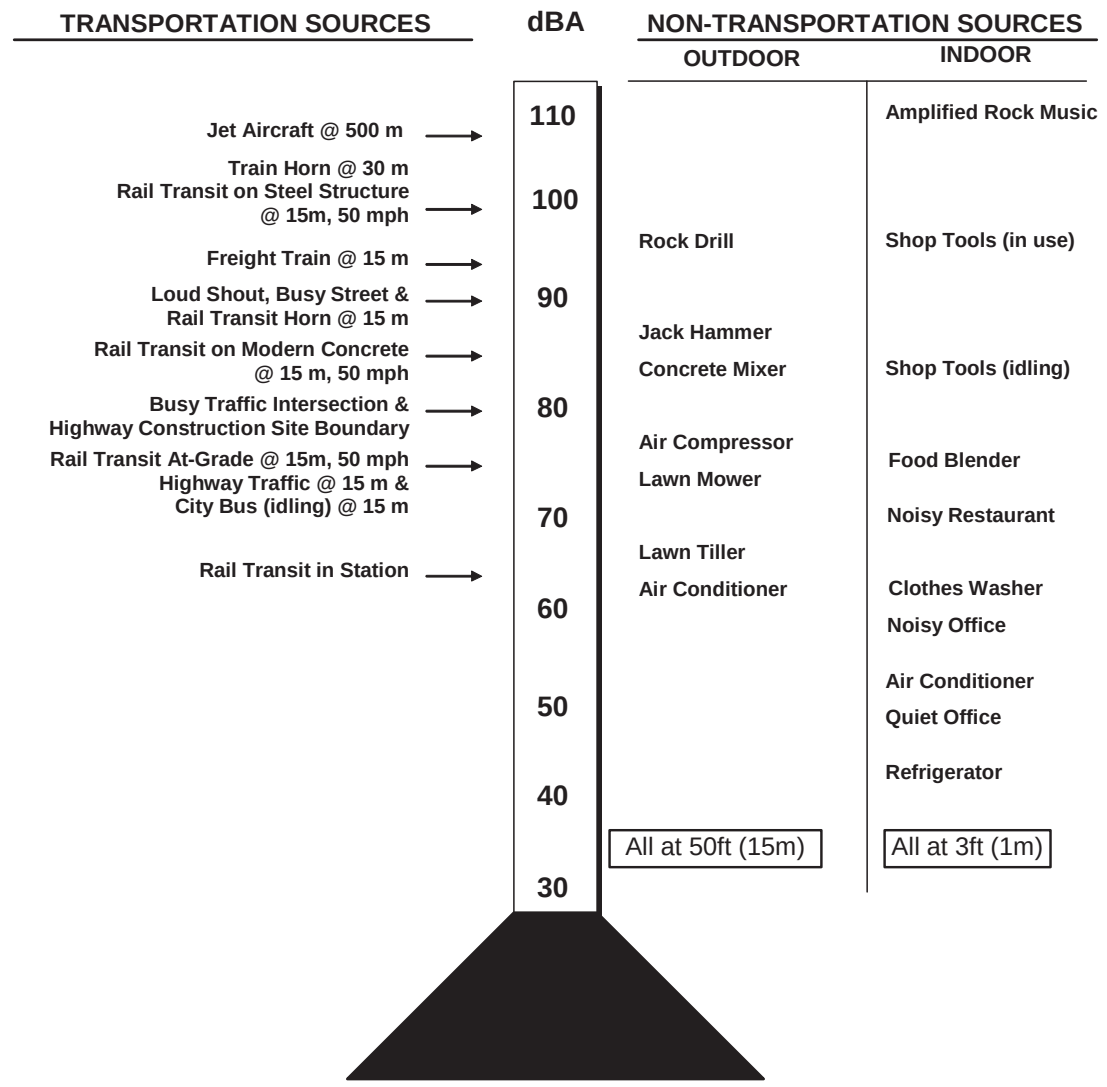
Under the *CEQR Technical Manual*, increases in daytime noise levels as a result of the proposed action are not considered significant unless the resulting noise levels exceed 65 dBA. At night and during the day where the No-action noise levels exceed 65 dBA, a 3dBA increase from the No-action condition is considered a significant adverse impact. In addition, the introduction of sensitive uses such as residences into an area with noise levels above 70 dBA constitutes a significant adverse impact unless interior noise levels for the buildings are attenuated to 45 dBA. See Figure 3.6-1 for common indoor and outdoor noise levels.

3.6.3 MOBILE SOURCE NOISE ASSESSMENT

EXISTING CONDITIONS

1. Noise Monitoring Locations

Information about land uses in the rezoning area and trip assignment for potential future uses was reviewed to select monitoring sites and for assessing the future noise impacts on sensitive sites. The six monitoring sites depicted in Figure 3.6-2 are representative of the sensitive land uses in the area and of locations where additional new vehicle trips are expected, which could result in an increase in noise. Measured noise levels at the six monitoring sites represent the existing noise exposure conditions during non-game day and game day at these locations. One of the six monitoring sites (Site 2) was considered as an elevated site facing the train tracks. Hourly Leq noise measurements performed at this site for one time period showed that the noise contribution from trains as calculated using the Federal Transit Administration's (FTA) procedures marginally contribute to the total (traffic plus trains) noise level at this site. Ground level noise measurements performed at this site during all other time periods were therefore adjusted accordingly to calculate the elevated site noise level and are reported as noise levels at the elevated site 2 on Tables 2 and 3. Noise monitoring was performed during June 10 through September 20, 2008 during different time periods. Time periods chosen for sampling included AM peak, Midday peak, PM peak and Midday Saturday. In addition to $L_{eq(h)}$ and L_{10} noise levels, other statistical noise descriptors (L_1, L_{50}, and L_{90}) were also sampled at all locations for all time periods. The monitored noise levels are summarized in Tables 2 and 3. For noise



m = meters; mph = miles per hour.

Sources: FTA Report DOT-T-95-16. "Transit Noise and Vibration Impact Assessment: Final Report", April 1995

Figure 3.6-1 - Common Indoor and Outdoor Noise Levels

Figure 3.6-2 - Locations of Noise Monitoring Sites 1 to 6

assessment purposes, only L_{eq} and L_{10} values were used in this report, consistent with *CEQR Technical Manual* guidelines.

2. Equipment Used in Noise Monitoring

A calibrated Bruel and Kjaer Type 2231 sound level meter with a Type 4165 condenser microphone and windshield was used at the noise-monitoring sites. The noise meter was calibrated before and after each reading. The sound level meter was mounted on a tripod at a height of approximately 5.5 feet above ground level. At the end of the preset time period of twenty minutes, the statistical levels and the L_{eq} noise levels were read on the digital display of the meter. (For traffic noise measurements 20 minute readings at the monitoring sites are adequate and they are representative of one hour statistical and Leq noise levels). Noise monitoring was performed under acceptable weather and road surface conditions: low wind speed (less than 20 mph) and dry road surface.

3. Results of Baseline Noise Measurements

The results of baseline noise measurements are presented in Tables 2 and 3. Daytime noise levels at all of the receptor sites (see Figure 3.6-2) are fairly typical of noise levels in the study area. A steady background noise exists at all locations due to constant traffic on nearby streets. The background noise level L90 (lowest average minimum level) is in the range of 51 to 71 dBA. The highest L10 monitored noise level was measured during the AM peak period at Site 1 (816 River Avenue) and it is represented by an L_{10} noise level of 87.7 dBA. Noise level, in terms of twenty minutes L_{eq} at the same location during the same time period, was 84.6dBA. This level of exposure places this site under CEQR defined “Clearly Unacceptable” category. Site 2 (840 River Avenue) also falls under the “Clearly Unacceptable” category. Site 3 (62 East 161 Street), Site 5 (198 East 161 Street), and Site S6 (271 East 161 Street) fall under the “Marginally Unacceptable” category. Site 4 (857 Concourse Village West) falls under the “Marginally Acceptable” category. The categorization of these monitoring sites is based on the results of baseline noise monitoring and *CEQR Technical Manual* Attenuation Level Exposure Guidelines (Table 3.6-1 and Table 3.6-6). (The highest noise value during the game day at Site 3 was used for attenuation purposes with 35 dBA.)

Table 3.6-1 - Noise Exposure Standards for Use in City Environmental Impact Reviews

Receptor Type	Time Period	Acceptable General External Exposure	Airport[3] Environs	Marginally Acceptable General External Exposure	Airport[3] Environs	Marginally Unacceptable General External Exposure	Airport[3] Environs	Clearly Unacceptable General External Exposure	Airport[3] Environs
1. Outdoor area requiring serenity and quiet [2]		L_{10} less or equal 55 dBA	L_{dn} less than or equal to 60 dBA	--	L_{dn} less than or equal to 65 dBA	--	(I)L_{dn} less than or equal to 70 dBA (II) L_{dn} less than or equal to 75 dBA	--	L_{dn} >75 dBA
2. Hospital, Nursing Home		L_{10} less or equal55 dBA		55<L_{10} but less or equal 65 dBA		65<L_{10} but less or equal80 dBA		L_{10}> 80 dBA	
3. Residence, Residential Hotel or Motel	7 AM to 11 PM	L_{10} Less or equal 65 dBA		65<L_{10} but less or equal 70 dBA		70<L_{10} but less or equal 80 dBA		L_{10}> 80 dBA	
	11 PM to 7 AM	L_{10} Less or equal 55 dBA		55<L_{10} but less or equal 70 dBA		70<L_{10} but less or equal 80 dBA		L_{10}> 80 dBA	
4. School, Museum, Library, Court, House of Worship, Transient Hotel or Motel, Public Meeting Room, Auditorium, Out- Patient Public Health Facility		Same as Residential Day (7AM-11PM)		Same as Residential Day (7AM-11PM)		Same as Residential Day (7AM-11PM)		Same as Residential Day (7AM-11PM)	
5. Commercial or Office		Same as Residential Day (7AM-11PM)		Same as Residential Day (7AM-11PM)		Same as Residential Day (7AM-11PM)		Same as Residential Day (7AM-11PM)	
6. Industrial, Public Areas Only [4]	Note [4]	Note [4]		Note [4]		Note [4]		Note [4]	

Source: CEQR Technical Manual (NYCDEP, adopted policy 1983).

Notes:

(I) In addition, any new activity shall not increase the ambient noise level by 3 dBA or more.

(II) Noise standards for train noise are similar to the aircraft noise standards: the category for train noise is derived by taking the L_{dn} value for such train noise to be an L_{dn} (L_{dn} contour) value.

[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 requiring special qualities of serenity and quiet, such as at sanitariums and old-age homes.

[3] Either the 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 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).

Table 3.6-2 - Existing Short-Term Noise Levels on Non-Game Day at Monitoring Sites 1 through 6 (June 10 through 28, 2008)

Site #	Location	Measurement Times	Existing Noise Level					CEQR Noise Exposure Category[1]
			Leq	L1	L10	L50	L90	
1	816 River Avenue	AM	84.6	97.7	87.7	69.2	63.2	Clearly Unacceptable
		Midday	83.9	97.2	84.2	65.7	58.7	
		PM	84.1	97.7	86.7	66.2	60.2	
		SAT MD	80.3	94.1	79.6	62.1	54.6	
2[2]	840 River Avenue	AM	76.2	89.6	79.6	61.6	54.6	Clearly Unacceptable
		Midday	74.5	88.6	72.6	66.1	59.1	
		PM	77.2	89.5	82.0	60.5	53.0	
		SAT MD	73.3	86.6	73.1	58.1	51.1	
3	62 East 161st Street	AM	70.8	78.6	74.1	68.6	66.10	Marginally Unacceptable
		Midday	71.6	80.1	74.6	69.6	65.10	
		PM	69.8	77.1	71.6	66.1	62.10	
		SAT MD	70.2	80.1	72.6	66.1	62.60	
4	857 Concourse Village West	AM	66.2	78.2	66.7	60.7	59.20	Marginally Acceptable
		Midday	65.5	76.7	65.7	60.7	59.20	
		PM	64.1	72.2	65.2	61.7	60.70	
		SAT MD	62.3	71.1	64.6	59.6	58.60	
5	198 East 161st Street	AM	73.8	84.7	77.2	68.7	64.20	Marginally Unacceptable
		Midday	72.6	82.7	75.7	69.2	64.20	
		PM	71.3	82.7	73.7	67.7	63.70	
		SAT MD	71.1	82.1	73.6	68.1	62.10	
6	271 East 161 Street	AM	73.1	82.2	75.7	70.7	67.20	Marginally Unacceptable
		Midday	74.2	84.2	76.2	71.2	67.70	
		PM	74.5	83.2	77.2	71.7	68.20	
		SAT MD	73.7	82.7	76.7	71.2	66.20	

Notes:
[1] Noise exposure Category classification (Table 3.6-1) was based on the highest noise level measured during any of the four time periods. The highest L10 noise levels monitored during the noted time periods are underlined.
[2] Noise levels during midday time period were measured at Site 2 on elevated level facing train tracks and the measured levels include traffic and train noise. Noise levels at the other time periods at this site were estimated.

Table 3.6-3 - Existing Short-term Noise Levels During Game Day at Monitoring Sites 1 through 6 (during September 18 and 20, 2008)

Site #	Location	Measurement Times	Existing Noise Level					CEQR Noise Exposure Category[1]
			Leq	L1	L10	L50	L90	
1	816 River Avenue	PM	85.8	98.7	87.2	70.2	68.2	Clearly Unacceptable
		SAT MD	82.0	96.1	79.1	74.1	71.1	
2[2]	840 River Avenue	PM	77.3	89.1	81.6	67.1	64.1	Clearly Unacceptable
		SAT MD	75.6	89.7	74.7	69.7	67.2	
3	62 161st Street	PM	74.9	84.1	75.6	68.6	65.1	Marginally Unacceptable
		SAT MD	71.8	80.6	74.1	69.1	66.6	
4	857 Concourse Village West	PM	64.0	73.4	66.4	61.4	58.4	Marginally Acceptable
		SAT MD	63.1	74.4	64.4	58.4	55.9	
5	198 East 161st Street	PM	71.4	81.4	73.9	67.4	63.9	Clearly Unacceptable
		SAT MD	71.3	81.1	74.1	68.1	62.6	
6	271 East 161 Street	PM	72.7	80.9	75.4	70.9	66.9	Marginally Unacceptable
		SAT MD	71.6	80.4	74.4	68.9	64.9	

Notes:
[1] Noise exposure Category classification (Table 3.6-1) was based on the highest noise level measured during any of the two time periods. The highest L10 noise levels monitored during the noted time periods are underlined.
[2] Noise levels at this elevated site at the two time periods shown were based on ground level measurements at this site which were adjusted for the height of the elevated location facing the train tracks.

Future Without The Proposed Action

As per *CEQR Technical Manual* Guidelines, in order to predict the noise levels in the future without the proposed action, monitored noise levels were adjusted by using a proportional modeling equation to take into account the increases in traffic associated with area growth. Future traffic volumes were obtained by adding future 2018 No Action traffic volumes to the existing baseline conditions. The vehicular traffic volumes under the existing and future No Action conditions were converted into Passenger Car Equivalent (PCE) values for which one medium truck is estimated to generate the noise equivalent of 13 cars, one bus is estimated to generate the noise equivalent of 18 cars, and one heavy truck generated the noise equivalent of 47 cars. Future No Action noise levels are calculated using the following equation:

*Future No Action Noise Level= Existing Noise Level+ 10*log$_{10}$ (Future No Action PCEs/Existing PCEs)*

As indicated in Tables 2 and 3, the existing noise levels range from the "Marginally Acceptable" to the "Clearly Unacceptable" category at the Development Sites. Future No Action noise levels at the six monitoring sites as shown in Tables 4 and 5 would be higher than the existing noise levels, with increases in the range of 0.2 to 3.1 dBA. CEQR noise analysis impacts account only for changes from No Action to with-Action noise levels.

Future With The Proposed Action

In order to predict noise levels in the future with the proposed action, the traffic noise associated with the No Action scenario was added to the future year 2018 With Action traffic noise scenario. Using the methodology used to calculate noise previously described, there would be no perceptible increases in traffic noise levels at the Development Sites as a result of increases in traffic associated with the proposed action (see Tables 4 and 5).

On non-game days the increase in noise level conditions at Site 3 in the future with the proposed action compared to the future year 2018 No Action condition noise levels is predicted to be 1.8 dBA. At the remaining monitoring sites (1, 2, 4, 5 and 6), the increase in future traffic volume would result in higher noise levels when compared with the future No Action condition, with noise level increments ranging between 0.1 to 1.4 dBA, which is insignificant and imperceptible.

On game days, during active time periods the maximum increase in the build year 2018 action noise level over the No action noise level would be 1.2 dBA at monitoring Site 4 and less than 1 dBA at all other monitoring sites. These increases are less than the 3 dBA CEQR impact threshold at any of the receptor sites. Therefore, significant adverse traffic noise impacts are not predicted to occur.

Table 3.6-4 - Existing Year 2008 and Future Year 2018 Traffic Noise Levels (Leq) on Non-Game Days at Short-Term Monitored Sites

Site #	Peak Traffic Time Period	Existing PCEs	Future No Action PCEs	Future Proposed Action PCEs	Existing Leq Reading (dBA) 2008	Predicted Future No Action Leq (dBA) 2018	Predicted Future No Action Action L_{10} (dBA) 2018	Predicted Future Proposed Action Leq (dBA) 2018	Predicted Future Proposed Action L_{10} (dBA) 2018
1	AM	2837	3616	3746	84.6	85.7	88.7	85.8	88.9
	MIDDAY	1829	2592	2616	83.9	85.4	88.4	85.5	85.8
	PM	623	998	1033	84.1	86.1	89.1	86.3	88.9
	SAT MD	334	678	683	80.3	83.4	86.4	83.4	82.7
2	AM	2837	3616	3746	76.2	77.3	80.3	77.4	80.8
	MIDDAY	1829	2592	2616	74.5	76.0	79	76.1	74.2
	PM	623	998	1033	77.2	79.2	82.2	79.4	84.2
	SAT MD	334	678	683	73.3	76.4	79.4	76.4	76.2
3	AM	3143	3599	3891	70.8	71.4	74.4	71.7	75
	MIDDAY	1872	2225	3442	71.6	72.4	75.4	74.2	77.2
	PM	1805	2280	2371	69.8	70.8	73.8	71.0	72.8
	SAT MD	1593	1957	1986	70.2	71.1	74.1	71.2	73
4	AM	255	358	365	66.2	67.7	70.7	67.8	68.3
	MIDDAY	140	148	160	65.5	65.7	68.7	66.1	66.3
	PM	250	479	621	64.1	66.9	69.9	68.1	69.2
	SAT MD	363	404	463	62.3	62.8	65.8	63.4	65.7
5	AM	2009	2467	2550	73.8	74.7	77.7	74.8	78.2
	MIDDAY	1967	2223	2270	72.6	73.1	76.1	73.2	76.3
	PM	2559	3269	3427	71.3	72.4	75.4	72.6	75
	SAT MD	2383	2776	2841	71.1	71.8	74.8	71.9	74.4
6	AM	1808	2253	2332	73.1	74.1	77.1	74.2	76.8
	MIDDAY	1962	2231	2276	74.2	74.8	77.8	74.8	76.8
	PM	2572	3275	3427	74.5	75.6	78.6	75.7	78.4
	SAT MD	2008	2377	2436	73.7	74.4	77.4	74.5	77.5

Note: Calculations are based on passenger car equivalents (PCEs)

Table 3.6-5 - Existing Year 2008 and Future Year 2018 Traffic Noise Levels (Leq) on Game Days at Short-Term Monitored Sites

Site #	Peak Traffic Time Period	Existing PCEs	Future No Action PCEs	Future Proposed Action PCEs	Existing Reading Leq (dBA) 2008	Predicted Future No Action Leq (dBA) 2018	Predicted Future No Action L_{10} (dBA) 2018	Predicted Future Proposed Action Leq (dBA) 2018	Estimated Future Proposed Action L_{10} (dBA) 2018
1	PM	618	989	1024	85.8	87.8	90.8	88.0	89.4
	SAT MD	0	456	460	82.0	N/A	N/A	N/A	N/A
2	PM	618	989	1024	77.3	79.3	82.3	79.5	83.8
	SAT MD	0	455	460	75.6	N/A	N/A	N/A	N/A
3	PM	2112	2656	2747	74.9	75.9	78.9	76.0	76.7
	SAT MD	1957	2339	2370	71.8	72.6	75.6	72.6	74.9
4	PM	240	469	611	64.0	66.9	69.9	68.1	70.5
	SAT MD	454	497	556	63.1	63.5	66.5	64.0	65.3
5	PM	2737	3417	3575	71.4	72.4	75.4	72.6	75.1
	SAT MD	2388	2588	2653	71.3	71.6	74.6	71.8	74.6
6	PM	2186	2873	3024	72.7	73.9	76.9	74.1	76.8
	SAT MD	1735	2086	2146	71.6	72.4	75.4	72.5	75.3

Notes:

- N/A - Road closed during the game.
- For impact assessment, the highest measured hourly level for the AM Peak, Midday Peak, and PM Peak and Sat. Midday Peak, was used for each site to calculate change in noise level from calculated PCE's for the no-build and the build conditions.
- Calculations based on passenger car equivalents (PCEs).
- The required window attenuation will be determined from the underlined L10 values in the above Table.

Table 3.6-6 - Required Attenuation Values to Achieve Acceptable Interior Noise Levels

	Marginally Acceptable	**Marginally Unacceptable**		**Clearly Unacceptable**		
Noise level with proposed action	$65 < L_{10} \leq 70$	$70 < L_{10} \leq 75$	$75 < L_{10} \leq 80$	$80 < L_{10} \leq 85$	$85 < L_{10} \leq 90$	$90 < L_{10} \leq 95$
Attenuation	25 dBA	30 dBA	35 dBA	40 dBA	45 dBA	50 dBA

Source: CEQR Technical Manual; NYCDEP.

3.6.3 SENSITIVE RECEPTOR ASSESSMENT

As indicated in Table 3.6-1 the existing noise levels range from "Marginally Acceptable" to "Clearly Unacceptable" at the proposed residential sites.

The proposed action would introduce new sensitive receptors into an area with high existing ambient noise levels. The existing noise levels at the six monitoring sites and the future noise levels at all of the proposed residential sites would exceed 70 dBA. The proposed (E) designation for these sites would preclude the potential for significant adverse noise impacts. These sites would be suitable for residential uses only by providing window-wall attenuation ranging from 30 dBA to 45 dBA for the exterior facade of the affected residences in order to achieve a 45 dBA interior noise level (Table 3.6-4). Window attenuation requirements for the six noise monitoring sites are shown in the following bulleted items. The closed window condition at these sites can be maintained only by providing an alternate means of ventilation for the interior spaces. . Details of window insulation are the following:

- Sound attenuation of 30 dBA would be needed for sites in the area of noise monitoring Sites 3, 4 and 5 where future L10 noise levels would be between 70 and 75 dBA with 5 dBA reduction for commercial use. The projected development site in this category is Site 4 and the potential sites are B, C, D, E, G, H, and I. The required window attenuation can be achieved through installing ¼ inch laminated single glazed window or double-glazed windows with 1/8 inch glass panes with ¼ inch air space between them mounted in a heavy frame.

- Sound attenuation of 35 dBA would be required for sites in the area of noise monitoring site 6 where future L10 noise levels would be between 75 and 80 dBA. The projected development sites in this category are Sites 5 through 11 and the potential sites are A, J and K. This can be achieved through installing double glazed windows on a heavy frame in masonry structures or windows consisting of laminated glass.

- Sound attenuation of 40 dBA would be required for sites in the area of noise monitoring site 2 where future L10 noise levels would be between 80 and 85 dBA. The projected development sites in this category are Sites 1a, 1b, 2a, and 2b and the potential site is F. This mitigation requires the use of measures that typically exceed standard practice for new construction. The required degree of window/wall attenuation would require added project costs and could limit the range of design options.

- Sound attenuation of 45 dBA would be required for sites in the area of noise monitoring site 1 where future L10 noise levels would be between 85 and 90 dBA. The projected development site in this category is Site 3. This mitigation requires the use of measures that typically exceed standard practice for new construction. The required degree of window/wall attenuation would require added project costs and could limit the range of design options.

To achieve 40 dBA or more of building attenuation, special design features that go beyond the normal double-glazed window and central air conditioning would be necessary and may include using specially designed windows (i.e., windows with small sizes, windows with air gaps, windows with thicker glazing, etc.) and additional building insulation. In order to maintain a closed-window condition, an alternate means of ventilation must also be provided. Alternate means of ventilation includes, but is not limited to, central air conditioning. The required degree of window/wall attenuation would require added project costs and could limit the range of design options. The City has not made any determination that cost-effective attenuation measures are available for these sites. Commercial uses must provide a closed window condition with a minimum of 35 dBA window/wall attenuation in order to maintain an interior noise level of 50 dBA. Window attenuation requirements for each of the noise monitoring site areas are as follows:

The text for the E-designation for sites requiring 30 dBA is as follows:

"In order to ensure an acceptable interior noise environment, future residential/commercial uses must provide a closed window condition with a minimum of 30 dBA window/wall attenuation on all façades in order to maintain an interior noise level of 45 dBA. In order to maintain a closed-window condition, an alternate means of ventilation must also be provided. Alternate means of ventilation includes, but is not limited to, central air conditioning."

The text for the E-designation for sites requiring 35 dBA is as follows:

"In order to ensure an acceptable interior noise environment, future residential/commercial uses must provide a closed window condition with a minimum of 35 dBA window/wall attenuation on all façades in order to maintain an interior noise level of 45 dBA. In order to maintain a closed-window condition, an alternate means of ventilation must also be provided. Alternate means of ventilation includes, but is not limited to, central air conditioning."

The text for the E-designation for sites requiring 40 dBA is as follows:

In order to ensure an acceptable interior noise environment, future residential/commercial uses must provide a closed window condition with a minimum of 40 dBA window/wall attenuation on all façades in order to maintain an interior noise level of 45 dBA. To achieve 40 dBA of building attenuation, special design features that go beyond the normal double-glazed windows are necessary and may include using specially designed windows (i.e., windows with small sizes, windows with air gaps, windows with thicker glazing, etc.), and additional building attenuation. In order to maintain a closed-window condition, an alternate means of ventilation must also be provided. Alternate means of ventilation includes, but is not limited to, central air conditioning. The required degree of window/wall attenuation would require added project costs and could limit the range of design options. The City has not made any determination that cost-effective attenuation measures are available for these sites. Commercial uses must provide a closed window condition with a minimum of 35 dBA window/wall attenuation in order to maintain an interior noise level of 50 dBA."

The text for the E-designation for sites requiring 45 dBA is as follows:

In order to ensure an acceptable interior noise environment, future residential/commercial uses must provide a closed window condition with a minimum of 45 dBA window/wall attenuation on all façades in order to maintain an interior noise level of 45 dBA. To achieve 45 dBA of building attenuation, special design features that go beyond the normal double-glazed windows are necessary and may include using specially designed windows (i.e., windows with small sizes, windows with air gaps, windows with thicker glazing, etc.), and additional building attenuation. In order to maintain a closed-window condition, an alternate means of ventilation must also be provided. Alternate means of ventilation includes, but is not limited to, central air conditioning. The required degree of window/wall attenuation would require added project costs and could limit the range of design options. The City has not made any determination that cost-effective attenuation measures are available for these sites. Commercial uses must provide a closed window condition with a minimum of 35 dBA window/wall attenuation in order to maintain an interior noise level of 50 dBA."

With the attenuation measures specified above, the proposed rezoning would not result in any significant adverse noise impacts, and would meet CEQR Technical Manual guidelines.

Table 3.6.7 – Required Attenuation Values for Each Projected and Potential Site

Site	Address (Monitoring Site Number)	Block Number	Lot(s) Number	Build Max L_{10} (dBA) (2018)**	Attenuation Required
PROJECTED DEVELOPMENT SITES					
1a	880 River Avenue (2)	2484	9	84.2	40 dBA
1b	51 East 161st Street (2)	2484	5	84.2	40 dBA
2a	48 East 161st Street (2)	2483	40	84.2	40 dBA
2b	850 River Avenue (2)	2483	34	84.2	40 dBA
3	810 River Avenue (1)	2483	5	89.4	45 dBA
4*	198 East 161st Street (5)	2443	p/o 90,94	78.2	30 dBA
5	271 East 161st Street (6)	2421	1	78.4	35 dBA
6	281 East 161st Street (6)	2421	57	78.4	35 dBA
7	284 East 161st Street (6)	2421	16	78.4	35 dBA
	286 East 161st Street (6)	2421	17	78.4	35 dBA
	288 East 161st Street (6)	2421	75	78.4	35 dBA
8	294 East 161st Street (6)	2421	18	78.4	35 dBA
9	296 East 161st Street (6)	2421	20	78.4	35 dBA
10	308 East 161st Street (6)	2421	26	78.4	35 dBA
11	316 East 161st Street (6)	2421	27	78.4	35 dBA
POTENTIAL DEVELOPMENT SITES					
A	881 Gerard Avenue(2 with reduction)	2484	33	84.2	35 dBA
B*	67 East 161st Street (3)	2484	35	77.2	30 dBA
C*	58 East 161st Street (3)	2483	44	77.2	30 dBA
D*	62 East 161st Street (3)	2483	45	77.2	30 dBA
E*	48 East 161st Street (3)	2474	40	77.2	30 dBA
F	830 River Avenue (2)	2483	32	84.2	40 dBA
	87 East 158th Street (2)	2483	68	84.2	40 dBA
G*	891 Sheridan Avenue(5)	2460	25	78.2	30 dBA
H*	871 Concourse Village West (5)	2459	46	78.2	30 dBA
	869 Concourse Village West (5)	2459	49	78.2	30 dBA
	Sheridan Avenue (5)	2459	50	78.2	30 dBA
I	859 Concourse Village West (4)	2459	53	70.5	30 dBA
	857 Concourse Village West (4)	2459	54	70.5	30 dBA
J	285 East 161st Street (6)	2421	56	78.4	35 dBA
	287 East 161st Street (6)	2421	55	78.4	35 dBA
	289 East 161st Street (6)	2421	54	78.4	35 dBA
	291 East 161st Street (6)	2421	53	78.4	35 dBA
	293 East 161st Street (6)	2421	52	78.4	35 dBA
K	295 East 161st Street (6)	2421	51	78.4	35 dBA
	297 East 161st Street (6)	2421	50	78.4	35 dBA

* Sites with commercial use (Sites 4, B, C, D, E, G , and H) require 5 dBA less attenuation.
** Highest estimated future proposed action L10 from on-game and non-game days.

Mechanical Equipment

No detailed designs of the mechanical systems (i.e., heating, ventilation, and air conditioning systems) for buildings on the projected or potential development sites are available at this time. However, it is assumed that those systems would be designed to meet all applicable noise regulations and requirements, and designed to produce noise levels that would not result in any significant increases in ambient noise levels.

CONCLUSION

The proposed action would introduce new residential commercial and community facility uses in area occupied by residential and commercial land uses. As discussed above, as part of the proposed action, (E) designations would be placed on the zoning map for all projected and potential development sites where there is the potential for significant adverse noise impacts. Residential development on lots mapped with an (E) designation would be required to provide sufficient noise attenuation to maintain interior noise levels of 45 dBA or lower.

Table 3.6.8 Required Window Attenuation for Each Projected and Potential Developmental Site

Required Attenuation													
30 dBA				35dBA				40 dBA				45 dBA	
Projected Sites		Potential Sites		Projected Sites		Potential Sites		Projected Sites		Potential Sites		Projected Sites	
Block	Lot	Block	Lot	Block	Lot	Block	Lot	Block	Lot	Block	Lot	Block	Lot
2443	p/o90	2459	46	2421	1	2421	50	2483	34	2483	32	2483	5
2443	94	2459	49	2421	16	2421	51	2483	40	2483	68		
		2459	50	2421	17	2421	52	2484	5				
		2459	53	2421	18	2421	53	2484	9				
		2459	54	2421	20	2421	54						
		2460	25	2421	26	2421	55						
		2474	40	2421	27	2421	56						
		2483	44	2421	57	2484	33						
		2483	45	2421	75								
		2484	35										