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 the city's inhabitants, such as noise from emergency vehicle sirens, garbage collection operations, and construction and maintenance equipment. Other sources, such as traffic, stem from the movement of people and goods, activities that are essential to the viability of the 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 for the proposed actions consisted of three parts:

- A screening analysis to determine whether there are any locations where traffic generated by the proposed actions would have the potential to cause significant noise impacts;
- A detailed analysis at any location where traffic generated by the proposed actions would have the potential to result in significant adverse noise impacts, to determine the magnitude of the increase in noise level; and
- An analysis to determine the level of building attenuation necessary to ensure that interior noise levels within the study area satisfy applicable interior noise criteria.

This chapter has been updated to reflect changes to the Reasonable Worst Case Development Scenario since the Draft Environmental Impact Statement (DEIS) and corresponding changes to traffic volumes. Additional noise monitoring was also undertaken between the DEIS and FEIS to identify which development sites would require 40 dB of noise attenuation and which would require lower levels of attenuation.

In summary, the analysis concludes that project-generated traffic would not be expected to produce significant increases in noise levels at any location in or near the study area. In addition, with the proposed building design measures, noise levels within any future buildings would comply with all applicable requirements. Therefore, the proposed actions would not result in any significant adverse noise impacts.

NOISE FUNDAMENTALS

Quantitative information on the effects of airborne noise on people is well documented. If sufficiently loud, noise may adversely affect people in several ways. For example, 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. Although it is possible to study these effects on people on an average or statistical basis, it must be remembered that all the stated effects of noise on people vary greatly with the individual. Several noise scales and rating methods are used to quantify the effects of noise on people. These scales and methods consider such factors as loudness, duration, time of occurrence, and changes in noise level with time.

"A"-WEIGHTED SOUND LEVEL (dBA)

Noise is typically measured in units called decibels (dB), which are ten times the logarithm of the ratio of the sound pressure squared to a standard reference pressure 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. Frequency is the rate at which sound pressures fluctuate in a cycle over a given quantity of time, and is measured in Hertz (Hz), where 1 Hz equals 1 cycle per second. Frequency defines sound in terms of pitch components. In the measurement system, 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—that simulate 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 analysis, all measured noise levels are reported in dBA or A-weighted decibels. 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	
Busy city street, loud shout	80
Busy traffic intersection	
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	
Background noise in an office	50
Suburban areas with medium density transportation	
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.
Source: Cowan, James P. Handbook of Environmental Acoustics. Van Nostrand Reinhold, New York, 1994. Egan, M. David, Architectural Acoustics. McGraw-Hill Book Company, 1988.

COMMUNITY RESPONSE TO 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 less than 3 dBA are barely perceptible to most listeners, whereas 10 dBA changes are normally perceived as doublings (or halvings) of noise levels. 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 Neuman, Inc., *Fundamentals and Abatement of Highway Traffic Noise*, Report No. PB-222-703. Prepared for Federal Highway Administration, June 1973.

It is also possible to characterize the effects of noise on people by studying the aggregate response of people in communities. The rating method used for this purpose is based on a statistical analysis of the fluctuations in noise levels in a community, and integrates the fluctuating sound energy over a known period of time, most typically during 1 hour or 24 hours. Various government and research institutions have proposed criteria that attempt to relate changes in noise levels to community response. One commonly applied criterion for estimating this response is incorporated into the community response scale proposed by the International Standards Organization (ISO) of the United Nations (see Table 19-3). This scale relates changes in noise level to the degree of community response and permits direct estimation of the probable response of a community to a predicted change in noise level.

Table 19-3
Community Response to Increases in Noise Levels

Change (dBA)	Category	Description
0	None	No observed reaction
5	Little	Sporadic complaints
10	Medium	Widespread complaints
15	Strong	Threats of community action
20	Very strong	Vigorous community action

Source: International Standards Organization, Noise Assessment with Respect to Community Responses, ISO/TC 43 (New York: United Nations, November 1969).

NOISE DESCRIPTORS USED IN IMPACT ASSESSMENT

Because the sound pressure level unit of dBA describes a noise level at just one moment and very few noises are constant, other ways of describing noise over extended periods have been developed. One way of describing fluctuating sound is to describe the fluctuating noise heard over a specific time 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 time period (e.g., 1 hour, denoted by $L_{eq(1)}$, or 24 hours, denoted as $L_{eq(24)}$), 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_1 levels. L_{eq} is used in the prediction of future noise levels, by adding the contributions from new sources of noise (i.e., increases in traffic volumes) to the existing levels and in relating annoyance to increases in noise levels.

The relationship between L_{eq} and levels of exceedance is worth noting. Because L_{eq} is defined in energy rather than straight numerical terms, it is not simply related to the levels of exceedance. If the noise fluctuates very little, L_{eq} will approximate L_{50} or the median level. If the noise fluctuates broadly, the L_{eq} will be approximately equal to the L_{10} value. If extreme fluctuations are present, the L_{eq} will exceed L_{90} or the background level by 10 or more decibels. Thus the relationship between L_{eq} and the levels of exceedance will depend on the character of the noise. In community noise measurements, it has been observed that the L_{eq} is generally between L_{10} and L_{50}. The relationship between L_{eq} and exceedance levels has been used in this analysis to characterize the noise sources and to determine the nature and extent of their impact at all receptor locations.

For the purposes of this project, the maximum 1-hour equivalent sound level ($L_{eq(1)}$) has been selected as the noise descriptor to be used in the noise impact evaluation. $L_{eq(1)}$ is the noise descriptor used in the *New York City Environmental Quality Review (CEQR) Technical Manual* for noise impact evaluation, and is used to provide an indication of highest expected sound levels. $L_{10(1)}$ is the noise descriptor used in the *CEQR Technical Manual* for building attenuation. Hourly statistical noise levels (particularly L_{10} and L_{eq} levels) were used to characterize the relevant noise sources and their relative importance at each receptor location.

B. NOISE PREDICTION METHODOLOGY

INTRODUCTION

A screening analysis was performed using proportional modeling to determine whether there are any locations where traffic generated by the proposed actions would have the potential to cause significant noise impacts. At locations where traffic generated by the proposed actions would have the potential to result in significant adverse noise impacts, a detailed analysis was performed using the Traffic Noise Model (TNM) to more accurately determine the magnitude of the increase in noise level.

Analyses were conducted for three time periods—weekday AM, weekday midday (MD), and weekday PM. These time periods are the hours when the proposed actions would generate the most traffic and, therefore, the hours when the Build conditions are most likely to result in maximum noise impacts.

PROPORTIONAL MODELING

Proportional modeling was used to determine locations which had the potential for having significant noise impacts. Proportional modeling is one of the techniques recommended in the New York City *CEQR Technical Manual* for mobile source analysis.

Using this technique, the prediction of future noise levels, where traffic is the dominant noise source, is based on a calculation using measured existing noise levels and predicted changes in traffic volumes to determine No Build and Build levels. Vehicular traffic volumes are converted into Passenger Car Equivalent (PCE) values, for which one medium-duty truck (having a gross weight between 9,900 and 26,400 pounds) is assumed to generate the noise equivalent of 13 cars, and one heavy-duty truck (having a gross weight of more than 26,400 pounds) is assumed to generate the noise equivalent of 47 cars, and one bus (vehicles designed to carry more than nine passengers) is assumed to generate the noise equivalent of 18 cars. Future noise levels are calculated using the following equation:

$$F\ NL - E\ NL = 10 * \log_{10} (F\ PCE / E\ PCE)$$

where:

F NL = Future Noise Level

E NL = Existing Noise Level

F PCE = Future PCEs

E PCE = Existing PCEs

Sound levels are measured in decibels and therefore increase logarithmically with sound source strength. In this case, the sound source is traffic volumes measured in PCEs. For example, assume that traffic is the dominant noise source at a particular location. If the existing traffic volume on a street is 100 PCE and if the future traffic volume were increased by 50 PCE to a total of 150 PCE, the noise level would increase by 1.8 dBA. Similarly, if the future traffic were increased by 100 PCE, or doubled to a total of 200 PCE, the noise level would increase by 3.0 dBA.

At locations where substantial increases in PCEs are expected to occur, a more detailed analysis was performed using the Traffic Noise Model.

TRAFFIC NOISE MODEL (TNM)

TNM is a computerized model developed for the Federal Highway Administration (FHWA) that takes into account various factors due to traffic flow, including traffic volumes, vehicle mix (i.e., percentage of autos, light duty trucks, heavy duty trucks, buses, etc.), sources/receptor geometry, and shielding (including barriers and terrain, ground attenuation, etc.). It is the current state-of-the-art model for traffic noise analysis.

The detailed analysis involved using TNM to model the Existing, No Build, and Build scenarios during the AM and PM peak hours. This model can be used to more precisely determine the magnitude of noise level increases and to determine whether there would be a significant adverse noise impact.

APPLICABLE NOISE CODES AND IMPACT CRITERIA

NEW YORK CITY NOISE CODE

In December 2005 the New York City Noise Control Code was amended. The amended noise code contains: prohibitions regarding unreasonable noise; requirements for noise due to construction activities (including noise limits from specific pieces of construction equipment, noise limits on total construction noise, limits on hours of construction [weekdays between 7 AM and 6 PM], and requirements for adopting and implementing noise mitigation plans for each construction site prior to the start of construction); and specifies noise standards, including plainly audible criteria, for specific noise sources (i.e., refuse collection vehicles, air compressors, circulation devises, exhausts, paving breakers, commercial music, personal audio devises, sound reproduction devises, animals, motor vehicles including motorcycles and trucks, sound signal devises, burglar alarms, emergency signal devises, lawn care devises, snow blowers, etc.). 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 19-4 at the specified receiving properties.

Table 19-4
New York City Noise Codes

Octave Band Frequency (Hz)	Maximum Sound Pressure Levels (dB) as Measured Within a Receiving Property as Specified Below	
	Residential receiving property for mixed-use building and residential buildings (as measured within any room of the residential portion of the building with windows open, if possible)	Commercial receiving property (as measured within any room containing offices within the building with windows open, if possible)
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

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

NEW YORK CEQR NOISE STANDARDS

The New York City Department of Environmental Protection (NYCDEP) has set external noise exposure standards. These standards are shown in Table 19-5 and 19-6. Noise Exposure is classified into four categories: acceptable, marginally acceptable, marginally unacceptable, and clearly unacceptable. The standards shown are based on maintaining an interior noise level for the worst-case hour L_{10} less than or equal to 45 dBA. Attenuation requirements are shown in Table 19-6.

Table 19-5
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
1. Outdoor area requiring serenity and quiet[2]		$L_{10} \le 55$ dBA	------- $Ldn \le 60$ dBA -------						
2. Hospital, Nursing Home		$L_{10} \le 55$ dBA		$55 < L_{10} \le 65$ dBA	------- $60 < Ldn \le 65$ dBA -------	$65 < L_{10} \le 80$ dBA	(1) $65 < Ldn \le 70$ dBA, (II) $70 \le Ldn$	$L_{10} > 80$ dBA	------- $Ldn \le 75$ dBA -------
3. Residence, residential hotel or motel	7 AM to 10 PM	$L_{10} \le 65$ dBA		$65 < L_{10} \le 70$ dBA		$70 < L_{10} \le 80$ dBA		$L_{10} > 80$ dBA	
	10 PM to 7 AM	$L_{10} \le 55$ dBA		$55 < L_{10} \le 70$ dBA		$70 < L_{10} \le 80$ 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 (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)	
5. Commercial or office		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)	
6. 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;

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 old-age homes.

3 One may use 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 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 19-6
Required Attenuation Values to Achieve Acceptable Interior Noise Levels

	Marginally Acceptable	Marginally Unacceptable		Clearly Unacceptable		
Noise Level With Proposed Action	$65 < L_{10} \le 70$	$70 < L_{10} \le 75$	$75 < L_{10} \le 80$	$80 < L_{10} \le 85$	$85 < L_{10} \le 90$	$90 < L_{10} \le 95$
Attenuation*	25 dB(A)	(I) 30 dB(A)	(II) 35 dB(A)	(I) 40 dB(A)	(II) 45 dB(A)	(III) 50 dB(A)

Note: * 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

In addition, the *CEQR Technical Manual* uses the following criteria to determine whether proposed actions would result in a significant adverse noise impact. The impact assessments compare the project's Build condition $L_{eq(1)}$ noise levels to those calculated for the No Build condition, for receptors potentially affected by the proposed actions. If the No Build levels are less than 60 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period, the threshold for a significant impact would be an increase of at least 5 dBA $L_{eq(1)}$. For the 5 dBA threshold to be valid, the resultant Build condition noise level would have to be equal to or less than 65 dBA. If the No Build 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 standards as being between 10 PM and 7 AM), the incremental significant impact threshold would be 3 dBA $L_{eq(1)}$. (If the No Build noise level is 61 dBA $L_{eq(1)}$, the maximum incremental increase would be 4 dBA, since an increase higher than this would result in a noise level higher than the 65 dBA $L_{eq(1)}$ threshold.)

C. EXISTING CONDITIONS

SELECTION OF NOISE RECEPTOR LOCATIONS

The potential noise receptor locations were chosen based on the following four criteria: 1) locations where the greatest potential for traffic increases are likely to occur under the proposed actions; 2) near potential development sites; 3) to provide comprehensive geographic coverage throughout the study area in order to get an accurate picture of the ambient noise environment; and 4) based upon a consideration of existing land use patterns (e.g., locations near rail lines, along major commercial road corridors, etc.). A total of sixty-eight (68) receptor sites were selected within the project study area. Twenty-nine (29) receptor locations were selected as sites to be analyzed to identify potential project impacts, and thirty-nine (39) receptor locations were selected as sites to determine the level of building attenuation that would be necessary to satisfy CEQR building attenuation requirements (see Figure 19-1).

Sites 52-54 are immediately adjacent to the LIRR tracks, and were performed at elevated locations to capture the loudest possible noise levels that would be caused by the LIRR.

NOISE MONITORING

At each receptor site existing noise levels were determined for each of the three noise analysis time periods by field measurements. Noise monitoring was performed at sites 1-54 between May 18, 2006 and May 31, 2006. Noise monitoring at sites 55-64 was performed on May 10 and September 13, 2005. Noise monitoring at sites 65-68 was performed on November 3, 2005. At sites 1-50 and 53-68, 20-minute spot measurements were taken either on a Tuesday, Wednesday, or Thursday during the three weekday periods that reflect peak hours of trip generation: AM peak period (7:15-9:15 AM), midday (MD) peak period (11:00 AM-2:30 PM), and PM peak period (4:30-6:30 PM). At sites 51 and 52, continuous 24-hour noise measurements were performed.

At sites 52-54, rail noise is the dominant noise source. At all other locations, traffic noise was the dominant noise source.

EQUIPMENT USED DURING NOISE MONITORING

The instrumentation used for the 20-minute noise measurements was a Brüel & Kjær Type 4189 ½-inch microphone connected to a Brüel & Kjær Model 2260 Type 1 (according to ANSI Standard S1.4-1983) sound level meter. This assembly was mounted at a height of 5 feet above the ground surface on a tripod and at least 6 feet away from any large sound-reflecting surface to avoid major interference with sound propagation. The meter was calibrated before and after

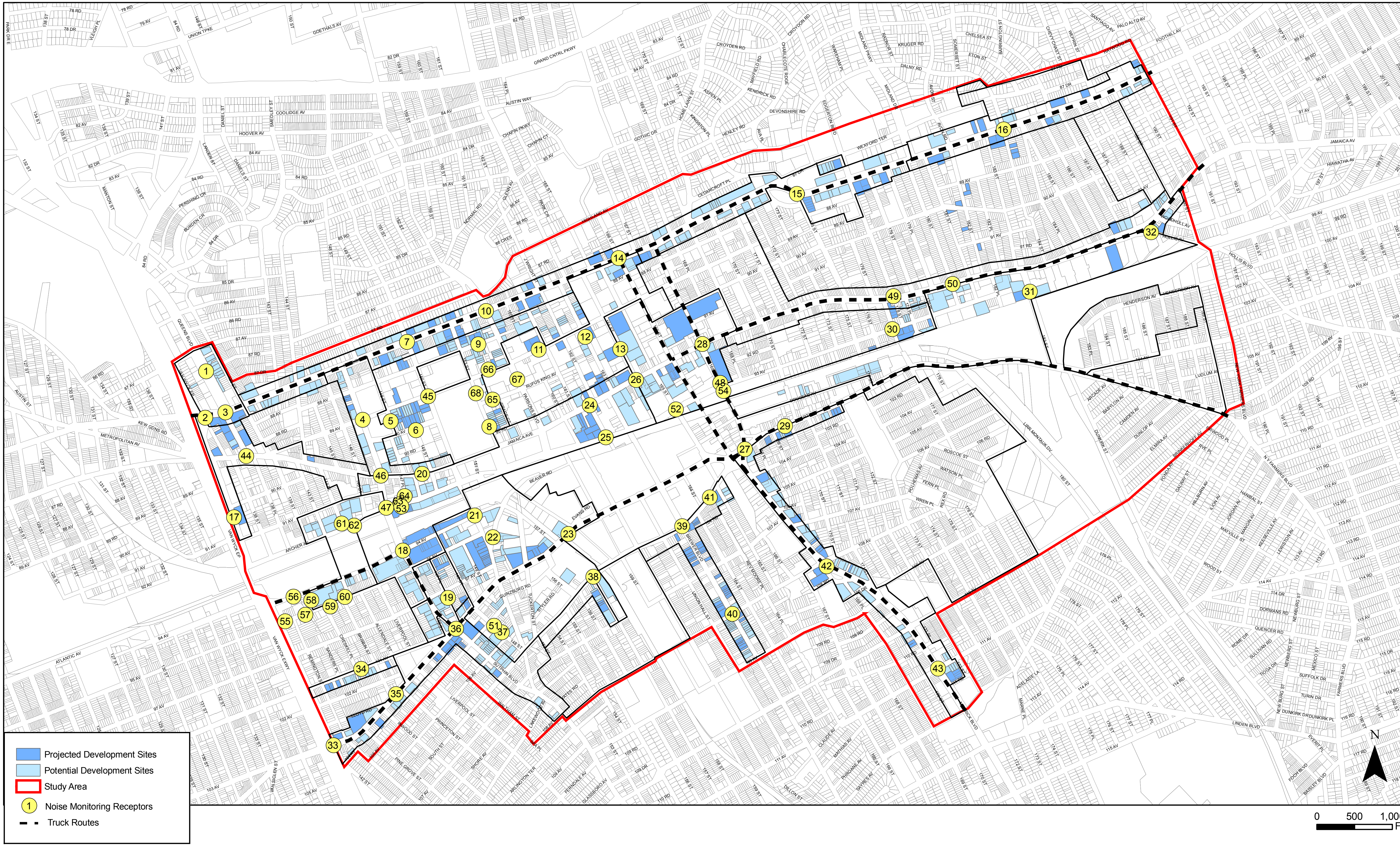

Figure 19-1
Projected and Potential Development Sites with Proposed Noise Receptor Sites

readings with a Brüel & Kjær Type 4231 sound-level calibrator using the appropriate adaptor. Measurements at each location were made on the A-scale (dBA). The data were digitally recorded by the sound level meter 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}. A windscreen was used during all sound measurements except for calibration. Only traffic related noise was measured; noise from other sources (e.g. emergency sirens, aircraft flyovers, etc.) was excluded from the measured noise levels. Weather conditions were noted to ensure a true reading as followed: wind speed under 12 mph; relative humidity under 90 percent; and temperature above 14^{o}F and below 122^{o}F. All measurement procedures conformed with the requirements of ANSI Standard S1.13-1971 (R1976).

EXISTING NOISE LEVELS AT NOISE RECEPTOR LOCATIONS

MEASURED NOISE LEVELS

Noise monitoring results for all of the receptor locations are summarized in Table 19-7. Traffic was the dominant noise source at all sites, and the values shown in the Table 19-7 reflect the level of vehicular activity on the adjacent streets. Noise levels are generally moderate to relatively high, and reflect the level of traffic in the area.

Table 19-7
Jamaica Redevelopment Plan
Existing Noise Levels (in dBA)

Site	Location	Time		Leq	L1	L10	L50	L90	Lmin	Lmax
1	Queens Boulevard between 87th Avenue and 87th Road	weekday	AM	68.7	78.3	72.1	64.8	60.0	55.9	85.2
			MD	68.3	77.6	71.8	65.1	58.9	54.3	81.6
			PM	69.8	78.1	73.6	67.1	61.8	57.8	81.0
2	138th Street and Hillside Avenue	weekday	AM	73.5	81.8	76.4	71.6	67.2	63.6	86.7
			MD	76.0	88.1	77.3	71.4	67.5	64.4	94.4
			PM	73.1	83.3	75.3	70.0	66.0	62.4	90.5
3	Queens Boulevard and Hillside Avenue	weekday	AM	73.4	82.8	76.4	70.0	65.0	60.3	89.7
			MD	72.7	82.1	75.4	70.1	65.8	62.1	88.3
			PM	71.9	81.7	75.0	69.1	64.3	60.4	85.5
4	89th Avenue and Sutphin Boulevard	weekday	AM	72.7	83.5	75.7	68.5	62.7	56.9	87.0
			MD	70.1	80.1	73.6	65.8	60.8	57.2	84.0
			PM	69.8	80.8	72.1	65.9	60.9	57.0	84.7
5*	148th Street Between 89th ad 90th Avenues	weekday	AM	62.8	75.4	62.9	57.8	55.2	53.9	82.0
			MD	63.6	73.6	63.4	58.1	55.6	53.6	84.9
			PM	61.8	70.2	64.5	59.6	57.3	56.0	74.5
6*	149th Street and 90th Avenue	weekday	AM	57.4	68.3	59.5	54.1	52.1	49.7	72.2
			MD	60.5	72.8	60.2	53.2	50.8	48.8	81.4
			PM	61.4	72.7	63.1	56.0	53.2	51.1	82.5
7	Hillside Avenue and 150th Street	weekday	AM	71.9	80.8	75.0	69.6	64.6	58.0	84.4
			MD	72.8	82.1	75.9	69.6	63.8	58.6	86.7
			PM	71.6	81.8	73.9	69.0	62.6	57.3	86.9

Table 19-7 (cont'd)
Jamaica Redevelopment Plan
Existing Noise Levels (in dBA)

Site	Location	Time		Leq	L1	L10	L50	L90	Lmin	Lmax
8*	153rd Street between 90th Road and Rufus King Avenue	weekday	AM	71.9	83.5	75.3	63.4	56.0	53.6	86.1
			MD	66.8	78.6	69.0	61.0	58.7	56.4	82.4
			PM	69.9	82.1	72.0	62.4	59.6	56.6	86.5
9*	88th Avenue between 153rd Street and Parsons Boulevard	weekday	AM	68.6	79.8	71.0	65.0	58.5	55.1	86.1
			MD	66.6	76.9	69.0	61.4	56.2	53.0	88.9
			PM	67.8	80.1	69.6	61.8	56.3	53.3	85.0
10	Hillside Avenue and Parsons Boulevard	weekday	AM	76.0	85.3	78.6	73.1	66.9	60.4	92.5
			MD	74.5	84.0	77.5	72.3	67.7	62.2	88.2
			PM	74.9	86.0	76.9	71.9	67.8	63.5	89.4
11	89th Avenue between Parsons Boulevard and 161st Street	weekday	AM	66.5	77.7	69.1	60.1	54.7	52.4	85.6
			MD*	67.0	78.2	69.2	60.0	54.6	52.1	67.0
			PM	65.8	74.9	68.7	60.8	55.7	52.0	86.0
12	163rd Street between 89th and Jamaica Avenues	weekday	AM	65.0	77.5	66.8	58.7	54.0	52.1	83.6
			MD	69.0	79.9	71.3	64.5	61.6	60.1	83.9
			PM	65.5	74.1	68.6	62.7	58.4	55.8	81.6
13	164th Street between 89th and Jamaica Avenues	weekday	AM	62.3	71.5	65.1	59.8	56.0	53.0	78.8
			MD	63.9	72.5	66.5	61.6	59.0	57.0	79.5
			PM	62.6	68.5	64.7	61.6	59.2	57.3	73.7
14*	Hillside Avenue and 166th Street	weekday	AM	73.5	82.1	77.0	71.3	63.9	58.4	85.9
			MD	71.9	81.9	74.5	68.6	61.5	56.9	85.8
			PM	71.6	81.0	74.8	69.0	65.1	60.8	85.5
15*	Hillside Avenue and 175th Street	weekday	AM	77.4	68.5	81.4	73.6	67.6	60.8	88.1
			MD	73.3	83.4	76.7	69.3	63.0	56.3	87.2
			PM	74.7	84.6	78.5	70.2	63.8	60.7	91.2
16*	Hillside Avenue and 184th Street	weekday	AM	75.2	84.0	78.2	72.6	66.5	61.7	89.1
			MD	75.6	86.5	78.2	69.0	60.9	54.4	96.5
			PM	74.9	84.2	78.7	71.4	65.0	59.9	88.3
17*	Van Wyck Expressway Northbound Service Road between 90th and 91st Avenues	weekday	AM	73.4	79.7	76.1	72.1	68.2	65.1	88.7
			MD	71.3	81.5	73.2	68.9	66.4	64.1	86.9
			PM	74.0	80.8	77.1	72.6	66.6	61.8	88.3
18	Sutphin Boulevard and 94th Avenue	weekday	AM	75.4	85.2	78.5	72.3	67.1	63.5	89.4
			MD	72.7	81.5	76.6	69.1	64.4	58.9	88.7
			PM	75.1	82.7	78.4	73.0	68.3	61.3	89.1
19*	147th Place between Liberty and 97th Avenues	weekday	AM	60.1	67.8	62.5	58.3	56.1	54.5	75.0
			MD	55.8	63.3	57.8	53.7	51.1	49.7	75.5
			PM	59.6	70.4	61.4	56.8	54.2	52.3	75.5
20*	Jamaica Avenue between 148th and 149th Streets	weekday	AM	74.6	83.9	78.7	70.0	62.3	58.2	90.9
			MD	70.5	80.7	74.8	66.2	60.1	54.2	84.1
			PM	72.2	82.4	75.7	66.3	61.5	56.3	91.2

Table 19-7 (cont'd)
Jamaica Redevelopment Plan
Existing Noise Levels (in dBA)

Site	Location	Time		Leq	L1	L10	L50	L90	Lmin	Lmax
21	94th Avenue and 150th Street	weekday	AM	71.9	82.4	74.3	68.3	62.4	57.2	88.5
			MD	73.5	85.8	75.8	65.7	58.0	53.0	91.0
			PM	72.3	82.6	75.5	69.3	62.7	58.4	85.4
22*	Beaver Road between 150th and 157th Streets	weekday	AM	63.9	75.7	65.5	58.3	55.5	53.1	83.2
			MD	65.2	75.0	67.5	61.0	58.9	57.6	83.6
			PM	66.0	76.3	68.7	62.3	59.1	56.3	83.1
23*	Liberty Avenue between 157th and 158th Streets	weekday	AM	74.5	85.1	77.8	69.4	61.2	58.6	88.7
			MD	72.2	83.2	75.5	66.5	60.8	58.0	86.5
			PM	72.2	83.0	75.3	67.3	60.8	58.1	90.7
24	Jamaica Avenue and Union Hall Street	weekday	AM	75.3	84.2	78.9	72.4	68.1	59.9	88.7
			MD	73.2	81.5	76.9	70.7	65.5	61.5	83.3
			PM	74.4	84.1	77.1	71.1	67.2	63.6	92.7
25	93rd Avenue and Union Hall Street	weekday	AM	76.1	86.0	79.9	70.9	65.4	62.2	90.2
			MD	74.6	84.0	78.8	70.3	63.2	58.4	88.4
			PM	76.1	85.3	79.4	72.7	68.1	61.9	93.3
26	Jamaica Avenue and 164th Street	weekday	AM	76.8	86.8	80.3	73.4	67.7	58.9	91.4
			MD	76.1	84.1	79.0	74.3	70.8	64.2	87.8
			PM	74.4	84.5	77.7	70.1	66.1	63.7	88.9
27	Merrick Boulevard (Northbound) and Liberty Avenue	weekday	AM	74.7	82.1	78.3	72.4	68.1	64.2	85.2
			MD	72.8	81.0	76.8	69.6	64.7	59.3	84.4
			PM	73.2	82.0	76.6	70.2	64.1	59.1	84.1
28*	168th Street and Jamaica Avenue	weekday	AM	77.5	87.4	81.1	73.9	69.2	59.6	89.3
			MD	76.9	87.1	79.9	73.2	67.9	62.1	93.3
			PM	74.9	84.4	77.3	72.2	67.6	60.3	92.1
29*	Liberty Avenue between 169th and 170th Streets	weekday	AM	72.5	82.6	75.3	69.4	62.8	58.1	87.8
			MD	73.0	82.7	77.0	69.0	62.1	56.2	84.4
			PM	71.7	81.8	74.9	68.1	61.3	55.9	88.0
30*	Archer Avenue and 177th Street	weekday	AM	70.7	80.4	73.9	67.7	61.9	56.5	82.0
			MD	73.6	86.7	76.4	65.8	58.9	52.1	91.8
			PM	71.5	81.7	74.5	67.6	62.5	56.5	87.4
31*	183rd Street between Liberty and Jamaica Avenues	weekday	AM	71.5	82.5	74.4	66.9	59.7	55.1	89.5
			MD	69.3	79.2	73.0	65.4	57.2	51.9	85.3
			PM	71.6	80.0	75.0	69.1	63.0	54.0	83.5
32*	Hollis Avenue and Jamaica Avenue	weekday	AM	73.4	83.5	76.5	70.2	65.8	60.1	87.9
			MD	72.4	82.2	74.6	68.8	65.8	63.7	92.5
			PM	70.4	80.9	72.5	68.1	63.9	61.4	83.7
33*	Northbound Van Wyck Expressway Service Road and Liberty Avenue	weekday	AM	77.2	86.2	80.0	74.8	70.2	66.7	91.3
			MD	78.6	87.5	81.5	75.9	71.0	66.6	94.0
			PM	76.0	84.8	78.8	73.8	69.5	64.0	91.8

Table 19-7 (cont'd)
Jamaica Redevelopment Plan
Existing Noise Levels (in dBA)

Site	Location	Time		Leq	L1	L10	L50	L90	Lmin	Lmax
34*	101st Avenue between Cresskill Place and Brisbin Street	weekday	AM	68.5	78.5	71.4	65.4	57.2	52.0	86.3
			MD	62.9	73.8	65.8	57.5	51.7	47.9	78.1
			PM	63.3	74.0	66.2	59.6	52.4	48.8	78.3
35*	Liberty Avenue between Brisbin and Princeton Streets	weekday	AM	71.7	80.6	75.1	58.5	52.1	56.8	86.5
			MD	71.2	79.9	75.1	67.9	60.5	54.6	88.7
			PM	72.6	80.3	76.2	70.0	64.4	57.7	87.9
36	Liberty Avenue and Sutphin Boulevard	weekday	AM	75.9	83.7	79.1	73.6	68.9	63.4	90.3
			MD	75.6	84.9	79.3	71.9	67.2	61.9	89.8
			PM	74.8	83.8	77.9	71.6	67.7	63.8	91.2
37*	148th Street between 106th and 105th Avenues	weekday	AM	80.2	82.5	81.4	80.1	78.6	72.2	86.8
			MD	75.4	82.9	78.3	72.9	63.8	59.8	87.2
			PM	68.3	76.6	70.6	64.6	61.5	58.6	90.2
38*	South Street and 157th Street	weekday	AM	72.0	82.9	74.9	67.6	63.9	61.8	87.8
			MD	70.5	79.3	73.3	68.1	65.2	64.2	84.7
			PM	71.8	82.1	74.4	67.9	65.8	64.9	85.7
39	Guy R Brewer Boulevard and South Street	weekday	AM	73.9	83.3	77.9	69.1	61.9	57.3	89.3
			MD	72.5	83.2	75.9	68.6	61.1	55.5	87.0
			PM	72.5	83.0	75.8	68.1	62.9	54.6	88.2
40*	Guy R Brewer Boulevard and 108th Avenue	weekday	AM	73.3	83.9	77.3	68.0	59.5	52.3	86.9
			MD	71.7	82.7	75.9	64.3	54.8	48.9	86.2
			PM*	72.4	82.8	75.5	67.1	59.7	54.9	91.3
41*	South Street between 164th and 165th Streets	weekday	AM	66.3	75.8	69.3	62.3	57.5	54.2	84.2
			MD	67.2	77.7	68.2	60.4	55.6	52.2	90.5
			PM	63.2	72.1	64.8	58.2	50.8	46.3	84.9
42	Merrick Boulevard between 108th Avenue and 108th Road	weekday	AM	72.9	81.8	76.1	70.7	59.7	53.9	89.1
			MD	66.9	75.1	70.5	64.6	59.1	50.8	77.0
			PM	68.2	76.9	71.6	65.5	60.6	55.9	81.2
43*	Merrick Boulevard and 111th Avenue	weekday	AM	75.6	84.8	79.1	72.9	64.7	60.5	87.0
			MD	73.6	83.9	76.7	69.5	62.0	57.7	91.8
			PM	74.2	83.8	77.3	70.4	62.3	57.3	90.8
44	Jamaica Avenue and Queens Boulevard	weekday	AM	72.9	83.0	76.8	68.7	62.3	58.9	88.0
			MD	73.8	82.9	76.8	70.3	63.4	60.2	91.1
			PM	72.5	83.6	75.0	67.7	64.8	61.0	88.9
45	89th Avenue and 150th Street	weekday	AM	66.8	77.9	69.7	63.3	58.6	54.4	84.5
			MD	63.6	74.7	65.9	60.0	55.9	53.7	81.0
			PM	64.3	73.0	67.4	62.2	59.4	57.0	76.5
46	Jamaica Avenue and Sutphin Boulevard	weekday	AM	75.3	84.2	78.6	72.2	67.5	63.4	96.1
			MD	75.6	85.1	78.9	71.5	67.1	62.9	89.2
			PM	73.8	82.1	77.1	71.5	67.3	64.0	86.7

Table 19-7 (cont'd)
Jamaica Redevelopment Plan
Existing Noise Levels (in dBA)

Site	Location	Time		Leq	L1	L10	L50	L90	Lmin	Lmax
47	Archer Avenue and Sutphin Boulevard	weekday	AM	74.8	83.1	77.9	72.5	67.4	64.4	89.6
			MD	74.3	83.7	77.4	71.9	67.3	61.5	87.1
			PM	75.3	84.8	77.9	73.1	69.0	64.8	88.1
48*	168th Street and Archer Avenue	weekday	AM	**						
			MD	74.6	85.5	77.5	68.6	63.4	59.2	91.9
			PM	72.2	80.5	75.7	69.5	64.9	59.8	84.7
49	Jamaica Avenue and 178th Street	weekday	AM	74.3	85.0	77.3	70.2	64.1	55.5	89.5
			MD	72.5	84.1	74.8	68.2	61.3	55.2	90.0
			PM	70.9	80.3	73.4	67.8	62.4	56.9	88.2
50	Jamaica Avenue and 180th Street	weekday	AM	73.5	82.4	76.4	71.8	65.0	57.0	88.3
			MD	70.5	80.9	72.9	66.0	56.8	47.7	89.8
			PM	71.5	80.7	74.4	69.0	61.8	55.7	86.3
51*	148th Street Between 105th Avenue and 106th Avenue	weekday	AM	79.0	82.1	80.4	78.9	76.7	73.8	84.8
			MD	77.3	84.2	79.6	77.1	68.5	65.1	88.4
			PM	76.1	89.3	77.5	70.6	67.8	66.7	92.9
52*	Roof of Parking Garage at 165th Street and Archer Avenue	weekday	AM	64.0	73.6	66.3	60.5	57.5	55.7	81.2
			MD	66.2	72.4	65.3	59.5	56.5	54.7	91.4
			PM	65.6	75.5	69.4	61.7	58.2	55.7	77.1
53*	Roof of 147-16 Archer Avenue	weekday	AM	70.8	80.2	75.5	63.5	60.4	58.8	86.0
			MD	70.4	79.5	76.9	62.0	58.4	56.4	82.4
			PM	73.4	79.4	77.1	71.4	61.2	56.6	89.2
54*	Elevated at 168th Street and Archer Avenue	weekday	AM	71.9	79.7	75.3	69.5	63.6	60.7	84.9
			MD	70.0	78.7	73.1	67.5	61.8	56.9	83.3
			PM	72.1	80.5	75.3	69.5	64.0	60.0	85.6
55*	95th Avenue between Van Wyck Expressway Service Road and Remington Street	weekday	AM	64.0	70.5	66.1	62.9	61.2	58.3	75.1
			MD	63.8	71.8	65.6	62.5	60.0	57.2	77.5
			PM	63.2	71.8	65.6	61.1	58.8	57.0	78.6
56	94th Avenue between Van Wyck Expressway Service Road and 138th Place	weekday	AM	72.7	83.6	75.4	68.9	61.6	57.4	87.1
			MD	73.6	82.0	75.3	70.4	68.5	67.6	93.6
			PM	73.0	82.5	76.3	70.2	67.4	66.3	88.0
57*	95th Avenue between Remington Street and Cresskill Place	weekday	AM	61.6	70.4	64.6	59.0	54.6	52.1	79.1
			MD	59.1	68.8	62.4	55.4	53.0	51.7	85.3
			PM	59.6	69.0	63.0	55.6	53.4	51.6	83.2
58*	138th Place between 94th Avenue and 95th Avenue	weekday	AM	65.8	77.9	67.4	61.5	56.6	40.0	83.6
			MD	68.3	79.7	70.7	63.7	61.4	60.4	86.7
			PM	65.4	75.9	66.8	62.0	59.3	57.9	84.5
59*	95th Avenue between Cresskill Place and Brisbin Street	weekday	AM	63.0	73.6	65.6	54.2	49.0	47.0	84.6
			MD	65.8	77.0	65.0	52.6	49.0	47.0	90.3
			PM	65.8	74.0	65.8	58.4	53.4	49.5	92.7

Table 19-7 (cont'd)
Jamaica Redevelopment Plan
Existing Noise Levels (in dBA)

Site	Location	Time		Leq	L1	L10	L50	L90	Lmin	Lmax
60*	95th Avenue between 143rd Street and 138th Place	weekday	AM	63.2	75.0	64.8	58.0	53.0	49.3	66.6
			MD	65.5	79.0	66.0	57.0	52.8	50.7	83.5
			PM	61.6	71.8	64.2	58.4	54.0	51.3	75.1
61*	144th Place between 91st Avenue and Archer Avenue	weekday	AM	61.5	70.0	64.6	59.4	54.2	51.9	74.0
			MD	63.3	73.0	66.0	60.7	57.8	56.2	78.0
			PM	63.4	72.0	65.2	60.4	57.2	52.7	83.6
62*	Archer Avenue between 144th Place and 146th Street	weekday	AM	70.6	81.2	73.4	67.2	61.4	56.1	84.9
			MD	69.2	78.6	71.8	65.8	61.2	59.0	85.7
			PM	68.3	77.3	71.3	65.6	58.8	55.3	84.4
63*	Archer Avenue between 147th Place and Sutphin Boulevard	weekday	AM	75.8	86.4	78.0	71.2	65.0	61.4	96.3
			MD	73.5	83.4	77.0	69.5	64.8	60.5	86.1
			PM	75.7	86.9	79.2	69.9	64.5	61.6	91.8
64*	147th Place between Archer Avenue and Jamaica Avenue	weekday	AM	65.3	75.0	68.6	62.0	57.2	53.8	79.3
			MD	65.6	75.1	69.2	62.1	58.3	55.3	78.1
			PM	66.6	75.9	69.6	63.2	59.2	56.7	80.4
65	Rufus King Avenue between 153rd Street and Parsons Boulevard	weekday	AM	61.8	68.0	66.2	59.0	55.4	53.8	74.0
			MD	68.8	64.0	58.4	55.6	54.2	77.4	61.0
			PM	59.2	67.2	61.8	57.4	55.0	53.4	70.0
66	89th Avenue between 153rd Street and Parsons Boulevard	weekday	AM	75.4	85.4	78.6	70.8	64.2	78.1	91.8
			MD	70.5	81.0	73.0	65.8	59.6	56.7	90.4
			PM	70.1	79.6	73.4	66.4	60.8	57.3	85.7
67	Parsons Boulevard between 89th Avenue and Rufus King Avenue	weekday	AM	75.4	85.4	78.6	70.8	64.2	58.1	91.8
			MD	70.5	81.0	73.0	65.8	59.6	56.7	90.4
			PM	70.1	79.6	73.4	66.4	60.8	57.3	85.7
68	153rd street between Rufus King Avenue and 89th Avenue	weekday	AM	76.4	85.7	79.8	72.9	64.0	57.9	90.3
			MD	70.6	80.6	74.0	64.2	60.4	57.5	59.2
			PM	72.4	83.6	75.2	63.0	58.4	55.7	90.9

Notes:
* Building Attenuation Measurement
** Measurement could not be taken due to construction noise
Source: Noise Monitoring was performed by AKRF, Inc.

In terms of CEQR criteria, receptors 5, 6, 19, and 57 are in the "acceptable" category; receptors 11, 13, 22, 41, 45, 52, 55, 59-61, 64 and 65 are in the "marginally acceptable" category; receptors 1-4, 7-10, 12, 14, 16-18, 20, 21, 23-25, 27, 29-32, 34-36, 38-40, 42-44, 46-50, 53-55, 58, 62, 63, and 66-68 are in the "marginally unacceptable" category; and receptors, 15, 26, 28, 33, 37, and 51 are in the "clearly unacceptable" category.

D. THE FUTURE WITHOUT THE PROPOSED ACTIONS

Future noise levels without the Proposed Actions were calculated using the proportional modeling technique described above. The results of this calculation are shown in Table 19-8. In the future without the proposed actions, the maximum increase would be 2.0 dBA, which would be barely perceptible and, according to CEQR criteria, insignificant.

Table 19-8
Future Noise Levels Without the Proposed Actions

Site	Day	Time	dBA		
			Existing Leq	No Build Leq	Change
1	Weekday	AM	68.7	69.2	0.5
		MD	68.3	68.8	0.5
		PM	69.8	70.3	0.5
2	Weekday	AM	73.5	74.3	0.8
		MD	76.0	76.9	0.9
		PM	73.1	74.0	0.9
3	Weekday	AM	73.4	74.2	0.8
		MD	72.7	73.6	0.9
		PM	71.9	72.8	0.9
4	Weekday	AM	72.7	73.3	0.6
		MD	70.1	70.7	0.6
		PM	69.8	70.4	0.6
7	Weekday	AM	71.9	72.4	0.5
		MD	72.8	73.8	1.0
		PM	71.6	72.2	0.6
10	Weekday	AM	76.0	76.8	0.8
		MD	74.5	76.5	2.0
		PM	74.9	75.8	0.9
11	Weekday	AM	66.5	67.0	0.5
		MD	67.0	67.5	0.5
		PM	65.8	66.4	0.6
12	Weekday	AM	65.0	65.5	0.5
		MD	69.0	69.6	0.6
		PM	65.5	66.0	0.5
13	Weekday	AM	62.3	63.1	0.8
		MD	63.9	64.4	0.5
		PM	62.6	63.1	0.5
18	Weekday	AM	75.4	75.7	0.3
		MD	72.7	72.8	0.1
		PM	75.1	75.7	0.6
21	Weekday	AM	71.9	72.5	0.6
		MD	73.5	74.2	0.7
		PM	72.3	72.9	0.6

Table 19-8 (cont'd)
Future Noise Levels Without the Proposed Actions

Site	Day	Time	dBA		
			Existing Leq	No Build Leq	Change
24	Weekday	AM	75.3	75.5	0.2
		MD	73.2	74.0	0.8
		PM	74.4	74.5	0.1
25	Weekday	AM	76.1	76.7	0.6
		MD	74.6	75.2	0.6
		PM	76.1	76.7	0.6
26	Weekday	AM	76.8	77.5	0.7
		MD	76.1	76.8	0.7
		PM	74.4	75.2	0.8
27	Weekday	AM	74.7	75.3	0.6
		MD	72.8	73.4	0.6
		PM	73.2	73.8	0.6
36	Weekday	AM	75.9	76.5	0.6
		MD	75.6	76.2	0.6
		PM	74.8	75.4	0.6
39	Weekday	AM	73.9	74.4	0.5
		MD	72.5	73.1	0.6
		PM	72.5	73.0	0.5
42	Weekday	AM	72.9	73.5	0.6
		MD	66.9	68.4	1.5
		PM	68.2	69.5	1.3
44	Weekday	AM	72.9	73.8	0.9
		MD	73.8	74.4	0.6
		PM	72.5	73.3	0.8
45	Weekday	AM	66.8	67.5	0.7
		MD	63.6	64.4	0.8
		PM	64.3	65.2	0.9
46	Weekday	AM	75.3	76.1	0.8
		MD	75.6	76.4	0.8
		PM	73.8	74.6	0.8
47	Weekday	AM	74.8	75.3	0.5
		MD	74.3	74.6	0.3
		PM	75.3	75.8	0.5
49	Weekday	AM	74.3	74.8	0.5
		MD	72.5	73.2	0.7
		PM	70.9	71.7	0.8
50	Weekday	AM	73.5	74.1	0.6
		MD	70.5	71.2	0.7
		PM	71.5	72.2	0.7

Table 19-8 (cont'd)
Future Noise Levels Without the Proposed Actions

Site	Day	Time	dBA		
			Existing Leq	No Build Leq	Change
56	Weekday	AM	72.7	73.1	0.4
		MD	73.6	73.8	0.2
		PM	73.0	73.4	0.4
65	Weekday	AM	61.8	62.4	0.6
		MD	68.8	69.5	0.7
		PM	59.2	59.7	0.5
66	Weekday	AM	75.4	76.1	0.7
		MD	70.5	71.4	0.9
		PM	70.1	71.1	1.0
67	Weekday	AM	75.4	76.2	0.8
		MD	70.5	71.4	0.9
		PM	70.1	71.2	1.1
68	Weekday	AM	76.4	77.1	0.7
		MD	70.6	71.3	0.7
		PM	72.4	73.0	0.6

E. THE FUTURE WITH THE PROPOSED ACTIONS

MOBILE SOURCES

Future noise levels with the Proposed Actions were calculated based on traffic conditions under the proposed actions are using the proportional modeling technique described above. The results of this calculation are shown in Table 19-9. With one exception, the incremental change in noise levels due to traffic generated by the proposed actions would result in increases of less than 1 dBA in one-hour equivalent noise levels $L_{eq(1)}$, which is below the significant impact threshold. That one exception was receptor site 7 at the intersection of Hillside Avenue and 150th Street during the PM peak hour. At receptor site 7, during the PM peak hour, the screening analysis yielded a maximum increase in noise levels of 1.3 dBA. To be conservative a detailed analysis was performed was performed for site 7.

Table 19-9
Future Noise Levels With the Proposed Actions

Site	Day	Time	dBA		
			No Build Leq	Build Leq	Change
1	Weekday	AM	69.2	69.2	0.0
		MD	68.8	68.8	0.0
		PM	70.3	70.3	0.0
2	Weekday	AM	74.3	74.5	0.2
		MD	76.9	77.0	0.1
		PM	74.0	74.2	0.2

Table 19-9 (cont'd)
Future Noise Levels With the Proposed Actions

Site	Day	Time	dBA No Build Leq	dBA Build Leq	dBA Change
3	Weekday	AM	74.2	74.3	0.1
		MD	73.6	73.7	0.1
		PM	72.8	72.9	0.1
4	Weekday	AM	73.3	73.8	0.5
		MD	70.7	71.1	0.4
		PM	70.4	70.9	0.5
7	Weekday	AM	72.4	72.7	0.3
		MD	73.8	74.0	0.2
		PM	72.2	73.5	1.3
10	Weekday	AM	76.8	77.1	0.3
		MD	76.5	76.7	0.2
		PM	75.8	76.1	0.3
11	Weekday	AM	67.0	67.1	0.1
		MD	67.5	67.6	0.1
		PM	66.4	66.3	-0.1
12	Weekday	AM	65.5	65.6	0.1
		MD	69.6	69.4	-0.2
		PM	66.0	66.0	0.0
13	Weekday	AM	63.1	63.7	0.6
		MD	64.4	64.4	0.0
		PM	63.1	63.2	0.1
18	Weekday	AM	75.7	76.1	0.4
		MD	72.8	73.4	0.6
		PM	75.7	76.3	0.6
21	Weekday	AM	72.5	72.7	0.2
		MD	74.2	74.4	0.2
		PM	72.9	73.0	0.1
24	Weekday	AM	75.5	75.6	0.1
		MD	74.0	74.0	0.0
		PM	74.5	74.7	0.2
25	Weekday	AM	76.7	76.7	0.0
		MD	75.2	75.2	0.0
		PM	76.7	76.7	0.0
26	Weekday	AM	77.5	77.7	0.2
		MD	76.8	76.9	0.1
		PM	75.2	75.4	0.2
27	Weekday	AM	75.3	75.4	0.1
		MD	73.4	73.7	0.3
		PM	73.8	73.9	0.1
36	Weekday	AM	76.5	76.8	0.3
		MD	76.2	76.6	0.4
		PM	75.4	75.6	0.2

Table 19-9 (cont'd)
Future Noise Levels With the Proposed Actions

Site	Day	Time	dBA		
			No Build Leq	Build Leq	Change
39	Weekday	AM	74.4	74.5	0.1
		MD	73.1	73.1	0.0
		PM	73.0	73.1	0.1
42	Weekday	AM	73.5	73.5	0.0
		MD	68.4	68.4	0.0
		PM	69.5	69.5	0.0
44	Weekday	AM	73.8	73.9	0.1
		MD	74.4	74.5	0.1
		PM	73.3	73.4	0.1
45	Weekday	AM	67.5	67.6	0.1
		MD	64.4	64.5	0.1
		PM	65.2	65.2	0.0
46	Weekday	AM	76.1	76.3	0.2
		MD	76.4	76.6	0.2
		PM	74.6	74.9	0.3
47	Weekday	AM	75.3	75.6	0.3
		MD	74.6	75.1	0.5
		PM	75.8	76.2	0.4
49	Weekday	AM	74.8	74.9	0.1
		MD	73.2	73.2	0.0
		PM	71.7	71.8	0.1
50	Weekday	AM	74.1	74.2	0.1
		MD	71.2	71.2	0.0
		PM	72.2	72.3	0.1
56	Weekday	AM	73.1	73.1	0.0
		MD	73.8	73.8	0.0
		PM	73.4	73.4	0.0
65	Weekday	AM	62.4	62.4	0.0
		MD	69.5	69.5	0.0
		PM	59.7	59.7	0.0
66	Weekday	AM	76.1	76.2	0.1
		MD	71.4	71.4	0.0
		PM	71.1	71.1	0.0
67	Weekday	AM	76.2	76.2	0.0
		MD	71.4	71.4	0.0
		PM	71.2	71.2	0.0
68	Weekday	AM	77.1	77.1	0.0
		MD	71.3	71.3	0.0
		PM	73.0	73.0	0.0

DETAILED ANALYSIS (SITE 7)

Using the methodology described above a detailed analysis using the TNM model was performed for site 7. This analysis examined conditions during the AM and PM peak hours, the two peak hours for traffic generated by the proposed actions

THE FUTURE WITHOUT THE PROPOSED ACTION: 2015

Table 19-10 shows calculated future noise levels in the future without the proposed actions for the AM and PM analysis periods in the year 2015. As shown in the table, calculated No Build noise levels would be less than 1 dBA higher than Existing noise levels. Increases of this magnitude are imperceptible, and would not be significantly different from Existing noise levels. In terms of CEQR criteria, receptor 7 would remain in the “marginally unacceptable” category.

Table 19-10
Site 7 Future No Build Noise Levels (in dBA)

Day	Time	Calculated 2015 Existing $L_{eq(1)}$	Calculated 2015 No Build $L_{eq(1)}$	Change
Weekday	AM	74.3	75.1	0.8
	PM	74.3	74.9	0.6
Note: Noise Levels calculated using TNM 2.5 **Source:** AKRF, Inc., November 2006				

THE FUTURE WITH THE PROPOSED ACTION: 2015

Table 19-11 shows calculated future noise levels with the proposed actions for the AM and PM analysis periods in the year 2015. Calculated Build noise levels would be less than 1 dBA higher than No Build noise levels. Increases of this magnitude are imperceptible, and would not be significantly different from No Build noise levels. Thus, no significant source noise impact would occur under the proposed actions.

Table 19-11
Site 7 Future Build Noise Levels (in dBA)

Day	Time	Calculated 2015 No Build $L_{eq(1)}$	Calculated 2015 Build $L_{eq(1)}$	Change
Weekday	AM	75.1	75.6	0.5
	PM	74.9	75.5	0.6
Note: Noise Levels calculated using TNM 2.5 **Source:** AKRF, Inc., November 2006				

NOISE ATTENUATION

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.

ATTENUATION REQUIREMENTS

As shown in Table 19-6, the *CEQR Technical Manual* has set noise attenuation requirements for buildings, based on exterior ambient noise levels. Recommended noise attenuation values for buildings are designed to maintain interior noise levels of 45 dBA or lower, and are determined based on exterior $L_{10(1)}$ noise levels.

Table 19-12 shows the highest calculated L_{10} noise levels (for the three analysis time periods) at each receptor location in the study area. Based upon these calculated L_{10} noise levels, the minimum level of building attenuation necessary to achieve acceptable interior noise levels that comply with CEQR requirements was determined for each receptor location (see Table 19-12).

Table 19-12
Required Building Attenuation

Site	Time	$L_{10(1)}$ (dBA)	Minimums Required Building Attenuation Under CEQR (dB)
1	PM	74.1	30
2	MD	78.3	35
3	AM	77.3	35
4	AM	76.8	35
5	PM	64.5	20
6	PM	63.1	20
7	MD	77.1	35
8	AM	75.5	35
9	AM	71.0	30
10	AM	79.7	35
11	MD	69.8	25
12	MD	71.7	30
13	MD	67.0	25
14	AM	77.0	35
15	AM	81.4	40
16	PM	78.7	35
17	PM	77.1	35
18	PM	79.6	35
19	AM	62.5	20
20	AM	78.7	35
21	MD	76.7	35
22	PM	68.7	25
23	AM	77.8	35
24	AM	79.3	35
25	AM	80.5	40
26	AM	81.1	40
27	AM	79.0	35
28	AM	81.1	40

Table 19-12 (cont'd)
Required Building Attenuation

Site	Time	$L_{10(1)}$ (dBA)	Required Attenuation (dB)
29	MD	77.0	35
30	MD	76.4	35
31	PM	75.0	35
32	AM	76.5	35
33	MD	81.5	40
34	AM	71.4	30
35	PM	76.2	35
36	MD	80.3	40
37	AM	81.4	40
38	AM	74.9	30
39	AM	78.5	35
40	AM	77.3	35
41	AM	69.3	25
42	AM	76.7	35
43	AM	79.1	35
44	AM	77.8	35
45	AM	70.5	30
46	MD	79.9	35
47	PM	78.8	35
48	MD	77.5	35
49	AM	77.9	35
50	AM	77.1	35
51	AM	80.4	40
52	PM	69.4	25
53	PM	77.1	35
54	AM	75.3	35
55	AM	66.1	25
56	PM	76.7	35
57	AM	64.6	20
58	MD	70.7	30
59	PM	65.8	25
60	MD	66.0	25
61	MD	66.0	25
62	AM	73.4	30
63	PM	79.2	35
64	PM	69.6	25
65	AM	66.8	25
66	AM	79.3	35
67	AM	79.4	35
68	AM	80.5	40

Source: AKRF, Inc., November 2006

To achieve 25 dBA of building attenuation, double glazed windows with good sealing properties as well as an alternate means of ventilation such as well sealed window air conditioning, is necessary; to achieve 30 dBA of building attenuation, double glazed windows with good sealing properties as well as alternate means of ventilation such as well sealed through-the-wall air conditioning, would be necessary; to achieve 35 dBA of building attenuation, double glazed windows with good sealing properties as well as alternate ventilation such as central air conditioning, is necessary; and to achieve 40 dBA of building attenuation, special design features that go beyond the normal double-glazed window and central air condition is 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.

An (E) designation would be placed on properties that need this attenuation in order to ensure that CEQR interior noise requirements are met. Properties that would be subject to these (E) designations are listed in Appendix C along with a description of the proposed (E) designation language.

Between the DEIS and the FEIS additional monitoring was undertaken at 25 additional locations in the study area for the purposes of gathering supplemental noise data relative to determining ambient noise conditions and project impacts for the FEIS. This involved supplemental noise monitoring around locations where measured $L_{10(1)}$ values reported in the DEIS indicated that 40 dBA of attenuation would be necessary to satisfy CEQR interior noise requirements. The purpose of these additional measurements and subsequent analyses performed for the FEIS was to identify which development sites and/or facades of those sites would require 40 dB of attenuation and which development sites and/or facades of those sites would require less attenuation. As a result of these efforts, certain sites along higher-level noise corridors in the project area were confirmed to require 40 dB of attenuation (e.g., Jamaica Avenue, Van Wyck Expressway). However, at other locations or facades of buildings, based on the supplemental noise monitoring, it was determined that less than 40 dB of attenuation (i.e., 35 dB of attenuation) would be adequate to satisfy CEQR requirements. Appendix C of this FEIS Appendix C, “Proposed (E) Designations” has been modified to reflect this additional noise monitoring work. ✷