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, stem from the movement of people and goods, activities that 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.

This chapter details the potential significant noise impacts that could result from the proposed action. The proposed action would change traffic volumes in the general vicinity of the rezoning area. Since traffic is a main source of ambient noise, project-generated traffic increases could lead to changes in the ambient noise level. To identify and quantify any such potential impacts from the proposed action, a noise analysis was designed and conducted, and is detailed in this chapter. The noise analysis for the proposed action consists of three parts:

- A screening analysis to determine locations where traffic generated by the proposed action would have the potential to cause significant noise impacts;
- A detailed analysis at any location where traffic generated by the proposed action 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 in proposed buildings satisfy applicable interior noise criteria.

B. PRINCIPAL CONCLUSIONS

The analysis concludes that the traffic generated by the proposed action would not produce significant increases in noise levels at any location within and/or adjacent to the rezoning area. In addition, with implementation of the proposed design measures, noise levels within the proposed buildings would comply with all applicable requirements. The measures for providing sufficient building attenuation would be mandated by placing an E-designation on the rezoning area—Block 4978, Lot 25—requiring window/wall attenuation that would provide at least 35 dBA for all façades of each building. This would provide sufficient attenuation to achieve the CEQR requirements, and, therefore, the proposed action would not result in any significant adverse noise impacts.

C. 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, 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 10 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 simulates 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 17-1.

Table 17-1
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 17-2). Generally, changes in noise levels of 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 17-2
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 17-3). 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 17-3
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 analysis, 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.

D. METHODOLOGY

TRAFFIC NOISE MODEL (TNM)

At all locations, the *Traffic Noise Model* Version 2.5 (TNM) was used to calculate noise levels. 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 model for traffic noise analysis.

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 before the start of construction); and specifies noise standards, including plainly audible criteria, for specific noise sources (i.e., refuse collection vehicles, air compressors, circulation devices, exhausts, paving breakers, commercial music, personal audio devices, sound reproduction devices, animals, motor vehicles including motorcycles and trucks, sound signal devices, burglar alarms, emergency signal devices, lawn care devices, snow blowers, etc.). In addition, the amended code specifies that 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 17-4 at the specified receiving properties.

Table 17-4
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 17-4 and 17-5. 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 17-6.

Table 17-5
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]		$L_{10} \leq 55$ dBA	---------- Ldn ≤ 60 dBA ----------						
2. Hospital, nursing home		$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 65$ dBA	---------- 60 < Ldn ≤ 65 dBA ----------	$65 < L_{10} \leq 80$ dBA	(I) 65 < Ldn ≤ 70 dBA, (II) 70 ≤ Ldn	$L_{10} > 80$ dBA	---------- Ldn ≤ 75 dBA ----------
3. 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	
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 17-6
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 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 and future actions would result in a significant adverse noise impact. The impact assessments compare the projected Build condition $L_{eq(1)}$ noise levels to those calculated for the No Build condition, for receptors potentially affected by the proposed and future 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).

E. EXISTING CONDITIONS

STUDY AREA

The study area for this analysis is bounded to the east by Prince Street, to the south by Roosevelt Avenue, to the west by Bowne Street, and to the north by Northern Boulevard. These roadways surround the rezoning area and are thus the areas with the highest potential for noise impacts.

SELECTION OF NOISE RECEPTOR LOCATIONS

Based on a screening analysis, six noise receptor locations were chosen near the rezoning area (see Figure 17-1). Site 1 is located on 38th Avenue between Union Street and Bowne Street, Site 2 is located on Union Street between 37th Avenue and 38th Avenue, Site 3 is located on 37th Avenue between Union Street and 138th Street, Site 4 is located on 138th Street between 37th Avenue and 38th Avenue, Site 5 is located on 38th Street between 138th Street and Main Street, and Site 6 is located on Union Street and 138th Street.

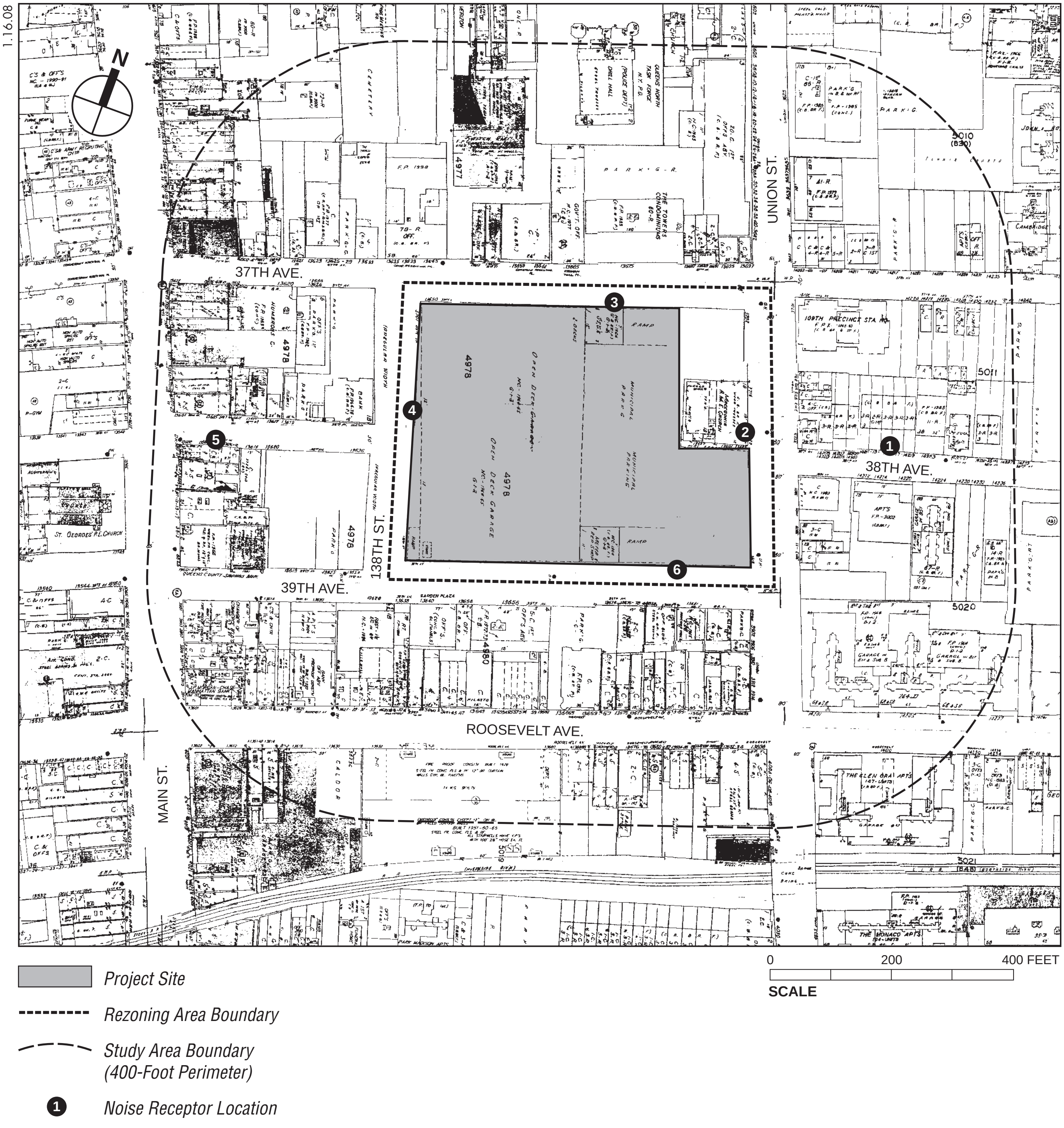
These sites are representative of other locations in the immediate area and are generally the locations where maximum impacts would be expected. These sites were used to assess the potential impacts due to traffic noise generated by the proposed action.

NOISE MONITORING

At each receptor site, existing noise levels were determined for the three noise analysis time periods by field measurements. Noise monitoring was performed at all six sites on October 10 and 14, 2007, and January 15, 2008. At all of the noise monitoring locations, 20-minute spot measurements were taken during the two weekday periods and one Saturday period that reflect peak hours of trip generation: AM weekday (7:30 AM to 8:30 AM), PM weekday (5 PM to 6:30 PM), and Saturday midday (1 PM to 3 PM).

EQUIPMENT USED DURING NOISE MONITORING

The instrumentation used for the 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 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



Noise Receptor Locations
Figure 17-1

sound measurements except for calibration. All measurement procedures conformed to the requirements of ANSI Standard S1.13-1971 (R2005).

EXISTING NOISE LEVELS AT NOISE RECEPTOR LOCATIONS

MEASURED NOISE LEVELS

Noise monitoring results for the six receptor locations are summarized in Table 17-7. Traffic is the dominant noise source at all six sites. Noise levels are generally moderate to high and reflect the level of activity in the area.

Table 17-7
Existing Noise Levels at Sites 1 Through 6 (in dBA)

Site	Measurement Location	Day	Time	L_{eq}	L_1	L_{10}	L_{50}	L_{90}
1	38th Avenue between Union Street and Bowne Street	Weekday	AM	62.9	73.8	64.4	59.2	54.8
		Weekday	PM	62.7	71.6	65.2	60.2	55.4
		Weekend	MD	63.1	73.5	64.4	58.9	54.4
2	Union Street between 37th Avenue and 38th Avenue	Weekday	AM	71.7	81.8	74.8	66.2	60.4
		Weekday	PM	72.5	84.8	75.6	66.4	59.6
		Weekend	MD	68.6	80.2	71.5	63.4	58.6
3	37th Avenue between Union Street and 138th Street	Weekday	AM	61.4	67.4	64.6	60.1	56.4
		Weekday	PM	64.6	77.2	65.8	59.0	55.0
		Weekend	MD	63.0	74.6	63.9	58.8	55.9
4	138th Street between 37th Avenue and 38th Avenue	Weekday	AM	68.7	80.6	70.0	63.4	60.6
		Weekday	PM	67.6	78.6	69.6	63.6	59.8
		Weekend	MD	66.0	77.0	68.2	62.5	59.3
5	38th Avenue between 138th Street and Main Street	Weekday	AM	69.3	81.4	70.2	63.2	59.4
		Weekday	PM	67.0	76.6	68.6	62.4	57.2
		Weekend	MD	66.6	77.1	68.6	62.4	58.8
6	39th Avenue between Union Street and 138th Street	Weekday	AM	66.7	77.0	69.8	61.8	58.4
		Weekday	PM	70.9	81.0	73.2	67.2	60.8
		Weekend	MD	67.1	76.5	69.9	63.4	59.4
Note:	Field measurements were performed by AKRF, Inc. on October 10 and 14, 2007, and January 15, 2008.							

In terms of CEQR noise criteria, noise levels at Sites 1 and 3 are in the “marginally acceptable” category, and noise levels at Sites 2, 4, 5, and 6 are in the “marginally unacceptable” category.

F. THE FUTURE WITHOUT THE PROPOSED ACTION

Using the methodology previously described, future noise levels without the proposed action (i.e., No Build conditions) were calculated for the three analysis periods in the year 2013. Table 17-8 shows the calculated noise levels.

Comparing future 2013 No Build conditions with existing conditions, the maximum increase in $L_{eq(1)}$ noise level would be less than 3 dBA. Increases of this magnitude would be barely perceptible, and, based on CEQR criteria, insignificant. At Sites 1, 2, 5, and 6, during certain time periods, there would be a decrease in noise levels between existing conditions and the future without the proposed action. This would result from decreases in traffic at these locations during these time periods as a result of directional flow changes (see Chapter 14, “Traffic and Parking,” for details of roadway changes in the future without the proposed action).

Table 17-8
2013 No Build Noise Levels (in dBA)

Site	Day	Time	Existing $L_{eq(1)}$	2013 No Build $L_{eq(1)}$	Change
1	Weekday	AM	62.9	63.3	0.4
	Weekday	PM	62.7	63.1	0.4
	Weekend	MD	63.1	64.0	0.9
2	Weekday	AM	71.7	72.8	1.1
	Weekday	PM	72.5	72.1	-0.4
	Weekend	MD	68.6	70.0	1.4
3	Weekday	AM	61.4	62.2	0.5
	Weekday	PM	64.6	65.7	1.1
	Weekend	MD	63.0	63.9	0.9
4	Weekday	AM	68.7	69.4	0.7
	Weekday	PM	67.6	69.7	2.1
	Weekend	MD	66.0	66.8	0.8
5	Weekday	AM	69.3	69.5	0.2
	Weekday	PM	67.0	69.4	2.4
	Weekend	MD	66.6	67.6	1.0
6	Weekday	AM	66.7	66.8	0.1
	Weekday	PM	70.9	70.1	-0.8
	Weekend	MD	67.1	65.9	-1.2

In terms of CEQR noise criteria, noise levels at Sites 1 and 3 would remain in the “marginally acceptable” category, and noise levels at Sites 2, 4, 5, and 6 would remain in the “marginally unacceptable” category.

G. PROBABLE IMPACTS OF THE PROPOSED ACTION

Using the methodology previously described, future noise levels with the proposed action (i.e., Build conditions) were calculated for the three analysis periods in the year 2013. Table 17-9 shows the calculated noise levels.

Comparing future 2013 Build conditions with 2013 No Build conditions, the maximum increase in $L_{eq(1)}$ noise level would be less than 3 dBA. Increases of this magnitude would be barely perceptible, and, based on CEQR impact criteria, would not be significant. At Sites 1, 2, 4 and 5 during certain time periods, there would be a decrease in noise levels between conditions in the future without the proposed action and in the future with the proposed action. This would result from decreases in traffic at these locations during these time periods as a result of changes in the configuration of public parking on the project site (see Chapter 14 for details).

In terms of CEQR noise criteria, noise levels at Site 1 would change from the “marginally acceptable” category to the “clearly acceptable” category, noise levels at Site 3 would remain in the “marginally acceptable” category, and noise levels at Sites 2, 4, 5, and 6 would remain in the “marginally unacceptable” category.

Table 17-9
2013 Build Noise Levels (in dBA)

Site	Day	Time	2013 No Build $L_{eq(1)}$	2013 Build $L_{eq(1)}$	Change
1	Weekday	AM	63.3	61.1	-2.2
	Weekday	PM	63.1	61.4	-1.7
	Weekend	MD	64.0	62.0	-2.0
2	Weekday	AM	72.8	72.5	-0.3
	Weekday	PM	72.1	72.0	-0.1
	Weekend	MD	70.0	69.7	-0.3
3	Weekday	AM	62.2	62.8	0.6
	Weekday	PM	65.7	66.7	1.0
	Weekend	MD	63.9	65.5	1.6
4	Weekday	AM	69.4	69.1	-0.3
	Weekday	PM	69.7	69.0	-0.7
	Weekend	MD	66.8	65.7	-1.1
5	Weekday	AM	69.5	69.2	-0.3
	Weekday	PM	69.4	69.4	0.0
	Weekend	MD	67.6	67.8	0.2
6	Weekday	AM	66.8	67.3	0.5
	Weekday	PM	70.1	72.8	2.7
	Weekend	MD	65.9	68.3	2.4

MECHANICAL EQUIPMENT

No detailed designs of the proposed buildings' mechanical systems (i.e., heating, ventilation, and air conditioning systems) are available at this time. However, these systems would be designed to meet all applicable noise regulations and requirements, and would not produce any significant increases in ambient noise levels.

ATTENUATION REQUIREMENTS

As shown in Table 17-6, the *CEQR Technical Manual* has set noise attenuation requirements for buildings based on exterior $L_{10(1)}$ noise levels. Recommended noise attenuation values for buildings are designed to maintain interior noise levels of 45 dBA or lower for residential use and 50 dBA or lower for commercial use.

Table 17-10 shows the highest calculated $L_{10(1)}$ noise levels (for the three analysis time periods) for noise receptors within the project site and rezoning area and the building attenuation that would be required to achieve acceptable interior noise levels at each location. The provision for providing sufficient building attenuation would be mandated by placing an E-designation on the project site and rezoning area—Block 4978, Lot 25. The text of the E-designation is as follows:

> In order to ensure an acceptable interior noise environment, any future residential, community facility, and/or commercial uses must be designed to provide a closed window condition with a minimum of 35 dBA window/wall attenuation on the east façade, at least 30 dBA of window/wall attenuation on the west and south facades, and at least 25 dBA of window/wall attenuation on the north façade in order to maintain an interior ($L_{10(1)}$) noise level of 45 dBA. 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).

Table 17-10
Minimum Building Attenuation to Comply with CEQR Requirements

Site	Maximum Build $L_{10(1)}$ (dBA)	Required Building Attenuation (dBA)
2	75.6	35
3	67.9	25
4	71.0	30
6	75.1	30

Notes: The required attenuation figures assume a residential use. Required attenuation would be 5 dBA less for commercial uses.

The design of these buildings would include the use of well-sealed, double-glazed windows and central air conditioning (i.e., an alternate means of ventilation). With these measures, the window/wall attenuation would provide at least 35 dBA for all façades of each building, which would provide sufficient attenuation to achieve the CEQR requirements. ✷