CHAPTER 18: 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 *CEQR Technical Manual* sets forth procedures for noise impact evaluation, intending to minimize or prevent negative effects on the community as a result of noise. These procedures formed the basis for an analysis of the noise implications of the proposed actions.

B. OVERVIEW

The noise analysis for the proposed actions included the following:

- 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;
- Prediction of future noise levels;
- 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.

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 attenuation design measures, noise levels within any buildings that would occur due to the proposed actions 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 18-1.

Table 18-1
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 18-2). 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.

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

Table 18-2
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.

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 18-3). 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 18-3
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 *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.

C. METHODOLOGY

PROPORTIONAL MODELING

Proportional modeling is a screening tool that was used to determine locations which had the potential for having significant noise impacts and to access potential impacts. Proportional modeling is one of the techniques recommended in the *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 action 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:

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

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.

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 18-4 at the specified receiving properties.

Table 18-4
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 18-5 and 18-6. 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 18-6.

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 action 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

Table 18-5
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 ≤ 60 dBA ----------						
2. Hospital, Nursing Home		$L_{10} \le 55$ dBA		$55 < L_{10} \le 65$ dBA	---------- 60 < Ldn ≤ 65 dBA ----------	$65 < L_{10} \le 80$ 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	$L_{10} \le 65$ 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 18-6
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

$L_{eq(1)}$. 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.)

D. EXISTING CONDITIONS

NOISE MONITORING

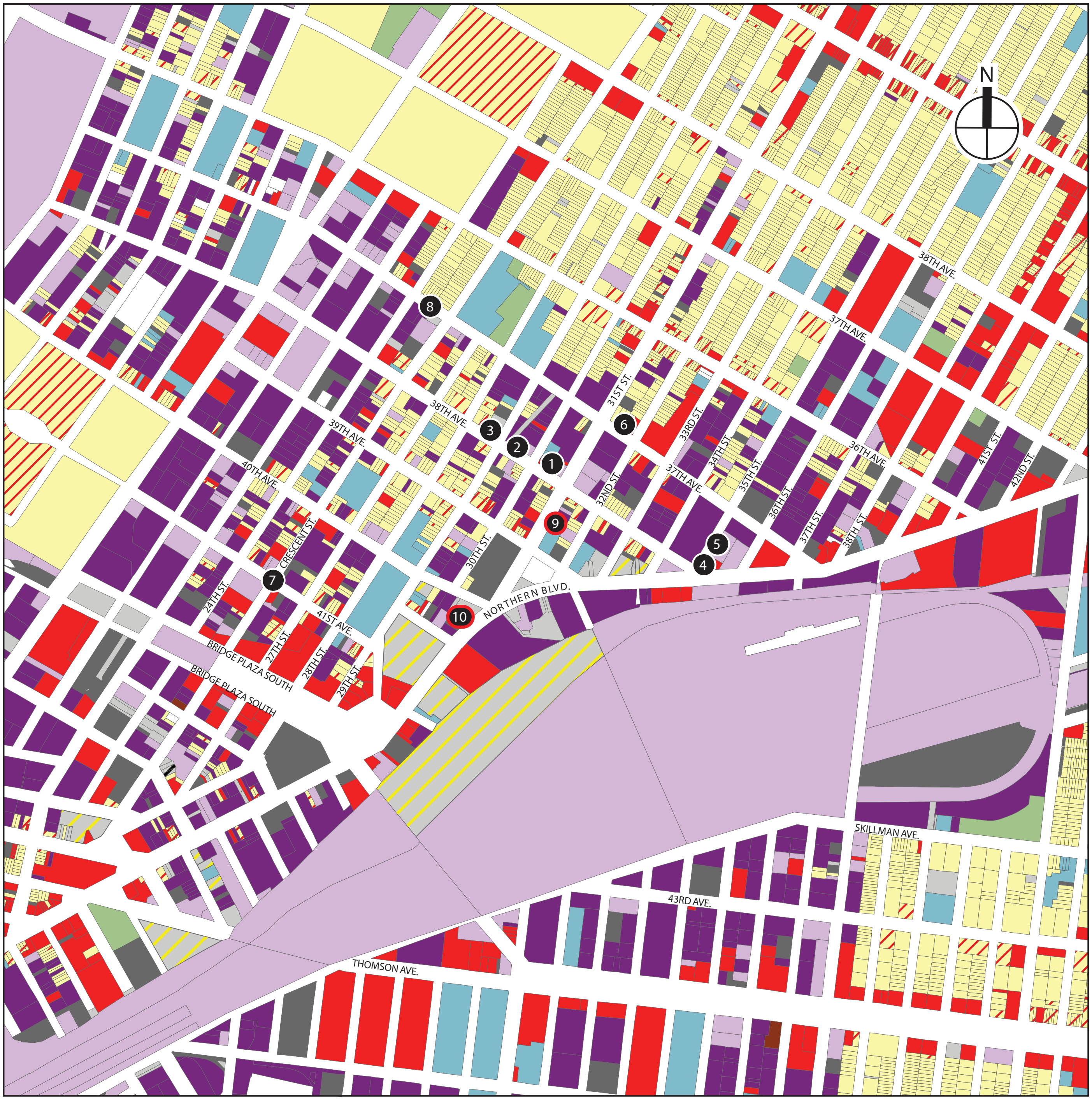
Existing noise levels were measured for 20-minute periods during the three weekday peak periods—AM (7:30– 9:30 AM), midday (MD) (12:00 – 2:00 PM), and PM (4:00 – 6:00 PM) between February 1 and March 11, 2008 at ten noise receptor sites within the project area. An additional 1-hour measurement was taken by DCP during the midday peak period on August 26, 2008.

- Noise Receptor Site 1 was located on 38th Avenue between 31st Street and 30th Street;
- Noise Receptor Site 2 was located on 38th Avenue between 30th Street and 29th Street;
- Noise Receptor Site 3 was located on 38th Avenue between 29th Street and 28th Street;
- Noise Receptor Site 4 was located on Northern Boulevard between 35th Street and 36th Street;
- Noise Receptor Site 5 was located on 35th Avenue between Northern Boulevard and 37th Avenue;
- Noise Receptor Site 6 was located on 37th Avenue between 32nd Street and 31st Street;
- Noise Receptor Site 7 was located on Crescent Street between 37th Avenue and 38th Avenue;
- Noise Receptor Site 8 was located on 39th Avenue between Crescent Street and 24th Street;
- Noise Receptor Site 9 was at an elevated location on 31st Street between 38th Avenue and 39th Avenue;
- Noise Receptor Site 10 was at an elevated location on Northern Boulevard between 40th Road and 40th Avenue.

Noise Receptor Sites 1-7 were examined for potential project-generated traffic related noise impacts and for determining building attenuation requirements, and Noise Receptor Sites 8-10 were examined only for building attenuation purposes (See Figure 18-1).

EQUIPMENT USED DURING NOISE MONITORING

The instrumentation used for the ~~20-minute~~ noise measurements was a Brüel & Kjær Type 4189 one-half-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 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°F and below 122°F. All measurement procedures conformed with the requirements of ANSI Standard S1.13-1971 (R2005).



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SCALE

- 1 Noise Receptor Location
- 10 Elevated Noise Receptor
- Residential
- Residential with Commercial Below
- Hotels
- Commercial and Office Buildings
- Industrial and Manufacturing
- Transportation and Utility
- Public Facilities and Institutions
- Open Space and Outdoor Recreation
- Parking Facilities
- Vacant Land
- Vacant Building
- Under Construction

New York City
Department of City Planning

Dutch Kills Rezoning and Related Actions

Noise Receptor Locations

The Louis Berger Group, Inc.

Figure 18-1

EXISTING NOISE LEVELS AT NOISE RECEPTOR LOCATIONS

MEASURED NOISE LEVELS

Noise monitoring results for all of the receptor locations are summarized in Table 18-7. At Noise Receptor Sites 1, 9 and 10, noise generated by the elevated N and W subway lines was the dominant noise source. At Noise Receptor Sites 2 and 3, noise generated by the elevated N and W subway lines and traffic on adjacent roadways were both major contributors to the ambient noise levels. At all other locations, traffic on adjacent roadways was the dominant noise source.

Table 18-7
Existing Noise Levels (in dBA)

Site	Measurement Location	Time	L_{eq}	L_1	L_{10}	L_{50}	L_{90}
1	38th Avenue between 30th Street and 31st Street	AM	71.7	83.0	74.7	66.1	58.3
		MD	68.9	80.1	71.3	62.6	57.9
		PM	69.0	82.0	71.1	62.9	57.5
2	38th Avenue between 29th Street and 30th Street	AM	64.6	74.1	67.0	62.2	58.5
		MD	66.7	75.6	69.8	64.1	59.2
		PM	64.0	73.5	66.2	61.2	56.6
3	38th Avenue between 28th Street and 29th Street	AM	66.8	77.5	69.4	63.0	56.0
		MD	63.9	75.1	67.1	58.9	52.3
		PM	61.4	70.1	65.2	58.7	53.2
4	Northern Boulevard between 35th Street and 36th Street	AM	73.3	82.7	75.7	72.2	63.8
		MD	70.7	78.1	73.4	69.5	63.2
		PM	71.2	77.8	73.7	70.5	65.1
5	35th Street between 37th Avenue and 38th Avenue	AM	64.0	73.9	64.8	60.5	57.5
		MD	65.2	74.3	68.0	62.6	57.6
		PM	65.4	74.0	67.0	62.2	57.3
6	37th Avenue between 31st Street and 32nd Street	AM	70.1	82.4	73.1	64.1	59.2
		MD	70.0	82.6	73.8	61.9	56.7
		PM	68.3	78.8	73.4	60.6	55.3
7	Crescent Street between 37th Avenue and 38th Avenue	AM	71.9	84.2	74.2	68.2	65.6
		MD	69.7	79.8	70.7	65.2	61.9
		PM	68.6	76.9	71.1	66.3	62.0
8	39th Avenue between 24th Street and Crescent Street	AM	65.9	75.2	69.2	62.8	59.1
		MD	66.4	76.6	69.5	62.4	55.6
		PM	64.9	75.6	67.2	58.9	54.9
9	31st Street between 38th Avenue and 39th Avenue*†	AM	78.5	90.2	82.4	67.1	60.8
		MD	~~81.2~~ 74.9	~~93.6~~ 87.4	~~85.2~~ 80.6	~~67.4~~ 65.2	~~60.3~~ 58.8
		PM	80.6	93.2	83.8	68.9	60.4
10	Northern Boulevard between 40th Avenue and 40th Road*	AM	80.6	91.8	84.4	73.9	65.7
		MD	79.3	90.9	82.1	72.4	65.5
		PM	79.5	91.4	83.0	73.6	67.5

Note: *Measurements performed at elevated locations adjacent to elevated subway.
Field measurements were performed by AKRF, Inc. between February 1 and March 11, 2008.
[†]Additional MD measurements performed at an elevated location adjacent to the elevated subway by DCP on August 26, 2008.

In terms of the CEQR criteria, Noise Receptor Sites 2, 3, 5, and 8 are in the "marginally acceptable" category; Noise Receptor Sites 1, 4, 6, and 7 are in the "marginally unacceptable" category; and Noise Receptor Sites 9 and 10 are in the "clearly unacceptable" category.

E. IMPACT ANALYSIS

Future noise levels at Noise Receptor Sites 1-7, with and without the proposed actions, were calculated using the proportional modeling technique described above. The results of these calculations are shown in Table 18-8. In the future without the proposed actions, the maximum increase would be 2.6 dBA or less. Increases of this magnitude would be barely perceptible and, according to CEQR criteria, insignificant. In the future with the proposed actions, the maximum increase would be less than 1 dBA. Increases of this magnitude would be imperceptible and, according to CEQR criteria, insignificant. As a result, there is no potential for the proposed actions to result in a significant adverse noise impact. At some locations during certain time periods the noise levels would be less in the future with the proposed actions than the future without the proposed actions. This is due to changes that would occur in truck routes with the proposed actions.

Table 18-8
Noise Impact Screening Analysis Results

Site	Time	dBA					
		Existing L_{eq}	No Build L_{eq}	No Build Increment	Build L_{eq}	Build Increment	Build L_{10}
1	AM	71.7	72.4	0.7	72.3	-0.1	75.3
	MD	68.9	69.8	0.9	69.8	0.0	72.2
	PM	69.0	69.7	0.7	69.8	0.1	71.9
2	AM	64.6	65.0	0.4	65.0	0.0	67.4
	MD	66.7	67.2	0.5	67.3	0.1	70.4
	PM	64.0	64.6	0.6	64.6	0.0	66.6
3	AM	66.8	67.3	0.5	67.3	0.0	69.9
	MD	63.9	64.5	0.6	64.5	0.0	67.7
	PM	61.4	62.0	0.6	62.0	0.0	65.6
4	AM	73.3	74.3	1.0	74.2	-0.1	76.6
	MD	70.7	71.6	0.9	71.5	-0.1	74.2
	PM	71.2	72.3	1.1	72.3	0.0	74.8
5	AM	64.0	65.1	1.1	64.6	-0.5	65.4
	MD	65.2	66.3	1.1	66.2	-0.1	69.0
	PM	65.4	66.4	1.0	66.5	0.1	68.1
6	AM	70.1	71.9	1.8	71.9	0.0	74.9
	MD	70.0	72.6	2.6	72.6	0.0	76.4
	PM	68.3	69.7	1.4	69.8	0.1	74.9
7	AM	71.9	72.2	0.3	72.3	0.1	74.4
	MD	69.7	70.0	0.3	70.1	0.1	71.1
	PM	68.6	68.9	0.3	68.9	0.0	71.4

NOISE ATTENUATION

ATTENUATION REQUIREMENTS

As shown in Table 18-6, 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 18-9 shows the minimum window/wall attenuation necessary to meet CEQR requirements for internal noise levels at each of the noise measurement locations.

All of the projected and potential development sites included in the proposed actions are within the Long Island City Special Mixed Use District. The zoning text for this district specifies that all residential uses will include at least 35 dBA of window/wall attenuation. In light of this fact, the building attenuation analysis focuses on identifying locations that will need more attenuation than is specified in the zoning text.

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

Table 18-9
Required Attenuation at Noise Measurement Locations

Site	Location	Maximum Calculated/Measured $L_{10(1)}$ Value (dBA)	Minimum Required Attenuation** (dBA)
1	38th Avenue between 30th Street and 31st Street	75.3	35
2	38th Avenue between 29th Street and 30th Street	70.4	30*
3	38th Avenue between 28th Street and 29th Street	69.9	25*
4	Northern Boulevard between 35th Street and 36th Street	76.6	35
5	35th Street between 37th Avenue and 38th Avenue	69.0	25*
6	37th Avenue between 31st Street and 32nd Street	76.4	35
7	Crescent Street between 37th Avenue and 38th Avenue	74.4	30*
8	39th Avenue between 24th Street and Crescent Street	69.5	25*
9	31st Street between 38th Avenue and 39th Avenue	85.2 83.8	45 40
10	Northern Boulevard between 40th Avenue and 40th Road	84.4	40

Notes: ***These values are the minimum attenuation to provide an interior $L_{10(1)}$ value less than 45 dBA, the actual minimum required attenuation at these locations will be at least 35 dBA as specified by the Long Island City Special Mixed Use district zoning text.
****Attenuation values are shown for residential uses; commercial uses would be 5 dBA less.

designed windows (i.e., windows with small sizes, windows with air gaps, windows with thicker glazing, etc.), and additional building insulation.

Based on the values shown in Table 18-8, minimum required building attenuation levels beyond the 35dBA specified by Long Island City Special Mixed Use District were determined at each affected projected and potential development site. E-designations would be employed for these development sites which are shown in Tables G-1 and G-2 in Appendix G[1].

As noted in the DEIS, between the DEIS and FEIS, DCP examined the potential to make attenuation requirements specific to certain building facades and determined that such refinements could not be made.

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.

F. CONCLUSION

In conclusion, the noise 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. To maintain acceptable interior noise levels, E-designations for noise will be mapped on the necessary development sites as part of the rezoning action to ensure that there would not be any significant adverse noise impacts Therefore, the proposed actions would not result in any significant adverse noise impacts.

~~It is possible that between Draft EIS and Final EIS, further noise analysis and refinements will be undertaken which could result in more specific building attenuation requirements as presently seen in the E-designations found in Appendix G. If so, the DCP will coordinate with NYCDEP between the Draft EIS and Final EIS.~~

[1] Prior to publication of the FEIS, DCP learned that certain development sites within the rezoning area are being developed for hotel use (see footnote on page 1-15). Therefore, these sites have been removed from the list of sites receiving E-designations (see Appendix G, “Noise E-Designations”)