15. Noise

15.1 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, sanitation trucks, construction and maintenance equipment. Other sources, such as train and traffic noise, are essential by products of maintaining the viability of the city as a place for people to live and do business. Although all these noise-producing activities are necessary, the noise they generate is largely undesirable and detracts from the quality of life of the living environment. Furthermore, there is increasing evidence that excessive noise is a threat to the general public health.

This chapter assesses the potential for the Proposed Action to result in significant adverse noise impacts as a result of the proposed East Midtown Rezoning project. In accordance with the guidelines of the *CEQR Technical Manual*, ambient noise levels were measured at representative locations within the project study area and where future project generated traffic could have the potential to cause a significant traffic noise impact.

15.2 PRINCIPAL CONCLUSIONS

The findings of the noise analysis indicated that the Proposed Action would not generate sufficient traffic to have the potential to cause a significant noise impact (i.e., it would not result in a doubling of the noise passenger car equivalents which would be necessary to cause a three dBA increase in noise levels). Therefore, the noise analysis concludes that the traffic generated by the Proposed Action would not have the potential to produce significant increases to noise levels at any sensitive receptors within the project study area. However, ambient noise levels adjacent the projected and potential development sites were examined to determine if building noise attenuation requirements for maintaining interior noise level would be necessary. That assessment found noise levels would be in the "marginally unacceptable" or "clearly unacceptable" exterior noise exposure category, resulting in a minimum noise attenuation requirement of 31-36 dBA to ensure noise levels within the proposed development sites would comply with all applicable requirements. As a result, the Proposed Action includes (E) designations (E-310) for all of the projected and potential development sites. The window/wall attenuation levels required under the (E) designation would avoid the potential for significant adverse noise impacts due to the Proposed Action.

15.3 ACOUSTICAL FUNDAMENTALS

Noise is considered unwanted sound. Sound is a fluctuation in air pressure. Sound pressure levels are measured in units called "decibels" (dB). The particular character of the sound that we hear (a whistle compared with a French horn, for example) is determined by the speed, or "frequency," at which the air pressure fluctuates, or "oscillates." Frequency defines the oscillation of sound pressure in terms of cycles per second (cps). One cycle per second is known as 1 hertz (Hz). People can hear sound over a relatively limited range of frequencies, generally between 20 Hz and 20,000 Hz. Furthermore, the human ear does not perceive all frequencies equally well. High frequencies (e.g., a whistle) are more easily discernable and therefore more intrusive than many of the lower frequencies (e.g., the lower notes on the French horn).

15.3.1 A-Weighted Sound Level (dBA)

In order to establish a uniform noise measurement that simulates people's perception of loudness and annoyance, the decibel measurement is weighted to account for those frequencies most audible to the human hearing range. This is known as the A-weighted sound level, or "dBA," and it is the descriptor of noise levels most often used for community noise. As shown in Table 15-1, the threshold of human hearing is defined as 0 dBA; very quiet conditions (as in a library, for example) are approximately 40 dBA; levels between 50 dBA and 70 dBA define the range of noise levels generated by normal daily activity; levels above 70 dBA would be considered noisy, and then loud, intrusive, and deafening as the scale approaches 130 dBA.

TABLE 15-1: COMMON NOISE LEVELS

Sound Source	dBA
Military jet, air raid siren	130
Amplified rock music	110
Jet takeoff at 500 meters	100
Train horn at 30 meters	90
Busy city street, loud shout	80
Highway traffic at 15 meters, train	70
Predominantly industrial area	60
Background noise in an office	50
Public library	40
Soft whisper at 5 meters	30
Threshold of hearing	0

Source: *Cowan, James P.* Handbook of Environmental Acoustics. *Van Nostrand Reinhold, New York, 1994; Egan, M. David, Architectural Acoustics. McGraw-Hill Book Company, 1988.*
Note: A 10 dBA increase in level appears to double the loudness, and a 10 dBA decrease halves the apparent loudness.

It is important to note that the dBA scale is logarithmic, meaning that each increase of 10 dBA describes a doubling of perceived loudness. Thus, the background noise in an office, at 50 dBA, is perceived as twice as loud as a library at 40 dBA. For most people to perceive an increase in noise, it must be at least 3 dBA. At 5 dBA, the change will be readily noticeable.

Combinations of different sources are added logarithmically due to the dBA scale's nature. For example, two noise sources—a vacuum cleaner operating at approximately 72 dBA and a telephone ringing at approximately 58 dBA—do not combine to create a noise level of 130 dBA (the equivalent of a jet airplane or air raid siren as show in Table 15-1). In fact, the noise produced by the telephone ringing would be largely masked by the noise of the vacuum cleaner, and the combination of these two noise sources would yield a total noise level of 72.2 dBA.

15.3.2 Community Response to Changes in Noise Levels

The average ability of an individual to perceive a change in noise levels is well documented (Table 15-2). 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 halving) of noise levels. These guidelines permit direct estimation of an individual's probable perception of changes in noise levels.

TABLE 15-2: 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

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. Table 15-3 outlines 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. 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 15-3: AVERAGE ABILITY TO PERCEIVE CHANGES 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).

15.3.3 Effects of Distance on Sound

Sound varies with distance. For example, highway traffic 50 feet away from a person listening to the traffic noise (considered a receptor) typically produces sound levels of approximately 70 dBA. The same highway noise would be measured as 66 dBA at a distance of 100 feet, assuming "soft" ground conditions. Soft ground conditions are those surfaces consisting of grass or short vegetation and hard surfaces are typically those comprised of concrete pavements. Soft ground surfaces absorb more of the sound as you move further away from the noise source. The decrease of sound with distance is known as "drop-off" rate. The outdoor drop-off rate for line sources, such as traffic, is a decrease of approximately 4.5 dBA (for soft ground) for every doubling of distance between the noise source and receiver. Whereas the drop-off rate for line sources under hard ground conditions is 3 dBA for every doubling of distance. Sound sources not moving are referred to as stationary noise sources. Assuming soft ground, for point sources, such as amplified rock music, the outdoor drop-off rate is a decrease of approximately 7.5 dBA for every doubling of distance between the noise source and receiver (for hard ground the outdoor drop-off rate is 6 dBA for point sources).

15.3.4 Sound Level Descriptors

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 that fluctuates over extended periods have been developed. One way is to describe the fluctuating sound 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 by $L_{eq(24)}$)—conveys the same sound energy as the actual time-varying sound. Statistical sound level descriptors such as L_1, L_{10}, L_{50}, L_{90}, and L_x are 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.

The relationship between L_{eq} and exceedance percentile noise levels is worth noting. Because L_{eq} is defined as sound energy rather than straight numerical statistical 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 generated noise fluctuates broadly, the L_{eq} will be approximately equal to the L_{10} value. If extreme fluctuations are present, the $L_{eq(1)}$ will exceed the L_{90} or the background level by 10 or more decibels. Thus the relationship between $L_{eq(1)}$ and the percentile levels of exceedance will depend on the character of the generated noise. In community noise measurements, it has been observed in general that the L_{eq} is generally between L_{10} and L_{50}.

15.4 NOISE STANDARDS AND CRITERIA

15.4.1 New York CEQR Noise Standards

The *CEQR Technical Manual* contains noise exposure guidelines for use in New York City environmental impact review, and required attenuation values to achieve acceptable interior noise levels. These values are shown in Table 15-4 and Table 15-5. Noise exposure is classified into four categories: “acceptable,” “marginally acceptable,” “marginally unacceptable,” and “clearly unacceptable.” The *CEQR Technical Manual* criteria are based on maintaining an interior noise level for the worst-case hour L_{10} or less than or equal to 45 A-weighted decibels (dBA).

15.4.2 Impact Definition

- An increase of 5 dBA or more, in With-Action $L_{eq(1)}$ noise levels at sensitive receptors (including residences, play areas, parks, schools, libraries and houses of worship) over those calculated for the No-Action condition, if the No-Action levels are less than 60 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 4 dBA or more, in With-Action $L_{eq(1)}$ noise levels at sensitive receptors over those calculated for the No-Action condition, if the No-Action levels are 61 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 3 dBA or more, in With-Action $L_{eq(1)}$ noise levels at sensitive receptors over those calculated for the No-Action condition, if the No-Action levels are 62 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 3 dBA or more, in With-Action $L_{eq(1)}$ noise levels at sensitive receptors over those calculated for the No-Action condition, if the analysis period is a nighttime period (defined by the *CEQR Technical Manual* criteria as being between 10 p.m. and 7 a.m.).

TABLE 15-4: NOISE EXPOSURE GUIDELINES FOR USE IN CITY ENVIRONMENTAL IMPACT REVIEW[1]

Receptor Type	Time Period	Acceptable General External Exposure	Airport[3] Exposure	Marginally Acceptable General External Exposure	Airport[3] Exposure	Marginally Unacceptable General External Exposure	Airport[3] Exposure	Clearly Unacceptable General External Exposure	Airport[3] Exposure
1. Outdoor area requiring serenity and quiet[2]		$L_{10} \le 55$ dBA	------------ $Ldn \le 60$ dBA ------------	NA	NA	NA	NA	NA	NA
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	(I) $65 < Ldn \le 70$ 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	

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

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).

TABLE 15-5: REQUIRED ATTENUATION VALUES TO ACHIEVE ACCEPTABLE INTERIOR NOISE LEVELS

Noise Level with Proposed Project	Marginally Unacceptable				Clearly Unacceptable
	$70 < L_{10} \le 73$	$73 < L_{10} \le 76$	$76 < L_{10} \le 78$	$78 < L_{10} \le 80$	$80 < L_{10}$
Attenuation [A]	(I) 28 dB(A)	(II) 31 dB(A)	(III) 33 dB(A)	(IV) 35 dB(A)	36+ $(L_{10} - 80)$ [B] dB(A)

Source: New York City Department of Environmental Protection (DEP)

Notes:

(A) The above composite window-wall attenuation values are for residential dwellings. Attenuation for commercial office spaces and meeting rooms would be 5 dB(A) less than in each category. All the above categories require a closed window situation and hence an alternative means of ventilation.

(B) Required attenuation values increase by 1 dB(A) increments for L_{10} values greater than 80 dBA.

15.5 NOISE PREDICTION METHODOLOGY

A noise screening analysis was completed at each of the representative noise monitoring locations using the PCE methodology as described in Chapter 19 of the *CEQR Technical Manual* for estimating future noise levels from mobile source noise. Using this technique, peak-hour existing, and future No-Action and With-Action traffic volumes are converted into Noise PCE values. Incremental changes in future noise levels are computed based on the logarithmic ratio of Noise PCE values. These incremental noise level changes are calculated between existing and No-Action traffic scenarios and between No-Action and With-Action traffic scenarios. The projected incremental noise level changes are then added to the measured existing noise levels to approximate future No-Action and With-Action noise levels. The Noise PCE calculation assumes that one medium-duty truck generates the noise equivalent of 13 cars, and one heavy-duty truck is assumed to generate the noise equivalent of 47 cars, and one bus is assumed to generate the noise equivalent of 18 cars.

If a doubling of Noise PCE levels is found to occur from the noise screening analysis then a significant noise impact from the project is found to occur and a refinement in the noise analysis is completed using the Federal Highway Traffic Model (TNM 2.5). For the East Midtown Rezoning Project, no doubling of Noise PCE levels was found to occur based on the results of the screening evaluation, and therefore no TNM-based mobile source noise analysis was completed.

15.6 EXISTING NOISE LEVELS

15.6.1 Selection of Noise Receptor Locations

A total of 10 receptor sites within the proposed rezoning area were selected for evaluation of noise attenuation requirements. These locations are described below and depicted in Figure 15-1. The existing land use adjacent to each site is provided in Table 15-6. Representative noise monitoring locations were chosen based on the following criteria:

- Locations where the highest noise levels are likely to occur based upon the consideration of existing land use patterns (e.g., locations near rail lines, near major commercial roadways)
- Near projected and potential development sites
- To provide a comprehensive geographic coverage throughout the proposed rezoning area to get an accurate depiction of the overall ambient noise environment

The noise measurement locations were collected at the following locations:

- Site 1: Northeast corner of Madison Avenue and East 56th Street
- Site 2: Southwest corner of Park Avenue and East 50th Street
- Site 3: Northeast corner of Lexington Avenue and East 49th Street
- Site 4 Southeast corner of Madison Avenue and East 46th Street
- Site 5: Southwest corner of Vanderbilt Avenue and East 45th Street
- Site 6: Southeast corner of Madison Avenue and East 44th Street
- Site 7: Northeast corner of Third Avenue and East 44th Street
- Site 8: Northeast corner of Madison Avenue and East 42nd Street
- Site 9: East 42nd Street Between Third and Second Avenues
- Site 10: Northwest corner of Madison Avenue and East 39th Street

TABLE 15-6: NOISE RECEPTOR LOCATIONS

Site	Location	Existing Use
1	550 Madison Avenue (and 56th Street)	Commercial/Office
2	300 Park Avenue (and 50th Street)	Commercial/Office
3	541 Lexington Avenue (and 49th Street)	Commercial/Office
4	361 Madison Avenue (and 46th Street)	Commercial/Office
5	52 Vanderbilt Avenue (and 45th Street)	Commercial/Office
6	333 Madison Avenue (and 44th Street)	Commercial/Office
7	702 Third Avenue (and 44th Street)	Commercial/Office
8	33 East 42nd Street (and Madison Avenue)	Commercial/Office
9	235 East 42nd Street (between 2nd and 3rd Avenues)	Commercial/Office
10	266 Madison Avenue (and 39th Street)	Commercial/Office

15.6.2 Noise Monitoring

At each receptor site existing noise levels were measured and recorded for each of the three noise analysis time periods by using laboratory certified sound sampling equipment. Existing noise levels at each receptor site were collected for 20-minute duration sampling time during the three weekday peak periods: AM (7:00 – 9:00 a.m.), Midday (MD) (12:00 – 2:00 p.m.) and PM (4:00 – 6:00 p.m.). All noise measurements were collected in January 2013 on the dates shown in Table 15-7.

15.6.3 Noise Monitoring Equipment

Ambient noise measurements were performed using two Brüel & Kjær (B&K) Sound Level Meters (SLM) Model Type 2250 (serial #3002422 and serial #3002633) each outfitted with a B&K Type ZC0032 ½-inch microphone (serial #18308 and serial #18310). The SLM was calibrated before and after noise measurement using a Brüel & Kjær Type 4231 sound-level calibrators (serial numbers #2170008 and #2412378). The Brüel & Kjær SLM Model 2250 is a Type 1 sound level meter satisfying ANSI Standard S1.4-1983 (R2006) requirements for measurement precision and sampling rate. The two sound meters used for this study have laboratory calibration certificates valid for field measurement use from December 20, 2012, through December 20, 2013.

Each B&K 2250 sound meter assembly was mounted at a height of 5 feet above the ground surface on a tripod and placed at least six feet away from any large sound-reflecting surface to avoid major interference with sound propagation. All noise measurements were recorded on the A-scale (dBA). The data were digitally recorded by the SLMs and displayed at the end of the measurement period in units of dBA. Measured quantities included L_{eq}, L_1, L_{10}, L_{50}, L_{90}, L_{max} and L_{min}. A windscreen was used during all sound measurements except for calibration. All noise-measurement data collection was completed in conformance with ANSI Standard S1.13-2005 monitoring standards and requirements.

15.6.4 Existing Noise Levels at Receptor Locations

The noise measurement locations are shown on Figure 15-1 and a summary of the measured noise levels is provided in Table 15-7. At all monitoring sites, vehicular traffic was the dominant noise source. Measured noise levels ranged from moderate to relatively high levels of ambient noise exposure with generally similar noise exposure measured throughout the project study area. Moreover, measured noise readings reflect a relatively high level of vehicular activity observed on the adjacent streets. In terms of the CEQR noise exposure criteria (Table 15-4); the existing peak L_{10} noise levels at all but one of the sites are within the "marginally unacceptable" category with the remaining site within the "clearly unacceptable" category. Measured noise levels were collected in January 2013 on the dates shown in Table 15-7. Measured $L_{eq(1)}$ levels ranged from an minimum recording of 66.8 dBA at Site 5 during the peak PM time period to a maximum level of 77 dBA at Site 8 during the peak AM period. However, in general within the East Midtown Rezoning study area, ambient noise levels were more typically in a narrow range of 70 to 75 dBA.

FIGURE 15-1: NOISE RECEPTOR LOCATIONS

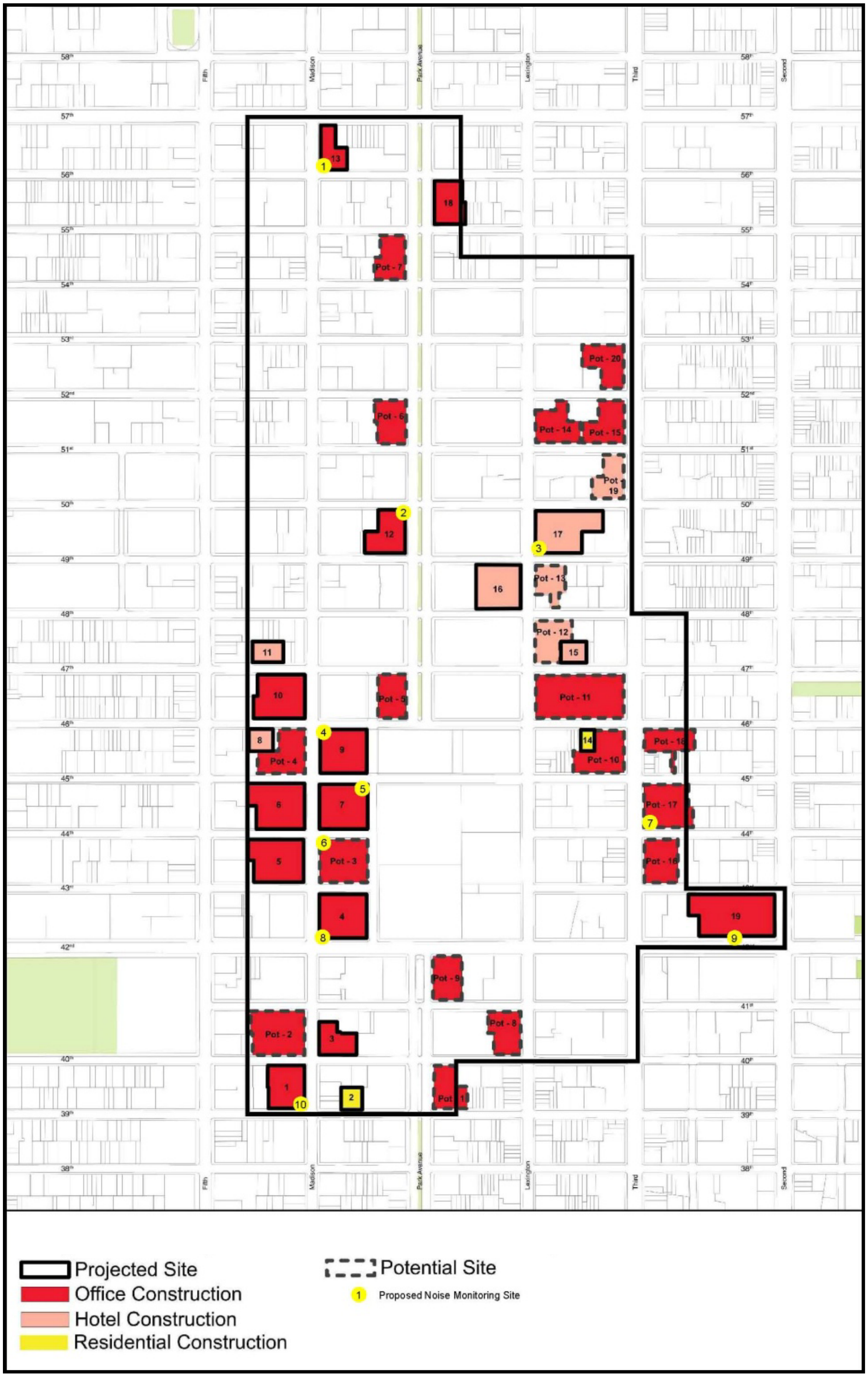

TABLE 15-7: EXISTING NOISE LEVELS (dBA)

Site	Measurement Location	Date of Noise Measurement	Time	L_{eq}	L_1	L_{10}	L_{50}	L_{90}
1	550 Madison Avenue	1/23/13	AM	72.3	80.0	75.2	70.6	66.9
		1/23/13	MD	70.9	78.6	74.2	68.6	66.0
		1/23/13	PM	71.2	80.3	73.6	69.0	67.4
2	300 Park Avenue	1/22/13	AM	72.2	80.7	74.9	70.4	65.9
		1/22/13	MD	70.7	78.8	73.6	69.0	64.9
		1/22/13	PM	70.7	78.4	73.7	69.0	63.5
3	541 Lexington Avenue	1/22/13	AM	75.2	86.4	76.3	69.9	66.9
		1/22/13	MD	73.2	83.2	74.5	70.4	67.2
		1/22/13	PM	73.6	84.5	75.5	69.9	65.2
4	361 Madison Avenue	1/10/13	AM	73.1	80.3	76.3	71.2	67.3
		1/10/13	MD	71.1	78.7	74.0	69.0	65.3
		1/10/13	PM	71.4	78.0	74.6	69.6	65.8
5	52 Vanderbilt Avenue	1/10/13	AM	73.2	82.6	75.6	70.4	67.9
		1/10/13	MD	70.4	78.2	72.4	68.6	66.5
		1/10/13	PM	68.8	76.8	70.6	67.6	65.5
6	333 Madison Avenue	1/10/13	AM	72.2	79.8	75.5	69.8	66.1
		1/10/13	MD	70.9	78.8	73.8	69.1	66.0
		1/10/13	PM	71.7	80.8	73.7	69.5	65.5
7	702 3rd Avenue	1/17/13	AM	72.4	80.4	75.7	69.6	65.0
		1/17/13	MD	71.9	80.7	74.2	70.1	67.4
		1/17/13	PM	72.8	82.0	75.4	69.3	63.7
8	33 East 42nd Street	1/15/13	AM	76.2	84.2	79.2	74.1	70.9
		1/15/13	MD	74.4	81.9	76.9	73.0	69.7
		1/15/13	PM	74.1	81.6	76.9	72.5	69.5
9	235 East 42nd Street	1/17/13	AM	72.2	80.8	74.6	69.2	65.7
		1/17/13	MD	69.8	78.6	72.4	67.2	63.2
		1/17/13	PM	70.7	79.2	73.8	68.1	63.7
10	266 Madison Avenue	1/15/13	AM	73.5	81.8	76.3	71.4	68.2
		1/15/13	MD	72.5	80.8	74.6	70.6	67.5
		1/15/13	PM	72.4	79.6	74.5	71.0	67.6

Note: Field measurements performed by Parsons Brinckerhoff Inc. in January 2013

15.7 THE FUTURE WITHOUT THE PROPOSED ACTION (NO-ACTION)

Using the Noise PCE methodology previously described, future noise levels without the Proposed Action (No-Action conditions) were calculated for the three analysis periods in the year 2033 at representative noise sensitive receptor locations identified within the East Midtown Rezoning study area. Table 15-8 provides a summary of the calculated noise levels.

TABLE 15-8: 2033 NO-ACTION NOISE LEVELS (WEEKDAY)

Receptor	Location	Time	2013 Existing Noise Levels (dBA)		2033 No-Action Noise Levels (dBA)		
			L_{eq}	L_{10}	L_{eq}	L_{10}	Change
1	550 Madison Avenue	AM	72.3	75.2	72.7	75.6	0.4
		MD	70.9	74.2	71.4	74.7	0.5
		PM	71.2	73.6	71.7	74.1	0.5
2	300 Park Avenue	AM	72.2	74.9	72.6	75.3	0.4
		MD	70.7	73.6	71.2	74.1	0.5
		PM	70.7	73.7	71.1	74.1	0.4
3	541 Lexington Avenue	AM	75.2	76.3	75.7	76.8	0.5
		MD	73.2	74.5	73.7	75.0	0.5
		PM	73.6	75.5	74.1	76.0	0.5
4	361 Madison Avenue	AM	73.1	76.3	73.5	76.7	0.4
		MD	71.1	74.0	71.6	74.5	0.5
		PM	71.4	74.6	72.0	75.2	0.6
5	52 Vanderbilt Avenue	AM	73.2	75.6	73.5	75.9	0.3
		MD	70.4	72.4	70.8	72.8	0.4
		PM	68.8	70.6	69.1	70.9	0.3
6	333 Madison Avenue	AM	72.2	75.5	72.6	75.9	0.4
		MD	70.9	73.8	71.5	74.4	0.6
		PM	71.7	73.7	72.3	74.3	0.6
7	702 Third Avenue	AM	72.4	75.7	72.9	76.2	0.5
		MD	71.9	74.2	72.4	74.7	0.5
		PM	72.8	75.4	73.3	75.9	0.5
8	33 East 42nd Street	AM	76.2	79.2	76.8	79.8	0.6
		MD	74.4	76.9	75.2	77.7	0.8
		PM	74.1	76.9	74.9	77.7	0.8
9	235 East 42nd Street	AM	72.2	74.6	73.2	75.6	1.0
		MD	69.8	72.4	70.4	73.0	0.6
		PM	70.7	73.8	71.5	74.6	0.8
10	266 Madison Avenue	AM	73.5	76.3	74.1	76.9	0.6
		MD	72.5	74.6	73.1	75.2	0.6
		PM	72.4	74.5	73.1	75.2	0.7

In the future without the Proposed Action, noise levels at and adjacent to the project area would be generally comparable to those in the existing conditions. The largest estimated increase in noise level from existing conditions is projected to occur at receptor 9 located at 235 East 42nd Street between Third and Second Avenues where peak-hour AM noise levels are projected to increase by 1.0 dBA adjacent to proposed Development Site 19. Peak-hour noise levels at other representative locations within the project study area show similar but smaller increases in noise levels. Increases of this magnitude would not be perceptible, and based on the CEQR criteria would be considered insignificant.

15.8 THE FUTURE WITH THE PROPOSED ACTION (WITH-ACTION)

Using the Noise PCE methodology previously described, future noise levels with the Proposed Action (With-Action conditions) were calculated for the three analysis periods in the year 2033 at representative noise sensitive receptor locations identified within the East Midtown Rezoning study area. Table 15-9 provides a summary of the calculated noise levels.

In the future with the Proposed Action, noise levels at and adjacent to the project area would be generally comparable to those under the future No-Action conditions. The largest estimated increase in noise level from future No-Action conditions is projected to occur at receptor 4 and receptor 6, which were located at 361 Madison Avenue (at the southeast corner of Madison Avenue and East 46th Street) and 333 Madison Avenue (at the southeast corner of Madison Avenue and 44th Street), where peak-hour PM noise levels are projected to increase by 0.6 dBA. Peak-hour noise levels at other representative locations within the project study area showed similar but smaller increases in noise levels. Increases of this magnitude would not be perceptible, and based on the CEQR criteria would be considered insignificant. The details of the Noise PCE screening at each of the representative noise monitoring locations and at all projected and potential development sites is provided in Appendix 9. In terms of the CEQR noise exposure criteria, noise levels are projected to show very little change from the Future No-Action to With-Action condition. Noise levels at all receptors sites evaluated yield build noise exposure generally within the higher range of "marginally unacceptable" category condition.

TABLE 15-9: 2033 WITH-ACTION NOISE LEVELS (WEEKDAY)

Receptor	Location	Time	2033 No-Action Noise Levels		2033 With-Action Noise Levels		
			L_{eq}	L_{10}	L_{eq}	L_{10}	Change
1	550 Madison Avenue	AM	72.7	75.6	72.9	75.8	0.2
		MD	71.4	74.7	71.4	74.7	0.0
		PM	71.7	74.1	71.9	74.3	0.2
2	300 Park Avenue	AM	72.6	75.3	72.6	75.3	0.0
		MD	71.2	74.1	71.3	74.2	0.1
		PM	71.1	74.1	71.2	74.2	0.1
3	541 Lexington Avenue	AM	75.7	76.8	76.0	77.1	0.3
		MD	73.7	75.0	73.9	75.2	0.2
		PM	74.1	76.0	74.2	76.1	0.1
4	361 Madison Avenue	AM	73.5	76.7	74.0	77.2	0.5
		MD	71.6	74.5	72.2	75.1	0.6
		PM	72.0	75.2	72.7	75.9	0.7
5*	52 Vanderbilt Avenue	AM	73.5	75.9	72.6	75.0	-0.9
		MD	70.8	72.8	70.0	72.0	-0.8
		PM	69.1	70.9	67.3	69.1	-1.8
6	333 Madison Avenue	AM	72.6	75.9	72.9	76.2	0.3
		MD	71.5	74.4	72.0	74.9	0.5
		PM	72.3	74.3	72.8	74.8	0.5
7	702 Third Avenue	AM	72.9	76.2	73.0	76.3	0.1
		MD	72.4	74.7	72.6	74.9	0.2
		PM	73.3	75.9	73.4	76.0	0.1
8	33 East 42nd Street	AM	76.8	79.8	77.0	80.0	0.2
		MD	75.2	77.7	75.2	77.7	0.0
		PM	74.9	77.7	75.0	77.8	0.1
9	235 East 42nd Street	AM	73.2	75.6	73.2	75.6	0.0
		MD	70.4	73.0	70.5	73.1	0.1
		PM	71.5	74.6	71.6	74.7	0.1
10	266 Madison Avenue	AM	74.1	76.9	74.4	77.2	0.3
		MD	73.1	75.2	73.2	75.3	0.1
		PM	73.1	75.2	73.2	75.3	0.1

* The results for the With-Action scenario should not be considered for attenuation purposes due to a reduction in traffic noise caused by the re-routing of traffic away from Vanderbilt Ave under the future 2033 With-Action scenario. As a result, the future 2033 No-Action values should be use for this analysis. The rationale is that 2033 With-Action values cannot be lower than the 2013 Existing noise level readings.

15.8.1 Noise Attenuation Measures

The attenuation of a composite structure is a function of the attenuation provided by each of its component parts and how much of the area is made up of each part. Normally, a building façade is composed of the wall, glazing, and any vents and louvers for the heating-ventilation-and-air-conditioning (HVAC) systems in various ratios of building surface area. The design for all buildings proposed to be located on the (E)-designated projected or potential development sites would be designed to provide a composite Outdoor-Indoor Transmission Class (OITC) rating greater than or equal to the attenuation requirements listed in Appendix 9 (Tables 4 and 5). The OITC classification is defined by the American Society of Testing and Materials (ASTM E1332-90, Re-approved 2003) and provides a single-number rating that is used for designing a building façade including walls, doors, glazing and the combination thereof. The OITC rating is designed to evaluate building elements by their ability to reduce noise the overall loudness of ground and air transportation noise. Proposed development with an OITC rating of 30 or greater would require incorporating the following minimum building design elements to achieve these rating levels:

- To achieve a composite OITC rating of 30, a building façade would likely include well sealed insulating glass, as well as alternate means of ventilation such as well sealed through-the-wall air conditioning, package-terminal air conditioners, or central air conditioning.
- To achieve a composite OITC rating of 35, a building façade would likely include a well-sealed laminated insulating glass, as well as alternate means of ventilation such as central air conditioning.
- To achieve a composite OITC rating of 36 or higher, a building façade would likely include special design features that go beyond the normal double-glazed windows and may include using specially designed windows (i.e., windows with small sizes, windows with air gaps, windows with thicker glazing, etc.) and additional building attenuation, as well as alternate means of ventilation such as central air conditioning.

As indicated in Table 15-5, the NYC *CEQR* guidelines contain window/wall attenuation requirements for buildings based on maximum exterior L_{10} noise exposure levels. Recommended noise attenuation values for buildings are designed to maintain interior noise levels of 45 dBA or lower for residential uses and 50 dBA or lower for commercial uses. The estimated minimum building window/wall attenuation requirements at each of the 10 representative monitoring locations is provided in Table 15-10. Future L_{10} noise levels and associated window/wall attenuation requirements were established based on the PCE estimated peak-hour levels shown in Table 15-9. Future With-Action maximum L_{10} levels at the 10 representative sites, range from 72 to 80[1] dBA and are therefore in the "marginally unacceptable" or "clearly unacceptable" exterior noise exposure category, resulting in a minimum noise attenuation

[1] The actual value is 80.02 and any exceedance in excess of 80 dBA results in a minimum noise attenuation requirement of 36 or higher.

requirement of 31-36 dBA. A summary of the window/wall attenuation levels required at each projected and potential development site is provided in Table 15-11 and the applicable text for each (E) designation by development site is located in Appendix 10.

TABLE 15-10: MINIMUM ATTENUATION REQUIREMENTS FOR RECEPTOR SITES

Receptor Site #	Location	Maximum With-Action Condition L_{10} (dBA)	Minimum Attenuation Required[1] (dBA)
1	550 Madison Avenue	75.8	31
2	300 Park Avenue	75.4	31
3	541 Lexington Avenue	77.1	33
4	361 Madison Avenue	77.2	33
5[2]	52 Vanderbilt Avenue	75.9	31
6	333 Madison Avenue	76.1	33
7	702 Third Avenue	76.3	33
8	33 East 42nd Street	80.0[2]	36
9	235 East 42nd Street	75.9	31
10	266 Madison Avenue	77.2	33

Notes: The results for the With-Action scenario should not be considered for attenuation purposes due to a reduction in traffic noise caused by the re-routing of traffic away from Vanderbilt Ave under the future 2033 With-Action scenario. As a result, the future 2033 No-Action values should be use for this analysis. The rationale is that 2033 With-Action values cannot be lower than the 2013 Existing noise level readings.

1 Attenuation values are shown for residential uses; commercial uses would be 5 dBA less.

2 The actual value is 80.02 and any exceedance in excess of 80 dBA results in a minimum noise attenuation requirement of 36 or higher.

The (E) designations as set forth in Appendix 10 would apply to a development on a projected or potential development site which utilizes the provisions of the Proposed Action which allow for increases in the maximum base floor area ratio for qualifying sites pursuant to the District Improvement Bonus (ZR Section 81-62), the demolition and reconstruction of non-complying floor area on a site which is not a qualifying site (ZR Section 81-614(b)), or the transfer of development rights from landmarks by certification in the Grand Central Subarea (ZR Section 81-651), as applicable. For purposes of these (E) designations, the term "building permit" under Section 11-15(a) of the Zoning Resolution shall be a New Building Permit, except in the event a transfer under Section 81-651 is used for purposes of enlargement, extension or change of use of an existing building. A Notice of No Objection from the Office of Environmental Remediation would be required prior to issuance of a New Building Permit and a Notice of Satisfaction would be required prior to issuance of a temporary or permanent certificate of occupancy.

To the extent permitted under ZR Section 11-15, the requirements of the (E) designation may be modified, or determined to be unnecessary, based on new information or technology, additional facts or updated standards that are relevant at the time the site is ultimately developed.

TABLE 15-11: BUILDING ATTENUATION REQUIREMENTS FOR PROJECTED AND POTENTIAL DEVELOPMENT SITES REQUIRING (E) DESIGNATIONS[2]

Site	Block	Lot(s)	Projected Use	Nearest Noise Governing Measurement Location	Minimum Required Building Attenuation[1]
Projected Development Sites					
1	869	16,58,61,64	Commercial	R10	33
2	869	25,26,27	Residential	R10	33
3	1275	23	Commercial	R10	33
4	1277	20,27,46,52	Commercial	R8	36
5	1278	8,14,15,17,62,63,64,65	Commercial	R6	33
6	1279	9,17,57,63,65	Commercial	R5/R6	31/33
7	1279	23,24,25,28,45,48	Commercial	R5/R6	31/33
8	1281	62,64,65	Hotel	R4	33
9	1281	21	Commercial	R4/R5	33/31
10	1282	17,64	Commercial	R4	33
11	1283	8,9,10,11,12,13	Hotel	R4	33
12	1285	36	Commercial	R2	31
13	1292	52	Commercial	R1	31
14	1300	42,44	Residential	R4	33
15	1302	25,27,28,29,127	Hotel	R3	33
16	1303	14	Hotel	R3	33
17	1304	20,25,26,28,41,45	Hotel	R3	33
18	1310	1	Commercial	R1/R2	31
19	1316	12,23,30	Commercial	R9	31
Potential Development Sites					
Pot-1	895	1	Commercial	R10	33
Pot-2	1275	8,11,12,14,16,59,60,61,63,64	Commercial	R10	33
Pot-3	1278	20	Commercial	R6	33
Pot-4	1281	9,56,59,7501	Commercial	R4/R5	33/31
Pot-5	1282	34	Commercial	R2/R4	31/33
Pot-6	1287	33	Commercial	R2	31
Pot-7	1290	31,36,37	Commercial	R2	31
Pot-8	1295	17,58	Commercial	R10	33
Pot-9	1296	1	Commercial	R8	36
Pot-10	1300	33	Commercial	R4/R5/R7	31/33 (33dBA on Third Ave and 46th Street and 31 dBA other façades)
Pot-11	1301	23,33	Commercial	R3/R4/R7	33
Pot-12	1302	21,22,23,24,51,123	Hotel	R3	33
Pot-13	1303	53	Hotel	R3	33
Pot-14	1306	23	Commercial	R3	33
Pot-15	1306	33	Commercial	R7	33
Pot-16	1317	1	Commercial	R7	33
Pot-17	1318	1,43,44,143	Commercial	R7	33
Pot-18	1319	47	Commercial	R5, R7	33
Pot-19	1305	32,33,40	Hotel	R7	33
Pot-20	1307	43,7501	Commercial	R7	33

Note:
1. Attenuation values are shown for proposed residential developments; commercial developments would be 5 dBA less.
2. The applicable text for each (E) designation by development site is located in Appendix 10.

The L_{10} noise levels and associated window/wall noise attenuation requirements shown in Table 15-11 at Site R5 are derived for the future 2033 No-Action condition because of the expected divergence in traffic under build conditions away from Vanderbilt Avenue resulting in lower 2033 With-Action noise levels at R5. The rational is that noise levels under the future 2033 Action condition cannot be lower than the measured noise levels recorded at Site R5 and therefore the 2033 No-Action L_{10} levels are considered more representatives of future noise levels under 2033 build conditions. A 5 dBA noise reduction should be applied to all window/wall attenuation specifications shown in Table 15-11.

15.9 MECHANICAL EQUIPMENT

It is assumed that building mechanical systems, including emergency generators associated with the proposed development projects, would be designed with enclosures where necessary to meet all applicable noise regulations (i.e., Subchapter 5, §24-227 of the New York City Noise Control Code and the New York City Department of Buildings Code) and to avoid producing noise levels that would result in a significant increase in ambient noise levels. Therefore, the Proposed Action would not result in any significant increase in ambient noise levels.