Chapter 16: Noise*

16.1 Introduction

This chapter discusses potential impacts to the neighborhood noise environment as a result of the Proposed Actions. Therefore, a noise analysis is prepared to evaluate the potential effect of the Proposed Actions at projected and potential development sites and nearby noise sensitive locations in the rezoning area. Existing noise levels in the rezoning area are predominantly the result of vehicular traffic and the elevated NYCT No. 4 line operating along Jerome Avenue. Noise sensitive locations include residential, commercial, and open space uses.

As described in Chapter 1, "Project Description," the Jerome Avenue Rezoning consists of a series of land use actions (collectively, the "Proposed Actions") intended to facilitate the implementation of the objectives of the Jerome Avenue Neighborhood Plan (the "Plan"). The affected area comprises an approximately 92-block area primarily along Jerome Avenue and its east west commercial corridors in Bronx Community Districts (CDs) 4, 5, and 7 (the "rezoning area"). The rezoning area is generally bounded by 184th Street to the north and East 165th Street to the south, and also includes portions of 183rd Street, Burnside Avenue, Tremont Avenue, Mount Eden Avenue, 170th Street, Edward L. Grant Highway, and East 167th Street.

In order to assess the potential for significant adverse noise impacts, the noise analysis considers changes in noise due to increases in traffic and the introduction of sensitive receptors into an area with high existing noise levels. The noise analysis addresses two factors: 1) the change in noise levels from the existing condition in the area as a result of the Proposed Actions; and 2) the location of new sensitive receptors and the degree to which window/wall attenuation would provide acceptable interior noise levels.

16.2 Principal Conclusions

The noise analysis concludes that the Proposed Actions 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 passenger car equivalents which would be necessary to cause a three dBA increase in noise levels). At all noise receptor sites, the maximum noise level increase would be below 3 dBA, which would not be considered a significant adverse noise impact. Therefore, the noise analysis concludes that the traffic generated by the

* This chapter has been revised since the DEIS to include additional mobile source inputs based on the added Expanded Rezoning Area and A-Application Alternatives.

Proposed Actions would not have the potential to produce significant increases to noise levels at any sensitive receptors within the rezoning area. Ambient noise levels adjacent to the projected and potential development sites were examined to determine if building noise attenuation requirements for maintaining interior noise levels would be necessary. That assessment finds that noise levels would range between the "marginally unacceptable" and "clearly unacceptable" exterior noise exposure categories, resulting in a noise attenuation requirement range of 28 to 43 dBA to ensure noise levels within the proposed development sites would comply with all applicable requirements. As a result, the Proposed Actions includes (E) designations for all of the projected and potential development sites. The window/wall attenuation levels required under the (E) designations would avoid the potential for significant adverse noise impacts due to the Proposed Actions; refer to Appendix G, "Noise," (G1, "Projected Development Sites Noise Attenuation Requirements") for the proposed (E) designations.

16.3 Acoustical Fundamentals

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. One cycle per second is known as one Hertz ("Hz"). People can hear over a relatively limited range of sound frequencies, generally between 20 Hz and 20,000 Hz, and the human ear does not perceive all frequencies equally well. High frequencies (e.g., a whistle) are more easily discernible and therefore more intrusive than many of the lower frequencies (e.g., the lower notes on the French horn).

"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 ear. 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 16-1, "Typical Noise Levels," 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 16-1: Typical 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	80-90
Busy city street, loud shout	80
Busy traffic intersection	70-80
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	50-60
Background noise in an office	50
Suburban areas with medium-density transportation	40-50
Public library	40
Soft whisper at 5 meters	30
Threshold of hearing	0
Note: A ten dBA increase in level appears to double the loudness, and a ten dBA decrease halves the apparent loudness.	

Sources: Cowan, James P. *Handbook of Environmental Acoustics,* Van Nostrand Reinhold, New York, 1994. Egan, M. David, Architectural Acoustics, McGraw-Hill Book Company, 1988.

In considering these values, it is important to note that the dBA scale is logarithmic, meaning that each increase of ten 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 three dBA. At five dBA, the change will be readily noticeable.

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., one 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. The Day−Night Sound Level (i.e., L_{dn}) refers to a 24−hour average noise level with a 10 dB penalty applied to the noise levels during the hours between 10 PM and 7 AM, due to increased sensitivity to noise levels during these hours. 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.

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 ten 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 Leq is generally between L_{10} and L_{50}.

For purposes of the Proposed Actions, the maximum one−hour equivalent sound level (i.e., $L_{eq}[1]$) has been selected as the noise descriptor to be used in this noise impact evaluation. $L_{eq}(1)$ is the noise descriptor recommended for use in the *CEQR Technical Manual* for vehicular traffic and is used to provide an indication of highest expected sound levels. The one−hour L_{10} is the noise descriptor used in the CEQR Technical Manual noise exposure guidelines for city environmental impact review classification

16.4 Noise Standards and Criteria

NEW YORK CEQR TECHNICAL MANUAL NOISE STANDARDS

The *CEQR Technical Manual* defines attenuation requirements for buildings based on exterior noise levels (see Table 16-2, "Required Attenuation Values to Achieve Acceptable Interior Noise 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, and are determined based on exterior L_{10} noise levels.

Table 16-2: Required Attenuation Values to Achieve Acceptable Interior Noise Levels

	Marginally Unacceptable				**Clearly Unacceptable**
Noise Level With Proposed Actions	$70 < L_{10} \leq 73$	$73 < L_{10} \leq 76$	$76 < L_{10} \leq 78$	$78 < L_{10} \leq 80$	$80 < L_{10}$
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)

Notes:

[A] The above composite window-wall attenuation values are for residential dwellings. Retail and office spaces would be 5 dB(A) less in each category. All of the above categories require a closed window situation and hence an alternate means of ventilation.

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

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

New York City Noise Control Code

Specific noise standards for the proposed development site would be governed by the 2005 New York City Noise Code. Table 16-3, "New York City Noise Code," shows the permitted sound levels for sources operating in connection with any residential, commercial, or business enterprises. These noise levels do not apply to construction activities or equipment, but do apply to mechanical systems which may be related to the Proposed Actions' operation.

Table 16-3: New York City Noise Code

Octave Band	Maximum Sound Pressure Levels (dB) as measured within a receiving property, as specified below	
Frequency (Hz)	Residential receiving property for mixed use buildings 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: NYC Noise Code, 2005.

16.5 Existing Noise Levels

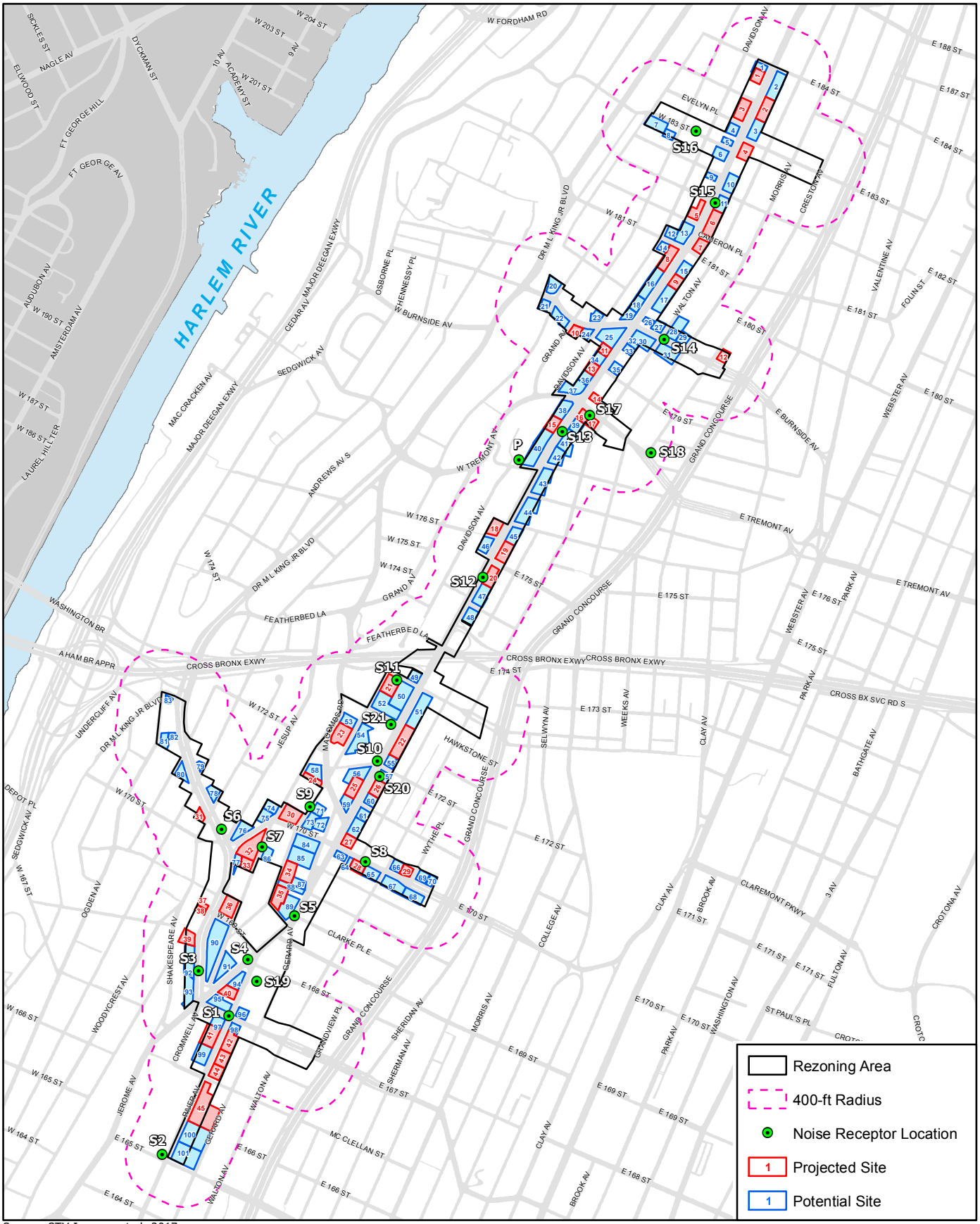
SELECTION OF NOISE RECEPTOR LOCATIONS

Information concerning specific land usage in and around the study area site, as well as trip assignments for potential future uses, are reviewed to select monitoring sites and assess future noise impacts on existing and future sensitive land uses. The 21 monitoring sites depicted in Table 16-4, "Noise Receptor Locations," and shown on Figure 16-1, "Noise Receptor Locations," are nearby sites of projected and potential development and are representative of the sensitive land uses in the rezoning area.

Table 16-4: Noise Receptor Locations

Receptor	Location
1	River Avenue and East 167th Street
2	River Avenue and East 165th Street
3	Edward L. Grant Highway between Jerome Avenue and West 169th Street
4	Jerome Avenue (west side) and West 168th Street
5	Corner of Jerome Ave and E. Clark Place, north of Jerome Avenue, Gerard Avenue and E. Clark Place Triangle
6	Edward L. Grant Highway between Jesup Avenue and Shakespeare Avenue
7	Cromwell Avenue between West 169th Street and West 170th Street
8	East 170th Street between Townsend Avenue and Walton Avenue
9	Inwood Avenue between West 170th Street and Macombs Road
10	Jerome Avenue and West 172nd Street. (northwest corner)
11	West Mount Eden Avenue between Jerome Avenue and Inwood Avenue
12	Jerome Avenue between Clifford Place East and East 175th Street
13	Jerome Avenue between East 177th Street and East Tremont Avenue
14	East Burnside Avenue between Walton Avenue and Morris Avenue
15	Jerome Avenue and East 182nd Street
16	West 183rd Street between Grand Avenue and Davidson Avenue
17	East Tremont Avenue between Jerome Avenue and Walton Avenue
18	Northeast corner of Creston Avenue and East Tremont Avenue (replacement monitoring site for Burnside due to construction)
19	River Avenue between East 167th Street and East 168th Street (Elevated)
20	Jerome Avenue between East 172nd Street and East 171st Street (Elevated)
P	PS 306 Playground

Source: STV Incorporated, 2017.



Source: STV Incorporated, 2017.

N

0 0.25 0.5 Miles

Figure 16-1

Jerome Avenue Rezoning

NOISE RECEPTOR LOCATIONS

NOISE MONITORING

Noise monitoring was performed on several weekdays from May 5th to May 17th, 2016 and weekends from September 17th to September 24th, 2016. Time periods chosen for monitoring include the weekday AM (7-9 AM), midday (11:30AM-12:30 PM), early PM (2:30-3:30 PM) for receptors near school locations, PM (5-6 PM), and Saturday midday (12-5 PM) peak hours for locations near destination retail stores. These time periods represent the peak hours when the majority of existing and future project-generated traffic would be passing these locations. The noise monitoring took into account the peak work week, commercial, and school-related traffic and the peak weekend commercial traffic. Measurements were conducted for a 20 minute time period so that the typical fluctuations in peak hour traffic could be properly accounted for.

In addition to $L_{eq}(h)$ and L_{10} noise levels, other statistical noise descriptors (L_{50}, L_{90}, L_{max}, and L_{min}) were also sampled at all locations for all time periods. For the Proposed Actions, the analysis of potential noise impacts utilizes the L_{10} and $L_{eq}(h)$ descriptors. The other noise descriptors collected during the monitoring program are utilized to assist in the characterization of the existing noise environment. Typically, L_{50} tends to describe the statistical median noise value, while the L_{90} typically describes the residual background noise level in an environment.

EQUIPMENT USED DURING NOISE MONITORING

Noise measurements were taken with a 3M SoundPro DL Type I sound level meters ("SLM") and a Larson and Davis (L&D) LxT SLM. A windscreen was placed over the microphone for all measurements. The SLM had a laboratory calibration date within the past year at the time of use, as is standard practice. The SLMs were also properly field calibrated for all measurements using the 3M AC-300 and the L&D Cal 200 calibrators. There were no significant variances between the beginning and ending calibration measurements. To avoid interference with sound propagation, the measuring microphone was placed approximately six feet away from any reflecting surfaces and at a height of approximately five feet from the ground surface. Weather conditions during the measurement periods, with respect to temperature and wind conditions, were conducive to obtaining valid noise readings, per guidelines outlined in ANSI Standard S1.13-2005.

EXISTING NOISE LEVELS AT NOISE RECEPTOR LOCATIONS

Measured Noise Levels

The Proposed Actions are located in an area that is exposed to numerous sources of noise. These sources include vehicular traffic from local streets, highway noise from the depressed Cross Bronx Expressway, and transit noise from the elevated NYC Transit IRT No. 4 line which traverses River Avenue and Jerome

Avenue within the entire project corridor. Receptors which are exposed to the most noise are those which are in close proximity to the elevated train line along River Avenue and Jerome Avenue. The dominant source of neighborhood noise comes from local vehicular traffic and transit noise. Per the guidance of the *CEQR Technical Manual* noise exposure criteria, receptors 1, 4, 5, 10, 13, 15, and 17 would be within the "clearly unacceptable" category. The remaining sites, which include receptor locations 2, 3, 6, 7, 8, 11, 12, 14, 16, 18, 19, and 20, are all in the "marginally unacceptable" category. Receptor 9 would be in the "marginally acceptable" category. The results of the measurements of existing noise levels are summarized in Table 16-5, "Existing Noise Levels (in dBA)."

Table 16-5: Existing Noise Levels (in dBA)*

Receptor	Measurement Location	Time	L_{eq}	L_{10}	L_{50}	L_{90}
1	River Avenue and East 167th Street	AM	76.9	84.5	71.5	66.0
		Midday	76.9	83.9	69.9	65.2
		PM	77.0	84.7	70.4	66.3
		Saturday	77.2	83.6	70.8	66.6
2	River Avenue and East 165th Street	AM	74.7	78.2	66.5	59.6
		Midday	73.2	77.1	66.2	60.6
		PM	73.3	79.3	65.7	60.7
		Saturday	73.6	76.1	64.9	58.8
3	Edward L. Grant Highway between Jerome Avenue and West 169th Street	AM	68.5	72.5	66.0	60.9
		Midday	66.1	69.2	65.0	59.9
		PM	66.6	69.5	64.1	59.2
		Saturday	66.5	70.8	64.5	58.8
4	Jerome Avenue (west side) and West 168th Street	AM	73.3	82.2	65.0	58.0
		Midday	68.2	71.4	62.3	57.9
		PM	74.5	83.7	64.0	58.2
		Saturday	75.1	78.4	65.5	61.2
5	Corner of Jerome Avenue and E. Clark Place, north of Jerome Avenue, Gerard Avenue and E. Clark Place Triangle	AM	73.7	80.3	64.6	59.2
		Midday	73.6	76.9	65.3	61.5
		PM	74.2	78.6	65.0	60.6
		Saturday	70.4	72.3	61.6	58.2
6	Edward L. Grant Highway between Jesup Avenue and Shakespeare Avenue	AM	69.5	74.0	66.0	61.3
		Midday	65.5	69.4	63.8	60.3
		PM	67.2	70.4	65.3	61.1
		Saturday	64.1	64.3	63.9	63.6
7	Cromwell Avenue between West 169th Street and West 170th Street	AM	61.3	64.3	59.9	55.2
		Midday	67.5	70.7	65.7	62.5
		PM	59.7	63.0	58.2	55.2
		Saturday	61.9	67.8	57.5	52.6
8	East 170th Street between Townsend Avenue and Walton Avenue	AM	68.6	72.5	67.1	62.7
		Midday	62.4	66.7	59.8	55.2
		PM	67.8	71.6	66.3	62.2
		Saturday	68.3	73.1	66.4	63.1
9	Inwood Avenue between West 170th Street and Macombs Road	AM	64.2	69.6	61.7	56.9
		Midday	61.2	65.0	58.8	55.2
		PM	62.1	65.5	61.0	56.7
		Saturday	65.2	68.9	62.6	58.8

Table 16-5 (continued): Existing Noise Levels (in dBA)

Receptor	Measurement Location	Time	L_{eq}	L_{10}	L_{50}	L_{90}
10	Jerome Avenue and West 172nd Street (northwest corner)	AM	74.5	82.4	67.1	60.8
		Midday	74.0	75.5	65.2	58.3
		PM	73.1	78.4	64.1	58.5
		Saturday	72.9	76.0	64.1	60.3
11	West Mount Eden Avenue between Jerome Avenue and Inwood Avenue	AM	67.8	71.6	65.5	63.4
		Midday	67.8	71.1	66.2	64.2
		PM	62.3	65.6	60.5	57.9
		Saturday	64.7	68.4	62.9	60.3
12	Jerome Avenue between Clifford Place East and East 175th Street	AM	73.2	74.0	65.2	59.8
		Midday	70.3	72.7	62.6	59.5
		PM	73.7	77.9	64.7	61.0
		Saturday	72.5	73.1	64.6	61.7
13	Jerome Avenue between East 177th Street and East Tremont Avenue	AM	77.3	81.9	68.0	61.3
		Midday	76.1	77.8	65.8	62.4
		PM	77.4	83.6	66.6	61.7
		Saturday	72.3	73.5	66.0	62.1
14	East Burnside Avenue between Walton Avenue and Morris Avenue	AM	70.1	73.5	66.7	61.3
		Midday	66.4	71.6	64.3	60.1
		PM	67.0	70.4	65.1	60.8
		Saturday	70.1	73.1	66.9	64.4
15	Jerome Avenue and East 182nd Street	AM	75.0	83.2	65.9	60.2
		Midday	72.9	77.8	67.9	60.1
		PM	74.0	80.5	65.9	58.3
		Saturday	72.6	76.2	65.6	62.3
16	West 183rd Street between Grand Avenue and Davidson Avenue	AM	64.4	67.2	61.8	57.7
		Midday	63.9	67.6	60.6	56.3
		PM	62.2	65.9	60.2	57.8
		Saturday	69.1	72.8	65.3	62.1
17	East Tremont Avenue between Jerome Avenue and Walton Avenue	AM	72.5	78.4	67.1	61.4
		Midday	71.4	75.9	68.6	64.0
		PM	72.9	80.8	68.6	61.5
		Saturday	73.0	78.2	68.8	62.5
18	Northeast corner of Creston Avenue and East Tremont Avenue (replacement monitoring site for Burnside due to construction)	AM	67.5	72.0	65.1	60.7
		Midday	64.6	68.9	61.6	56.1
		PM	67.6	72.1	65.5	60.9
		Saturday	69.9	71.7	63.8	59.7
19	River Avenue between East 167th Street and East 168th Street (Elevated)	AM	72.4	77.4	60.1	55.9
		Midday	71.5	76.7	59.0	55.4
		PM	78.2	73.8	62.0	56.7
		Saturday	72.6	74.6	61.0	57.1
20	Jerome Avenue between East 172nd Street and East 171st Street (Elevated)	AM	72.2	76.5	66.1	55.3
		Midday	71.4	73.1	63.9	58.2
		PM	71.9	73.6	65.5	59.7
		Saturday	71.7	72.6	65.2	61.2

Source: STV Incorporated, 2017.

Potential Development Site 40 would be located directly adjacent to the PS 306 school playground along West 177th Street. As a result, one noise measurement site P was also monitored to determine the midday sound level nearby potential Development Site 40. The resulting L_{eq} noise level was measured at 68.6 dBA.

16.6 Noise Prediction Methodology

GENERAL METHODOLOGY

Proportional Modeling

In order to predict the noise levels in the future with and without the Proposed Actions, monitored noise levels are projected by using a proportional modeling procedure, per the guidance of the *CEQR Technical Manual* guidelines. This procedure takes into account the changes in noise levels due to increases in traffic associated with area growth. First, future traffic volumes are obtained by adding future traffic volumes to the existing baseline conditions. Then, vehicular traffic volumes under the baseline and future conditions are converted into Passenger Car Equivalent ("PCE") values. For this conversion, one medium truck is estimated to generate the noise equivalent of 13 cars, one bus is estimated to generate the noise equivalent of 18 cars, and one heavy truck is estimated to generate the noise equivalent of 47 cars. Future noise levels are calculated using the following equation:

$$Future\ Noise\ Level\ = 10 * log\ (\frac{Future\ PCE}{Existing\ PCE}) + Baseline\ Noise\ Level$$

The calculation is conducted using the L_{eq} noise measurement results. L_{10} values are calculated by adding the difference between the L_{10} and L_{eq} descriptors found to exist in the measurement program to the calculated future L_{eq} noise level.

Noise from the School Playground

Future development sites located adjacent to existing school playgrounds areas require an analysis of school playground noise to determine the potential for window/wall attenuation. Therefore, as Potential Development Site 40 is located directly adjacent to P.S. 306 (40 W. Tremont Avenue), an additional analysis of the potential for noise from school playground areas to impact the development site is performed. The *CEQR Technical Manual* provides the following guidance to determine the sound effects of proposed playgrounds:

> *"….based upon noise measurements made at 10 school playground sites in 1987, it may be assumed the $L_{eq(1)}$ noise levels at the boundary would be 75 dB(A), 15 feet from the boundary would be 73 dB(A), 30 feet from the boundary would be 70 dB(A), and the noise level would decrease by 4.5 dB(A) per doubling of distance beyond 30 feet."*

As a result, the analysis of the proposed playground consists of the following procedures:

- Existing noise measurements were conducted along the edge of the existing playground nearby potential development site 40 during the midday period;
- The distances between the playground boundary and nearby noise-sensitive building are determined;
- Play area noise levels are predicted for the west façade of potential development site 30 per the guidance of the *CEQR Technical Manual* outlined above;
- Play area noise levels are combined with the predicted With-Action traffic noise levels to determine total future noise levels with the Proposed Actions; and
- Total future noise levels with the Proposed Actions are compared to the predicted No-Action noise levels for purposes of impact determination.

16.7 The Future without the Proposed Actions (No-Action Condition)

Using the methodologies previously described, No-Action noise levels for the 2026 analysis year are calculated at the 20 mobile source noise analysis receptors. These No-Action values are shown in Table 16-6, "2026 No-Action Condition Noise Levels (in dBA)."

Table 16-6: 2026 No-Action Condition Noise Levels (in dBA)

Receptor	Measurement Location	Time	Existing L_{eq}	No-Action L_{eq}	L_{eq} change	No-Action L_{10}
1	River Avenue and East 167th Street	AM	76.9	78.6	1.7	86.2
		Midday	76.9	78.3	1.4	85.3
		PM	77.0	78.3	1.3	86.0
		Saturday	77.2	78.6	1.4	85.0
2	River Avenue and East 165th Street	AM	74.7	75.5	0.8	79.0
		Midday	73.2	73.7	0.5	77.6
		PM	73.3	73.3	0.0	79.3
		Saturday	73.6	73.6	0.0	76.1
3	Edward L. Grant Highway between Jerome Avenue and West 169th Street	AM	68.5	70. 1	1.6	74.1
		Midday	66.1	67.5	1.4	70.6
		PM	66.6	68.9	2.3	71.8
		Saturday	66.5	68.2	1.7	72.5
4	Jerome Avenue (west side) and West 168th Street	AM	73.3	74.0	0.7	82.9
		Midday	68.2	68.5	0.3	71.7
		PM	74.5	74.8	0.3	84.0
		Saturday	75.1	75.2	0.1	78.5
5	Corner of Jerome Avenue and E. Clark Place, north of Jerome Avenue, Gerard Avenue and E. Clark Place Triangle	AM	73.7	74.3	0.6	80.9
		Midday	73.6	73.6	0.0	76.9
		PM	74.2	74.2	0.0	78.6
		Saturday	70.4	70.4	0.0	72.3
6	Edward L. Grant Highway between Jesup Avenue and Shakespeare Avenue	AM	69.5	71.2	1.7	75.7
		Midday	65.5	66.3	0.8	70.2
		PM	67.2	68.6	1.4	71.8
		Saturday	64.1	65.3	1.2	65.5
7	Cromwell Avenue between West 169th Street and West 170th Street	AM	61.3	62.0	0.7	65.0
		Midday	67.5	67.6	0.1	70.8
		PM	59.7	59.7	0.0	63.0
		Saturday	61.9	61.9	0.0	67.8
8	East 170th Street between Townsend Avenue and Walton Avenue	AM	68.6	71.0	2.4	74.9
		Midday	62.4	63.2	0.8	67.5
		PM	67.8	70.0	2.2	73.8
		Saturday	68.3	69.8	1.5	74.6
9	Inwood Avenue between West 170th Street and Macombs Road	AM	64.2	64.2	0.0	69.6
		Midday	61.2	61.2	0.0	65.0
		PM	62.1	62.1	0.0	65.5
		Saturday	65.2	65.2	0.0	68.9
10	Jerome Avenue and West 172nd Street (northwest corner)	AM	74.5	75.9	1.4	83.8
		Midday	74.0	74.4	0.4	75.9
		PM	73.1	73.5	0.4	78.8
		Saturday	72.9	72.9	0.0	76.0

Table 16-6 (continued): 2026 No-Action Condition Noise Levels (in dBA)

Receptor	Measurement Location	Time	Existing L_{eq}	No-Action L_{eq}	L_{eq} change	No-Action L_{10}
11	West Mount Eden Avenue between Jerome Avenue and Inwood Avenue	AM	67.8	75.2	7.4	79.0
		Midday	67.8	74.8	7.0	78.1
		PM	62.3	68.2	5.9	71.5
		Saturday	64.7	69.6	4.9	73.3
12	Jerome Avenue between Clifford Place East and East 175th Street	AM	73.2	75.1	1.9	75.9
		Midday	70.3	71.4	1.1	73.8
		PM	73.7	75.3	1.6	79.5
		Saturday	72.5	73.5	1.0	74.1
13	Jerome Avenue between East 177th Street and East Tremont Avenue	AM	77.3	78.7	1.4	83.3
		Midday	76.1	77.3	1.2	79.0
		PM	77.4	79.2	1.8	85.4
		Saturday	72.3	73.6	1.3	74.8
14	East Burnside Avenue between Walton Avenue and Morris Avenue	AM	70.1	72.6	2.5	76.0
		Midday	66.4	67.9	1.5	73.1
		PM	67.0	68.8	1.8	72.2
		Saturday	70.1	71.4	1.3	74.4
15	Jerome Avenue and East 182nd Street	AM	75.0	77.1	2.1	85.3
		Midday	72.9	73.8	0.9	78.7
		PM	74.0	75.9	1.9	82.4
		Saturday	72.6	73.6	1.0	77.2
16	West 183rd Street between Grand Avenue and Davidson Avenue	AM	64.4	66.8	2.4	69.6
		Midday	63.9	64.7	0.8	68.4
		PM	62.2	63.4	1.2	67.1
		Saturday	69.1	70.0	0.9	73.7
17	East Tremont Avenue between Jerome Avenue and Walton Avenue	AM	72.5	75.4	2.9	81.3
		Midday	71.4	74.3	2.9	78.8
		PM	72.9	75.1	2.2	83.0
		Saturday	73.0	74.6	1.6	79.8
18	Northeast corner of Creston Avenue and East Tremont Avenue (replacement monitoring site for Burnside due to construction)	AM	67.5	70.0	2.5	74.5
		Midday	64.6	66.9	2.3	71.2
		PM	67.6	69.4	1.8	73.9
		Saturday	69.9	71.2	1.3	73.0
19	River Avenue between East 167th Street and East 168th Street (Elevated)	AM	72.4	74.7	2.3	79.7
		Midday	71.5	74.6	3.1	79.8
		PM	78.2	80.6	2.4	76.2
		Saturday	72.6	73.9	1.3	75.9
20	Jerome Avenue between East 172nd Street and East 171st Street (Elevated)	AM	72.2	74.1	1.9	78.4
		Midday	71.4	72.6	1.2	74.3
		PM	71.9	72.5	0.6	74.2
		Saturday	71.7	72.2	0.5	73.1

Source: STV Incorporated, 2017.

In 2026, the maximum increase in $L_{eq}(1)$ noise levels for the No-Action condition would be 7.4 dBA. Changes of this magnitude would be clearly perceptible to nearby residents. However, this increase would only apply to site 11. For informational purposes only, no other site would experience noise increases greater than the 3dBA hearing perception threshold. In terms of CEQR noise exposure guidelines, noise levels at receptor site 9 would remain classified in the "marginally acceptable" category, noise levels at receptor sites 2, 3, 6, 7, 8, 11, 12, 14, 16, 18, 19, and 20 would remain in the "marginally unacceptable" category, and noise levels at receptor sites 1, 4, 5, 10, 13, 15, and 17 would remain in the "clearly unacceptable" category.

16.8 The Future with the Proposed Actions (With-Action Condition)

NOISE IMPACT IDENTIFICATION

Using the methodologies previously described, With-Action noise levels are calculated at the 20 noise impact analysis receptors for the 2026 analysis year. The With-Action noise levels for all receptors are shown in Table 16-7, "2026 With-Action Noise Levels (in dBA)."

In 2026, the maximum increase in $L_{eq}(1)$ noise levels for the With-Action condition compared to the No-Action condition for all receptor sites would be 1.4 dBA. Changes of this magnitude would be barely perceptible and would not constitute a significant adverse noise impact according to *CEQR Technical Manual* impact criteria. In terms of CEQR noise exposure guidelines, noise levels at receptor site 9 would remain in the "marginally acceptable" category, noise levels at receptor sites 2, 3, 6, 7, 8, 12, 19, and 20 would remain in the "marginally unacceptable" category, noise levels at receptor sites 13, 15, and 17 would move from the "clearly unacceptable" category to the "marginally unacceptable" category, noise levels at receptor sites 11, 14, 16, and 18 would change from the "marginally unacceptable" category to the "clearly unacceptable" category and noise levels at receptor sites 1, 4, 5, and 10 would remain in the "clearly unacceptable" category.

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Table 16-7: 2026 With-Action Condition Noise Levels (in dBA)

Receptor	Measurement Location	Time	No-Action L_{eq}	With-Action L_{eq}	L_{eq} change	With-Action L_{10}
1	River Avenue and East 167th Street	AM	78.6	78.7	0.1	86.3
		Midday	78.3	78.5	0.2	85.5
		PM	78.3	78.4	0.1	86.1
		Saturday	78.6	78.7	0.1	85.1
2	River Avenue and East 165th Street	AM	75.5	75.6	0.1	79.1
		Midday	73.7	73.9	0.2	77.8
		PM	73.3	73.4	0.1	79.4
		Saturday	73.6	73.9	0.3	76.4
3	Edward L. Grant Highway between Jerome Avenue and West 169th Street	AM	70.1	70.2	0.1	74.2
		Midday	67.5	67.7	0.2	70.8
		PM	68.9	69.0	0.1	71.9
		Saturday	68.2	68.3	0.1	72.6
4	Jerome Avenue (west side) and West 168th Street	AM	74.0	74.1	0.1	83.0
		Midday	68.5	68.6	0.1	71.8
		PM	74.8	74.9	0.1	84.1
		Saturday	75.2	75.4	0.2	78.7
5	Corner of Jerome Avenue and E. Clark Place, north of Jerome Avenue, Gerard Avenue and E. Clark Place Triangle	AM	74.3	74.4	0.1	81.0
		Midday	73.6	73.8	0.2	77.1
		PM	74.2	74.4	0.2	78.8
		Saturday	70.4	70.6	0.2	72.5
6	Edward L. Grant Highway between Jesup Avenue and Shakespeare Avenue	AM	71.2	71.3	0.1	75.8
		Midday	66.3	66.4	0.1	70.3
		PM	68.6	68.7	0.1	71.9
		Saturday	65.3	65.3	0.0	65.5
7	Cromwell Avenue between West 169th Street and West 170th Street	AM	62.0	62.0	0.0	65.0
		Midday	67.6	68.5	0.9	71.7
		PM	59.7	61.1	1.4	64.4
		Saturday	61.9	62.8	0.9	68.7
8	East 170th Street between Townsend Avenue and Walton Avenue	AM	71.0	71.2	0.2	75.1
		Midday	63.2	63.5	0.3	67.8
		PM	70.0	70.3	0.3	74.1
		Saturday	69.8	70.2	0.4	75.0
9	Inwood Avenue between West 170th Street and Macombs Road	AM	64.2	64.2	0.0	69.6
		Midday	61.2	61.3	0.1	65.1
		PM	62.1	62.2	0.1	65.6
		Saturday	65.2	65.3	0.1	69.0
10	Jerome Avenue and West 172nd Street (northwest corner)	AM	75.9	76.1	0.2	84.0
		Midday	74.4	74.6	0.2	76.1
		PM	73.5	74.0	0.5	79.3
		Saturday	72.9	73.3	0.4	76.4

Table 16-7 (continued): 2026 With-Action Condition Noise Levels (in dBA)

Receptor	Measurement Location	Time	No-Action L_{eq}	With-Action L_{eq}	L_{eq} change	With-Action L_{10}
11	West Mount Eden Avenue between Jerome Avenue and Inwood Avenue	AM	75.2	75.2	0.0	79.0
		Midday	74.8	74.8	0.0	78.1
		PM	68.2	68.2	0.0	71.5
		Saturday	69.6	69.6	0.0	73.3
12	Jerome Avenue between Clifford Place East and East 175th Street	AM	75.1	75.3	0.2	76.1
		Midday	71.4	71.8	0.4	74.2
		PM	75.3	75.7	0.4	79.9
		Saturday	73.5	73.9	0.4	74.5
13	Jerome Avenue between East 177th Street and East Tremont Avenue	AM	78.7	78.7	0.0	83.3
		Midday	77.3	77.7	0.4	79.4
		PM	79.2	79.6	0.4	85.8
		Saturday	73.6	74.0	0.4	75.2
14	East Burnside Avenue between Walton Avenue and Morris Avenue	AM	72.6	72.7	0.1	76.1
		Midday	67.9	68.2	0.3	73.4
		PM	68.8	69.0	0.2	72.4
		Saturday	71.4	71.6	0.2	74.6
15	Jerome Avenue and East 182nd Street	AM	77.1	77.3	0.2	85.5
		Midday	73.8	74.5	0.7	79.4
		PM	75.9	76.6	0.7	83.1
		Saturday	73.6	74.2	0.6	77.8
16	West 183rd Street between Grand Avenue and Davidson Avenue	AM	66.8	66.9	0.1	69.7
		Midday	64.7	64.7	0.0	68.4
		PM	63.4	63.5	0.1	67.2
		Saturday	70.0	70.0	0.0	73.7
17	East Tremont Avenue between Jerome Avenue and Walton Avenue	AM	75.4	75.4	0.0	81.3
		Midday	74.3	74.4	0.1	78.9
		PM	75.1	75.2	0.1	83.1
		Saturday	74.6	74.7	0.1	79.9
18	Northeast corner of Creston Avenue and East Tremont Avenue (replacement monitoring site for Burnside due to construction)	AM	70.0	70.1	0.1	74.6
		Midday	66.9	67.3	0.4	71.6
		PM	69.4	69.6	0.2	74.1
		Saturday	71.2	71.4	0.2	73.2
19	River Avenue between East 167th Street and East 168th Street (Elevated)	AM	74.7	74.7	0.0	79.7
		Midday	74.6	74.6	0.0	79.8
		PM	80.6	80.6	0.0	76.2
		Saturday	73.9	73.9	0.0	75.9
20	Jerome Avenue between East 172nd Street and East 171st Street (Elevated)	AM	74.1	74.3	0.2	78.6
		Midday	72.6	72.9	0.3	74.6
		PM	72.5	73.0	0.5	74.7
		Saturday	72.2	72.7	0.5	73.6

Source: STV Incorporated, 2017.

PLAYGROUND NOISE ASSESSMENT

To address the potential impacts that playground noise could have on the proposed project, a playground noise analysis was conducted at a potentially affected project site. Predicted playground L_{10} noise levels at Potential Development Site 40 are subsequently used to determine building attenuation requirements at the western façade of that location. As shown in Table 16-8, "Noise Level at Potential Development Site 40 due to the PS 306 School Playground (in dBA)," the total With-Action noise levels at the residential receiver were calculated by logarithmically adding the adjusted future playground noise to the No-Action (assumed to be unchanged from the existing condition monitored value) traffic noise level. As shown in Table 16-8, the resulting L_{10} noise levels would be 75.9 dBA at the western façade of Potential Development Site 40.

Table 16-8: Noise Level at Potential Development Site 40 due to the PS 306 School Playground (in dBA)

Potentially Affected Project Site	Time of Day	Total No-Action Noise [1]	Approximate Distance to Playground	With-Action Playground Noise	Total With-Action Noise	Predicted L_{10} [2]
Potential Development Site 40	Midday	68.6 [3]	1	71.2	73.1	75.9

Notes:
[1] Assumes no significant change in noise level along W 177th Street between the Existing and No-Action scenario.
[2] Predicted L_{10} is calculated by adding 2.8 dBA to the predicted combined L_{eq} based on SCA Playground Noise Study, AKRF, Inc., October 23, 1992.
[3] The existing noise level, from which the No-Action noise level is derived, represents a monitored noise level taken in the field.

Source: STV Incorporated, 2017

Predicted playground L_{10} noise levels at Potential Development Site 40 were used to determine building attenuation requirements for the western façade of the proposed building.

NOISE ATTENUATION MEASURES

CEQR

The *CEQR Technical Manual* has set noise attenuation requirements for buildings based on exterior noise 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, and are determined based on exterior $L_{10}(1)$ noise levels.

Table 16-9, "Required Attenuation at Noise Measurement Locations," shows the minimum window/wall attenuation necessary to meet *CEQR Technical Manual* requirements for internal noise levels at each of the noise measurement locations. The With-Action $L_{10}(1)$ noise levels are calculated using the existing noise measurements, the traffic noise analysis, and the playground noise analysis. Based on

the values shown in Table 16-9, required attenuation levels are determined for all projected and potential development sites. These values are shown in Appendix G, "Noise," (G1, "Projected Development Sites Noise Attenuation Requirements").

Table 16-9: Required Attenuation at Noise Measurement Locations

Receptor #	Location	Maximum Calculated Total $L_{10(1)}$ Noise Level in dBA	CEQR Minimum Required Attenuation in dBA [2]
1	River Avenue and East 167th Street	86.3	43
2	River Avenue and East 165th Street	79.4	35
3	Edward L. Grant Highway between Jerome Avenue and West 169th Street	74.2	31
4	Jerome Avenue (west side) and West 168th Street	84.1	41
5	Corner of Jerome Ave and E. Clark Place, north of Jerome Avenue, Gerard Avenue and E. Clark Place Triangle	81.0	37
6	Edward L. Grant Highway between Jesup Avenue and Shakespeare Avenue	75.8	31
7	Cromwell Avenue between West 169th Street and West 170th Street	71.7	28
8	East 170th Street between Townsend Avenue and Walton Avenue	75.1	31
9	Inwood Avenue between West 170th Street and Macombs Road	70.0	28
10	Jerome Avenue and West 172nd Street. (northwest corner)	84.0	41
11	West Mount Eden Avenue between Jerome Avenue and Inwood Avenue	79.0	35
12	Jerome Avenue between Clifford Place East and East 175th Street	79.9	35
13	Jerome Avenue between East 177th Street and East Tremont Avenue	85.8	42
14	East Burnside Avenue between Walton Avenue and Morris Avenue	76.1	33
15	Jerome Avenue and East 182nd Street	85.5	42
16	West 183rd Street between Grand Avenue and Davidson Avenue	73.7	31
17	East Tremont Avenue between Jerome Avenue and Walton Avenue	83.1	40
18	Northeast corner of Creston Avenue and East Tremont Avenue (replacement monitoring site for Burnside due to construction)	74.6	31
19	River Avenue between East 167th Street and East 168th Street (Elevated)	79.8	35
20	Jerome Avenue between East 172nd Street and East 171st Street (Elevated)	78.6	35
P	PS 306	75.9	31

Notes:
1 Attenuation values are shown for residential uses; retail and office uses would be 5 dBA less.
2 "N/A" indicates that the highest calculated L10 is below 70 dBA. The *CEQR Technical Manual* does not specify minimum attenuation guidance for exterior L10 values below this level.

Source: STV Incorporated, 2017.

The attenuation of a composite structure is a function of the attenuation provided by each of its component parts and the surface area of each part. Normally, a building façade consists of wall, glazing, and any vents or louvers associated with the building mechanical systems in various ratios of area. The designs for the projected and potential development site With-Action buildings would include acoustically rated windows and air conditioning (a means of alternate ventilation). The buildings would be designed, including these elements, to provide a composite Outdoor–Indoor Transmission Class (OITC) rating[1] greater than or equal to the values listed in Appendix G, "Noise," (G1, "Projected Development Sites Noise Attenuation Requirements") along with an alternative means of ventilation in all habitable rooms of the residential units.

To implement the attenuation requirements shown in Appendix G, "Noise," (G1, "Projected Development Sites Noise Attenuation Requirements") an (E) Designation for noise would be applied to all privately held projected and potential development sites specifying the appropriate amount of window/wall attenuation. The text of Noise (E) Designation E-442 for window/wall attenuation of 40 dBA or less would be as follows:

> **To ensure an acceptable interior noise environment, the building façade(s) or future development must provide minimum composite building façade attenuation as shown in Appendix G, "Noise," (G1, "Projected Development Sites Noise Attenuation Requirements") of the Jerome Avenue Rezoning Environmental Impact Statement in order to maintain an interior L_{10} noise level not greater than 45 dBA for residential and community facility uses or not greater than 50 dBA for commercial uses. To maintain a closed-window condition in these areas, an alternate means of ventilation that brings outside air into the building without degrading the acoustical performance of the building façade(s) must also be provided.**

The text of Noise (E) Designation E-442 for window/wall attenuation greater than 40 dBA would be as follows:

To ensure an acceptable interior noise environment, the building façade(s) or future development must provide minimum composite building façade attenuation as shown in Appendix G, "Noise," (G1, "Projected Development Sites Noise Attenuation Requirements") of Jerome Avenue Rezoning Environmental Impact Statement in order to maintain an interior L_{10} noise level not greater than 45 dBA

[1] The OITC classification is defined by ASTM International (ASTM E1332) and provides a single–number rating that is used for designing a building façade including walls, doors, glazing, and combinations thereof. The OITC rating is designed to evaluate building elements by their ability to reduce the overall loudness of ground and air transportation noise.

for residential and community facility uses or not greater than 50 dBA for commercial uses. To achieve up to 43 dBA of building attenuation, special design features that go beyond the normal double-glazed windows are necessary and may include using specifically designed windows (i.e., windows with small sizes, windows with air gaps, windows with thicker glazing, etc.), and additional building attenuation. To maintain a closed-window condition in these areas, an alternate means of ventilation that brings outside air into the building without degrading the acoustical performance of the building façade(s) must also be provided.

16.9 Mechanical Equipment

It is assumed that building mechanical systems (i.e., HVAC systems) for all buildings associated with the Proposed Actions would be designed to meet all applicable noise regulations (i.e., Subchapter 5, §24−227 of the New York City Noise Control Code, the New York City Department of Buildings Code) and to avoid producing levels that would result in any significant increase in ambient noise levels. Therefore, the Proposed Actions would not result in any significant adverse noise impacts related to building mechanical equipment.