6

Noise

The goal of this chapter is to determine whether the Proposed Actions would have a significant adverse impact on the environment at existing sensitive receptors and whether noise levels at new noise-sensitive receptors within the project area would exceed applicable New York City noise limits.

Introduction

As described in **Chapter 1, Project Description**, the Proposed Actions would allow the applicants to lease space in the existing Starrett-Lehigh Building and Terminal Warehouse to a more diverse range of tenant types. The two buildings are currently occupied by a number of different types of businesses—including eating and drinking establishments, office, showroom, studio, warehouse, and storage space (Use Groups 6, 7, 9 and 16). The Starrett-Lehigh Building also currently contains manufacturing uses (Use Groups 16 and 17). These uses would continue to be allowed as-of-right, and the Proposed Actions would allow certain additional commercial and community facility uses to be located within the two buildings, including destination retail as well as academic space and medical offices.[1] Retail spaces are not considered to be sensitive to noise. As such, the Proposed Actions would allow for new noise-sensitive community facility uses. However, no residential uses, community facility uses that provide living or sleeping accommodations of any kind, or hotels would be permitted.

Per the *2020 CEQR Technical Manual*, a noise analysis is appropriate if an action would generate mobile or stationary sources of noise or would be located in an area with high

[1] Food stores, including supermarkets, grocery stores or delicatessen stores would continue to be allowed as-of-right but would not have limitations on floor area per establishment.

ambient noise levels. Mobile sources include vehicular traffic; stationary sources include rooftop equipment such as emergency generators, cooling towers, and other mechanical equipment. The Proposed Actions would generate noise from mobile sources, which has the potential to increase noise at existing receptors. In addition, as discussed above, the Proposed Actions would allow for new noise-sensitive receptors to be located within the project area. No construction would occur as part of the Proposed Actions, other than interior renovations typically associated with a change of tenant, and the Proposed Actions would not result in changes to either building's heating, ventilation, or air conditioning (HVAC) systems. Therefore, the purpose of this noise assessment is to determine if:

- The Proposed Actions would have a significant adverse environmental impact by significantly increasing sound levels from mobile sources at existing sensitive noise receptors within the Traffic study area, including residential, commercial, and institutional land uses; and
- New noise receptors introduced at the project area would be in an acceptable ambient sound level environment as defined in applicable provisions of the City's noise code.

Principal Conclusions

A noise assessment was conducted to determine whether the Proposed Actions would significantly increase sound levels from mobile sources at existing noise receptors, and if new noise receptors that would be introduced would be in an acceptable ambient sound level environment as defined in applicable provisions of the City's noise code. Because the Proposed Actions would not result in changes to either building's heating, ventilation, or air conditioning (HVAC) systems and as the Proposed Actions would provide sufficient partition requirements, an assessment of whether the Proposed Actions would significantly increase sound levels from stationary sources is not warranted.

Existing Noise Receptors

Based on the Level 2 Screening Results completed for the transportation analysis (see **Chapter 4, Transportation**), detailed traffic analyses were completed at 21 intersections for the weekday PM and Saturday peak hours. Future 2024 No-Action and 2024 With-Action noise conditions were determined based on proportional traffic modeling using passenger car equivalents (PCEs). With-Action noise conditions would not increase by more than 3 dBA compared to the No-Action noise conditions and there would be no significant adverse noise impact to existing receptors.

New Noise Receptors

Noise monitoring was conducted at the project area, and future 2024 No-Action and 2024 With-Action noise conditions were determined using proportional modeling of the traffic as presented in the transportation analysis. Based on this analysis, like in existing and No-Action conditions, 2024 With-Action noise conditions would be Clearly Unacceptable on the western facades of both buildings where sound levels are projected to exceed 80 dBA and Marginally Unacceptable on all other facades of both buildings where sound levels are projected to be between 70 dBA and 80 dBA according to the CEQR Noise Exposure Guidelines.

Since With-Action noise conditions would be Clearly Unacceptable or Marginally Unacceptable according to the CEQR Noise Exposure Guidelines, building attenuation would be required to ensure that interior noise levels for new community facility spaces meet CEQR criteria. A minimum window/wall sound attenuation would be required for new community facility spaces to meet an interior noise condition of 45 dBA. The window/wall attenuation and alternative means of ventilation requirements would be set forth in a Noise (E) Designation (E-625) for the project area.

There is the potential for interior noise generated by manufacturing/industrial uses to result in high interior noise conditions when they are located immediately adjacent to new community facility spaces (i.e., sharing a partition wall or floor/ceiling). To ensure that new community facility spaces maintain an interior noise condition of 45 dBA (L_{eq} or L_{10}) or lower, sufficient partitions between immediately adjacent manufacturing/industrial and community facility uses are required. To reduce the potential for interior noise to enter new community facility spaces from manufacturing/industrial spaces, mechanical ventilation systems shall not result in sound transmission that exceeds the interior noise condition of 45 dBA (L_{eq} or L_{10}). The interior partition sound attenuation and building sound transmission requirements would also be set forth in an (E) Designation (E-625) for noise that would be applied to the project area.

Noise Background

Noise is defined as unwanted or excessive sound. Sound becomes unwanted when it interferes with normal activities such as sleep, work, or recreation. How people perceive sound depends on several measurable physical characteristics. These factors include:

- Level - Sound level is based on the amplitude of sound pressure fluctuations and is often equated to perceived loudness.
- Frequency - Sounds are comprised of acoustic energy distributed over a variety of frequencies. Acoustic frequencies, commonly referred to as tone or pitch, are typically measured in Hertz (Hz). Pure tones have energy concentrated in a narrow frequency range and can be more audible to humans than broadband sounds. Sound levels are most often measured on a logarithmic scale of decibels (dB). The decibel scale compresses the audible acoustic pressure levels which can vary from the threshold of hearing (0 dB) to the threshold of pain (120 dB). Because sound levels are measured in dB, the addition of two sound levels is not linear. Adding two equal sound levels results in a 3 dB increase in the overall level. Research indicates the following general relationships between sound level and human perception:
  - A 3-dB increase is a doubling of acoustic energy and is the threshold of perceptibility to the average person.
  - A 10-dB increase is a tenfold increase in acoustic energy and is perceived as a doubling in loudness to the average person.

Audible sound is comprised of acoustic energy over a range of frequencies typically from 20 to 20,000 Hz. The human ear does not perceive sound levels at each frequency as equally loud. To compensate for this phenomenon in perception, a frequency filter known as A-weighting (dBA) is used to evaluate environmental noise levels. **Table 6-1** presents a list of common outdoor and indoor sound levels.

Table 6-1 Common Indoor and Outdoor Sound Levels

Outdoor Sound Levels	Sound Pressure μPa		Sound Level dBA	Indoor Sound Levels
	6,324,555	-	110	Rock Band at 5 m
Jet Over-Flight at 300 m		-	105	
	2,000,000	-	100	Inside New York Subway Train
Gas Lawn Mower at 1 m		-	95	
	632,456	-	90	Food Blender at 1 m
Diesel Truck at 15 m		-	85	
Noisy Urban Area—Daytime	200,000	-	80	Garbage Disposal at 1 m
		-	75	Shouting at 1 m
Gas Lawn Mower at 30 m	63,246	-	70	Vacuum Cleaner at 3 m
Suburban Commercial Area		-	65	Normal Speech at 1 m
	20,000	-	60	
Quiet Urban Area—Daytime		-	55	Quiet Conversation at 1 m
	6,325	-	50	Dishwasher Next Room
Quiet Urban Area—Nighttime		-	45	
	2,000	-	40	Empty Theater or Library
Quiet Suburb—Nighttime		-	35	
	632	-	30	Quiet Bedroom at Night
Quiet Rural Area—Nighttime		-	25	Empty Concert Hall
Rustling Leaves	200	-	20	
		-	15	Broadcast and Recording Studios
	63	-	10	
		-	5	
Reference Pressure Level	20	-	0	Threshold of Hearing

μPA: MicroPascals describe pressure. The pressure level is what sound level monitors measure.
dBA: A-weighted decibels describe pressure logarithmically with respect to 20 μPa (the reference pressure level).
Source: Highway Noise Fundamentals, Federal Highway Administration, September 1980.

Because sound levels change over time, a variety of sound level metrics can be used to describe environmental noise. The following is a list of sound level descriptors that are used in the noise analysis:

- L_{10} is the sound level which is exceeded for 10 percent of the time during a given time period. Therefore, it represents the higher end of the range of sound levels. The unit is commonly used in the *2020 CEQR Technical Manual* to evaluate acceptable thresholds for noise exposure for new receptors that would be introduced by a proposed development.
- L_{eq} is the energy-average A-weighted sound level. The L_{eq} is a single value that is equivalent in sound energy to the fluctuating levels over a period of time. Therefore, the L_{eq} considers how loud noise events are during the period, how long they last, and how many times they occur. L_{eq} is commonly used to describe environmental noise and relates well to human annoyance. In accordance with the *2020 CEQR Technical Manual*, the L_{eq} sound level is used to assess the potential for significant increases in noise due to a proposed development at existing receptors in the study area.

Assessment Methodology

This noise analysis considers two receptor types when evaluating noise for a proposed development: existing and new receptor(s). Since the Proposed Actions would allow for new community facility uses to be located at the two buildings, these are considered "new receptors."

The analysis also considers "existing receptors," which are the current noise-sensitive uses, such as residential and commercial properties within the Traffic study area. The following describes the results of the noise assessment for these two types of receptors.

Noise Assessment Methodology for Existing Receptors (Mobile Sources)

Noise impact at existing nearby sensitive receptors is assessed according to the relative increase between No-Action and With-Action sound levels. Noise impact is assessed according to the increase in the L_{eq} sound level in accordance with the *2020 CEQR Technical Manual*. If mobile sources associated with a proposed action would increase L_{eq} sound levels by 3 dB or more and absolute levels would exceed 65 dBA L_{eq}, the proposed action would cause a significant adverse impact prior to mitigation. Additionally, if No-Action condition noise levels are 60 dBA Leq or less, a 5 dB increase would be considered a significant adverse noise impact.

Based on the level 2 Screening Results completed for the transportation analysis, detailed traffic analyses were completed at 21 intersections for the weekday PM and Saturday peak hours. Future 2024 No-Action and 2024 With-Action noise conditions were determined based on proportional traffic modeling using passenger car equivalents (PCEs).

Noise Assessment Methodology for New Receptors

With-Action noise conditions for new community facilities that would be allowed with the Proposed Actions are evaluated according to absolute exterior sound level. The assessment methodology includes conducting ambient sound measurements at the project area, determining With-Action sound levels, including increases in noise due to mobile and stationary sources, and assessing the need for minimum window/wall sound attenuation requirements in accordance with CEQR Noise Exposure Guidelines. The assessment also evaluates the need for minimum partition sound attenuation requirements for new community facility uses immediately adjacent to manufacturing/industrial uses.

Noise Exposure Guidelines

The *2020 CEQR Technical Manual* provides noise exposure guidelines for assessing ambient noise conditions at new community facility receptors, as shown in **Table 6-2**. The noise exposure guidelines for acceptable ambient conditions depend on the type of land use. Community facility uses must maintain an interior noise level of 45 dBA. With-Action exterior sound levels are evaluated to determine if receptors would be in an acceptable ambient sound level environment. As shown in **Table 6-2**, exterior ambient sound levels exceeding the greater of the 70 dBA L_{eq} or L_{10} at community facilities are considered to be Marginally Unacceptable and require a minimum window/wall sound attenuation sufficient to reduce

interior sound levels to acceptable levels. There is also the potential for interior noise generated by industrial uses to result in high interior noise conditions within new community facility spaces.

Table 6-2 Noise Exposure Guidelines for Use in City Environmental Impact Review

Receptor Type	Time Period	Acceptable External Exposure	Marginally Acceptable External Exposure	Marginally Unacceptable External Exposure	Clearly Unacceptable External Exposure
Community Facilities	All Times	$L_{10} \leq 65$ dBA	$65 < L_{10} \leq 70$ dBA	$70 < L_{10} \leq 80$ dBA	$L_{10} > 80$ dBA

Source: Table 19-2, *2020 CEQR Technical Manual*.

Noise Assessment at Existing Receptors (Mobile Source Noise Analysis)

No-Action (2024) and With-Action (2024) mobile source noise at the project area have been determined based on ambient sound measurements adjusted for No-Action and With-Action traffic conditions as presented in **Chapter 4, Transportation**. Noise conditions have been determined by adjusting the measurements for the change in traffic volumes using proportional modeling (see **Table 6-3**).

The *2020 CEQR Technical Manual* describes the process to determine PCEs. Vehicle classes are defined to have the following PCEs based on typical vehicles speeds:

- Each automobile or light truck: 1 noise PCE
- Each medium truck: 13 noise PCEs
- Each bus: 18 noise PCEs
- Each heavy truck: 47 noise PCEs

Noise increases are calculated using the following equations. These result in the incremental changes in noise between the existing and No-Action conditions, and between the No-Action and With-Action conditions.

$$No - Action\ L_{eq}\ Increase = 10 * \log\left(\frac{No - Action\ PCE}{2019\ PCE}\right)$$

$$With - Action\ L_{eq}\ Increase = 10 * \log\left(\frac{With - Action}{No - Action}\right)$$

Consistent with the transportation analysis, weekday evening and Saturday peak traffic data were used in the proportional noise modeling.[2] Vehicle classifications, including the percentage of automobiles, buses, medium trucks, and heavy trucks, were based on a combination of turning movement counts from the NYCDOT Traffic Information Management System (TIMS), data collected for other studies, and traffic counts conducted during the 2020 noise measurements. As shown in **Table 6-3**, the number of PCEs in the

[2] As detailed in Chapter 4, Transportation, project-generated traffic increments during the AM and midday peak periods are below the *CEQR Technical Manual* thresholds for detailed analysis.

2024 No-Action condition are slightly higher than the 2020 conditions and the sound levels would increase up to 1.0 dBA. The Proposed Actions would cause no change in noise condition at Site 1 and a minimal change in noise condition up to 0.2 dBA at Sites 2 and 3 compared to the No-Action condition.

Table 6-3 Passenger Car Equivalents

					Sound Increase (dBA)		
Intersection	**Period**	**Existing PCEs**	**No-Action PCEs**	**With-Action PCEs**	**No-Action minus Existing**	**With-Action minus No-Action**	**With-Action minus Existing**
Twelfth Avenue and W. 30th Street	Weekday PM	9,023	9,343	9,400	0.2	0.0	0.2
	Saturday	5,760	5,996	6,040	0.2	0.0	0.2
Twelfth Avenue and W. 29th Street	Weekday PM	8,804	9,115	9,171	0.2	0.0	0.2
	Saturday	5,670	5,913	5,949	0.2	0.0	0.2
Twelfth Avenue Between W. 29th Street and W. 26th Street	Weekday PM	8,517	8,757	8,813	0.1	0.0	0.1
	Saturday	5,363	5,556	5,576	0.2	0.0	0.2
Twelfth Avenue and W. 26th Street	Weekday PM	8,479	8,707	8,759	0.1	0.0	0.1
	Saturday	5,032	5,204	5,209	0.1	0.0	0.1
Eleventh Avenue and W. 30th Street	Weekday PM	2,295	2,854	2,906	0.9	0.1	1.0
	Saturday	2,139	2,311	2,398	0.3	0.2	0.5
Eleventh Avenue and W. 29th Street	Weekday PM	3,358	3,877	3,916	0.6	0.0	0.7
	Saturday	2,236	2,375	2,430	0.3	0.1	0.4
Eleventh Avenue and W. 28th Street	Weekday PM	2,577	2,967	3,029	0.6	0.1	0.7
	Saturday	2,022	2,042	2,092	0.0	0.1	0.1
W. 28th Street Between Twelfth Avenue and Eleventh Avenue	Weekday PM	264	250	273	-0.2	0.4	0.2
	Saturday	288	238	249	-0.8	0.2	-0.6
Eleventh Avenue Between W. 28th Street and W.27th Street	Weekday PM	2,014	2,402	2,463	0.8	0.1	0.9
	Saturday	1,510	1,559	1,608	0.1	0.1	0.3
Eleventh Avenue and W. 27th Street	Weekday PM	2,219	2,622	2,706	0.7	0.1	0.9
	Saturday	1,982	2,042	2,127	0.1	0.2	0.3
W. 27th Street Between Twelfth Avenue and Eleventh Avenue	Weekday PM	446	452	468	0.1	0.2	0.2
	Saturday	440	429	442	-0.1	0.1	0.0

Table 6-3 Passenger Car Equivalents

Intersection	Period	Existing PCEs	No-Action PCEs	With-Action PCEs	Sound Increase (dBA)		
					No-Action minus Existing	With-Action minus No-Action	With-Action minus Existing
Eleventh Avenue Between W. 27th Street and W.26th Street	Weekday PM	1,773	2,171	2,239	0.9	0.1	1.0
	Saturday	1,542	1,613	1,685	0.2	0.2	0.4
Eleventh Avenue and W. 26th Street	Weekday PM	2,855	3,261	3,346	0.6	0.1	0.7
	Saturday	1,874	1,960	2,002	0.2	0.1	0.3
W. 26th Street Between Twelfth Avenue and Eleventh Avenue	Weekday PM	738	740	757	0.0	0.1	0.1
	Saturday	373	381	351	0.1	-0.4	-0.3
Eleventh Avenue and W. 25th Street	Weekday PM	2,462	2,927	2,961	0.8	0.1	0.8
	Saturday	1,675	1,760	1,799	0.2	0.1	0.3
Eleventh Avenue and W. 24th Street	Weekday PM	2,986	3,500	3,538	0.7	0.0	0.7
	Saturday	1,932	2,026	2,072	0.2	0.1	0.3
Tenth Avenue and W. 34th Street	Weekday PM	6,845	8,301	8,359	0.8	0.0	0.9
	Saturday	4,116	4,521	4,556	0.4	0.0	0.4
Tenth Avenue and W. 33rd Street	Weekday PM	4,098	5,168	5,198	1.0	0.0	1.0
	Saturday	2,493	2,780	2,826	0.5	0.1	0.5
Tenth Avenue and W. 31st Street	Weekday PM	3,517	4,223	4,245	0.8	0.0	0.8
	Saturday	2,211	2,369	2,405	0.3	0.1	0.4
Tenth Avenue and W. 30th Street	Weekday PM	3,826	4,428	4,462	0.6	0.0	0.7
	Saturday	3,005	3,161	3,240	0.2	0.1	0.3
Tenth Avenue and W. 29th Street	Weekday PM	4,227	4,655	4,737	0.4	0.1	0.5
	Saturday	2,790	2,901	2,956	0.2	0.1	0.3
Tenth Avenue and W. 28th Street	Weekday PM	3,619	4,001	4,059	0.4	0.1	0.5
	Saturday	2,243	2,337	2,366	0.2	0.1	0.2
Tenth Avenue and W. 27th Street	Weekday PM	3,096	3,474	3,554	0.5	0.1	0.6
	Saturday	2,580	2,711	2,775	0.2	0.1	0.3
Tenth Avenue and W. 26th Street	Weekday PM	4,195	4,554	4,636	0.4	0.1	0.4
	Saturday	2,364	2,497	2,563	0.2	0.1	0.4
Tenth Avenue and W. 25th Street	Weekday PM	3,440	3,862	3,902	0.5	0.0	0.5
	Saturday	2,359	2,481	2,545	0.2	0.1	0.3
Tenth Avenue and W. 24th Street	Weekday PM	4,216	4,566	4,617	0.3	0.0	0.4
	Saturday	3,003	3,129	3,200	0.2	0.1	0.3
Tenth Avenue and W. 23rd Street	Weekday PM	4,914	5,259	5,308	0.3	0.0	0.3
	Saturday	2,966	3,113	3,176	0.2	0.1	0.3

Source: VHB, 2021.

The greatest increases in noise level near the project area between the existing and No-Action conditions are during the weekday afternoon period. The greatest increase in noise level at all intersections and roadway segments along the project area between the existing and No-Action conditions would be 1.0 dBA. The greatest increase in noise level between the No-Action and With-Action conditions would be 0.4 dBA. Since the With-Action noise conditions would not increase by more than 3 dBA compared to the No-Action condition at any intersection, there would not be significant adverse noise impact to existing receptors.

Noise Assessment at New Receptors

The following presents the results of the noise assessment at new receptors including the ambient sound monitoring results, No-Action and With-Action sound levels including increases due to mobile sources, and the assessment for minimum window/wall sound attenuation and partition sound attenuation requirements in accordance with noise exposure guidelines.

Existing Sound Levels

Noise monitoring was conducted on Tuesday October 27, 2020 to determine the existing sound levels near project area. A noise monitor was set up at ground level on the sidewalks on Twelfth Avenue between West 27th Street and West 28th Street (Site 1), on Eleventh Avenue between West 27th Street and West 28th Street (Site 2), and on West 26th Street between Twelfth Avenue and Eleventh Avenue (Site 3) as shown in **Figure 6-1**. The microphone was located to have a direct line of sight to vehicles traveling on the respective roadways. Site 3 is representative of ground-level receptors on West 26th Street, West 27th Street, and West 28th Street.

Figure 6-1 Noise Monitoring Locations



Source: VHB, 2020

The noise monitor was placed with a minimum of four feet between the microphone and nearby reflecting surfaces. With roadway and construction activity dominating the overall noise environment, 20-minute noise measurements were conducted during the weekday morning peak period (7:00 – 9:00 AM), midday period (12:00 – 2:00 PM) and evening peak period (4:30 – 6:30 PM). Measurements were conducted using a Type I sound level meter at ground level and followed the procedures outlined in the *2020 CEQR Technical Manual*, which include documenting significant sources of sound and conducting spot counts of traffic by vehicle classification.

As shown in **Table 6-4,** the measured L_{eq} levels ranged from 66.6 dBA to 81.5 dBA and the L_{10} levels ranged between 69.5 dBA to 85.3 dBA.

Table 6-4 2020 Measured Sound Levels

Monitoring Location	Time Period	Duration	L_{max}	L_{eq}	L_{10}	L_{50}	L_{90}
Twelfth Avenue between West 27th Street and West 28th Street (Site 1)	Morning	20 Mins	94.4	81.5	**84.9**	79.5	69.2
	Midday	20 Mins	91.8	81.4	**85.3**	80.0	58.6
	Evening	20 Mins	89.4	81.1	**84.7**	80.5	61.3
Eleventh Avenue between West 27th Street and West 28th Street (Site 2)	Morning	20 Mins	92.2	72.7	**75.3**	67.0	64.7
	Midday	20 Mins	83.4	71.0	**73.9**	68.7	65.1
	Evening	20 Mins	80.7	66.7	**71.3**	61.2	58.5
West 26th Street between Twelfth Avenue and Eleventh Avenue (Site 3)	Morning	20 Mins	84.1	70.6	**72.4**	67.8	64.8
	Midday	20 Mins	85.2	68.5	**70.8**	65.7	62.3
	Evening	20 Mins	79.2	66.6	**69.5**	64.8	59.5

Source: Measurements conducted by VHB on October 27. 2020.

No-Action and With-Action Sound Levels

No-Action and With-Action sound levels at the project area, including increases due to mobile sources, were calculated based on the mobile source noise analysis as shown in **Table 6-5** and **Table 6-6**, respectively. No-Action and With-Action sound levels at the Starrett-Lehigh and Terminal Warehouse buildings have been evaluated based on the existing sound measurements and the mobile source noise analysis.

- No-Action and With-Action sound levels at the western facades of both buildings have been evaluated based on the measurements and the mobile source noise analysis at Twelfth Avenue between West 29th Street and West 26th Street and the intersections of Twelfth Avenue and West 29th Street and Twelfth Avenue and West 26th Street. No-Action and With-Action noise levels would be up to 0.2 dBA greater than existing conditions.

- No-Action and With-Action sound levels at the northern, southern, and eastern facades of both buildings has been evaluated based on the measurements and the mobile source noise analysis at roadway segments of Eleventh Avenue between West 28th Street and West 27th Street and Eleventh Avenue between West 27th Street and West 26th Street and the intersections of Twelfth Avenue and West 29th

Street, Twelfth Avenue and West 26th Street, Eleventh Avenue and West 26th Street, Eleventh Avenue and West 27th Street, and Eleventh Avenue and West 28th Street. No-Action noise levels would be up to 0.8 dBA greater than existing conditions and With-Action noise levels would be up to 1.0 dBA greater than existing conditions.

Table 6-5 2024 No-Action Sound Levels

Monitoring Location	Time Period	Duration	L_{max}	L_{eq}	L_{10}	L_{50}	L_{90}
Twelfth Avenue between West 27th Street and West 28th Street (Site 1)	Morning	20 Mins	94.5	81.6	**85.1**	79.7	69.4
	Midday	20 Mins	91.9	81.5	**85.5**	80.2	58.8
	Evening	20 Mins	89.6	81.3	**84.9**	80.7	61.5
Eleventh Avenue between West 27th Street and West 28th Street (Site 2)	Morning	20 Mins	93.0	73.5	**76.1**	67.8	65.5
	Midday	20 Mins	84.3	71.8	**74.7**	69.5	65.9
	Evening	20 Mins	81.6	67.5	**72.1**	62.0	59.3
West 26th Street between Twelfth Avenue and Eleventh Avenue (Site 3)	Morning	20 Mins	84.9	71.5	**73.2**	68.6	65.6
	Midday	20 Mins	86.0	69.3	**71.5**	66.5	63.1
	Evening	20 Mins	80.0	67.4	**70.3**	65.6	60.3

Source: VHB, 2021.

Table 6-6 2024 With-Action Sound Levels

Monitoring Location	Time Period	Duration	L_{max}	L_{eq}	L_{10}	L_{50}	L_{90}
Twelfth Avenue between West 27th Street and West 28th Street (Site 1)	Morning	20 Mins	94.6	81.7	**85.1**	79.7	69.4
	Midday	20 Mins	92.0	81.6	**85.5**	80.2	58.8
	Evening	20 Mins	89.6	81.3	**84.9**	80.7	61.5
Eleventh Avenue between West 27th Street and West 28th Street (Site 2)	Morning	20 Mins	93.1	73.7	**76.3**	68.0	65.7
	Midday	20 Mins	84.4	72.0	**74.9**	69.7	66.1
	Evening	20 Mins	81.7	67.6	**72.3**	62.2	59.5
West 26th Street between Twelfth Avenue and Eleventh Avenue (Site 3)	Morning	20 Mins	85.0	71.6	**73.4**	68.8	65.8
	Midday	20 Mins	86.2	69.5	**71.8**	66.7	63.3
	Evening	20 Mins	80.1	67.5	**70.5**	65.8	60.5

Source: VHB, 2021.

The No-Action L_{eq} levels would range from 67.4 dBA to 81.6 dBA and the L_{10} levels would range between 70.3 to 85.5 dBA. The With-Action L_{eq} levels would range from 67.5 dBA to 81.7 dBA and the L_{10} levels would range between 70.5 dBA to 85.5 dBA.

The *2020 CEQR Technical Manual* provides noise exposure guidelines for assessing ambient sound levels, as shown in **Table 6-2**. Based on these noise exposure guidelines, noise impact has been assessed to determine the level of acceptability for new community facility uses at the project area.

Table 6-7 summarizes the maximum measured existing and associated With-Action sound levels at each building façade based on results of the noise monitoring and mobile source analysis. The L_{10} levels are higher than L_{eq} levels for all locations. **Table 6-7** also indicates whether the With-Action sound levels are considered to be acceptable according to the *2020 CEQR Technical Manual*. The bolded values are the highest level among all periods.

Table 6-7 Sound Level Acceptability, Dba

Building / Façade	Time Period	Measured Sound Level (L_{10}, dBA)	With-Action Sound Level (L_{10}, dBA)	Acceptability
Terminal Warehouse/West, North and South Facades Within 50 feet of Twelfth Avenue (Site 1)	Morning	84.9	85.1	Clearly Unacceptable
	Midday	**85.3**	**85.5**	**Clearly Unacceptable**
	Evening	84.7	84.9	Clearly Unacceptable
Terminal Warehouse/North (Site 3)	Morning	**72.4**	**73.4**	**Marginally Unacceptable**
	Midday	70.8	71.8	Marginally Unacceptable
	Evening	69.5	70.5	Marginally Unacceptable
Terminal Warehouse/East, North and South Facades Within 50 feet of Eleventh Avenue (Site 2)	Morning	**75.3**	**76.3**	**Marginally Unacceptable**
	Midday	73.9	74.9	Marginally Unacceptable
	Evening	71.3	72.3	Marginally Unacceptable
Terminal Warehouse/South (Site 3)	Morning	**72.4**	**73.4**	**Marginally Unacceptable**
	Midday	70.8	71.8	Marginally Unacceptable
	Evening	69.5	70.5	Marginally Unacceptable
Starrett-Lehigh/West North and South Facades Within 50 feet of Twelfth Avenue (Site 1)	Morning	84.9	85.1	Clearly Unacceptable
	Midday	**85.3**	**85.5**	**Clearly Unacceptable**
	Evening	84.7	84.9	Clearly Unacceptable
Starrett-Lehigh/North (Site 3)	Morning	**72.4**	**73.4**	**Marginally Unacceptable**
	Midday	70.8	71.8	Marginally Unacceptable
	Evening	69.5	70.5	Marginally Unacceptable
Starrett-Lehigh/East North and South Facades Within 50 feet of Eleventh Avenue (Site 2)	Morning	**75.3**	**76.3**	**Marginally Unacceptable**
	Midday	73.9	74.9	Marginally Unacceptable
	Evening	71.3	72.3	Marginally Unacceptable
Starrett-Lehigh/South (Site 3)	Morning	**72.4**	**73.4**	**Marginally Unacceptable**
	Midday	70.8	71.8	Marginally Unacceptable
	Evening	69.5	70.5	Marginally Unacceptable

Source: VHB, 2021.

According to the noise exposure guidelines in the *CEQR Technical Manual*, like in the existing and No-Action conditions, With-Action sound levels would be Clearly Unacceptable at the western facade of the Terminal Warehouse building and the Starrett Lehigh building on Twelfth Avenue because noise levels would be above 80 dBA (L_{10}). Similarly, With-Action

sound levels would be Marginally Unacceptable at the north, east, and south facades of the buildings because noise levels would be between 70 and 80 dBA (L_{10}). These high ambient noise conditions are due primarily to existing traffic volumes; increases in traffic volumes associated with the Proposed Actions would have a minimal effect on noise conditions. Based on the findings of Clearly Unacceptable or Marginally Unacceptable sound levels at the project area, sufficient outdoor-to-indoor sound attenuation of the window/wall must be specified to provide acceptable sound attenuation from the window/wall materials.

Building Sound Attenuation

Window/Wall Sound Attenuation

The most common measure for reducing interior noise from ambient sources is to specify sufficient outdoor-to-indoor sound attenuation for portions of the buildings where there would be new community facility uses. As shown in **Table 6-8**, the required level of attenuation varies based on the exterior sound levels and type of receptor.

Table 6-8 Required Attenuation Values

	Marginally Unacceptable				Clearly Unacceptable
With-Action Sound Level	$70<L_{10}\leq73$	$73<L_{10}\leq76$	$76<L_{10}\leq78$	$78<L_{10}\leq80$	$80<L_{10}$
Attenuation for Community Facilities[A]	(I) 28 dBA	(II) 31 dBA	(III) 33 dBA	(IV) 35 dBA	$36+(L_{10}-80)^{B}$ dBA

Note: [A] The above categories require a closed window situation and hence an alternate means of ventilation.
[B] Required attenuation values increase by 1 dBA increments for L_{10} values greater than 80 dBA.
Source: New York City Department of Environmental Protection (*2020 CEQR Technical Manual*, Table 19-3)

The With-Action sound levels presented in **Table 6-6** were compared to the required attenuation values in **Table 6-8** to determine the sound attenuation needed on each façade of the project area. The results show that:

New community facility would experience sound levels up to 85.5 dBA (L_{10}) on the west, north and south façades within 50 feet of Twelfth Avenue of the Terminal Warehouse building and the Starrett Lehigh building; up to 73.4 dBA (L_{10}) on the north and south (West 26th, West 27th Street, and West 28th Street) façades of both buildings, and up to 76.3 dBA (L_{10}) on the east, north and south facades within 50 feet of Eleventh Avenue on the façades of both buildings.

The composite outdoor-to-indoor transmission classification (OITC) value of the window-wall structure is used to determine the necessary sound attenuation. Sound attenuation measures would be achieved through construction materials and techniques with sufficient OITC-rated windows and walls.

In the With Action condition, the buildings are projected to contain a mix of ground-level eating and drinking establishments; office, showroom, studio, warehouse, and storage space; manufacturing uses; grocery and food stores; and community facility uses. Retail space is not considered noise-sensitive and does not require minimum window/wall attenuation requirements to meet the CEQR Noise Exposure Guidelines.

New community facility uses would require sufficient outdoor-to-indoor noise reduction measures to reduce the interior sound levels by 42 dBA OITC on the west, north, and south facades within 50 feet of Twelfth Avenue of the Terminal Warehouse building and Starrett Lehigh building, 31 dBA on the west façade of the Starrett Lehigh building and the West 26th Street, West 27th Street and West 28th Street façades of the buildings, and by 33 dBA on the east, north, and south facades within 50 feet of Eleventh Avenue of the buildings in order to maintain acceptable interior noise conditions and an alternative means of ventilation must be included such as, but not limited to central air conditioning, to provide ventilation during the closed window condition. To implement these attenuation requirements, it is anticipated that an (E) designation for noise would be applied to the project area specifying the appropriate amount of window/wall attenuation and an alternate means of ventilation for new community facility uses.

Partition Sound Attenuation

There is the potential for interior noise generated by manufacturing/industrial uses to result in high interior noise conditions within new community facility spaces that are located immediately adjacent to such manufacturing/industrial uses (i.e., share a wall or floor/ceiling). To ensure that new community facility spaces maintain an interior noise condition of 45 dBA (L_{eq} or L_{10}) or lower, sufficient partitions between immediately adjacent manufacturing/industrial and community facility uses are required. Interior partitions shall provide a minimum attenuation of 50 dBA. In order to reduce the potential for interior noise to enter new community facility spaces from manufacturing/industrial spaces, mechanical ventilation systems shall not result in sound transmission that exceeds the interior noise condition of 45 dBA (L_{eq} or L_{10}).

E-designation

The composite window/wall sound attenuation, alternate means of ventilation, and partition sound attenuation requirements would be implemented by (E) designation. Prior to the New York City Department of Buildings issuing a building permit/notice to proceed for the occupancy by new community facilities at either building, the respective applicant would demonstrate compliance with these requirements to the New York City Mayor's Office of Environmental Remediation (OER).

The text for the (E) Designation (E-625) would be as follows:

Block 672, Lot 1

To ensure an acceptable interior noise environment, future community facility uses must provide a closed window condition with a minimum of 42 dBA window/wall attenuation on the facades facing Twelfth Avenue and the facades facing West 26th Street within 50 feet of Twelfth Avenue and the facades facing 27th Street within 50 feet of Twelfth Avenue and 33 dBA of attenuation on the facades facing Eleventh Avenue and the facades facing West 26th Street within 50 feet of Eleventh Avenue and the facades facing West 27th Street within 50 feet of Eleventh Avenue and 31 dBA of attenuation on the remaining portions of facades facing West 26th Street and the remaining portions of facades facing West 27th Street to maintain an interior noise level not greater than 45 dBA for community facility uses. To achieve 42 dBA of building attenuation, special design features that go beyond the normal double-glazed windows are necessary and may include using specially designed windows

(i.e., windows with small sizes, windows with air gaps, windows with thicker glazing, etc.), and other additional building attenuation. In order to maintain a closed-window condition, an alternate means of ventilation must also be provided. Alternate means of ventilation includes, but is not limited to, air conditioning.

Sufficient partitions/attenuation between the manufacturing/industrial uses and immediately adjacent community facility uses (i.e., those that share a wall or floor/ceiling) are required to achieve an interior L_{eq} and L_{10} noise level not greater than 45 dBA in the community facility spaces and to achieve a minimum sound attenuation of 50 dBA. If necessary, to maintain the required attenuation, community facility spaces and immediately adjacent manufacturing/industrial uses within the Proposed Development shall have separate building systems, including mechanical ventilation or shall have systems that meet the minimum 50 dBA attenuation.

Block 673, Lot 1

To ensure an acceptable interior noise environment, future community facility uses must provide a closed window condition with a minimum of 42 dBA window/wall attenuation on the facades facing Twelfth Avenue and the facades facing West 27th Street within 50 feet of Twelfth Avenue and the facades facing 28th Street within 50 feet of Twelfth Avenue and 33 dBA of attenuation on the facades facing Eleventh Avenue and the facades facing West 27th Street within 50 feet of Eleventh Avenue and the facades facing West 28th Street within 50 feet of Eleventh Avenue and 31 dBA of attenuation on the remaining portions of facades facing West 27th Street and the remaining portions of facades facing West 28th Street to maintain an interior noise level not greater than 45 dBA for community facility uses. To achieve 42 dBA of building attenuation, special design features that go beyond the normal double-glazed windows are necessary and may include using specially designed windows (i.e., windows with small sizes, windows with air gaps, windows with thicker glazing, etc.), and other additional building attenuation. In order to maintain a closed-window condition, an alternate means of ventilation must also be provided. Alternate means of ventilation includes, but is not limited to, air conditioning.

Sufficient partitions/attenuation between the manufacturing/industrial uses and immediately adjacent community facility uses (i.e., those that share a wall or floor/ceiling) are required to achieve an interior L_{eq} and L_{10} noise level not greater than 45 dBA in the community facility spaces and to achieve a minimum sound attenuation of 50 dBA. If necessary, to maintain the required attenuation, community facility spaces and immediately adjacent manufacturing/industrial uses within the Proposed Development shall have separate building systems, including mechanical ventilation or shall have systems that meet the minimum 50 dBA attenuation.

With these commitments, no significant adverse impacts related to noise are expected and no further analysis is warranted.