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Noise

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

Introduction

The Proposed Action would facilitate the redevelopment of the Project Site with the Proposed Project, a new commercial office building up to approximately 1,050 feet tall (including the bulkhead), with ground floor retail uses and below-grade space (i.e., mechanical and back-of-house space). The Proposed Project would provide new pedestrian access to the LIRR East Side Access (ESA) concourse and improve circulation at the Grand Central – 42nd Street Subway Station. Since the Proposed Project would introduce new commercial office space, there would be new noise-sensitive receptors at the Project Site. The Project Site is comprised of Lots 23, 24, 25, and 48 on Block 1279 in the East Midtown neighborhood of Manhattan. Lot 25 includes a ventilation structure that is currently being constructed for MTA's ESA project. The purpose of the noise assessment under CEQR is to determine if:

- The Proposed Action would have a significant adverse environmental impact by significantly increasing sound levels from mobile and stationary sources at existing sensitive noise receptors adjacent to the Project Site, including residential, commercial, and institutional land uses; and

- New noise receptors introduced at the Project Site would be in an acceptable ambient sound level environment as defined in applicable provisions of the City's noise code.

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 ambient noise levels. Mobile sources include vehicular traffic; stationary sources include rooftop equipment such as emergency generators, cooling towers, and other mechanical equipment. Noise assessment includes the following:

- Background on metrics used to describe noise;
- The methodology and criteria used to assess potential impacts;
- An assessment of the potential for the Proposed Action to significantly affect existing receptors due to the introduction of new mobile or stationary sources;
- Results from a sound level monitoring program at the Project Site; and
- An evaluation of the ambient sound levels at new receptor locations.

This noise analysis considers two receptor types when evaluating noise; existing and new receptor(s). Since the Proposed Project would introduce a new commercial building, this is considered a "new receptor." The analysis also considers "existing receptors" which are the current noise-sensitive uses such as commercial and residential properties surrounding the Project Site. The following describes the results of the noise assessment for these two types of receptors.

Principal Conclusions

A noise assessment was conducted to determine whether the Proposed Action would significantly increase sound levels from mobile and stationary 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. The assessment concluded that the Proposed Action would not result in significant adverse noise impacts. An (E) designation (E-584) for noise would be placed on the Project Site (Block 1279, Lots 23, 24, 25, and 48) specifying the appropriate amount of window/wall attenuation and an alternate means of ventilation.

Existing Noise Receptors

Based on the travel demand assessment undertaken as part of the **Transportation** analysis, the Proposed Action is expected to generate more than 50 incremental vehicular trips in one or more peak hours but would not generate 50 or more vehicles at an intersection during the peak hours analyzed. In coordination with the New York City Department of City Planning (DCP) and the ~~NYCDOT,~~New York City Department of Transportation (NYC DOT), the four intersections at the corners of the Project Site block—Madison Avenue with East 44th and East 45th Streets, and Vanderbilt Avenue with East 44th and East 45th Streets—were included for a traffic analysis including traffic volumes for the 2026 No-Action and 2026 With-Action condition. These volumes were used to evaluate the No-Action and With-Action traffic noise conditions for new receptors in 2026, when the predominant source of ambient noise at the Project Site would be from existing and future traffic. Stationary sources, such as

building mechanical equipment and a ventilation building immediately to the east of the Project Site on Block 1279 Lot 25, are substantially quieter than noise generated by traffic.

Future 2026 No-Action and 2026 With-Action noise conditions were determined by proportional traffic modeling around the Project Site. Mobile source noise levels would change by 1.8 dBA or less due to traffic generated by the Proposed Action. Therefore, there would be no potential for significant adverse noise impacts due to mobile sources.

The MTA ventilation building immediately to the east of the Project Site (Block 1279 Lot 25) is currently under construction for the ESA project. The ventilation building is currently being designed and constructed to meet applicable noise codes. The Proposed Action has the potential to cause noise from the roof of the ventilation building to reflect off the bottom of the overhang and propagate out the front façade on East 44th Street. As a result, it is conservatively estimated that stationary source noise levels at that location may increase up to 1 or 2 dBA. However, since the increase in noise would be less than 3 dBA, reflection of the vent building noise would not have the potential to result in a significant adverse noise impact due to stationary sources.

The design and specifications for the Proposed Project's mechanical equipment would incorporate sufficient noise reduction devices that would enable the proposed project to comply with applicable noise regulations and standards, including the standards contained in the revised New York City noise control code.

Including mobile sources and stationary sources introduced with the Proposed Action, the 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 to determine the existing sound levels at the Project Site in 2016. Based on the 2016 sound levels and the 2019 traffic conditions, existing noise conditions were determined to be consistent with the 2016 measurement results. Similarly, the future 2026 No-Action and With-Action noise conditions were then determined using proportional modeling of the traffic as presented in the **Transportation** analysis. Traffic conditions between 2016 and 2019 were evaluated and determined to have decreased slightly. Therefore, the noise measurements conducted in 2016 were conservatively assumed to be similar to 2019 existing conditions and were not adjusted for decreases in traffic.

The No-Action noise conditions would be up to 2.6 dBA higher than the 2019 existing noise conditions. The With-Action noise conditions including mobile and stationary sources would be up to 1.8 dBA higher than the No-Action. The 2019 existing, 2026 No-Action and 2026 With-Action noise conditions would be Marginally Unacceptable or Clearly Unacceptable according to the CEQR Noise Exposure Guidelines. The With-Action noise conditions including mobile and stationary sources would be up to 80.7 (L_{10}) on the Madison Avenue façade, up to 82.0 dBA (L_{10}) on the East 44th Street façade, and up to 77.2 dBA(L_{10}) on the East 45th Street façade. With-Action noise conditions for the east façade of the Proposed Project have conservatively been assumed to be the higher of the noise exposure on East 44th Street and East 45th Street (82.0 dBA L_{10}). Since With-Action noise conditions would be Clearly Unacceptable or Marginally Unacceptable according to the CEQR Noise Exposure

Guidelines, a minimum window/wall sound attenuation is required to meet an interior noise condition of 50 dBA for commercial spaces.

The proposed building will have ground-level retail and commercial office space on upper floors. Retail space is not considered noise-sensitive and does not require minimum window/wall attenuation requirements to meet the CEQR Noise Exposure Guidelines. The commercial office space will require sufficient outdoor-to-indoor noise reduction measures to reduce the interior sound levels by 32 dBA OITC (outdoor-to-indoor transmission classification) on the Madison Avenue facade, 33 dBA on the East 44th and eastern (back) facades, and by 28 dBA OITC on the East 45th street façade in order to maintain acceptable interior noise conditions in commercial spaces 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 (E-584) for noise would be applied to the Project Site specifying the appropriate amount of window/wall attenuation and an alternate means of ventilation.

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 12-1** presents a list of common outdoor and indoor sound levels.

Table 12-1 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.

Noise Assessment 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 Leq sound level in accordance with the *2020 CEQR Technical Manual*. If mobile or stationary sources associated with a proposed development would increase Leq sound levels by 3 dB or more and absolute levels would exceed 65 dBA Leq, the proposed development 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 a travel demand assessment (see **Chapter 9, Transportation**), the Proposed Action is expected to generate more than 50 incremental vehicular trips in one or more peak hours but would not generate 50 or more vehicles at an intersection during the peak hours analyzed. In coordination with DCP and ~~the NYCDOT~~NYC DOT, the four intersections at the corners of the Development Site block—Madison Avenue with East 44th and East 45th Streets, and Vanderbilt Avenue with East 44th and East 45th Streets—were included for a traffic analysis including traffic volumes for the 2026 No-Action and 2026 With-Action condition. These volumes were used to evaluate the No-Action and With-Action traffic noise conditions for new receptors in 2026, when the predominant source of ambient noise at the Project Site would be from existing and future traffic.

Stationary Sources

Block 1279 Lot 25 immediately to the east of the Project Site includes an MTA ventilation building for the ESA project, which is currently under construction. The ventilation building will be used for emergency ventilation only. This ventilation building will generate noise through openings in the front and the roof. The proposed building would overhang approximately 36 feet above the roof of the ventilation building. As such, the Proposed Action may result in noise exposure from the ventilation building on the Project Site. The Proposed Action may also increase noise from the ventilation building coming out of the front façade due to the overhang. Such an increase in noise could adversely affect existing nearby receptors.

As part of the ESA Environmental Impact Statement, the noise assessment concluded that the ventilation building would be designed to meet the provisions of the New York City Department of Environmental Protection (NYCDEP) 1998 New York City Noise Code. The current noise codes (2004) applicable to the ventilation building include Section 24-227 *Circulation Devices* which limits sound to 45 dBA as measured inside residential dwelling units at a location three feet from an open window and Section 24-218 *General Prohibitions* which limits sound from any source to 7 dBA above ambient between 10:00 PM and 7:00 AM and 10 dBA above ambient between 7:00 AM and 10:00 PM as measured at a distance of 15 feet from the source on a public right-of-way.

The ventilation building is currently being designed and constructed to meet applicable noise codes. The ventilation building is expected to be completed and operational as part of future ESA service in December 2022. A acoustic analysis conducted in 2003 estimated noise levels at public ways and the Yale Club at Block 1279 Lot 28 based on general assumptions of typical sound generated by the fans (sound power level of 131 dBA) and typical sound attenuation from acoustic silencers (29 dBA of noise reduction) on the intake and discharge ends.

The results of the acoustic analysis indicated that exterior noise levels at sidewalk locations would be 49 to 53 dBA which is anticipated to be below ambient daytime levels which are typically in the upper 60's dBA. Therefore, noise levels are anticipated to be substantially lower than the Section 24-218 noise code which limits noise to 10 dBA above ambient conditions during the daytime and 7 dBA during the night.

The results of the acoustic analysis also indicated that exterior noise levels at the Yale Club would be up to 66 dBA or 37 dBA with windows closed. Recent (2018) design information on the actual acoustic silencers to be used for the ventilation building indicate they will generally provide 32 to 44 dB of noise reduction in the key mid-range frequencies (i.e., 500 and 1000 Hz) which is greater than that assumed in the preliminary analysis. Therefore, the actual silencers are anticipated to provide even greater noise reduction than that assumed in the acoustic analysis and noise levels are expected to be lower at nearby receptors such as the Yale Club. The Proposed Action has the potential to cause noise from the roof of the ventilation building to reflect off the bottom of the overhang and propagate out the front façade on East 44th Street. The increase in noise level depends on several factors including: 1) the relative contribution of noise that exits the roof versus the front of the ventilation building, 2) how reflective the bottom surface of the overhang will be, and 3) the size of the cavernous space created by overhang. Since the size of the opening at the East 44th Street façade between the two buildings is relatively similar to the size of the openings in the roof, the upper limit of a potential increase in noise would be 3 dB if there were perfectly efficient propagation of sound from the roof to the street line. However, the overhang is approximately 36 feet above the ventilation building roof and most sound would need to reflect off multiple surfaces before leaving the opening at the street line. With the increased distance that reflected sound needs to travel, it is substantially reduced. Finally, although the specific materials for the bottom surface of the building overhang have not been determined, the surface is likely to have some absorptive characteristics (e.g., a spray applied acoustical plaster) which would further reduce the potential for reflected noise. Accounting for all of these factors, noise is not expected to increase substantially due to the Proposed Action. As result, it is conservatively estimated that noise may increase up to 1 or 2 dBA. However, since the increase in noise would be less than 3 dBA, reflection of the vent building's noise would not have the potential to result in a significant adverse noise impact.

The acoustic analysis indicates that noise levels at the Project Site is similar to that at the Yale Club with exterior noise levels up to 66 dBA. Based on the conservative estimate of the potential effects of the Proposed Action, exterior noise levels from the ventilation building at the Project Site would be up to 68 dBA. Sound from this stationary equipment has been included along with changes in sound due to mobile sources (i.e. traffic) to predict No-Action and With-Action conditions.

Noise from stationary sources such as mechanical equipment that would be introduced by the Proposed Action must also be considered for potential noise impact. The design and

specifications for the proposed building's mechanical equipment, such as heating, ventilation, and air conditioning, are not known at this time. As the project design advances, mechanical equipment would be selected that incorporates sufficient noise reduction to comply with applicable noise regulations and standards, including the standards contained in the revised New York City Noise Control Code. The mechanical equipment will be selected to ensure that it does not result in any significant increases in noise levels by itself or cumulatively with other project noise sources at residential or commercial receptors. Therefore, the Proposed Actions do not have the potential to result in a significant adverse noise impact on existing receptors from stationary sources.

Noise Assessment for New Receptors

With-Action noise conditions at new sensitive receptors that would be introduced by the Proposed Action are evaluated according to absolute exterior sound level. The noise exposure guidelines for acceptable ambient conditions depend on the type of land use. Commercial uses must maintain an interior noise level of 50 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 12-2**, exterior ambient sound levels exceeding 70 dBA at commercial receptors are considered to be Marginally Unacceptable and require a minimum window/wall sound attenuation sufficient to reduce interior sound levels to acceptable levels.

Since the Proposed Action would introduce new commercial office space, the highest L_{10} sound level among the weekday morning, midday, and afternoon peak periods is used to evaluate whether the proposed development would introduce new receptors into an acceptable noise environment. The analysis presents the results of the ambient noise monitoring and the assessment of whether new receptors would be in a high ambient noise environment.

Noise Exposure Guidelines

The *2020 CEQR Technical Manual* provides noise exposure guidelines for assessing ambient noise conditions at new commercial receptors, as shown in **Table 12-2**.

Table 12-2 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
Commercial, Office	All Times	$L_{10} \leq 65$ dBA	$65 < L_{10} \leq 70$ dBA	$70 < L_{10} \leq 80$ dBA	$L_{10} > 80$ dBA

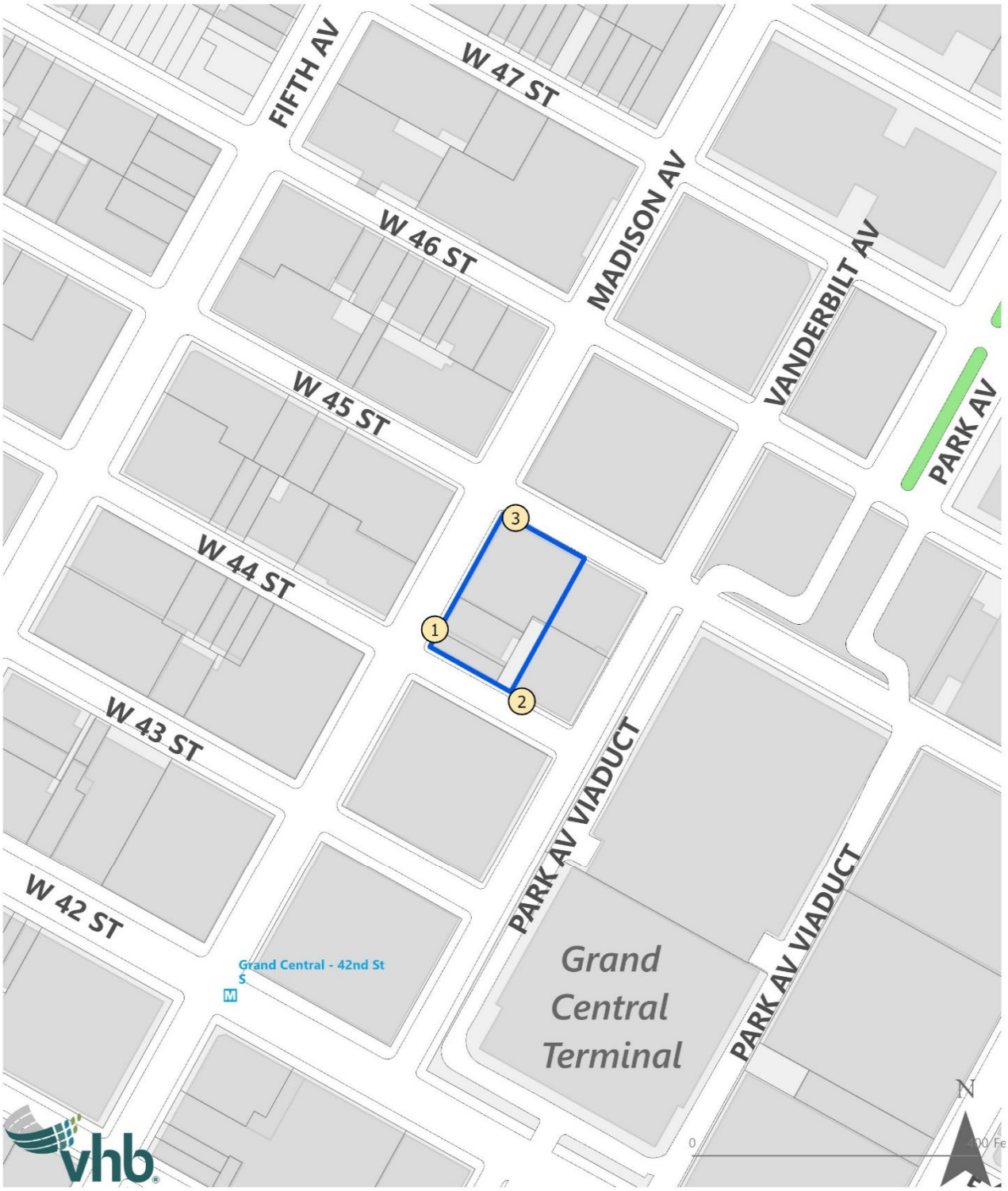
Source: Table 19-2, *2020 CEQR Technical Manual.*

Existing (2016) Sound Levels

Noise monitoring was conducted on Thursday May 19, 2016 and Thursday May 26, 2016 to determine the existing sound levels near Project Site. A noise monitor was set up at ground level on the sidewalks at the corner of East 44th Street and Madison Avenue (Site 1), East 44th Street between Madison Avenue and Vanderbilt Avenue (Site 2), and the corner of East

45th Street and Madison Avenue (Site 3) as shown in **Figure 12-1**. The microphone was located to have a direct line of sight to vehicles traveling on the respective roadways. These measurement locations are representative of ground-level receptors at the Project Site.

Figure 12-1 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 12-3,** the measured L_{eq} levels ranged from 70.4 dBA to 77.0 dBA and the L_{10} levels ranged between 72.3 and 80.1 dBA.

Table 12-3 2016 Ambient Sound Levels Measured at Ground Level

Monitoring Location	Time Period	Duration	L_{eq}	L_{min}	L_{max}	L_1	L_{10}	L_{50}	L_{90}
East 44th Street and Madison Avenue (Site 1)	Morning	20 Mins	76.7	67.9	90.9	85.9	**80.0**	73.6	69.8
	Midday	20 Mins	75.0	67.2	88.4	84.9	**77.8**	71.9	68.6
	Evening	20 Mins	75.3	63.9	85.9	82.8	**79.1**	73.3	66.9
East 44th Street between Madison Avenue and Vanderbilt Avenue (Site 2)	Morning	20 Mins	76.9	68.2	92.1	84.8	**80.1**	74.6	73.0
	Midday	20 Mins	77.0	72.2	91.7	85.6	**78.9**	75.5	73.2
	Evening	20 Mins	70.4	66.4	87.5	76.4	**72.3**	69.2	67.5
East 45th Street and Madison Avenue (Site 3)	Morning	20 Mins	73.8	65.8	86.5	82.0	**76.8**	71.8	68.1
	Midday	20 Mins	72.2	66.5	88.3	78.5	**75.3**	70.3	68.1
	Evening	20 Mins	72.9	65.9	90.7	82.1	**74.9**	70.6	68.1

Source: Measurements conducted by VHB on May 19, 2016 and Thursday May 26, 2016

Mobile Source Noise Analysis

Traffic conditions between 2016 and 2019 were evaluated and determined to have decreased slightly. Therefore, the noise measurements conducted in 2016 were conservatively assumed to be similar to 2019 existing conditions and were not adjusted for decreases in traffic. No-Action (2026), and With-Action (2026) mobile source noise at the Project Site have been determined based on ambient sound measurements adjusted for No-Action, and With-Action traffic conditions as presented in **Chapter 9, Transportation**. Noise conditions have been determined by adjusting the measurements for the change in traffic volumes using proportional modeling (see **Table 12-4**).

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 2019 and No-Action conditions, and between the No-Action and With-Action conditions.

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

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

Weekday morning, midday and afternoon peak traffic data were used to in the proportional noise modeling. 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~~NYC DOT Traffic Information Management System (TIMS) and traffic counts conducted during the 2016 noise measurements. As shown in **Table 12-4**, the number of PCEs in the 2026 No-Action condition are slightly higher than the 2019 conditions and the sound levels would increase up to 1.6 dBA. The Proposed Action would cause a minimal change in noise condition of up to 0.2 dBA at Site 1 and 3 during all periods and a change up to 1.8 dBA at Site 2 compared to the No-Action condition.

Table 12-4 Passenger Car Equivalents

Location	Period	Existing (2019) PCEs	No-Action PCEs	With-Action PCEs	Sound Increase (dBA)		
					No-Action minus Existing	With-Action minus No-Action	With-Action minus Existing
Intersection/East 44th Street and Madison Avenue (Site 1)	Morning	6,782	7,654	7,865	0.6	0.1	0.7
	Midday	3,417	3,656	3,813	0.3	0.2	0.5
	Evening	3,925	4,329	4,355	0.4	0.0	0.5
Roadway Segment/East 44th Street between Madison Avenue and Vanderbilt Avenue (Site 2)	Morning	1,471	1,873	2,069	1.0	0.4	1.5
	Midday	330	371	564	0.5	1.8	2.3
	Evening	140	202	215	1.6	0.3	1.9
Intersection/East 45th Street and Madison Avenue (Site 3)	Morning	7,392	7,987	8,080	0.3	0.1	0.4
	Midday	3,977	4,197	4,250	0.2	0.1	0.3
	Evening	4,496	4,857	4,872	0.3	0.0	0.3

Source: VHB, 2020.

As shown in **Table 12-5** and **Table 12-6** No-Action and With-Action noise conditions based on increases due to mobile sources have been calculated based on the mobile source noise analysis. The No-Action L_{eq} levels ranged from 72.0 dBA to 77.9 dBA and the L_{10} levels range between 73.9 and 81.1 dBA. The With-Action L_{eq} levels ranged from 72.3 dBA to 79.3 dBA and the L_{10} levels range between 74.2 and 81.6dBA.

As described previously, the Proposed Action would include contributions from the MTA ventilation building up to 66 dBA in the No-Action condition and up to 68 dBA in the With-Action condition on the 44th Street façade of the Project Site. **Table 12-7** and **Table 12-8** present the No-Action and With-Action noise conditions based on increases due to mobile sources as well as the stationary source ventilation building. Including mobile sources and stationary sources introduced with the Proposed Action, the 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.

Table 12-5 No-Action (2026) Sound Levels at Ground Level (with Mobile Sources)

Monitoring Location	Time Period	Duration	L_{eq}	L_{min}	L_{max}	L_1	L_{10}	L_{50}	L_{90}
East 44th Street and Madison Avenue (Site 1)	Morning	20 Mins	77.3	68.5	91.5	86.5	**80.6**	74.2	70.4
	Midday	20 Mins	75.3	67.5	88.7	85.2	**78.1**	72.2	68.9
	Evening	20 Mins	75.7	64.3	86.3	83.2	**79.5**	73.7	67.3
East 44th Street between Madison Avenue and Vanderbilt Avenue (Site 2)	Morning	20 Mins	77.9	69.2	93.1	85.8	**81.1**	75.6	74.0
	Midday	20 Mins	77.5	72.7	92.2	86.1	**79.4**	76.0	73.7
	Evening	20 Mins	72.0	68.0	89.1	78.0	**73.9**	70.8	69.1
East 45th Street and Madison Avenue (Site 3)	Morning	20 Mins	74.1	66.1	86.8	82.3	**77.1**	72.1	68.4
	Midday	20 Mins	72.4	66.7	88.5	78.7	**75.5**	70.5	68.3
	Evening	20 Mins	73.2	66.2	91.0	82.4	**75.2**	70.9	68.4

Source: VHB 2021.

Table 12-6 With-Action (2026) Sound Levels at Ground Level (with Mobile Sources)

Monitoring Location	Time Period	Duration	L_{eq}	L_{min}	L_{max}	L_1	L_{10}	L_{50}	L_{90}
East 44th Street and Madison Avenue (Site 1)	Morning	20 Mins	77.4	68.6	91.6	86.6	**80.7**	74.3	70.5
	Midday	20 Mins	75.5	67.7	88.9	85.4	**78.3**	72.4	69.1
	Evening	20 Mins	75.8	64.4	86.4	83.3	**79.6**	73.8	67.4
East 44th Street between Madison Avenue and Vanderbilt Avenue (Site 2)	Morning	20 Mins	78.4	69.7	93.6	86.3	**81.6**	76.1	74.5
	Midday	20 Mins	79.3	74.5	94.0	87.9	**81.2**	77.8	75.5
	Evening	20 Mins	72.3	68.3	89.4	78.3	**74.2**	71.1	69.4
East 45th Street and Madison Avenue (Site 3)	Morning	20 Mins	74.2	66.2	86.9	82.4	**77.2**	72.2	68.5
	Midday	20 Mins	72.5	66.8	88.6	78.8	**75.6**	70.6	68.4
	Evening	20 Mins	73.2	66.2	91.0	82.4	**75.2**	70.9	68.4

Source: VHB 2021.

Table 12-7 No-Action (2026) Sound Levels at Ground Level (with Mobile and Stationary Sources)

Monitoring Location	Time Period	Duration	L_{eq}	L_{min}	L_{max}	L_1	L_{10}	L_{50}	L_{90}
East 44th Street and Madison Avenue (Site 1)	Morning	20 Mins	77.3	68.5	91.5	86.5	**80.6**	74.2	70.4
	Midday	20 Mins	75.3	67.5	88.7	85.2	**78.1**	72.2	68.9
	Evening	20 Mins	75.7	64.3	86.3	83.2	**79.5**	73.7	67.3
East 44th Street between Madison Avenue and Vanderbilt Avenue (Site 2)	Morning	20 Mins	78.2	69.5	93.4	86.1	**81.4**	75.9	74.3
	Midday	20 Mins	77.8	73.0	92.5	86.4	**79.7**	76.3	74.0
	Evening	20 Mins	73.0	69.0	90.1	79.0	**74.9**	71.8	70.1
East 45th Street and Madison Avenue (Site 3)	Morning	20 Mins	74.1	66.1	86.8	82.3	**77.1**	72.1	68.4
	Midday	20 Mins	72.4	66.7	88.5	78.7	**75.5**	70.5	68.3
	Evening	20 Mins	73.2	66.2	91.0	82.4	**75.2**	70.9	68.4

Source: VHB 2021.

Table 12-8 With-Action (2026) Sound Levels at Ground Level (with Mobile and Stationary Sources)

Monitoring Location	Time Period	Duration	L_{eq}	L_{min}	L_{max}	L_1	L_{10}	L_{50}	L_{90}
East 44th Street and Madison Avenue (Site 1)	Morning	20 Mins	77.4	68.6	91.6	86.6	**80.7**	74.3	70.5
	Midday	20 Mins	75.5	67.7	88.9	85.4	**78.3**	72.4	69.1
	Evening	20 Mins	75.8	64.4	86.4	83.3	**79.6**	73.8	67.4
East 44th Street between Madison Avenue and Vanderbilt Avenue (Site 2)	Morning	20 Mins	78.8	70.1	94.0	86.7	**82.0**	76.5	74.9
	Midday	20 Mins	79.6	74.8	94.3	88.2	**81.5**	78.1	75.8
	Evening	20 Mins	73.6	69.6	90.7	79.6	**75.5**	72.4	70.7
East 45th Street and Madison Avenue (Site 3)	Morning	20 Mins	74.2	66.2	86.9	82.4	**77.2**	72.2	68.5
	Midday	20 Mins	72.5	66.8	88.6	78.8	**75.6**	70.6	68.4
	Evening	20 Mins	73.2	66.2	91.0	82.4	**75.2**	70.9	68.4

Source: VHB 2021.

Acceptability Assessment

The *2020 CEQR Technical Manual* provides noise exposure guidelines for assessing ambient sound levels, as shown in **Table 12-2**. Based on these noise exposure guidelines, noise impact has been assessed to determine the level of acceptability for new sensitive receptors at the Project Site.

Table 12-9 summarizes the maximum measured Existing L_{10} or L_{eq} level and the associated With-Action sound levels at each building façade based on results of the noise monitoring and mobile source and stationary source analysis. **Table 12-9** 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 12-9 Sound Level Acceptability, dBA

Façade	Time Period	Measured (2016) Sound Level (L_{10} or L_{eq}, dBA)	With-Action (2026) Sound Level (L_{10} or L_{eq}, dBA)	Acceptability
West Façade (Madison Avenue, Site 1)	Morning	80.0 (L_{10})	**80.7 (L_{10})**	**Clearly Unacceptable**
	Midday	77.8 (L_{10})	78.3 (L_{10})	Marginally Unacceptable
	Evening	79.1 (L_{10})	79.6 (L_{10})	Marginally Unacceptable
South Façade (East 44th Street, Site 2)	Morning	80.1 (L_{10})	**82.0 (L_{10})**	**Clearly Unacceptable**
	Midday	78.9 (L_{10})	81.5 (L_{10})	Clearly Unacceptable
	Evening	72.3 (L_{10})	75.5 (L_{10})	Marginally Unacceptable
North Façade (East 45th Street, Site 3)	Morning	76.8 (L_{10})	**77.2 (L_{10})**	**Marginally Unacceptable**
	Midday	75.3 (L_{10})	75.6 (L_{10})	Marginally Unacceptable
	Evening	74.9 (L_{10})	75.2 (L_{10})	Marginally Unacceptable
East Façade (Highest of Site 2 Site 3)	Morning	80.1 (L_{10})	**82.0 (L_{10})**	**Clearly Unacceptable**
	Midday	78.9 (L_{10})	81.5 (L_{10})	Clearly Unacceptable
	Evening	74.9 (L_{10})	75.5 (L_{10})	Marginally Unacceptable

According to the noise exposure guidelines in the *CEQR Technical Manual*, With-Action sound levels would be Marginally Unacceptable at ground-level on 45th Street (north façade) because they would be between 70 and 80 dBA and Clearly Unacceptable on 44th Street, Madison Avenue, and the east façades of the Project Site because they would exceed 80 dBA. Based on the finding of Marginally Unacceptable and Clearly Unacceptable sound levels at the Project Site, sufficient outdoor-to-indoor sound attenuation of the window/wall must be specified to provide acceptable sound attenuation from the window/wall materials.

Noise Attenuation Measures

The most common measure for reducing interior noise from ambient sources is to specify sufficient outdoor-to-indoor sound attenuation for the proposed building. As shown in **Table 12-10**, the required level of attenuation varies based on the exterior sound levels and type of receptor.

Table 12-10 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 Commercial Spaces[A]	(I) 23 dBA	(II) 26 dBA	(III) 28 dBA	(IV) 30 dBA	$31+(L_{10}-80)^{B}$ dBA

Note: [A] Per CEQR Technical Manual, the above composite window-wall attenuation values are 5 dBA less than the residential requirements 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 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 12-8** were compared to the required attenuation values in **Table 12-10** to determine the sound attenuation needed on each façade of the Project Site. The results show that:

New commercial uses at the Project Site would experience sound levels up to 80.7 dBA (L_{10}) on the Madison Avenue façade, up to 82.0 dBA (L_{10}) on the East 44th Street façade, up to 77.2 dBA (L_{10}) on the East 45th Street façade, and up to 82.0 dBA (L_{10}) on the east (rear) facade.

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.

The proposed building will have ground-level retail and commercial office space on upper floors. Retail space is not considered noise-sensitive and does not require minimum window/wall attenuation requirements to meet the CEQR Noise Exposure Guidelines. The commercial office space will require sufficient outdoor-to-indoor noise reduction measures to reduce the interior sound levels by 32 dBA OITC (outdoor-to-indoor transmission classification) on the Madison Avenue facade, 33 dBA on the East 44th and eastern (back) facades, and by 28 dBA OITC on the East 45th street façade in order to maintain acceptable interior noise conditions in commercial spaces 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 Site specifying the appropriate amount of window/wall attenuation and an alternate means of ventilation. The text for the (E) designation (E-584) would be as follows:

Block 1279, Lots 23, 24, 25, and 48

In order to ensure an acceptable interior noise environment, future commercial office uses must provide a closed-window condition with a minimum of 32 dBA window/wall attenuation on the facades facing Madison Avenue and 33 dBA of attenuation on the facades facing East 44th Street and the facades facing Vanderbilt Avenue and 28 dBA of attenuation on the facades facing East 45th Street to maintain an interior noise level not greater than 50 dBA for commercial office uses. 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.