12

Noise

The goal of this chapter is to determine whether the Proposed Actions would have a significant adverse impact on the environment at existing noise-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 Actions would facilitate the redevelopment of the Development Site on the block located between East 42nd Street, Vanderbilt Avenue and Lexington Avenue with the Proposed Project, a new building approximately 1,646 feet tall including commercial office space, hotel rooms,[1] publicly accessible space, and retail space. Retail space is not considered to be sensitive to noise and according to the *2020 CEQR Technical Manual*, publicly accessible space or open space is only sensitive to noise if serenity and quiet are an extraordinarily important part of their purpose and serve as important public need. Quiet and serenity are not expected to be a key element to the proposed publicly accessible space. Commercial office space and hotel rooms are sensitive to noise. As such, the Proposed Project would introduce new noise-sensitive land uses to the Development Site. The Proposed Actions would generate noise from mobile sources and stationary equipment such as emergency generators and other mechanical equipment which has the potential to increase noise at existing receptors. Per the *2020 CEQR Technical Manual*, a noise analysis is

[1] Development may also occur under an All-Office Scenario. Under this scenario, the overall building square footage and building massing would be the same as under the Proposed Project but would be comprised of approximately 2,561,770 gsf of office space, retail, and no hotel.

appropriate if an action would generate mobile or stationary sources of noise or would be located in an area with high ambient noise levels. The purpose of the noise assessment under CEQR is to determine if:

- The Proposed Actions 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 Development Site, including residential and commercial land uses; and
- New noise receptors introduced at the Development Site would be in an acceptable ambient sound level environment as defined in applicable provisions of the City's noise code.

The 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 Actions to significantly affect existing receptors due to the introduction of new mobile or stationary sources;
- Results from ambient sound level monitoring conducted as part of previous environmental assessments in the project area; 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 building with commercial and hotel space, 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 Development 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 Actions 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.

Existing Noise Receptors

Future No-Action and With-Action noise conditions in the Project Area were determined with proportional noise modeling. Mobile source noise levels would increase by up to 0.3 dBA due to traffic generated by the Proposed Actions. Therefore, there would be no potential for significant adverse noise impacts due to mobile sources.

New Noise Receptors

With-Action sound levels at the Development Site would be up to 81.5 dBA (L_{10}) on the south façade, up to 79.0 dBA (L_{10}) on the east façade, up to 79.7 dBA (L_{10}) on the north façade, and up to 78.1 dBA (L_{10}) on the west façade. Based on these findings of Clearly Unacceptable sound levels that exceed 80 dBA (L_{10}) on the south façade and Marginally

Unacceptable sound levels between 70 and 80 dBA (L_{10}) on the north, east, and west facades, outdoor-to-indoor sound attenuation of the window/wall will be specified to ensure acceptable sound attenuation from the window/wall materials.

To implement these attenuation requirements, it is anticipated that an (E) ~~designation, Restrictive Declaration, or other mechanism~~Designation (E-648) for noise would be applied to the Development Site specifying the appropriate amount of window/wall attenuation and an alternate means of ventilation. With these commitments, the Proposed Project would not result in any significant adverse noise impacts.

Methodology

As discussed in **Chapter 1, Project Description**, for conservative analysis purposes the EIS considers the two building program options to determine the With-Action reasonable worst case development scenario (RWCDS) for each density-based technical area: the Proposed Project with a mix of hotel, commercial office, local retail, and publicly accessible space; and the All Office Scenario, based on the same overall building square footage and building massing as the Proposed Project but comprised of approximately 2,561,770 gsf of office space, retail, and no hotel. In each chapter, where applicable, the EIS analyzes the scenario with the greater potential for impacts. This chapter evaluates the With-Action condition including the hotel space, as described above, because it represents the Proposed Project, and for the purposes of this analysis is not any less conservative than the All-Office Scenario.

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

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 or stationary sources associated with the proposed project would increase L_{eq} sound levels by 3 dB or more and absolute levels would exceed 65 dBA L_{eq}, the proposed project would cause a significant adverse impact prior to mitigation. Additionally, if No-Action condition noise levels are 60 dBA L_{eq} or less, a 5-dB increase would be considered a significant adverse noise impact.

Mobile Sources

As described in **Chapter 9, Transportation**, a detailed traffic analysis has been conducted at 15 intersections to evaluate Existing, No-Action, and With-Action traffic volumes near the Development Site including the following:

- Second Avenue and East 40th Street
- Second Avenue and East 42nd Street
- Third Avenue and East 40th Street
- Third Avenue and East 42nd Street
- Lexington Avenue and East 40th Street
- Lexington Avenue and East 42nd Street
- Lexington Avenue and East 43rd Street
- Lexington Avenue and East 44th Street
- Lexington Avenue and East 45th Street
- Lexington Avenue and East 46th Street
- Park Avenue and East 40th Street
- Madison Avenue and East 42nd Street
- Fifth Avenue and 42nd Street
- Sixth Avenue and West 42nd Street
- Broadway and West 42nd Street

The traffic analysis evaluated vehicle classification counts as part of the turning movement counts at 12 of these intersections. With-Action noise conditions have been determined based on ambient sound monitoring conducted as part of other CEQR Environmental Assessment Statements (EASs) and Environmental Impact Statements (EISs) and proportional modeling of noise passenger-car equivalents (PCEs) to determine the potential increase in noise due to traffic that would be generated in the With-Action condition.

If the proposed project would result in a doubling or more of PCEs, it would result in a 3 dBA or greater increase in noise levels. If PCEs would not double due to the proposed project, there would not be a significant adverse vehicular noise impact, and no further mobile source noise analysis is warranted. 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

Future With-Action noise increases are calculated using the following equation:

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

Table 12-2 presents the Existing, No-Action, and With-Action PCE values at study area intersections and the sound increment between conditions. This table shows that traffic noise would increase by up to 1.4 dBA in the No-Action condition compared to the Existing condition. The highest increase in noise would be at the Park Avenue and East 40th Street intersection due primarily to the re-opening of the Park Avenue tunnel. Traffic noise would increase up to 0.3 dBA at all intersections in the With-Action condition compared to the No-Action condition. The total increase in noise in the With-Action condition compared to the Existing condition would be less than 1 dBA at most intersections with a maximum increase of up to 1.4 dBA at Park Avenue and East 40th Street.

The Proposed Actions would not result in a doubling of PCEs compared to the No-Action condition, and noise levels would increase by less than 3 dB at all intersections. Therefore, there would be no significant adverse vehicular noise impact due to the Proposed Actions.

Table 12-2 Passenger Car Equivalents Analysis

Intersection	Period	Existing PCEs	No-Action PCEs	No-Action Sound Increment (dBA)[1]	With-Action PCEs	With-Action minus No-Action Sound Increment[2] (dBA)	With-Action minus Existing Sound Increment[3] (dBA)
1 2nd Avenue and East 40th Street	Morning	6,376	7,386	0.6	7,449	0.0	0.7
	Afternoon	5,059	5,833	0.6	5,887	0.0	0.7
	Evening	4,109	4,996	0.8	5,039	0.0	0.9
2 2nd Avenue and East 42nd Street	Morning	9,859	11,390	0.6	11,415	0.0	0.6
	Afternoon	6,879	7,787	0.5	7,813	0.0	0.6
	Evening	5,737	6,943	0.8	6,982	0.0	0.9
3 3rd Avenue and East 40th Street	Morning	4,600	5,492	0.8	5,588	0.1	0.8
	Afternoon	3,932	4,268	0.4	4,356	0.1	0.4
	Evening	2,856	3,312	0.6	3,371	0.1	0.7
4 3rd Avenue and East 42nd Street	Morning	8,639	9,756	0.5	9,896	0.1	0.6
	Afternoon	6,950	7,548	0.4	7,657	0.1	0.4
	Evening	6,538	7,376	0.5	7,451	0.0	0.6
5 Lexington Avenue and East 40th Street	Morning	4,345	4,828	0.5	4,898	0.1	0.5
	Afternoon	3,293	3,170	-0.2	3,229	0.1	-0.1
	Evening	3,011	3,281	0.4	3,322	0.1	0.4
6 Lexington Avenue and East 42nd Street	Morning	7,126	7,841	0.4	7,987	0.1	0.5
	Afternoon	5,805	5,783	0.0	5,937	0.1	0.41
	Evening	5,380	5,816	0.3	5,912	0.1	0.4
7 Lexington Avenue and East 43rd Street	Morning	3,816	4,009	0.2	4,115	0.1	0.3
	Afternoon	2,829	2,611	-0.3	2,712	0.2	-0.2
	Evening	2,470	2,449	0.0	2,498	0.1	0.0
8 Lexington Avenue and East 44th Street	Morning	3,507	4,061	0.6	4,171	0.1	0.8
	Afternoon	2,594	2,767	0.3	2,872	0.2	0.4
	Evening	2,340	2,501	0.43	2,552	0.1	0.4
9 Lexington Avenue and East 45th Street	Morning	4,559	5,265	0.76	5,530	0.2	0.8
	Afternoon	3,318	3,589	0.43	3,827	0.3	0.6
	Evening	3,114	3,346	0.43	3,411	0.1	0.4
10 Lexington Avenue and East 46th Street	Morning	4,161	4,812	0.76	5,059	0.2	0.8
	Afternoon	3,323	3,665	0.4	3,888	0.3	0.7
	Evening	3,148	3,541	0.5	3,607	0.1	0.6

Table 12-2 Passenger Car Equivalents Analysis

Intersection	Period	Existing PCEs	No-Action PCEs	No-Action Sound Increment (dBA)[1]	With-Action PCEs	With-Action minus No-Action Sound Increment[2] (dBA)	With-Action minus Existing Sound Increment[3] (dBA)
11 Park Avenue and East 40th Street	Morning	3,370	4,632	1.4	4,665	0.0	1.4
	Afternoon	3,066	3,945	1.1	3,977	0.0	1.1
	Evening	2,438	3,315	1.3	3,349	0.0	1.4
12 Madison Avenue and East 42nd Street	Morning	13,391	15,368	0.6	15,427	0.0	0.6
	Afternoon	8,478	9,262	0.4	9,350	0.0	0.4
	Evening	8,245	9,475	0.6	9,565	0.0	0.6
13 5th Avenue and East 42nd Street	Morning	10,266	11,303	0.4	11,374	0.0	0.4
	Afternoon	5,943	6,410	0.3	6,507	0.1	0.4
	Evening	7,193	8,078	0.5	8,166	0.0	0.6
14 6th Avenue and West 42nd Street	Morning	9,841	10,837	0.4	10,906	0.0	0.4
	Afternoon	5,745	6,104	0.3	6,200	0.1	0.3
	Evening	6,245	7,000	0.5	7,091	0.1	0.6
15 Broadway and West 42nd Street	Morning	5,136	6,082	0.7	6,132	0.0	0.8
	Afternoon	2,503	2,853	0.6	2,920	0.1	0.7
	Evening	3,261	3,975	0.9	4,040	0.1	0.9

[1] Sound increment represents No-Action sound levels minus Existing sound levels.

[2] Sound increment represents With-Action sound levels minus No-Action sound levels

[3] Sound increment represents With-Action sound levels minus Existing sound levels

Source: VHB, 2021.

Stationary Sources

The proposed building is not anticipated to include any substantial stationary source noise generators, such as unenclosed cooling or ventilation equipment, loudspeaker systems, stationary diesel engines, or other similar types of uses. The design and specifications for mechanical equipment – such as heating, ventilation, and air conditioning – would incorporate sufficient noise reduction to comply with applicable noise regulations and standards, including the standards contained in the revised New York City Noise Control Code, Subchapter 5, §24-227, the New York City Department of Building Code. This would ensure that mechanical equipment does not result in any significant increase in noise levels, either by itself or cumulatively with other project noise sources. Therefore, no stationary source analysis is warranted.

Noise Assessment for New Receptors

With-Action noise conditions at new sensitive receptors that would be introduced by the Proposed Project are evaluated according to absolute exterior sound level. The noise exposure guidelines for acceptable ambient conditions depend on the type of land use; for

hotel spaces, the goal is to maintain interior noise levels of 45 dBA or lower. For commercial office space, the goal is to maintain an interior noise level of 50 dBA or lower. With-Action exterior sound levels are evaluated to determine if receptors would be in an acceptable ambient sound level environment. It is generally assumed that without specific information on a building's window and wall construction, the outdoor-to-indoor noise reduction of the building is 25 decibels. As shown in **Table 12-3**, exterior ambient sound levels exceeding 70 dBA (L_{10}) during the daytime (7 AM to 10 PM) are considered to be Marginally Unacceptable. Exterior sound levels exceeding 80 dBA (L_{10}) are considered Clearly Unacceptable. If there would be Marginally Unacceptable or Clearly Unacceptable ambient noise conditions, there is a need to provide window/wall sound attenuation that is sufficient to reduce interior sound levels to acceptable levels.

Since the Proposed Actions would introduce new commercial offices and hotel space, the highest L_{10} or L_{eq} 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.

Noise Exposure Guidelines

The *2020 CEQR Technical Manual* provides noise exposure guidelines for assessing ambient noise conditions at new residential and commercial receptors, as shown in **Table 12-3**.

Table 12-3 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
Hotel	7 AM to 10 PM				

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

Existing Noise Levels

To characterize existing conditions, noise measurements would typically be conducted at the Development Site at ground-level for 20-minutes in duration during the weekday AM, midday, and PM time periods including simultaneous traffic counts. Due to COVID-19, the New York City Department of Transportation paused data collection on March 11, 2020, including noise measurements and traffic counts, due to potential changes in traffic patterns. Between March 2020 and October 2020, noise measurements were not allowed due to substantial changes in traffic conditions. Existing ambient noise conditions can, however, be characterized based on previous noise measurements conducted in the area as part of other recent EASs or EISs. As shown in **Figure 12-1** and **Table 12-4**, existing noise measurements in the area have been conducted as part of the *Greater East Midtown Rezoning EIS* (CEQR No. 17DCP001M) and the *Vanderbilt Corridor and One Vanderbilt EIS* (CEQR No. 14DCP188M). Since the predominant source of noise during these measurements was traffic, they would not be substantially different than normal traffic conditions today. As noise relates to traffic volumes, a doubling of traffic relates to a three decibel increase in noise. Traffic conditions

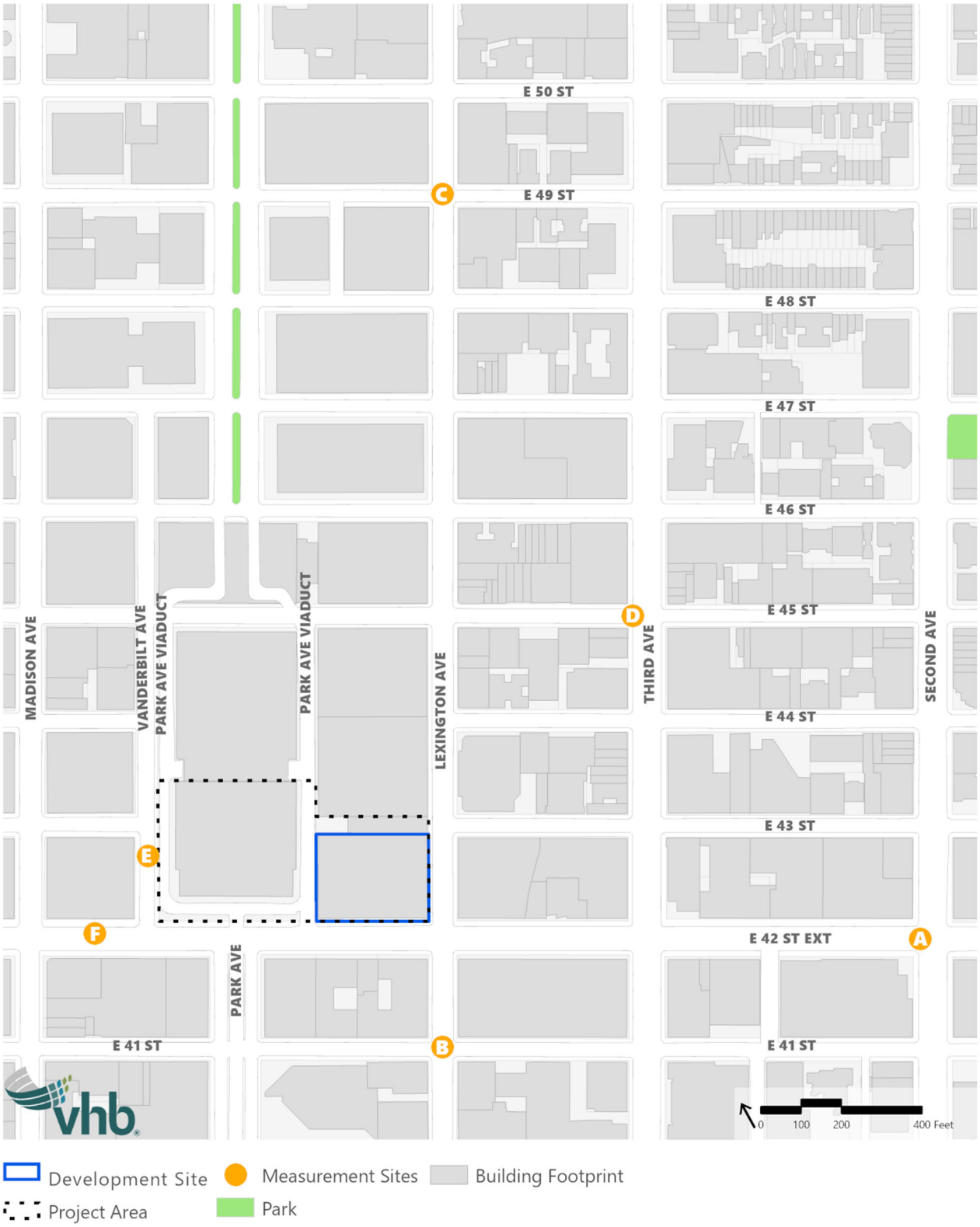
between 2016 and 2019 were evaluated and determined to have decreased slightly. Therefore, the noise measurements conducted in 2016 were conservatively assumed to be similar to 2019 existing condition and were not adjusted for decreases in traffic.

Table 12-4 Ambient Sound Level Measurements

Site	Monitoring Location	Time Period	Duration	L_{eq}	L_{10}	L_{50}	L_{90}
A	East 42nd Street and 2nd Avenue (Greater East Midtown Site 5)	Morning	20 minutes	75.7	79.0	72.9	70.1
		Midday	20 minutes	80.9	80.9	72.1	69.1
		Evening	20 minutes	74.8	75.7	71.5	68.9
B	East 41st Street and Lexington Avenue (Greater East Midtown Site 11)	Morning	20 minutes	75.6	78.3	72.1	67.9
		Midday	20 minutes	74.6	76.3	72.8	69.1
		Evening	20 minutes	74.1	77.1	71.1	67.9
C	East 49th Street and Lexington Avenue (Greater East Midtown Site 7)	Morning	20 minutes	73.9	76.4	71.3	68.5
		Midday	20 minutes	74.0	76.4	71.6	67.6
		Evening	20 minutes	75.7	78.1	72.9	68.6
D	East 45th Street and 3rd Avenue (Greater East Midtown Site 6)	Morning	20 minutes	77.4	79.0	72.0	68.9
		Midday	20 minutes	74.8	77.0	71.8	69.5
		Evening	20 minutes	75.2	77.7	72.3	68.5
E	Vanderbilt Avenue between East 42nd Street and East 43rd Street (One Vanderbilt Site 1)	Morning	20 minutes	69.6	70.3	67.9	66.4
		Midday	20 minutes	70.2	71.5	69.2	67.8
		Evening	20 minutes	70.1	71.3	69.5	69.3
F	East 42nd Street between Madison Avenue and Vanderbilt Avenue (One Vanderbilt Site 2)	Morning	20 minutes	74.8	77.1	72.5	70.3
		Midday	20 minutes	73.7	75.7	72.5	70.6
		Evening	20 minutes	75.3	77.5	73.1	70.6

Source: *Greater East Midtown EIS*, Measurements conducted on September 13 and 29, 2016.
Vanderbilt Corridor and One Vanderbilt EIS, Measurements conducted on June 20, 2013 and June 25, 2014.

Figure 12-1 Noise Monitoring Locations



Mobile Source Noise Analysis

A mobile source analysis has been conducted based on proportional noise modeling. The closest intersection was used to adjust sound levels for each measurement site. 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 70.~~3~~2 dBA to 81.~~5~~4 dBA and the L_{10} levels range between ~~71.0~~70.9 and 81.~~5~~4 dBA. The With-Action L_{eq} levels ranged from 70.~~5~~4 dBA to 81.5 dBA and the L_{10} levels range between 71.~~2~~1 and 81.5 dBA.

Table 12-5 No-Action Sound Levels

Site	Monitoring Location	Time Period	Intersection	L_{eq}	L_{10}	L_{50}	L_{90}
A	East 42nd Street and 2nd Avenue (Greater East Midtown Site 5)	Morning	2 2nd Avenue and East 42nd Street	76.3	79.6	73.5	70.7
		Midday		81.4	81.4	72.6	69.6
		Evening		75.6	76.5	72.3	69.7
B	East 41st Street and Lexington Avenue (Greater East Midtown Site 11)	Morning	6 Lexington Avenue and East 42nd Street	76.0	78.7	72.5	68.3
		Midday		74.6	76.3	72.8	69.1
		Evening		74.4	77.4	71.4	68.2
C	East 49th Street and Lexington Avenue (Greater East Midtown Site 7)	Morning	10 Lexington Avenue and East 46th Street	74.5	77.0	71.9	69.1
		Midday		74.4	76.8	72.0	68.0
		Evening		76.2	78.6	73.4	69.1
D	East 45th Street and 3rd Avenue (Greater East Midtown Site 6)	Morning	4 3rd Avenue and East 42nd Street	77.9	79.5	72.5	69.4
		Midday		75.2	77.4	72.2	69.9
		Evening		75.7	78.2	72.8	69.0
E	Vanderbilt Avenue between East 42nd Street and East 43rd Street (One Vanderbilt Site 1)	Morning	6 Lexington Avenue and East 42nd Street	70.2	70.9	68.5	67.0
		Midday		70.5	71.8	69.5	68.1
		Evening		70.4	71.6	69.8	69.6
F	East 42nd Street between Madison Avenue and Vanderbilt Avenue (One Vanderbilt Site 2)	Morning	12 Madison Avenue and East 42nd Street	75.4	77.7	73.1	70.9
		Midday		74.1	76.1	72.9	71.0
		Evening		75.9	78.1	73.7	71.2

Source: VHB, 2021.

Table 12-6 With-Action Sound Levels

Site	Monitoring Location	Time Period	Intersection	L_{eq}	L_{10}	L_{50}	L_{90}
A	East 42nd Street and 2nd Avenue (Greater East Midtown Site 5)	Morning	2 2nd Avenue and East 42nd Street	76.3	79.6	73.5	70.7
		Midday		81.5	81.5	72.7	69.7
		Evening		75.7	76.6	72.4	69.8
B	East 41st Street and Lexington Avenue (Greater East Midtown Site 11)	Morning	6 Lexington Avenue and East 42nd Street	76.1	78.8	72.6	68.4
		Midday		74.7	76.4	72.9	69.2
		Evening		74.5	77.5	71.5	68.3
C	East 49th Street and Lexington Avenue (Greater East Midtown Site 7)	Morning	10 Lexington Avenue and East 46th Street	74.7	77.2	72.1	69.3
		Midday		74.7	77.1	72.3	68.3
		Evening		76.3	78.7	73.5	69.2
D	East 45th Street and 3rd Avenue (Greater East Midtown Site 6)	Morning	4 3rd Avenue and East 42nd Street	78.0	79.6	72.6	69.5
		Midday		75.2	77.4	72.2	69.9
		Evening		75.8	78.3	72.9	69.1
E	Vanderbilt Avenue between East 42nd Street and East 43rd Street (One Vanderbilt Site 1)	Morning	6 Lexington Avenue and East 42nd Street	70.4	71.1	68.7	67.2
		Midday		70.8	72.1	69.8	68.4
		Evening		70.5	71.7	69.9	69.7
F	East 42nd Street between Madison Avenue and Vanderbilt Avenue (One Vanderbilt Site 2)	Morning	12 Madison Avenue and East 42nd Street	75.4	77.7	73.1	70.9
		Midday		74.1	76.1	72.9	71.0
		Evening		75.9	78.1	73.7	71.2

Source: VHB, 2021.

Acceptability Assessment

The *2020 CEQR Technical Manual* provides noise exposure guidelines for assessing ambient sound levels, as shown in **Table 12-3**. Based on these noise exposure guidelines, noise has been assessed to determine the level of acceptability for new sensitive receptors at the proposed building.

Table 12-7 summarizes the maximum measured Existing L_{10} or L_{eq} level and the associated No-Action and With-Action sound levels at each location based on results of the noise monitoring and mobile source noise analysis. **Table 12-7** also indicates whether the With-Action sound levels are considered to be acceptable according to the *2020 CEQR Technical Manual*.

Table 12-7 Sound Level Acceptability, dBA

Façade	Noise Site	Time Period	Existing Sound Level (L_{10} dBA)	No-Action Sound Level (L_{10} dBA)	With-Action Sound Level (L_{10} dBA)	Acceptability
South East 42nd Street	A	Morning	79.0	79.6	79.6	Marginally Unacceptable
	A	Midday	80.9	81.4	**81.5**	**Clearly Unacceptable**
	F	Evening	77.5	78.1	78.1	Marginally Unacceptable
East Lexington Avenue	B	Morning	78.3	78.7	**78.8**	**Marginally Unacceptable**
	C	Midday	76.4	76.8	77.1	Marginally Unacceptable
	C	Evening	78.1	78.6	78.7	Marginally Unacceptable
North	D	Morning	79.0	79.7	**79.6**	**Marginally Unacceptable**
	D	Midday	77.0	77.4	77.4	Marginally Unacceptable
	D	Evening	77.7	78.2	78.3	Marginally Unacceptable
West	F	Morning	77.1	77.7	77.7	Marginally Unacceptable
	F	Midday	75.7	76.1	76.1	Marginally Unacceptable
	F	Evening	77.5	78.1	**78.1**	**Marginally Unacceptable**

Bold values are maximum for each facade
Source: VHB, 2021.

According to the noise exposure guidelines in the *CEQR Technical Manual*, With-Action sound levels would be Clearly Unacceptable on the south façade (East 42nd Street) since midday sound levels would exceed 80 dBA. With-Action sound levels would be Marginally Unacceptable at the east, north, and west facades because sound levels would be between 70 and 80 dBA during all measurement periods.

With-Action sound levels at the Development Site would be up to 81.5 dBA (L_{10}) on the south façade, up to ~~79.0~~78.8 dBA (L_{10}) on the east façade, up to 79.~~7~~6 dBA (L_{10}) on the north façade, and up to 78.1 dBA (L_{10}) on the west façade. Based on the finding of Clearly Unacceptable and Marginally Unacceptable sound levels, 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 12-8**, the required level of attenuation varies based on the exterior sound levels and type of receptor.

Table 12-8 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 [A]	(I) 28 dBA	(II) 31 dBA	(III) 33 dBA	(IV) 35 dBA	$36+(L_{10}-80)$[B] dBA

Note: [A] The above composite window-wall attenuation values are for residential dwellings and community facility development. Commercial office spaces and meeting rooms would be 5 dBA 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 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 12-7** were compared to the required attenuation values in **Table 12-8** to determine the sound attenuation needed. The results show that on the south façade, new hotel spaces would require a minimum of 38 dBA of composite window/wall sound attenuation and commercial office spaces would require a minimum of 33 dBA of attenuation to maintain an interior noise level not greater than 45 dBA. On the east, north, and west façades, new hotel spaces would require a minimum of 35 dBA of composite window/wall sound attenuation and commercial office spaces would require a minimum of 30 dBA of attenuation to maintain an interior noise level not greater than 45 dBA. Retail space is not considered noise-sensitive and does not require minimum window/wall attenuation requirements to meet the CEQR Noise Exposure Guidelines. In order to maintain acceptable interior noise conditions in hotel and commercial spaces, 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.

The composite outdoor-to-indoor transmission classification (OITC) value of the window-wall structure is used to determine the necessary sound attenuation. The OITC classification is defined by ASTM International (ASTM E1331-10a) and provides a single number rating that is used for designing a building façade, including walls, doors, glazing, and combinations, thereof. Sound attenuation measures would be achieved through construction materials and techniques with sufficient OITC-rated windows and walls.

To implement these attenuation requirements, it is anticipated that an (E) ~~designation, Restrictive Declaration, or other mechanism~~Designation for noise would be applied to the Development Site specifying the appropriate amount of window/wall attenuation and an alternate means of ventilation. The text for the (E) ~~designation, Restrictive Declaration, or other mechanism would be as follows:~~Designation (E-648):

Block 1280, Lot 30

In order to ensure an acceptable interior noise environment, future hotel uses must provide a closed-window condition with a minimum of 38 dBA window/wall attenuation on the south

facade facing East 42nd Street and 35 dBA of attenuation on the other facades to maintain an interior noise level not greater than 45 dBA. for hotel uses. Future commercial office uses must provide a closed-window condition with a minimum of 33 dBA window/wall attenuation on the south facade facing East 42nd Street and 30 dBA of attenuation on the other facades 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.