A. INTRODUCTION

This chapter assesses the potential for the proposed action to result in significant adverse noise impacts. The Applicant is seeking several discretionary approvals (collectively, the "Proposed Action") that would facilitate the development of an approximately 684,242 gross square foot (gsf) commercial development (the "Proposed Project") in the South Williamsburg neighborhood of Brooklyn Community District (CD) 2. The Proposed Project would comprise approximately 598,442 gsf of office space and 21,233 gsf of retail uses. It would also contain approximately 49,453 sf of waterfront public open space, including a shore public walkway and supplemental public access area. Additionally, there would be 234 public parking spaces (64,567 gsf) and two loading berths.

The Proposed Project would be located at 500 Kent Avenue (Block 2023, Lot 10) and is bound by Division Avenue to the north, Kent Avenue to the east, the Brooklyn Navy Yard to the south, and Wallabout Channel to the west. The Applicant is seeking the following discretionary approvals:

(1) Zoning map amendment that would rezone the 2.65-acre Project Site from M3-1 to M1-5
(2) Waterfront bulk modification special permit pursuant to ZR 62-837 to modify various bulk requirements in sub-sections of ZR 62-341, including: (i) ZR 62-341(a)(2) - initial setback distance; (ii) ZR 62-341(c)(1) – maximum base height, (iii) ZR 62-341(c)(2) – maximum building height; and (iv) 62-341(c)(5) – maximum width of walls facing shoreline.
(3) Special permit pursuant to ZR 74-512 to allow a 234-space public parking garage

The project also requires one non-discretionary ministerial action by the City Planning Commission (CPC):

(4) Waterfront zoning certification pursuant to ZR 62-81 to demonstrate compliance with applicable waterfront zoning regulations.

As discussed in **Chapter 12, "Transportation,"** the Proposed Action is expected to change traffic volumes in the general vicinity of the Proposed Project. As the Proposed Action would result in more than 50 peak hour vehicle trips through any given intersection, a mobile source noise analysis was conducted to determine whether there are any noise-sensitive locations where project-generated traffic would have the potential to result in significant adverse noise impacts. Additionally, as the Proposed Action would create new noise-sensitive uses within the Proposed Project, an analysis was conducted in order to determine the level of building attenuation required to ensure that future interior noise levels would satisfy applicable noise criteria.

B. PRINCIPAL CONCLUSIONS

A mobile source noise analysis was conducted based on the methodology set forth in the 2021 *City Environmental Quality Review (CEQR) Technical Manual*, and determined that the Proposed Action would not have a significant adverse impact related to noise. In the future with the Proposed Action, the predicted peak period L_{10} values at the receptor locations would range from a minimum of 56.96 A-weighted decibels (dBA) to a maximum of 77.09 dBA. When compared to the future without the Proposed Action, the maximum increase in L_{eq} noise levels in the With-Action condition (compared to No-Action conditions) for all receptor sites would be less than 3.0 dBA. According to *CEQR Technical Manual* guidance, increases less than 3.0 dBA would not be perceptible and therefore, would not be significant. Accordingly, the Proposed Action would not result in any significant adverse impacts due to action-generated vehicular traffic.

Based on With-Action exterior noise levels and *CEQR Technical Manual* criteria, With-Action L_{10} noise levels at Receptor Location 1 would be above the 70 dBA CEQR threshold. However, as the existing noise measurements at Receptor Location 1 captured on-site operations of the adjacent lumber yard at 470 Kent Avenue (a use that will not occupy the site in future 2026 conditions), and as the noise PCE analysis based on the methodologies described in Section E, below, assumes that all measured noise levels are the result of traffic noise, the results of the proportional modeling technique used for projecting existing and future No-Action and With-Action noise levels at Receptor Location 1 are considered overly conservative. Additionally, absent the lumber yard in the future 2026 condition, a comparison of PCE values at Receptor Locations 1 and 2 shows that noise levels generated by traffic along Kent Avenue (Receptor Location 2) should be higher than those along Division Avenue (Receptor Location 1) (refer to **Table 15-10**, below). Therefore, since Receptor Location 2 provides the highest traffic noise expected at the Project Site, and as local traffic is assumed to be the dominant source of noise for the Project Site's northern frontage under future 2026 conditions, Receptor Location 2 will be used to determine attenuation requirements along the Project Site's northern (Division Avenue) and eastern (Kent Avenue) frontages. Since future With-Action noise levels at Receptor Location 2 would remain below the 70 dBA CEQR threshold (see **Table 15-10**, below), no special noise attenuation measures beyond standard construction practices would be required for commercial office uses on any of the Project Site's street frontages in order to achieve interior noise levels of 50 dBA or lower for commercial office uses. As such, the Proposed Project would provide sufficient attenuation to achieve the *CEQR Technical Manual* interior noise level guidelines, and thus, the Proposed Action would not result in any significant adverse noise impacts related to building attenuation requirements.

C. NOISE FUNDAMENTALS

Quantitative information on the effects of airborne noise on people is well documented. If sufficiently loud, noise may adversely affect people in several ways. For example, noise may interfere with human activities such as sleep, speech communication, and tasks requiring concentration or coordination. It may also cause annoyance, hearing damage, and other physiological problems. Although it is possible to study these effects on people on an average or statistical basis, it must be remembered that all the stated effects of noise on people vary greatly

with the individual. Several noise scales and rating methods are used to quantify the effects of noise on people. These scales and methods consider factors such as loudness, duration, time of occurrence, and changes in noise level with time.

"A"-Weighted Sound Level (dBA)

Noise is typically measured in units called decibels (dB), which are ten times the logarithm of the ratio of the sound pressure squared to a standard reference pressure squared. Because loudness is important in the assessment of the effects of noise on people, the dependence of loudness on frequency must be taken into account in the noise scale used in environmental assessments. Frequency is the rate at which sound pressures fluctuate in a cycle over a given quantity of time, and is measured in Hertz (Hz), where 1 Hz equals 1 cycle per second. Frequency defines sound in terms of pitch components. In the measurement system, one of the simplified scales that accounts for the dependence of perceived loudness on frequency is the use of a weighting network - known as A-weighting - that simulates the response of the human ear. For most noise assessments, the A-weighted sound pressure level in units of dBA is used due to its widespread recognition and its close correlation to perception. In this analysis, all measured noise levels are reported in dBA or A-weighted decibels. Common noise levels in dBA are shown in **Table 15-1**.

TABLE 15-1: Common Noise Levels

Sound Source	(dBA)
Air Raid Siren at 50 feet	120
Maximum Levels at Rock Concerts (Rear Seats)	110
On Platform by Passing Subway Train	100
On Sidewalk by Passing Heavy Truck or Bus	90
On Sidewalk by Typical Highway	80
On Sidewalk by Passing Automobiles with Mufflers	70
Typical Urban Area	60-70
Typical Suburban Area	50-60
Quiet Suburban Area at Night	40-50
Typical Rural Area at Night	30-40
Soft Whisper at 5 meters	30
Isolated Broadcast Studio	20
Audiometric (Hearing Testing) Booth	10
Threshold of Hearing	0

Source: *2021 CEQR Technical Manual* / Cowan, James P. Handbook of Environmental Acoustics. Van Nostrand Reinhold, New York, 1994. Egan, M. David, Architectural Acoustics. McGraw-Hill Book Company, 1988.
Note: A 10 dBA increase appears to double the loudness, and a 10 dBA decrease appears to halve the apparent loudness.

Community Response to Changes in Noise Levels

Table 15-2 shows the average ability of an individual to perceive changes in noise. Generally, changes in noise levels less than 3 dBA are barely perceptible to most listeners. However, as illustrated in **Table 15-2**, 5 dBA changes are readily noticeable, and 10 dBA changes are normally perceived as doublings (or halvings) of noise levels. These guidelines permit direct estimation of an individual's probable perception of changes in noise levels.

TABLE 15-2: Average Ability to Perceive Changes in Noise Levels

Change (dBA)	Human Perception of Sound
2-3	Barely perceptible
5	Readily noticeable
10	A doubling or halving of the loudness of sound
20	A dramatic change
40	Difference between a faintly audible sound and a very loud sound

Source: Bolt Beranek and Neuman, Inc., Fundamentals and Abatement of Highway Traffic Noise, Report No. PB-222-703. Prepared for Federal Highway Administration, June 1973.

Noise Descriptors Used In Impact Assessment

Because the sound pressure level unit, dBA, describes a noise level at just one moment, and very few noises are constant, other ways of describing noise over extended periods have been developed. One way of describing fluctuating sound is to describe the fluctuating noise heard over a specific time period as if it had been a steady, unchanging sound. For this condition, a descriptor called the "equivalent sound level", L_{eq}, can be computed. L_{eq} is the constant sound level that, in a given situation and time period (e.g., 1 hour, denoted by $L_{eq(1)}$, or 24 hours, denoted as $L_{eq(24)}$), conveys the same sound-energy as the actual time-varying sound. The Day-Night Sound Level (i.e., L_{dn}) refers to a 24-hour average noise level with a 10 dB penalty applied to the noise levels during the hours between 10:00 PM and 7:00 AM, due to increased sensitivity to noise levels during these hours. Statistical sound level descriptors such as L_1, L_{10}, L_{50}, L_{90}, and L_x, are sometimes used to indicate noise levels that are exceeded 1, 10, 50, 90 and x percent of the time, respectively. Discrete event peak levels are given as L_1 levels. L_{eq} is used in the prediction of future noise levels, by adding the contributions from new sources of noise (i.e., increases in traffic volumes) to the existing levels and in relating annoyance to increases in noise levels.

The relationship between L_{eq} and levels of exceedance is worth noting. Because L_{eq} is defined in energy rather than straight numerical terms, it is not simply related to the levels of exceedance. If the noise fluctuates very little, L_{eq} will approximate L_{50} or the median level. If the noise fluctuates broadly, the L_{eq} will be approximately equal to the L_{10} value. If extreme fluctuations are present, the L_{eq} will exceed L_{90} or the background level by ten or more decibels. Thus the relationship between L_{eq} and the levels of exceedance will depend on the character of the noise. In community noise measurements, it has been observed that the L_{eq} is generally between L_{10} and L_{50}.

For purposed of this analysis, the maximum one-hour equivalent continuous sound level (i.e., L_{eq}) has been selected as the noise descriptor to be used in the noise impact evaluation. L_{eq} is the noise descriptor recommended for use in the *CEQR Technical Manual* for vehicular traffic and is used to provide an indication of highest expected sound levels. For dominant vehicular noise, the one-hour L_{10} is the noise descriptor used in the *CEQR Technical Manual* noise exposure guidance for city environmental impact review classification.

D. NOISE STANDARDS AND CRITERIA

New York City Noise Code

The New York City Noise Control Code, amended in December 2005, contains prohibitions regarding unreasonable noise and specific noise standards, including plainly audible criteria for specific noise sources. In addition, the amended code specifies that no sound source operating in connection with any commercial or business enterprise may exceed the decibel levels in the designated octave bands at specified receiving properties. The New York City Department of Environmental Protection (DEP) has set external noise exposure standards. These standards are shown on the following page in **Table 15-3**.

TABLE 15-3: Noise Exposure Guidelines for Use in City Environmental Impact Review

Receptor Type	Time Period	Acceptable General External Exposure	Airport[3] Exposure	Marginally Acceptable General External Exposure	Airport[3] Exposure	Marginally Unacceptable General External Exposure	Airport[3] Exposure	Clearly Unacceptable General External Exposure	Airport[3] Exposure
1. Outdoor area requiring serenity and quiet[2]		$L_{10} \leq 55$ dBA	---- DNL ≤ 60 dBA ----		---- 60 < DNL ≤ 65 dBA ----		(1) 65 < DNL ≤ 75 dBA,		---- 75 dBA < DNL ----
2. Hospital, Nursing Home		$L_{10} \leq 55$ dBA		55 < $L_{10} \leq 65$ dBA		65 < $L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
3. Residence, residential hotel or motel	7 AM to 10 PM	$L_{10} \leq 65$ dBA		65 < $L_{10} \leq 70$ dBA		70 < $L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
	10 PM to 7 AM	$L_{10} \leq 55$ dBA		55 < $L_{10} \leq 70$ dBA		70 < $L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
4. School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, out-patient public health facility		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)	
5. Commercial or office		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)	
6. Industrial, public areas only[4]	Note 4	Note 4		Note 4		Note 4		Note 4	

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

Notes: (i) In addition, any new activity shall comply with the Impact Thresholds detailed in Section 410 in Chapter 19, "Noise," of the 2021 *CEQR Technical Manual*;

1 Measurements and projections of noise exposures are to be made at appropriate heights above site boundaries as given by American National Standards Institute (ANSI) Standards; all values are for the worst hour in the time period.

2 Tracts of land where serenity and quiet are extraordinarily important and serve an important public need and where the preservation of these qualities is essential for the area to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks or open spaces dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet. Examples are grounds for ambulatory hospital patients and patients and residents of sanitariums and old-age homes.

3 One may use the FAA-approved L_{dn} contours supplied by the Port Authority, or the noise contours may be computed from the federally approved INM Computer Model using flight data supplied by the Port Authority of New York and New Jersey.

4 External Noise Exposure standards for industrial areas of sounds produced by industrial operations other than operating motor vehicles or other transportation facilities are spelled out in the New York City Zoning Resolution, Sections 42-20 and 42-21. The referenced standards apply to M1, M2, and M3 manufacturing districts and to adjoining residence districts (performance standards are octave band standards).

New York CEQR Technical Manual Noise Standards

Noise Exposure is classified into four categories: Acceptable, Marginally Acceptable, Marginally Unacceptable, and Clearly Unacceptable. The *CEQR Technical Manual* defines attenuation requirements for buildings based on exterior noise levels (see **Table 15-4**). For dominant vehicular noise, recommended noise attenuation values for buildings are designed to maintain interior L_{10} noise levels of 45 dBA or lower for residential uses and 50 dBA or lower for commercial office uses. Attenuation requirements are shown on the following page in **Table 15-4**.

TABLE 15-4: Required Attenuation Values to Achieve Acceptable Interior Noise Levels

	Marginally Unacceptable				Clearly Unacceptable
Vehicular Traffic	$70<L_{10}\leq73$	$73<L_{10}\leq76$	$76<L_{10}\leq78$	$78<L_{10}\leq80$	$80<L_{10}$
Aircraft	$65<DNL\leq68$	$68<DNL\leq71$	$71<DNL\leq73$	$73<DNL\leq75$	$75<DNL$
Train	$65<L_{dn}\leq68$	$68<L_{dn}\leq71$	$71<L_{dn}\leq73$	$73<L_{dn}\leq75$	$75<L_{dn}$
Attenuation[A]	(I) 28 dB(A)	(II) 31 dB(A)	(III) 33 dB(A)	(IV) 35 dB(A)	See [c]

Note:

[A] DNL descriptor based on average values of Ldn over a year period.

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

[C] The required attenuation value is the difference between L_{build} and $L_{interior}$, using the appropriate noise descriptor, where:
L_{build} is the projected noise level under the build condition rounded up to the whole number
$L_{interior}$ is the designed interior noise level (45 dB(A) for vehicular noise, 40 dB(A) for aircraft and train noise)

Source: New York City Department of Environmental Protection / 2021 *CEQR Technical Manual*

E. NOISE PREDICTION METHODOLOGY

General Methodology

Future noise levels were calculated using a proportional modeling technique, which was used as a screening tool to estimate change in noise levels. The proportional modeling technique is an analysis methodology recommended for analysis purposes in the *CEQR Technical Manual*. The noise analysis examined the typical weekday AM, midday, and PM peak hours, and an additional School PM peak hour.

Besides the aforementioned School PM peak hour, the selected time periods are when development facilitated by the Proposed Action would be expected to produce the maximum traffic generation (based on the traffic studies presented in **Chapter 12, "Transportation"**) and, therefore, result in the maximum potential for significant noise level increases. The methodologies used for the noise analyses are described below.

Proportional Modeling

Proportional modeling was used to determine locations with the potential for having significant noise impacts. Proportional modeling is one of the techniques recommended in the *CEQR Technical Manual* for mobile source analysis.

Using this technique, the prediction of existing and future noise levels (where traffic is the dominant noise source) is based on a calculation using measured traffic counts and noise levels and predicted changes in traffic volumes to determine Existing, No-Action, and With-Action noise levels. The proportional modeling utilized the future (2026) No-Action and With-Action traffic volumes anticipated within the vicinity of the Project Site, consistent with the vehicle trip assignments presented in **Chapter 12**.

Vehicular traffic volumes are then converted into Passenger Car Equivalent (PCE) values, for which one medium-duty truck (having a gross weight between 9,900 and 26,400 pounds) is assumed to generate the noise equivalent of 13 cars, one heavy-duty truck (having a gross weight of more than 26,400 pounds) is assumed to generate the noise equivalent of 47 cars, and one bus (vehicles designed to carry more than nine passengers) is assumed to generate the noise equivalent of 18 cars. Future noise levels are calculated using the following equation:

FNA NL = 10 * log (NA PCE/E PCE) + E NL

where:

FNA NL = Future No-Action Noise Level
NA PCE = No-Action PCEs
E PCE = Existing PCEs
E NL = Existing Noise Level

Sound levels are measured in decibels and therefore increase logarithmically with sound source strength. In this case, the sound source is traffic volumes measured in PCEs. For example, assume that traffic is the dominant noise source at a particular location. If the existing traffic volume on a street is 100 PCEs and if the future traffic volumes were increased by 50 PCEs to a total of 150 PCEs, the noise level would increase by 1.8 dBA. Similarly, if the future traffic were increased by 100 PCEs, or doubled to a total of 200 PCEs, the noise level would increase by 3.0 dBA. To account for the differences between the number of PCEs counted during the noise monitoring period and the number of existing traffic volumes presented in **Chapter 12, "Transportation,"** an adjustment factor was created for Receptor Locations 1 and 2 to estimate the existing noise levels using the traffic volumes from the traffic analysis.

To calculate the No-Action noise levels, changes to the study area's traffic network as a result of general background growth and increased travel demand from new, nearby development were factored in. As per *CEQR Technical Manual* guidance, an annual background growth rate of 0.50 percent for the 2026 Build year, plus the estimated incremental travel demand from new development within the vicinity of the Project Site, was applied to the noise PCE values based on the existing vehicle volumes presented in **Chapter 12**.[1] In order to obtain the necessary With-Action PCE values to calculate the With-Action noise levels, the 2026 With-Action traffic increment assignments presented in **Chapter 12**, were converted into PCE values and added to the calculated No-Action PCE values.

[1] The background growth rate is based on information provided in Table 16-4 of the *CEQR Technical Manual.*

However, since Receptor Location 3 and 4 do not front public streets, proportional modeling was not used to determine the No-Action and With-Action noise levels for those frontages. As such, the existing noise levels at those locations represents the No-Action and With-Action future noise models.

Play Area Noise

While people are not usually thought of as stationary noise, children in playgrounds or spectators at outdoor sporting events or concerts can introduce additional sources of noise within communities. According to the *CEQR Technical Manual*, noise generated by children in playgrounds or people using parks is considered a stationary source of noise. As the Project Site is directly west of the Roberto Clemente Ballfield (see **Figure 15-1**), a play area noise analysis was conducted to determine the need for additional attenuation requirements for the building facades with frontages facing the existing ballfield.

Potential noise impacts on the Project Site due to the use of the existing ballfield were determined using methodology based on the measurements and procedures outlined in a study entitled, "SCA Playground Noise Study" (1992), provided as an appendix to the *CEQR Technical Manual*.[2] To predict potential noise impacts at a given distance from a play area boundary, the study suggests a 4.5 dBA reduction in L_{eq} noise levels per doubling of distance at a distance between 40 and 300 feet, with initial reductions of 4.8 dBA at 20 feet, 6.8 dBA at 30 feet, and 9.1 dBA at 40 feet. Noise levels can be estimated with the following equation at sensitive receptor with a direct line of sight to the play area between 40 to 300 feet:

$$Lp1 = Lp2 - 15*\log(d/10)$$

Where:

Lp1 = the predicted noise level at a specific distance.
Lp2 = the maximum L_{eq} at the boundary of the school play area.
d = the distance from the play area boundary to the sensitive receptor in feet.

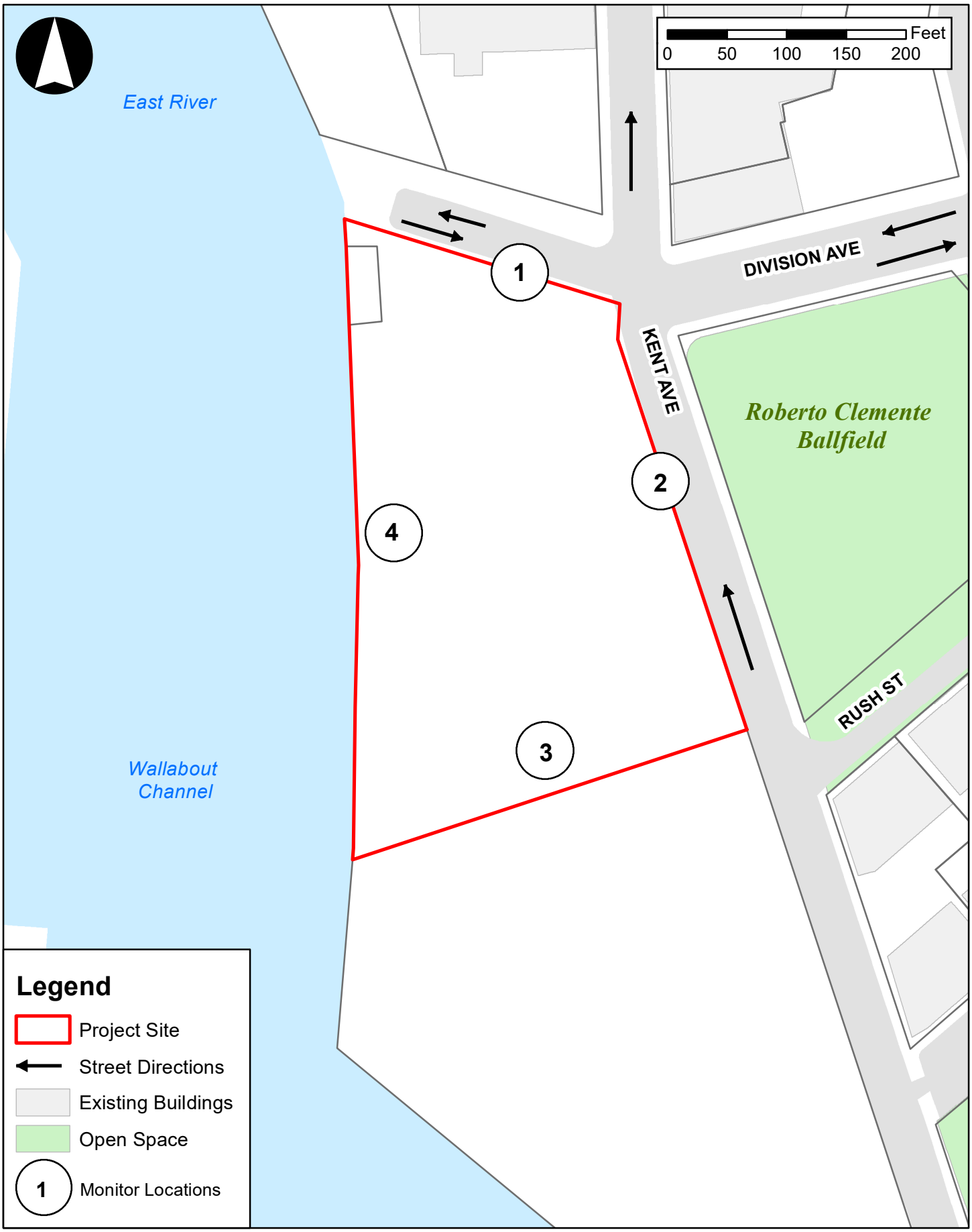
In certain situations these values may overstate play area noise levels.

The Project Site's eastern frontage facing Kent Avenue would have the greatest potential for noise level impacts due to noise from the nearby Roberto Clemente Ballfield, as the eastern-facing facades of the Proposed Project would be across the street from the existing ballfield at a distance of approximately 90-feet and would have a direct line of sight to the ballfield.

Table 15-5 shows the results of the play area noise assessment at these receptors using the methodology described above for predicting play area-generated noise levels. As indicated in the table, the maximum predicted L_{eq} noise levels along the eastern façades of the Project Site due to the Roberto Clemente Ballfield would be 57.2 dBA. The predicted play area noise levels presented in **Table 15-5** will be utilized to determine the maximum predicted L_{eq} and L_{10} noise levels by

[2] Cowan, James P. & Holley, Stephen J, AKRF Inc. "SCA Playground Noise Study," October 1992.

Figure 15-1
Noise Monitor Locations



combining the predicted play area noise values with predicted With-Action noise values based on the proportional modeling methodology, further detailed in Section H below.

TABLE 15-5: Highest Predicted Noise Levels due to the Roberto Clemente Ballfield Only (in dBA)

Receptor Location		Approximate Distance (feet) to Proposed Play Area	Play Area L_{eq} at Receptor (in dBA)
Building	Façade		
Project Site	Eastern (Kent Avenue)	90	57.2

Notes: Play Area L_{eq} noise levels presented in this table do not factor in background noise levels.

F. EXISTING CONDITIONS

As shown in **Figure 15-1**, Division Avenue is a two-way east-west street with two travel lanes and parking on both sides of the street. Division Avenue north of the Project Site is a dead-end two-way street with two travel lanes and parking on both sides of the street. Kent Avenue is a one-way northbound street with one travel lane, parking on both sides of the street, and a bike lane on the west side of the street.

The surrounding area is also well served by public transit. The closest subway station is the Marcy Avenue J/M/Z subway station (to the northeast at the intersection of Broadway and Williamsburg Street), located approximately 0.7 miles from the Project Site. The B67 bus runs along Kent and Wythe Avenues with a stop on the corner of Division Avenue and Wythe Avenue, one block east of the Project Site. The B67 operates in Williamsburg with weekday service only. The South Williamsburg landing on the East River Ferry route is located less than 0.3 miles to the north of the Project Site at the western terminus of S. 10th Street. As discussed above, the site is also served by a two-way, north-south bike lane on Kent Avenue. The bike lane will eventually be a part of the Brooklyn Waterfront Greenway, a long corridor of bike lanes connecting open space along the waterfront in Brooklyn. There is also a Citi Bike station located at Kent Avenue and S. 11th Street, 300 feet to the north of the Project Site.

Selection of Noise Receptor Locations

The local traffic along Kent Avenue is the dominant source of noise east of the Project Area, whereas operations of the existing lumber yard at 470 Kent Avenue (Block 2134, Lots 1 and 150) are currently the dominant source of noise north of the Project Area. It should be noted, however, that the property at 470 Kent Avenue is a known development site and planned for redevelopment, and would include the construction of five mixed-use buildings containing residential and commercial uses. As described in **Chapter 2, "Land Use, Zoning, and Public Policy,"** Phase 1 of the planned 470 Kent Avenue project, which is expected to be completed and operational by the 2026 Build Year, would include the development of two mixed-use towers rising to 20- and 21-stories, comprising of 431 DUs, 8,900 gsf of local retail, and 178 parking spaces. Phase 1 of the 470 Kent Avenue development would remove and replace the current lumber yard operations that occupy the site under existing conditions. As such, local traffic would become the dominant source of noise north of the Project Area in the future 2026 condition.

The noise receptor locations were selected to be along the perimeter of the future building under the Proposed Action. The assumption was made that all windows on all frontages of the buildings would be operable. The four selected receptor locations around the Project Area are presented in **Table 15-6** and shown in **Figure 15-1**.

TABLE 15-6: Noise Receptor Locations

Receptor Location / Map ID[1]	Duration	Monitoring Location
1	20 Minutes	Division Avenue between Wallabout Channel/East River and Kent Avenue (approximately 30 feet west of Kent Avenue)
2	20 Minutes	Kent Avenue (approximately 175 feet south of Division Avenue)
3	20 Minutes	Southern frontage from within the Project Site
4	20 Minutes	Wallabout Channel/East River shoreline

Notes: [1] Refer to **Figure 15-1** for noise receptor locations.

Noise Monitoring

At the four receptor locations, 20-minute spot measurements of existing noise levels were performed for each of the three noise analysis time periods - weekday AM peak hour (8:00AM to 9:00AM), weekday midday peak hour (12:00PM to 1:00PM), and weekday PM peak hour (5:00PM to 6:00PM). As the Project Site is located directly southwest of the Ohel Sura School located at 31 Division Avenue, additional noise measurements were performed at all four receptor locations during the school dismissal/bus departure (School PM) peak period (2:30PM to 3:30PM). Noise monitoring was conducted during the School PM weekday peak period in order to determine the noise levels emanating from vehicles along Division Avenue and Kent Avenue. Although Receptor Locations 3 and 4 do not front the publicly accessible street, for conservative purposes, School PM noise monitoring was conducted to determine if there would be an impact. If noise levels measured during the School PM weekday peak period at these locations were greater than those during the AM, midday, and PM weekday peak periods, they would supersede those values and be used in their place to determine building attenuation requirements.

Noise monitoring for Receptor Locations 1 and 2 was performed on Tuesday, April 27, and for Receptor Locations 3 and 4 was performed on Wednesday, May 12, 2021. On April 27, the weather was cloudy and temperatures were in the mid-60s ºF. On May 12, the weather was sunny and temperatures were in the high-60s ºF. During noise measurements, local traffic was the dominant noise source east of the Project Area (Receptor Location 2), whereas operations of the lumberyard at 470 Kent Avenue were the dominant noise source north of the Project Area (Receptor Location 1).

Equipment Used During Noise Monitoring

The instrumentation used for the measurements was a Brüel & Kjær Type 4189 ½-inch microphone connected to a Brüel & Kjær Model 2250 Type 1 (as defined by the American National Standards Institute) sound level meter. This assembly was mounted at a height of 5 feet above the ground surface on a tripod and at least 6 feet away from any sound-reflecting surfaces to avoid major interference with source sound level that is being measured. The meter was calibrated before

and after readings with a Brüel & Kjær Type 4231 sound-level calibrator using the appropriate adaptor. Measurements at the receptor location were made on the A-scale (dBA). The data were digitally recorded by the sound level meter and displayed at the end of the measurement period in units of dBA. Measured quantities included L_{eq}, L_1, L_{10}, L_{50}, and L_{90}. A windscreen was used during all sound measurements except for calibration. Only traffic-related noise was measured; noise from other sources (e.g., emergency sirens, aircraft flyovers, etc.) was excluded from the measured noise levels. Weather conditions were noted to ensure a true reading as follows: wind speed under 12 mph; relative humidity under 90 percent; and temperature above 14°F and below 122°F (pursuant to ANSI Standard S1.13-2005).

Existing Noise Levels at the Noise Receptor Locations

Measured Noise Levels

The noise monitoring results are shown below in **Table 15-7**. As described above, on-site operations of the existing lumber yard at 470 Kent Avenue were the dominant source of noise at Receptor Location 1, whereas area traffic was the dominant source of noise at Receptor Location 2. The existing noise levels at Receptor Locations 1 and 2 reflect the moderate level of operational activity at 470 Kent Avenue and vehicular activity on the roadways adjacent to the Project Area, with the highest existing noise levels observed at Receptor Location 1. General ambient sounds were the dominant source of noise at Receptor Locations 3 and 4.

TABLE 15-7: Existing Noise Levels (in dBA) at the Monitoring Locations

Receptor Location[1]	Time[2]	L_{max}	L_{min}	L_{eq}	L_1	L_{10}[3]	L_{50}	L_{90}	CEQR Noise Exposure Category
1	AM	84.70	52.90	59.77	67.65	62.18	57.59	55.47	Marginally Acceptable
	MD	82.67	54.57	64.97	75.10	68.11	60.69	57.84	
	SC PM	95.59	54.52	67.19	78.42	**68.96**	61.74	57.73	
	PM	86.85	58.75	65.21	73.14	66.36	63.49	61.93	
2	AM	86.07	51.91	64.69	75.03	**67.57**	60.82	55.38	Marginally Acceptable
	MD	82.84	49.20	62.50	72.71	65.11	57.92	52.58	
	SC PM	82.95	51.27	61.04	70.93	64.11	57.14	54.16	
	PM	88.16	50.75	63.47	75.75	64.59	58.67	54.68	
3	AM	80.28	57.82	63.13	69.99	**65.55**	61.46	59.69	Marginally Acceptable
	MD	68.40	50.81	55.45	59.60	56.96	55.13	53.06	
	SC PM	71.53	53.09	57.27	60.11	58.32	57.09	55.87	
	PM	70.99	51.20	59.01	66.61	62.68	56.53	53.98	
4	AM	72.69	57.53	60.81	66.70	62.14	60.17	59.13	Acceptable
	MD	76.80	55.37	59.41	68.29	59.67	58.10	57.03	
	SC PM	76.54	54.70	59.97	68.07	61.87	58.28	56.80	
	PM	72.23	56.57	61.21	66.79	**63.03**	60.15	58.60	

Notes: Field measurements were performed by Philip Habib & Associates on April 27 and May 12, 2021.
[1] Refer to **Figure 15-1** for noise monitoring receptor location.
[2] AM = AM weekday peak period; MD = midday weekday peak period; PM = PM weekday peak period; SC PM = school dismissal/bus departure weekday peak period.
[3] The highest L_{10} noise levels at each monitoring location are shown in **bold**.

As shown in **Table 15-7**, the highest L_{10} value was recorded in the School PM peak hour at Receptor Location 1 (68.96 dBA), placing this receptor location in the "Marginally Acceptable" Noise Exposure category pursuant to *CEQR Technical Manual* Guidelines. Receptor locations 2 and 3 had a maximum L_{10} value of 67.57 dBA and 65.55 dBA, respectively, placing each in the

"Marginally Acceptable" CEQR Noise Exposure category as well. Receptor Location 4 had L_{10} values that were below 65 dBA during all four peak hours, placing it in the "Acceptable" CEQR Noise Exposure category.

As described above, the observed noise levels and traffic volumes were adjusted to conform to observed traffic volumes and vehicular classifications for existing conditions that were provided by the traffic study in **Chapter 12, "Transportation".** The adjustments were made using the proportionality equation described in the Methodology section above. **Table 15-8** shows the adjusted one-hour traffic volumes and noise PCEs for existing conditions.

TABLE 15-8: Adjusted Existing Noise Levels (dBA)

Receptor	Time	L_{eq}	L_{10}	Autos	Bus	Heavy Trucks	Medium Trucks	Light Trucks	Total	Total PCES
1	AM	59.40	61.81	63	0	0	2	0	65	91
	MD	68.97	72.12	32	0	8	0	0	40	385
	SC PM[1]	-	-	-	-	-	-	-	-	-
	PM	54.21	55.36	25	0	0	0	20	45	45
2	AM	63.07	65.95	214	3	13	13	27	270	1091
	MD	65.09	67.70	272	0	7	55	26	360	1336
	SC PM[1]	-	-	-	-	-	-	-	-	-
	PM	64.78	65.90	473	4	4	29	21	530	1109

Notes: [1] As the detailed traffic analysis in Chapter 12, "Transportation," does not include an assessment of the weekday School PM peak hour, the existing noise levels during the School PM peak period were not adjusted and were thus based on counts conducting during field noise monitoring. Therefore, existing, No-Action, and With-Action noise levels during the School PM peak period will based on existing noise levels presented in Table 15-6.

G. FUTURE WITHOUT THE PROPOSED ACTION (NO-ACTION)

As described in **Chapter 1, "Project Description,"** in the future without the Proposed Action, it is anticipated that an as-of-right development would be constructed on the Project Site pursuant to the existing M3-1 zoning. Therefore, the No-Action development would be a four-story (74-foot tall) office and warehouse building totaling approximately 312,599 gsf with approximately 279 accessory parking spaces. Of that, approximately 58,000 gsf would be office space uses and 181,401 gsf would be warehouse uses. Additionally, Phase 1 of the planned development at 470 Kent Avenue (Block 2134, Lots 1 and 150) located directly north of the Project Site would be completed and operational. As such, the existing lumber yard at 470 Kent Avenue would be removed and replaced with two mixed-use towers containing approximately 431 DUs, 8,900 gsf of local retail, and 178 parking spaces.

Using the methodology described in the previous section, future noise levels in the No-Action condition were calculated for Receptor Location 1 and 2 during the weekday AM, midday, School PM, and PM peak periods for the 2026 Build Year. **Table 15-9** shows the existing noise levels, as well as the No-Action PCE values and the No-Action noise levels at those receptor locations with a street frontage.

Comparing future No-Action noise levels with existing noise levels, **Table 15-9** shows that increases in L_{eq} noise level would range from 0.62 dBA to 6.00 dBA at Receptor Locations 1 and

2. The projected No-Action L_{10} noise levels at the receptor locations would range from 61.35 dBA to 76.99 dBA, and noise levels at Receptor Locations 2, 3, and 4 would remain in their same respective CEQR Noise Exposure categories as under existing conditions. However, the projected No-Action L_{10} noise levels at Receptor Location 1 (76.99 dBA) would now fall in the "Marginally Unacceptable (III)" CEQR Noise Exposure category. As mentioned above, it should be noted that projected high noise levels at Receptor Location 1 are considered to be overly conservative and not representative of future ambient noise levels at the Project Site, and therefore, receptors at the Project Site are to be represented by noise levels from Receptor Locations 2, 3, and 4 for analysis purposes.

TABLE 15-9: 2026 No-Action Condition Noise Levels and Total PCE Values at Receptor Locations (in dBA)

Noise Receptor Location	Time	Existing PCEs	No-Action PCEs	Existing Leq	No-Action Leq	Change[1]	No-Action L10[2]	CEQR Noise Exposure Category
1	AM	91	261	59.40	63.98	4.58	66.39	Marginally Unacceptable (III)
	MD	385	1182	68.97	73.85	4.88	**76.99**	
	SC PM	147	459	67.19	72.13	4.94	73.90	
	PM	45	179	54.21	60.20	6.00	61.35	
2	AM	1091	1310	63.07	63.87	0.80	66.75	Marginally Acceptable
	MD	1336	1554	65.09	65.75	0.66	**68.36**	
	SC PM	636	846	61.04	62.28	1.24	65.35	
	PM	1109	1280	64.78	65.41	0.62	66.53	

Notes: All PCE and noise value are shown for a weekday.
[1] No-Action Leq - Existing Leq
[2] The highest L_{10} noise levels at each monitoring location are shown in **bold**.
[3] N/A = Not Applicable.

H. FUTURE WITH THE PROPOSED ACTION (WITH-ACTION)

As described above, in the future with the Proposed Action, an approximately 684,242-gsf commercial building would be developed. The Proposed Project would comprise approximately 598,442 gsf of office space and 21,233 gsf of retail uses. It would also contain approximately 49,453 sf of waterfront public open space, including a shore public walkway and supplemental public access area. Additionally, there would be 234 public parking spaces (64,567 gsf) and two loading berths.

Mobile Source Noise

Using the methodology described in Section E, future noise levels in the With-Action condition were calculated for Receptor Locations 1 and 2 during the weekday AM, midday, School PM, and PM peak periods for the 2026 Build Year. The With-Action noise levels for the receptor locations are shown in **Table 15-10**. After accounting for additional traffic introduced by the Proposed Action, the maximum projected L_{10} noise level in the With-Action condition would be 77.09 dBA during the midday peak hour at Receptor Location 1. In terms of CEQR noise exposure guidance, noise levels at Receptor Location 1 would remain in the "Marginally Unacceptable (III)" CEQR Noise Exposure category, Receptor Locations 2 and 3 would remain in the "Marginally Acceptable" CEQR Noise Exposure category, and Receptor Location 4 would remain in the "Acceptable" CEQR Noise Exposure category, as under No-Action conditions. As mentioned

above, it should be noted that projected high noise levels at Receptor Location 1 are considered overly conservative and not representative of future ambient noise levels at the Project Site, and therefore, receptors at the Project Site are to be represented by noise levels from Receptor Locations 2, 3, and 4 for analysis purposes.

As presented in **Table 15-10**, the maximum increase in L_{eq} noise levels in the With-Action condition (compared to No-Action conditions) for all receptor sites would be less than 3.0 dBA. According to *CEQR Technical Manual* guidance, increases less than 3.0 dBA would not be perceptible and therefore, would not be significant. Accordingly, the Proposed Action would not result in any significant adverse impacts due to action-generated vehicular traffic.

TABLE 15-10: 2026 With-Action Condition Noise Levels and Total PCE Values at Receptor Locations (in dBA)

Receptor Location	Time	With-Action PCEs	No-Action L_{eq}	With-Action L_{eq}	Change[1]	With-Action L_{10}[2]	CEQR Noise Exposure Category
1	AM	385	63.98	65.67	1.69	68.08	Marginally Unacceptable (III)
	MD	1209	73.85	73.95	0.10	**77.09**	
	SC PM	581	72.13	73.16	1.02	74.93	
	PM	301	60.20	62.46	2.26	63.61	
2	AM	1447	63.87	64.30	0.43	67.18	Marginally Acceptable
	MD	1644	65.75	66.00	0.24	**68.61**	
	SC PM	886	62.28	62.48	0.20	65.55	
	PM	1320	65.41	65.54	0.13	66.66	

Notes: All PCE and noise value are shown for a weekday.
[1] With-Action Leq – No-Action Leq
[2] The highest L_{10} noise levels at each monitoring location are shown in **bold**.
[3] N/A = Not Applicable.

Play Area Noise

As described above in Section F, due to the location of the nearby existing play area (i.e., the Roberto Clemente Ballfield) directly east of the Project Site, the play area noise assessment will utilize the maximum playground boundary noise level presented in **Table 15-5**. Therefore, the referenced noise levels in L_{eq} from the neighboring play area is assumed to be:

- 57.2 dBA along the eastern façades of the Proposed Project with a direct line of site to the Roberto Clemente Ballfield.[3]

As presented in **Table 15-11**, due to the location of the existing play area, the Project Site would experience combined L_{eq} play area noise levels of up to 66.53 dBA at the eastern facades of the Proposed Project with a direct line of the site to the neighboring Roberto Clemente Ballfield. After calculating the predicted L_{10} noise levels due to the nearby stationary noise source (refer to **Table 15-11**), the eastern façades of the Proposed Project fronting the existing play area would fall in the "Marginally Acceptable" CEQR Noise Exposure category.

[3] Cowan, James P. & Holley, Stephen J, AKRF Inc. "SCA Playground Noise Study," October 1992.

TABLE 15-11: Predicted Noise Levels on the Proposed Project due to the Roberto Clemente Ballfield (in dBA)

Sensitive Receptor		Time	Approximate Distance (feet) to Roberto Clemente Ballfield (in feet)	Play Area L_{eq} at Receptor (in dBA)	Predicted Combined L_{eq} at Receptor (in dBA)	Predicted Combined L_{10} at Receptor[1] (in dBA)
Building	Façade					
Project Site	Eastern	AM	90	57.2	65.07	67.95
		MD			66.53	69.14
		PM			63.60	66.67
		SAT			66.13	67.25

Notes:
[1] For conservative purposes, predicted L_{10} play area noise levels calculated by adding the difference between measured existing L_{eq} and L_{10} noise levels to the predicted combined play area L_{eq} under future conditions for each respective peak period.

I. ATTENUATION REQUIREMENTS

As shown above in **Table 15-4**, the *CEQR Technical Manual* has set noise attenuation requirements for buildings based on exterior noise levels. For dominant vehicular noise, recommended noise attenuation values for buildings are designed to maintain interior L_{10} noise levels of 45 dBA or lower for residential/community facility uses and 50 dBA or lower for commercial office uses. As noted in **Table 15-4**, additional attenuation measures would be required at the site wherever exterior noise levels exceed 70 dBA.

The attenuation of a composite structure is a function of the attenuation provided by each of its component parts and how much of the area is made up of each part. Typically, a building façade is composed of the wall, windows, and any vents or louvers for HVAC systems in various ratios of area. Window/Wall attenuation can be described in terms of sound transmission class ("STC"), transmission loss ("TL"), and outdoor-indoor transmission class ("OITC"). Although these terms are sometimes used interchangeably, they are unique from each other. Transmission loss refers to how many decibels of sound a façade (wall) or façade accessory (window or door) can stop at a given frequency. The TL for a given construction material varies with the individual frequencies of the noise.

To simplify the noise attenuation properties of a wall, the STC rating was developed. It is a single number that describes the sound isolation performance of a given material for the range of test frequencies between 125 and 4,000 Hz. These frequencies sufficiently cover the range of human speech. Higher STC values reflect greater efficiencies to block airborne sound. HUD uses the STC when identifying the required sound attenuation for a façade.

The OITC is similar to the STC, except that it is weighted more towards the lower frequencies associated with aircraft, rail, and truck traffic. The OITC classification is defined by the American Society of Testing and Materials (ASTM E1332-90 (Reapproved 2003)) and provides a single-

number rating that is used for designing a building façade including walls, doors, glazing, and combinations thereof. The OITC rating is designed to evaluate building elements by their ability to reduce the overall loudness of ground and air transportation noise. NYCDEP uses the OITC when identifying the required sound attenuation for a façade.

All facades that would experience an L_{10} of 70.0 dBA or greater must provide an alternate means of ventilation ("AMV") permitting a closed window condition during warm weather. This can be achieved by installing double-glazed windows on a heavy frame for masonry structures or windows consisting of laminated glass, along with AMV such as central air conditioning, through-wall sleeve-fitted air conditioners, packaged terminal air conditioning ("PTAC") units, trickle vents integrated into window frames, or other approved means. Where the required window/wall attenuation is above 40 dBA, special design features may be necessary that go beyond the normal double-glazed window and air conditioning. These may include specially designed windows (e.g., windows with small sizes, windows with air gaps, windows with thicker glazing, etc.) and additional building insulation.

Based on With-Action exterior noise levels and *CEQR Technical Manual* criteria, With-Action L_{10} noise levels at Receptor Location 1 would be above the 70 dBA CEQR threshold. However, as the existing noise measurements at Receptor Location 1 captured on-site operations of the adjacent lumber yard at 470 Kent Avenue (a use that will not occupy the site in future 2026 conditions), and as the noise PCE analysis based on the methodologies described in Section E assumes that all measured noise levels are the result of traffic noise, the results of the proportional modeling technique used for projecting future No-Action and With-Action noise levels at Receptor Location 1 are considered overly conservative. Additionally, absent the lumber yard in the future 2026 condition, a comparison of PCE values at Receptor Locations 1 and 2 shows that noise levels generated by traffic along Kent Avenue (Receptor Location 2) should be higher than those along Division Avenue (Receptor Location 1) (refer to **Table 15-10**). Therefore, since Receptor Location 2 provides the highest traffic noise expected at the Project Site, and as local traffic is assumed to be the dominant source of noise for the Project Site's northern frontage under future 2026 conditions, Receptor Location 2 will be used to determine attenuation requirements along the Project Site's northern (Division Avenue) and eastern (Kent Avenue) frontages. Since future With-Action noise levels at Receptor Location 2 would remain below the 70 dBA CEQR threshold (see **Table 15-10**), no special noise attenuation measures beyond standard construction practices would be required for commercial office uses on any of the Project Site's street frontages in order to achieve interior noise levels of 50 dBA or lower for commercial office uses. As such, the Proposed Project would provide sufficient attenuation to achieve the *CEQR Technical Manual* interior noise level guidelines, and thus, the Proposed Action would not result in any significant adverse noise impacts related to building attenuation requirements.

J. OTHER NOISE CONCERNS

Mechanical Equipment

No detailed designs of the building's mechanical systems (i.e., heating, ventilation, and air conditioning systems) are available at this time. However, those systems will be designed to meet all applicable noise regulations (i.e., Subchapter 5 §24-227 of the New York City Noise Control

Code and the DOB Building Code and requirements and would be designed to produce noise levels that would not result in any significant increase in ambient noise levels.

Train Noise

An initial train noise impact screening analysis could be warranted if a new receptor would be located within 1,500 feet of existing rail activity and have a direct line of sight to that activity. As the Project Area is not within 1,500 feet of an existing rail line nor does the site have a direct line of sight to a rail activity, no initial train noise impact screening analysis is warranted.

Aircraft Noise

An initial aircraft noise impact screening analysis would be warranted if the new receptor would either generate or reroute aircraft or introduce a new receptor that is within a 65 dBA DNL contour. Since the Proposed Action would not generate or reroute aircraft, and as the Project Area is not within a 65 dBA DNL contour, no initial aircraft noise impact screening analysis is warranted.