

**A. INTRODUCTION**

Noise pollution in an urban area comes from many sources. Some sources are activities essential to the health, safety, and welfare of a city's inhabitants, such as noise from emergency vehicle sirens, garbage collection operations, and construction and maintenance equipment. Other sources, such as traffic, are essential to the viability of a city as a place to live and do business. Although these and other noise-producing activities are necessary to a city, the noise they produce is undesirable. Urban noise detracts from the quality of the living environment, and there is increasing evidence that excessive noise represents a threat to public health.

The proposed project would change traffic patterns and volumes in the general vicinity of the project site. Since traffic is a main source of ambient noise, this could lead to changes in the ambient noise levels. In addition, the proposed project includes new parking facilities, which have the potential to result in changes to noise levels. An analysis was designed and conducted to identify and quantify any such impacts.

The noise analysis for the proposed project consists of the following elements:

- A screening analysis to determine locations where traffic generated by the proposed project would have the potential to cause significant noise impacts;
- A detailed analysis of noise due to traffic at any location where, based on the screening analysis, the traffic generated by the proposed project would have the potential to result in significant adverse noise impacts;
- An assessment of noise generated by the proposed new parking at nearby locations; and
- An analysis to determine the level of building attenuation necessary to ensure that interior noise levels at the proposed buildings would satisfy applicable interior noise criteria.

**PRINCIPAL CONCLUSIONS**

The analysis concludes that noise associated with traffic generated by the proposed project and its associated parking facilities would not be expected to result in any significant increases in noise levels, including at World's Fair Marina Park, which was predicted to experience a significant adverse noise impact in the 2008 FGEIS during the Saturday mid-day (MD) time period. This resulted from slightly less incremental traffic noise generated on streets immediately adjacent to the Park between the No Build and Build scenarios analyzed for the proposed project as compared to the 2008 FGEIS analysis. To meet CEQR interior noise level requirements, the analysis prescribes between 31 and 43 dBA of building attenuation for the proposed project buildings, which is similar to the amount of building attenuation specified in the 2008 FGEIS, except for the buildings included in the proposed project very close to the existing elevated subway tracks along Roosevelt Avenue, which would require greater attenuation than the levels specified in the 2008 FGEIS analysis. Similar to what was predicted

in the 2008 FGEIS, noise levels in the newly created open spaces would be greater than the 55 dBA  $L_{10(1)}$  prescribed by CEQR criteria, but would be comparable to other parks around New York City and would not constitute a significant adverse impact.

## **B. SUMMARY OF FINDINGS, 2008 FGEIS AND SUBSEQUENT TECHNICAL MEMORANDA**

The 2008 Final Generic Environmental Impact Statement (FGEIS) determined that traffic generated by the proposed Willets Point Development Plan would have the potential to result in a significant increase in noise levels only at the World's Fair Marina Park north of the District and only during the Saturday midday time period, constituting a significant adverse impact under City Environmental Quality Review (CEQR) impact criteria. The 2008 FGEIS concluded that no feasible mitigation was available to reduce noise levels within the park. With regard to building attenuation, the 2008 FGEIS prescribed between 30 and 37 dBA of building attenuation for buildings within the District, which was to be ensured through E-designations and/or subsequent Restrictive Declarations on the District. This would ensure that noise levels within all project buildings would not exceed the 45 dBA  $L_{10(1)}$  CEQR interior noise requirement for residences or 50 dBA  $L_{10}$  for commercial uses. The subsequent technical memoranda came to the same conclusions and required building attenuation in the same range as the 2008 FGEIS. The fourth technical memorandum issued after the 2008 FGEIS assumed a buffer area within the district between the area to be redeveloped and the surrounding areas. This buffer would not be included in the proposed project, and the absence of the buffer would not have the potential to result in any additional significant adverse noise impacts not found in the 2008 FGEIS as described in the analysis below.

## **C. NOISE FUNDAMENTALS**

Quantitative information on the effects of airborne noise on people is well-documented. If sufficiently loud, 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. Several noise scales and rating methods are used to quantify the effects of noise on people, taking into consideration such factors as loudness, duration, time of occurrence, and changes in noise level with time. However, it must be noted that all the stated effects of noise on people vary greatly with each individual.

### **“A”-WEIGHTED SOUND LEVEL (dBA)**

Noise is typically measured in units called decibels (dB), which are 10 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. 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, in the measurement system to simulate the response of the human ear. For most noise assessments, the A-weighted sound pressure level in units of dBA is used in view of its widespread recognition and its close correlation with perception. In the current study, all measured noise levels are reported in dBA. Common noise levels in dBA are shown in **Table 17-1**.

## ABILITY TO PERCEIVE CHANGES IN NOISE LEVELS

The average ability of an individual to perceive changes in noise levels is well-documented (see **Table 17-2**). Generally, changes in noise levels of less than 3 dBA are barely perceptible to most listeners, whereas changes in noise levels of 10 dBA are normally perceived as doubling (or halving) of noise loudness. These guidelines permit direct estimation of an individual's probable perception of changes in noise levels.

### NOISE DESCRIPTORS USED IN IMPACT ASSESSMENT

Because the sound pressure level unit of dBA describes a noise level at just one moment, and because very few noises are constant, other ways of describing noise over more extended periods have been developed. One way is to describe the fluctuating noise heard over a specific 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 period (e.g., 1 hour, denoted by  $L_{eq(1)}$ , or 24 hours, denoted by  $L_{eq(24)}$ ), conveys the same sound energy as the actual time-varying sound. Statistical sound level descriptors, such as  $L_1$ ,  $L_{10}$ ,  $L_{50}$ ,  $L_{90}$ , and  $L_x$ , are used to indicate noise levels that are exceeded 1, 10, 50, 90, and x percent of the time, respectively. Discrete event peak levels are given as  $L_{01}$  levels.

**Table 17-1**  
**Common Noise Levels**

| Sound Source   | (dBA) |
|--|-------|
| Military jet, air raid siren   | 130   |
| Amplified rock music   | 110   |
| Jet takeoff at 500 meters  | 100   |
| Freight train at 30 meters   | 95    |
| Train horn at 30 meters  | 90    |
| Heavy truck at 15 meters   | 80–90 |
| Busy city street, loud shout   | 80    |
| Busy traffic intersection  | 70–80 |
| Highway traffic at 15 meters, train  | 70    |
| Predominantly industrial area  | 60    |
| Light car traffic at 15 meters, city or commercial areas, or residential areas close to industry   | 50–60 |
| Background noise in an office  | 50    |
| Suburban areas with medium-density transportation  | 40–50 |
| Public library   | 40    |
| Soft whisper at 5 meters   | 30    |
| Threshold of hearing   | 0     |
| <b>Note:</b> A 10 dBA increase in level appears to double the loudness, and a 10 dBA decrease halves the apparent loudness.  |       |
| <b>Sources:</b> Cowan, James P. <i>Handbook of Environmental Acoustics</i> , Van Nostrand Reinhold, New York, 1994. Egan, M. David, <i>Architectural Acoustics</i> . McGraw-Hill Book Company, 1988. |       |

**Table 17-2**  
**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 |
| <b>Source:</b> Bolt, Beranek and Newman, Inc., <i>Fundamentals and Abatement of Highway Traffic Noise</i> , Report No. PB-222-703. Prepared for Federal Highway Administration, June 1973. |  |

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

### D. NOISE STANDARDS AND CRITERIA

Noise levels associated with the construction and operation of the proposed project would be subject to the emission source provisions of the New York City Noise Control Code and to noise criteria set for the CEQR process. Other standards and guidelines promulgated by federal agencies do not apply to project noise control, but are useful to review in that they establish measures of impacts. Construction equipment is regulated by the Noise Control Act of 1972 and the New York City Noise Control Code.

#### NEW YORK CITY NOISE CONTROL CODE

The New York City Noise Control Code, amended in December 2005, contains prohibitions regarding unreasonable noise, requirements for noise due to construction activities, circulation devices, and specific noise standards, with some specific noise sources being prohibited from being “plainly audible” within a receiving property.

#### NEW YORK CEQR NOISE CRITERIA

The *CEQR Technical Manual* contains noise exposure guidelines for use in city environmental impact review, and required attenuation values to achieve acceptable interior noise levels. These values are shown in **Tables 17-3** and **17-4**. Noise exposure is classified into four categories: “acceptable,” “marginally acceptable,” “marginally unacceptable,” and “clearly unacceptable.” The *CEQR Technical Manual* criteria shown in Table 17-4 are based on maintaining an interior noise level for the worst-case hour  $L_{10}$  of less than or equal to 45 A-weighted decibels (dBA) for residential uses.

### E. IMPACT DEFINITION

As recommended in the *CEQR Technical Manual*, this study uses the following criteria to define a significant adverse noise impact:

- An increase of 5 dBA, or more, in Build  $L_{eq(1)}$  noise levels at sensitive receptors (including residences, play areas, parks, schools, libraries, and houses of worship) over those calculated for the No Build condition, if the No Build levels are less than or equal to 60 dBA  $L_{eq(1)}$  and the analysis period is not a nighttime period.
- An increase in Build  $L_{eq(1)}$  noise levels at sensitive receptors of such that the total Build  $L_{eq(1)}$  noise levels would be 65 dBA or greater, if the No Build levels are between 60 and 62 dBA  $L_{eq(1)}$  and the analysis period is not a nighttime period.
- An increase of 3 dBA, or more, in Build  $L_{eq(1)}$  noise levels at sensitive receptors over those calculated for the No Build condition, if the No Build levels are greater than or equal to 62 dBA  $L_{eq(1)}$  and the analysis period is not a nighttime period.
- An increase of 3 dBA, or more, in Build  $L_{eq(1)}$  noise levels at sensitive receptors over those calculated for the No Build condition, if the analysis period is a nighttime period (defined by the *CEQR Technical Manual* criteria as being between 10 PM and 7 AM).

**Table 17-3**  
**Noise Exposure Guidelines For Use in City Environmental Impact Review<sup>1</sup>**

| Receptor Type  | Time Period   | Acceptable General External Exposure | Airport <sup>3</sup> Exposure | Marginally Acceptable General External Exposure | Airport <sup>3</sup> Exposure        | Marginally Unacceptable General External Exposure | Airport <sup>3</sup> Exposure                        | Clearly Unacceptable General External Exposure | Airport <sup>3</sup> Exposure |
|--|---------------|--------------------------------------|-------------------------------|---|--------------------------------------|---|--|--|-------------------------------|
| Outdoor area requiring serenity and quiet <sup>2</sup>   |               | $L_{10} \leq 55$ dBA                 | ----- Ldn $\leq 60$ dBA ----- | NA  | NA                                   | NA  | NA   | NA   | NA                            |
| Hospital, nursing home   |               | $L_{10} \leq 55$ dBA                 |                               | $55 < L_{10} \leq 65$ dBA                       | ----- 60 < Ldn $\leq 65$ dBA -----   | $65 < L_{10} \leq 80$ dBA                         | (i) $70 \leq L_{dn}$                                 | $L_{10} > 80$ dBA                              | ----- Ldn $\leq 75$ dBA ----- |
| 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                                 |  |  |                               |
| School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, outpatient public health facility |               | Same as Residential Day (7 AM-11 PM) |                               | Same as Residential Day (7 AM-11 PM)            | Same as Residential Day (7 AM-11 PM) | Same as Residential Day (7 AM-11 PM)              | (i) $65 < L_{dn} \leq 70$ dBA, (ii) $70 \leq L_{dn}$ | Same as Residential Day (7 AM-11 PM)           |                               |
| Commercial or office   |               | Same as Residential Day (7 AM-11 PM) |                               | Same as Residential Day (7 AM-11 PM)            | Same as Residential Day (7 AM-11 PM) | Same as Residential Day (7 AM-11 PM)              |  | Same as Residential Day (7 AM-11 PM)           |                               |
| Industrial, public areas only <sup>4</sup>   | Note 4        | Note 4                               | Note 4                        | Note 4  | Note 4                               | Note 4  | Note 4   |  |                               |

**Notes:**  
 (i) In addition, any new activity shall not increase the ambient noise level by 3 dBA or more; (ii) CEQR Technical Manual noise criteria for train noise are similar to the above aircraft noise standards: the noise category for train noise is found by taking the  $L_{dn}$  value for such train noise to be an  $L_{dn}$  ( $L_{dn}$  contour) value.

**Table Notes:**  
<sup>1</sup> 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.  
<sup>2</sup> 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 nursing homes.  
<sup>3</sup> One may use 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.  
<sup>4</sup> 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).

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

**Table 17-4**  
**Required Attenuation Values to Achieve Acceptable Interior Noise Levels**

|                                  | Marginally Acceptable |                       |                       |                       | Clearly Unacceptable         |
|----------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------------|
| Noise Level With Proposed Action | $70 < L_{10} \leq 73$ | $73 < L_{10} \leq 76$ | $76 < L_{10} \leq 78$ | $78 < L_{10} \leq 80$ | $L_{10} < 80$                |
| Attenuation*                     | (I)<br>28 dB(A)       | (II)<br>31 dB(A)      | (III)<br>33 dB(A)     | (IV)<br>35 dB(A)      | $36 + (L_{10} - 80)^B$ dB(A) |

**Notes:**  
<sup>A</sup> 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.  
<sup>B</sup> Required attenuation values increase by 1 dB(A) increments for  $L_{10}$  values greater than 80 dBA.

**Source:** New York City Department of Environmental Protection

## F. NOISE PREDICTION METHODOLOGY

### GENERAL METHODOLOGY

At all of the receptor sites in the vicinity of the project site, the dominant operational noise sources are vehicular traffic on adjacent and nearby streets and roadways, and train traffic from the elevated No. 7 subway line, which runs along Roosevelt Avenue.

Future noise levels were calculated using either a proportional modeling technique or the Federal Highway Administration (FHWA) *Traffic Noise Model* (TNM) Version 2.5. The proportional modeling technique was used as a screening tool to estimate changes in noise levels. At locations where proportional modeling screening indicated the potential for significant adverse noise impacts, the TNM was used to obtain more detailed results. Both the proportional modeling screening technique and the TNM are analysis methodologies recommended for analysis purposes in the *CEQR Technical Manual*.

The noise analysis examined four weekday conditions--AM, midday (MD), PM, and pre-game (before a baseball game at CitiField) time periods--and three weekend conditions--midday (MD), pre-game (before a baseball game at CitiField), and post-game (after a baseball game at CitiField). The selected time periods are when the proposed project would have maximum traffic generation and/or the maximum potential for significant adverse noise impacts based on the traffic studies presented in Chapter 14, "Transportation."

The analysis considers each of the three build years separately.

The proportional modeling and TNM procedures used for the analysis are described below.

### PROPORTIONAL MODELING

Proportional modeling was used to determine locations which had the potential for having significant noise impacts and to quantify the magnitude of those potential impacts. Proportional modeling is one of the techniques recommended in the New York City *CEQR Technical Manual* for mobile source analysis.

Using this technique, the prediction of future noise levels where traffic is the dominant noise source is based on a calculation using measured existing noise levels and predicted changes in traffic volumes to determine noise levels in the future without the proposed project (the No Build condition) and with the proposed project (the Build condition). Vehicular traffic volumes are converted into Noise Passenger Car Equivalent (Noise 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, and 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:

$$F\ NL - E\ NL = 10 * \log_{10} (F\ PCE / E\ PCE)$$

where:

F NL = Future Noise Level

E NL = Existing Noise Level

F PCE = Future Noise PCEs

E PCE = Existing Noise PCEs

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 Noise 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 Noise PCE and if the future traffic volume were increased by 50 Noise PCE to a total of 150 Noise PCE, the noise level would increase by 1.8 dBA. Similarly, if the future traffic were increased by 100 Noise PCE, or doubled to a total of 200 Noise PCE, the noise level would increase by 3.0 dBA.

### **TRAFFIC NOISE MODEL (TNM)**

At receptor sites where preliminary modeling studies using the proportional modeling technique indicated that the future traffic may have the potential to cause noticeable increases in noise levels (i.e., sites 3, 6, and 7), a refined analysis was performed using the TNM (described below).

The TNM is a computerized model developed for the FHWA that calculates the noise contribution of each roadway segment to a given noise receptor. The noise from each vehicle type is determined as a function of the reference energy-mean emission level, corrected for vehicle volume, speed, roadway grade, roadway segment length, and source-receptor distance. Further considerations included in modeling the propagation path include identifying the shielding provided by rows of buildings, analyzing the effects of different ground types, identifying source and receptor elevations, and analyzing the effects of any intervening noise barriers.

### **FTA PARKING LOT/GARAGE ANALYSIS METHODOLOGY**

Noise generated by the parking lots and garages associated with the proposed project would contribute to noise levels at nearby noise receptors. Noise due to vehicles accessing and traversing the proposed parking lots and garages were determined using methodologies set forth in the May 2006 version of the Federal Transit Administration's *Transit Noise and Vibration Impact Assessment* guidance manual. Specifically, parking lots were modeled using the techniques described for general noise assessment of a park and ride lot, and parking garages were modeled using the techniques described for general noise assessment of a parking garage.

The general noise assessment methodology consists of determining the project noise exposure at 50 feet from the center of each parking facility based on the maximum number of automobiles expected to enter and exit the facility in a given hour, and adjusting that level for the distance of each receptor from the center of the parking facility.

### **ANALYSIS PROCEDURE**

The following procedure was used in performing the noise analysis:

- Noise monitoring locations (receptor sites) were selected at noise-sensitive land uses (i.e., residential, church, school, etc.) located near the predicted traffic routes that project-generated traffic would use to access and egress the project site or parking facilities associated with the proposed project.
- Noise monitoring locations were selected adjacent to and on the proposed project site to determine the appropriate level of building attenuation required to satisfy CEQR interior noise level criteria and to compare noise levels at the proposed project's newly created open space with CEQR guidelines.

- Existing noise levels were determined at receptor sites listed above, for each analysis time period, by performing field measurements.
- Using the results of the traffic studies presented in Chapter 14, “Transportation,” a screening analysis was performed using the proportional model to identify locations that had the potential for a significant increase in noise levels.
- At locations where the screening analysis indicated the potential for a significant increase in noise levels (i.e., sites 3, 6, and 7), existing traffic noise levels were calculated at each receptor site, for each analysis time period in each build year, using the TNM and traffic data for existing conditions.
- At locations where the screening analysis indicated the potential for a significant increase in noise levels (i.e., Sites 3, 6, and 7), the calculated TNM existing traffic noise level for each analysis time period was subtracted from the measured existing noise level. The difference between the two reflects the contribution of non-traffic noise sources—such as train noise from the nearby elevated No. 7 subway train—to the existing noise levels. This difference was applied as a correction factor to calculated future traffic noise levels to account for non-traffic noise sources.
- At each location during each analysis time period in each build year, noise levels generated by the proposed project’s associated parking lots and garages were determined using the FTA analysis guidelines as described above.
- Future noise levels associated with on-road traffic for the No Action and With Action scenarios, for each receptor site and for each analysis time period in each build year, were determined using either the proportional model or the TNM approach described above.
- Total future noise levels for the No Action and With Action scenarios, for each receptor site and for each analysis time period in each build year, were determined by logarithmically adding the noise levels due to traffic and (for the With Action scenario only) noise levels due to the parking lots and garages.
- The level of building attenuation to satisfy CEQR requirements was determined for the proposed buildings on the project site based on the calculated noise levels in the future with the proposed project.

## G. EXISTING CONDITIONS

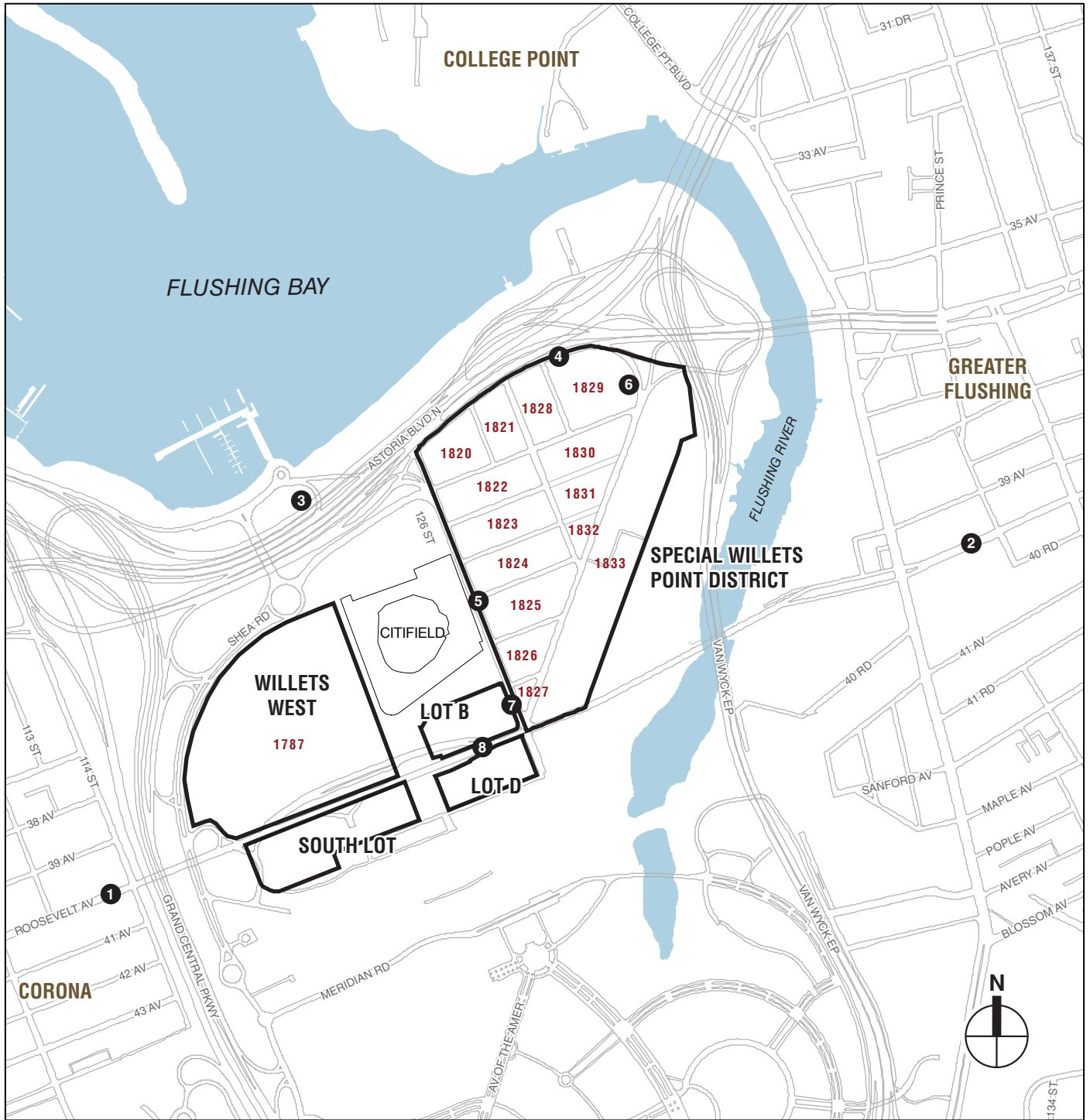
### SITE DESCRIPTION

The study area for this analysis is bounded to the east by Main Street, to the south by Roosevelt Avenue and the MTA Corona Rail Yard, to the west by 111th Street, and to the north by Flushing Bay. This area includes the project site and nearby receptors that would experience increases in traffic on adjacent roadways as a result of the proposed project.

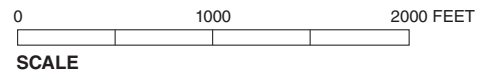
### SELECTION OF NOISE RECEPTOR LOCATIONS

Eight noise receptor locations were chosen within and around the project site (see **Figure 17-1**). Site 1 is located on Roosevelt Avenue between 111th and 114th Streets. Site 2 is located on Roosevelt Avenue between College Point Boulevard and Prince Street. Site 3 is located in World’s Fair Marina Park. Site 4 is located on Northern Boulevard between 127th Street and 127th Place. Site 5 is located on 126th Street between 36th and 37th Avenues. Site 6 is located on Willetts Point Boulevard between 34th Avenue and Northern Boulevard. Site 7 is located on





- Project Site
- 1 Noise Receptor Location
- 1825 Block Number



126th Street between 39th and Roosevelt Avenues. Site 8 is located on Roosevelt Avenue between 114th and 126th Streets.

Sites 1-3 were analyzed for impact assessment. These sites are representative of other locations in the immediate area, and are generally the locations where maximum impacts would be expected. These sites were used to assess the potential impacts due to traffic and parking facility noise generated by the proposed and future actions. Sites 4-8 were analyzed to determine the appropriate level of building attenuation for future development.

## **NOISE MONITORING**

At each receptor site, existing noise levels were determined for each of the seven noise analysis time periods by field measurements. Noise monitoring was performed at all eight sites between September 11, 2012 and October 24, 2012. Twenty-minute spot measurements were taken during the three weekday without-baseball-game periods, one Saturday without-baseball-game period, one weekday with-baseball-game period and two Saturday with-baseball-game periods that reflect peak hours of trip generation: AM weekday (7:45–8:45 AM), midday (MD) weekday (1:00–2:00 PM), PM weekday (5:15–6:15 PM), midday (MD) Saturday (1:00–2:00 PM), PM weekday pre-game (6:00–7:00 PM), midday (MD) Saturday pre-game (12:00–1:00 PM), and PM Saturday post-game (3:45–4:45 PM).

## **EQUIPMENT USED DURING NOISE MONITORING**

Measurements were performed using Brüel & Kjær Sound Level Meters (SLM) Type 2250, 2260, and 2270, Brüel & Kjær ½-inch microphones Type 4189, and Brüel & Kjær Sound Level Calibrators Type 4231. The Brüel & Kjær SLMs are Type 1 instruments according to ANSI Standard S1.4-1983 (R2006). The SLMs had a laboratory calibration date within one year of the time of use. The microphones were mounted at a height of approximately five feet above the ground surface on a tripod and approximately six feet or more away from any large sound-reflecting surface to avoid major interference with sound propagation. The SLMs were field calibrated before and after readings with a Brüel & Kjær Type 4231 Sound Level Calibrator using the appropriate adaptor. The data were digitally recorded by the SLMs and displayed at the end of the measurement period in units of dBA. Measured quantities included the  $L_{eq}$ ,  $L_1$ ,  $L_{10}$ ,  $L_{50}$ ,  $L_{90}$ , and 1/3 octave band data. A windscreen was used during all sound measurements except for calibration. All measurement procedures were based on the guidelines outlined in ANSI Standard S1.13-2005.

## **EXISTING NOISE LEVELS AT NOISE RECEPTOR LOCATIONS**

### *MEASURED NOISE LEVELS*

Noise monitoring results for the eight receptor locations are summarized in **Tables 17-5** and **17-6**. The elevated No. 7 subway line was the dominant noise source at Sites 1, 7, and 8. Traffic was the dominant noise source at Sites 2-6. Noise levels are generally relatively high, and reflect the level of activity in the area.

In terms of CEQR noise criteria, noise levels at Sites 2, 3, 5, 6, and 7 are in the “marginally unacceptable” category, and noise levels at Sites 1, 4, and 8 are in the “clearly unacceptable” category.

**Table 17-5**  
**2012 Existing Noise Levels During Non-game Time Periods (in dBA)**

| Site | Measurement Location  | Day      | Time | L <sub>eq</sub> | L <sub>1</sub> | L <sub>10</sub> | L <sub>50</sub> | L <sub>90</sub> |
|------|---|----------|------|-----------------|----------------|-----------------|-----------------|-----------------|
| 1    | Roosevelt Avenue between 114th Street and 111th Street              | Weekday  | AM   | 82.0            | 94.0           | 85.1            | 71.9            | 68.2            |
|      |   | Weekday  | MD   | 77.1            | 89.0           | 81.0            | 67.4            | 64.5            |
|      |   | Weekday  | PM   | 84.9            | 96.8           | 88.6            | 68.8            | 61.2            |
|      |   | Saturday | MD   | 76.4            | 88.2           | 79.2            | 69.2            | 65.4            |
| 2    | Roosevelt Avenue between College Point Boulevard and Prince Street  | Weekday  | AM   | 67.6            | 75.0           | 70.5            | 66.0            | 63.2            |
|      |   | Weekday  | MD   | 70.6            | 80.0           | 73.1            | 68.1            | 65.3            |
|      |   | Weekday  | PM   | 66.0            | 76.7           | 68.3            | 63.0            | 59.6            |
|      |   | Saturday | MD   | 65.6            | 71.8           | 67.2            | 64.7            | 62.4            |
| 3    | World's Fair Marina Park  | Weekday  | AM   | 70.0            | 78.1           | 72.2            | 68.1            | 65.9            |
|      |   | Weekday  | MD   | 68.4            | 77.4           | 70.8            | 66.0            | 63.7            |
|      |   | Weekday  | PM   | 68.7            | 76.9           | 70.3            | 67.4            | 65.7            |
|      |   | Saturday | MD   | 65.6            | 71.8           | 67.2            | 64.7            | 62.4            |
| 4    | Northern Boulevard between 127th Street and 127th Place             | Weekday  | AM   | 78.0            | 86.9           | 80.0            | 76.0            | 72.7            |
|      |   | Weekday  | MD   | 76.7            | 85.3           | 79.4            | 74.7            | 71.1            |
|      |   | Weekday  | PM   | 77.8            | 84.0           | 80.3            | 77.0            | 73.1            |
|      |   | Saturday | MD   | 78.3            | 84.7           | 80.7            | 77.4            | 74.2            |
| 5    | 126th Street between 36th Avenue and 37th Avenue                    | Weekday  | AM   | 69.6            | 78.6           | 71.8            | 67.2            | 64.6            |
|      |   | Weekday  | MD   | 68.6            | 79.1           | 71.4            | 64.8            | 60.9            |
|      |   | Weekday  | PM   | 70.0            | 79.1           | 72.1            | 67.6            | 63.4            |
|      |   | Saturday | MD   | 68.3            | 75.1           | 70.4            | 67.2            | 64.7            |
| 6    | Willetts Point Boulevard between 34th Avenue and Northern Boulevard | Weekday  | AM   | 73.0            | 84.8           | 76.4            | 64.9            | 61.3            |
|      |   | Weekday  | MD   | 68.9            | 79.4           | 71.1            | 64.2            | 61.9            |
|      |   | Weekday  | PM   | 66.5            | 74.8           | 67.6            | 65.4            | 63.8            |
|      |   | Saturday | MD   | 69.3            | 77.1           | 71.5            | 68.2            | 62.0            |
| 7    | 126th Street between 39th Avenue and Roosevelt Avenue               | Weekday  | AM   | 71.0            | 79.8           | 74.9            | 67.9            | 62.8            |
|      |   | Weekday  | MD   | 70.6            | 80.1           | 74.5            | 67.4            | 62.0            |
|      |   | Weekday  | PM   | 74.0            | 82.7           | 77.7            | 70.2            | 64.5            |
|      |   | Saturday | MD   | 68.0            | 76.4           | 70.2            | 65.8            | 61.9            |
| 8    | Roosevelt Avenue between 114th Street and 126th Street              | Weekday  | AM   | 79.1            | 89.9           | 82.5            | 74.6            | 66.9            |
|      |   | Weekday  | MD   | 80.3            | 91.0           | 84.4            | 72.2            | 64.0            |
|      |   | Weekday  | PM   | 82.9            | 92.7           | 88.2            | 75.5            | 68.5            |
|      |   | Saturday | MD   | 77.6            | 91.7           | 72.5            | 68.6            | 62.8            |

**Note:** Field measurements were performed by AKRF, Inc. between September 11, 2012 and October 24, 2012.

**Table 17-6**

**2012 Existing Noise Levels During Game Time Periods (in dBA)**

| Site | Measurement Location   | Day      | Time      | L <sub>eq</sub> | L <sub>1</sub> | L <sub>10</sub> | L <sub>50</sub> | L <sub>90</sub> |
|------|--|----------|-----------|-----------------|----------------|-----------------|-----------------|-----------------|
| 1    | Roosevelt Avenue between 114th Street and 111th Street             | Weekday  | pre-game  | 84.5            | 95.1           | 87.1            | 71.8            | 66.6            |
|      |  | Saturday | pre-game  | 81.3            | 94.1           | 81.8            | 68.9            | 65.2            |
|      |  | Saturday | post-game | 83.0            | 93.6           | 88.0            | 70.3            | 65.8            |
| 2    | Roosevelt Avenue between College Point Boulevard and Prince Street | Weekday  | pre-game  | 65.8            | 74.5           | 69.3            | 63.0            | 60.5            |
|      |  | Saturday | pre-game  | 66.0            | 74.0           | 69.0            | 63.6            | 61.1            |
|      |  | Saturday | post-game | 66.1            | 73.1           | 68.6            | 64.7            | 62.1            |
| 3    | World's Fair Marina Park   | Weekday  | pre-game  | 68.6            | 77.7           | 69.9            | 67.2            | 64.5            |
|      |  | Saturday | pre-game  | 71.1            | 79.8           | 72.5            | 69.6            | 68.0            |
|      |  | Saturday | post-game | 70.4            | 77.1           | 72.1            | 69.4            | 67.5            |
| 4    | Northern Boulevard between 127th Street and 127th Place            | Weekday  | pre-game  | 78.7            | 83.9           | 80.9            | 78.0            | 75.0            |
|      |  | Saturday | pre-game  | 76.9            | 83.7           | 79.4            | 75.9            | 72.4            |
|      |  | Saturday | post-game | 77.1            | 82.2           | 79.5            | 76.4            | 73.2            |
| 5    | 126th Street between 36th Avenue and 37th Avenue                   | Weekday  | pre-game  | 69.5            | 77.0           | 71.4            | 67.6            | 64.5            |
|      |  | Saturday | pre-game  | 68.9            | 75.8           | 71.0            | 68.0            | 65.6            |
|      |  | Saturday | post-game | 69.8            | 76.9           | 71.8            | 68.4            | 64.8            |
| 6    | Willets Point Boulevard between 34th Avenue and Northern Boulevard | Weekday  | pre-game  | 65.4            | 74.8           | 67.6            | 63.3            | 61.4            |
|      |  | Saturday | pre-game  | 68.4            | 76.5           | 71.1            | 66.0            | 64.1            |
|      |  | Saturday | post-game | 71.7            | 84.3           | 67.2            | 65.4            | 63.7            |
| 7    | 126th Street between 39th and Roosevelt Avenues                    | Weekday  | pre-game  | 72.8            | 83.3           | 76.9            | 67.5            | 63.3            |
|      |  | Saturday | pre-game  | 71.5            | 80.9           | 74.8            | 68.5            | 65.7            |
|      |  | Saturday | post-game | 71.8            | 82.5           | 74.4            | 67.0            | 63.1            |
| 8    | Roosevelt Avenue between 114th and 126th Streets                   | Weekday  | pre-game  | 83.7            | 94.0           | 90.2            | 69.1            | 64.7            |
|      |  | Saturday | pre-game  | 78.8            | 92.2           | 79.6            | 69.1            | 64.3            |
|      |  | Saturday | post-game | 79.5            | 92.5           | 82.2            | 68.9            | 64.2            |

**Note:** Field measurements were performed by AKRF, Inc. between September 11, 2012 and October 24, 2012.

## H. THE FUTURE WITHOUT THE PROPOSED PROJECT

### 2018 ANALYSIS YEAR

Using the methodology previously described, future noise levels in the 2018 No-Action condition were calculated for Sites 1-3 for all seven analysis periods. **Table 17-7** shows the calculated noise levels.

Comparing future 2018 No Action conditions with existing conditions, the maximum increase in L<sub>eq(1)</sub> noise levels would be less than 2.0 dBA. Increases of this magnitude would be barely perceptible and insignificant under CEQR criteria.

In terms of CEQR noise criteria, noise levels at Sites 2 and 3 would remain in the “marginally unacceptable” category, and Sites 1 would remain in the “clearly unacceptable” category.

### 2028 ANALYSIS YEAR

Using the methodology previously described, future noise levels in the 2028 No-Action condition were calculated for Sites 1-3 for all seven analysis periods. **Table 17-8** shows the calculated noise levels.

**Table 17-7  
2018 No Action Noise Levels (in dBA)**

| Site <sup>2</sup> | Day      | Time      | Existing<br>L <sub>eq(1)</sub> | 2018<br>No Action L <sub>eq(1)</sub> | Change | 2018<br>No Action L <sub>-10(1)</sub> |
|-------------------|----------|-----------|--------------------------------|--------------------------------------|--------|---------------------------------------|
| 1                 | Weekday  | AM        | 82.0                           | 83.6                                 | 1.6    | 86.7                                  |
|                   | Weekday  | MD        | 77.1                           | 78.9                                 | 1.8    | 82.8                                  |
|                   | Weekday  | PM        | 84.9                           | 86.5                                 | 1.6    | 90.2                                  |
|                   | Saturday | MD        | 76.4                           | 77.9                                 | 1.5    | 80.7                                  |
|                   | Weekday  | pre-game  | 84.5                           | 85.6                                 | 1.1    | 88.2                                  |
|                   | Saturday | pre-game  | 81.3                           | 82.6                                 | 1.3    | 83.1                                  |
|                   | Saturday | post-game | 83.0                           | 84.3                                 | 1.3    | 89.3                                  |
| 2                 | Weekday  | AM        | 67.6                           | 69.1                                 | 1.5    | 72.0                                  |
|                   | Weekday  | MD        | 70.6                           | 72.1                                 | 1.5    | 74.6                                  |
|                   | Weekday  | PM        | 66.0                           | 67.0                                 | 1.0    | 69.3                                  |
|                   | Saturday | MD        | 65.6                           | 66.7                                 | 1.1    | 69.4                                  |
|                   | Weekday  | pre-game  | 65.8                           | 66.5                                 | 0.7    | 70.0                                  |
|                   | Saturday | pre-game  | 66.0                           | 66.9                                 | 0.9    | 69.9                                  |
|                   | Saturday | post-game | 66.1                           | 67.0                                 | 0.9    | 69.5                                  |
| 3 <sup>1</sup>    | Weekday  | AM        | 70.0                           | 70.1                                 | 0.1    | 72.3                                  |
|                   | Weekday  | MD        | 68.4                           | 68.5                                 | 0.1    | 70.9                                  |
|                   | Weekday  | PM        | 68.7                           | 68.7                                 | 0.0    | 70.3                                  |
|                   | Saturday | MD        | 65.6                           | 65.7                                 | 0.1    | 67.3                                  |
|                   | Weekday  | pre-game  | 68.6                           | 68.7                                 | 0.1    | 70.0                                  |
|                   | Saturday | pre-game  | 71.1                           | 71.1                                 | 0.0    | 72.5                                  |
|                   | Saturday | post-game | 70.4                           | 70.5                                 | 0.1    | 72.2                                  |

**Notes:**  
<sup>1</sup> Future noise levels at this location were calculated using the TNM modeling technique.  
<sup>2</sup> Sites 4-8 were used solely for the purpose of determining the building attenuation required, and are therefore not presented in the No Action and future with the proposed project scenarios.

**Table 17-8  
2028 No Action Noise Levels (in dBA)**

| Site <sup>2</sup> | Day      | Time      | Existing<br>L <sub>eq(1)</sub> | 2028<br>No Action L <sub>eq(1)</sub> | Change | 2028<br>No Action L <sub>-10(1)</sub> |
|-------------------|----------|-----------|--------------------------------|--------------------------------------|--------|---------------------------------------|
| 1                 | Weekday  | AM        | 82.0                           | 83.7                                 | 1.7    | 86.8                                  |
|                   | Weekday  | MD        | 77.1                           | 78.9                                 | 1.8    | 82.8                                  |
|                   | Weekday  | PM        | 84.9                           | 86.6                                 | 1.7    | 90.3                                  |
|                   | Saturday | MD        | 76.4                           | 78.0                                 | 1.6    | 80.8                                  |
|                   | Weekday  | pre-game  | 84.5                           | 85.7                                 | 1.2    | 88.3                                  |
|                   | Saturday | pre-game  | 81.3                           | 82.7                                 | 1.4    | 83.2                                  |
|                   | Saturday | post-game | 83.0                           | 84.4                                 | 1.4    | 89.4                                  |
| 2                 | Weekday  | AM        | 67.6                           | 69.2                                 | 1.6    | 72.1                                  |
|                   | Weekday  | MD        | 70.6                           | 72.2                                 | 1.6    | 74.7                                  |
|                   | Weekday  | PM        | 66.0                           | 67.1                                 | 1.1    | 69.4                                  |
|                   | Saturday | MD        | 65.6                           | 66.7                                 | 1.1    | 69.4                                  |
|                   | Weekday  | pre-game  | 65.8                           | 66.6                                 | 0.8    | 70.1                                  |
|                   | Saturday | pre-game  | 66.0                           | 67.0                                 | 1.0    | 70.0                                  |
|                   | Saturday | post-game | 66.1                           | 67.0                                 | 0.9    | 69.5                                  |
| 3 <sup>1</sup>    | Weekday  | AM        | 70.0                           | 70.1                                 | 0.1    | 72.3                                  |
|                   | Weekday  | MD        | 68.4                           | 68.5                                 | 0.1    | 70.9                                  |
|                   | Weekday  | PM        | 68.7                           | 68.8                                 | 0.1    | 70.4                                  |
|                   | Saturday | MD        | 65.6                           | 65.8                                 | 0.2    | 67.4                                  |
|                   | Weekday  | pre-game  | 68.6                           | 68.8                                 | 0.2    | 70.1                                  |
|                   | Saturday | pre-game  | 71.1                           | 71.2                                 | 0.1    | 72.6                                  |
|                   | Saturday | post-game | 70.4                           | 70.5                                 | 0.1    | 72.2                                  |

**Notes:**  
<sup>1</sup> Future noise levels at this location were calculated using the TNM modeling technique.  
<sup>2</sup> Sites 4-8 were used solely for the purpose of determining the building attenuation required, and are therefore not presented in the No Action and future with the proposed project scenarios.

Comparing future 2028 No Action conditions with existing conditions, the maximum increase in  $L_{eq(1)}$  noise levels would be less than 2.0 dBA. Increases of this magnitude would be barely perceptible and insignificant under CEQR criteria.

In terms of CEQR noise criteria, noise levels at Sites 2 and 3 would remain in the “marginally unacceptable” category, and Site 1 would remain in the “clearly unacceptable” category.

**2032 ANALYSIS YEAR**

Using the methodology previously described, future noise levels in the 2032 No-Action condition were calculated for Sites 1-3 for all seven analysis periods. **Table 17-9** shows the calculated noise levels.

**Table 17-9  
2032 No Action Noise Levels (in dBA)**

| Site <sup>2</sup>   | Day      | Time      | Existing $L_{eq(1)}$ | 2032 No Action $L_{eq(1)}$ | Change | 2032 No Action $L_{10(1)}$ |
|---|----------|-----------|----------------------|----------------------------|--------|----------------------------|
| 1   | Weekday  | AM        | 82.0                 | 83.8                       | 1.8    | 86.9                       |
|   | Weekday  | MD        | 77.1                 | 79.0                       | 1.9    | 82.9                       |
|   | Weekday  | PM        | 84.9                 | 86.7                       | 1.8    | 90.4                       |
|   | Saturday | MD        | 76.4                 | 78.0                       | 1.6    | 80.8                       |
|   | Weekday  | pre-game  | 84.5                 | 85.8                       | 1.3    | 88.4                       |
|   | Saturday | pre-game  | 81.3                 | 82.7                       | 1.4    | 83.2                       |
|   | Saturday | post-game | 83.0                 | 84.4                       | 1.4    | 89.4                       |
| 2   | Weekday  | AM        | 67.6                 | 69.2                       | 1.6    | 72.1                       |
|   | Weekday  | MD        | 70.6                 | 72.2                       | 1.6    | 74.7                       |
|   | Weekday  | PM        | 66.0                 | 67.1                       | 1.1    | 69.4                       |
|   | Saturday | MD        | 65.6                 | 66.8                       | 1.2    | 69.5                       |
|   | Weekday  | pre-game  | 65.8                 | 66.6                       | 0.8    | 70.1                       |
|   | Saturday | pre-game  | 66.0                 | 67.0                       | 1.0    | 70.0                       |
|   | Saturday | post-game | 66.1                 | 67.1                       | 1.0    | 69.6                       |
| 3 <sup>1</sup>  | Weekday  | AM        | 70.0                 | 70.1                       | 0.1    | 72.3                       |
|   | Weekday  | MD        | 68.4                 | 68.6                       | 0.2    | 71.0                       |
|   | Weekday  | PM        | 68.7                 | 68.8                       | 0.1    | 70.4                       |
|   | Saturday | MD        | 65.6                 | 65.7                       | 0.1    | 67.3                       |
|   | Weekday  | pre-game  | 68.6                 | 68.8                       | 0.2    | 70.1                       |
|   | Saturday | pre-game  | 71.1                 | 71.2                       | 0.1    | 72.6                       |
|   | Saturday | post-game | 70.4                 | 70.5                       | 0.1    | 72.2                       |
| <b>Notes:</b>   |          |           |                      |                            |        |                            |
| <sup>1</sup> Future noise levels at this location were calculated using the TNM modeling technique.   |          |           |                      |                            |        |                            |
| <sup>2</sup> Sites 4-8 were used solely for the purpose of determining the building attenuation required, and are therefore not presented in the No Action and With Action scenarios. |          |           |                      |                            |        |                            |

Comparing future 2032 No Action conditions with existing conditions, the maximum increase in  $L_{eq(1)}$  noise levels would be less than 2.0 dBA. Increases of this magnitude would be barely perceptible and insignificant under CEQR criteria.

In terms of CEQR noise criteria, noise levels at Sites 2 and 3 would remain in the “marginally unacceptable” category, and Sites 1 would remain in the “clearly unacceptable” category.

**I. PROBABLE IMPACTS OF THE PROPOSED PROJECT**

**PHASE 1A (2018)**

Using the methodology described above, noise levels in the future with the proposed project (2018) were calculated for Sites 1-3 for all seven analysis periods. **Table 17-10** shows the calculated noise levels.

**Table 17-10  
2018 With Action Noise Levels (in dBA)**

| Site <sup>2</sup> | Day      | Time      | 2018<br>No Action<br>L <sub>eq(1)</sub> | 2018<br>With Action<br>L <sub>eq(1)</sub> | Change | 2018<br>With Action<br>L <sub>10(1)</sub> |
|-------------------|----------|-----------|---|---|--------|---|
| 1                 | Weekday  | AM        | 83.6                                    | 83.7                                      | 0.1    | 86.8                                      |
|                   | Weekday  | MD        | 78.9                                    | 79.1                                      | 0.2    | 83.0                                      |
|                   | Weekday  | PM        | 86.5                                    | 86.8                                      | 0.3    | 90.5                                      |
|                   | Saturday | MD        | 77.9                                    | 78.2                                      | 0.3    | 81.0                                      |
|                   | Weekday  | pre-game  | 85.6                                    | 85.8                                      | 0.2    | 88.4                                      |
|                   | Saturday | pre-game  | 82.6                                    | 82.9                                      | 0.3    | 83.4                                      |
|                   | Saturday | post-game | 84.3                                    | 84.5                                      | 0.2    | 89.5                                      |
| 2                 | Weekday  | AM        | 69.1                                    | 69.1                                      | 0.0    | 72.0                                      |
|                   | Weekday  | MD        | 72.1                                    | 72.2                                      | 0.1    | 74.7                                      |
|                   | Weekday  | PM        | 67.0                                    | 67.2                                      | 0.2    | 69.5                                      |
|                   | Saturday | MD        | 66.7                                    | 66.9                                      | 0.2    | 69.6                                      |
|                   | Weekday  | pre-game  | 66.5                                    | 66.7                                      | 0.2    | 70.2                                      |
|                   | Saturday | pre-game  | 66.9                                    | 67.1                                      | 0.2    | 70.1                                      |
|                   | Saturday | post-game | 67.0                                    | 67.2                                      | 0.2    | 69.7                                      |
| 3 <sup>1</sup>    | Weekday  | AM        | 70.1                                    | 70.4                                      | 0.3    | 72.6                                      |
|                   | Weekday  | MD        | 68.5                                    | 69.3                                      | 0.8    | 71.7                                      |
|                   | Weekday  | PM        | 68.7                                    | 69.3                                      | 0.6    | 70.9                                      |
|                   | Saturday | MD        | 65.7                                    | 67.0                                      | 1.3    | 68.6                                      |
|                   | Weekday  | pre-game  | 68.7                                    | 69.2                                      | 0.5    | 70.5                                      |
|                   | Saturday | pre-game  | 71.1                                    | 71.5                                      | 0.4    | 72.9                                      |
|                   | Saturday | post-game | 70.5                                    | 70.8                                      | 0.3    | 72.5                                      |

**Notes:**  
<sup>1</sup> Future noise levels at this location were calculated using the TNM modeling technique.  
<sup>2</sup> Sites 4-8 were used solely for the purpose of determining the building attenuation required, and are therefore not presented in the No Action and future with the proposed project scenarios.

Comparing 2018 With Action conditions with 2018 No Action conditions, the maximum increase in L<sub>eq(1)</sub> noise levels would be less than 2.0 dBA. Increases of this magnitude would be barely perceptible and insignificant under CEQR criteria.

In terms of CEQR noise criteria, noise levels at Sites 2 and 3 would remain in the “marginally unacceptable” category, and Sites 1 would remain in the “clearly unacceptable” category.

**PHASE 1B (2028)**

Using the methodology described above, noise levels in the future with the proposed project (2028) were calculated for Sites 1-3 for all seven analysis periods. **Table 17-11** shows the calculated noise levels.

**Table 17-11  
2028 With Action Noise Levels (in dBA)**

| Site <sup>2</sup>  | Day      | Time      | 2028<br>No Action<br>L <sub>eq(1)</sub> | 2028<br>With Action<br>L <sub>eq(1)</sub> | Change | 2028<br>With Action<br>L <sub>10(1)</sub> |
|--|----------|-----------|---|---|--------|---|
| 1  | Weekday  | AM        | 83.7                                    | 84.0                                      | 0.3    | 87.1                                      |
|  | Weekday  | MD        | 78.9                                    | 79.3                                      | 0.4    | 83.2                                      |
|  | Weekday  | PM        | 86.6                                    | 87.1                                      | 0.5    | 90.8                                      |
|  | Saturday | MD        | 78.0                                    | 78.5                                      | 0.5    | 81.3                                      |
|  | Weekday  | pre-game  | 85.7                                    | 86.1                                      | 0.4    | 88.7                                      |
|  | Saturday | pre-game  | 82.7                                    | 83.2                                      | 0.5    | 83.7                                      |
|  | Saturday | post-game | 84.4                                    | 84.9                                      | 0.5    | 89.9                                      |
| 2  | Weekday  | AM        | 69.2                                    | 69.3                                      | 0.1    | 72.2                                      |
|  | Weekday  | MD        | 72.2                                    | 72.4                                      | 0.2    | 74.9                                      |
|  | Weekday  | PM        | 67.1                                    | 67.4                                      | 0.3    | 69.7                                      |
|  | Saturday | MD        | 66.7                                    | 67.1                                      | 0.4    | 69.8                                      |
|  | Weekday  | pre-game  | 66.6                                    | 66.8                                      | 0.2    | 70.3                                      |
|  | Saturday | pre-game  | 67.0                                    | 67.3                                      | 0.3    | 70.3                                      |
|  | Saturday | post-game | 67.0                                    | 67.4                                      | 0.4    | 69.9                                      |
| 3 <sup>1</sup>   | Weekday  | AM        | 70.1                                    | 70.6                                      | 0.5    | 72.8                                      |
|  | Weekday  | MD        | 68.5                                    | 69.6                                      | 1.1    | 72.0                                      |
|  | Weekday  | PM        | 68.8                                    | 69.6                                      | 0.8    | 71.2                                      |
|  | Saturday | MD        | 65.8                                    | 67.4                                      | 1.6    | 69.0                                      |
|  | Weekday  | pre-game  | 68.8                                    | 69.4                                      | 0.6    | 70.7                                      |
|  | Saturday | pre-game  | 71.2                                    | 71.6                                      | 0.4    | 73.0                                      |
|  | Saturday | post-game | 70.5                                    | 70.9                                      | 0.4    | 72.6                                      |
| <b>Notes:</b>  |          |           |   |   |        |   |
| <sup>1</sup> Future noise levels at this location were calculated using the TNM modeling technique.  |          |           |   |   |        |   |
| <sup>2</sup> Sites 4-8 were used solely for the purpose of determining the building attenuation required, and are therefore not presented in the No Action and future with the proposed project scenarios. |          |           |   |   |        |   |

Comparing future 2028 With Action conditions with 2028 No Action conditions, the maximum increase in L<sub>eq(1)</sub> noise levels would be less than 2.0 dBA. Increases of this magnitude would be barely perceptible and insignificant under CEQR criteria.

In terms of CEQR noise criteria, noise levels at Sites 2 and 3 would remain in the “marginally unacceptable” category, and Sites 1 would remain in the “clearly unacceptable” category.

### **PHASE 2 (2032)**

Using the methodology described above, noise levels in the future with the proposed project (2032) were calculated for Sites 1-3 for all seven analysis periods. **Table 17-12** shows the calculated noise levels.

Comparing 2032 With Action conditions with 2032 No Action conditions, the maximum increase in L<sub>eq(1)</sub> noise levels would be 2.2 dBA. Increases of this magnitude would be barely perceptible and insignificant under CEQR criteria.

In terms of CEQR noise criteria, noise levels at Sites 2 and 3 would remain in the “marginally unacceptable” category, and Sites 1 would remain in the “clearly unacceptable” category.



**Table 17-12  
2032 With Action Noise Levels (in dBA)**

| Site <sup>2</sup>  | Day      | Time      | 2032<br>No Action<br>L <sub>eq(1)</sub> | 2032<br>With Action<br>L <sub>eq(1)</sub> | Change | 2032<br>With Action<br>L <sub>10(1)</sub> |
|--|----------|-----------|---|---|--------|---|
| 1  | Weekday  | AM        | 83.8                                    | 84.2                                      | 0.4    | 87.3                                      |
|  | Weekday  | MD        | 79.0                                    | 79.6                                      | 0.6    | 83.5                                      |
|  | Weekday  | PM        | 86.7                                    | 87.3                                      | 0.6    | 91.0                                      |
|  | Saturday | MD        | 78.0                                    | 78.7                                      | 0.7    | 81.5                                      |
|  | Weekday  | pre-game  | 85.8                                    | 86.4                                      | 0.6    | 89.0                                      |
|  | Saturday | pre-game  | 82.7                                    | 83.4                                      | 0.7    | 83.9                                      |
|  | Saturday | post-game | 84.4                                    | 85.1                                      | 0.7    | 90.1                                      |
| 2  | Weekday  | AM        | 69.2                                    | 69.4                                      | 0.2    | 72.3                                      |
|  | Weekday  | MD        | 72.2                                    | 72.5                                      | 0.3    | 75.0                                      |
|  | Weekday  | PM        | 67.1                                    | 67.6                                      | 0.5    | 69.9                                      |
|  | Saturday | MD        | 66.8                                    | 67.3                                      | 0.5    | 70.0                                      |
|  | Weekday  | pre-game  | 66.6                                    | 66.9                                      | 0.3    | 70.4                                      |
|  | Saturday | pre-game  | 67.0                                    | 67.4                                      | 0.4    | 70.4                                      |
|  | Saturday | post-game | 67.1                                    | 67.6                                      | 0.5    | 70.1                                      |
| 3 <sup>1</sup>   | Weekday  | AM        | 70.1                                    | 70.8                                      | 0.7    | 73.0                                      |
|  | Weekday  | MD        | 68.6                                    | 70.0                                      | 1.4    | 72.4                                      |
|  | Weekday  | PM        | 68.8                                    | 69.8                                      | 1.0    | 71.4                                      |
|  | Saturday | MD        | 65.7                                    | 67.9                                      | 2.2    | 69.5                                      |
|  | Weekday  | pre-game  | 68.8                                    | 69.6                                      | 0.8    | 70.9                                      |
|  | Saturday | pre-game  | 71.2                                    | 71.8                                      | 0.6    | 73.2                                      |
|  | Saturday | post-game | 70.5                                    | 71.1                                      | 0.6    | 72.8                                      |
| <b>Notes:</b>  |          |           |   |   |        |   |
| <sup>1</sup> Future noise levels at this location were calculated using the TNM modeling technique.  |          |           |   |   |        |   |
| <sup>2</sup> Sites 4-8 were used solely for the purpose of determining the building attenuation required, and are therefore not presented in the No Action and future with the proposed project scenarios. |          |           |   |   |        |   |

**J. BUILDING ATTENUATION FOR PROJECT BUILDINGS**

The *CEQR Technical Manual* also requires an analysis of the effect of introducing a sensitive use, such as a residential building, into an urban environment. As shown in **Table 17-4** above, the *CEQR Technical Manual* has set noise attenuation values for new buildings that are to be constructed as part of a proposed action, based on exterior noise levels. Recommended noise attenuation values for residential and school buildings are designed to maintain interior noise levels of 45 dBA L<sub>10(1)</sub> (50 dBA L<sub>10(1)</sub> for commercial uses) or lower and are determined based on exterior L<sub>10(1)</sub> noise levels.

**Table 17-13** shows the highest calculated L<sub>10(1)</sub> noise levels at the receptor locations in the study area and the building attenuation that would be required to achieve acceptable interior noise levels at each location.

Based on the values shown in **Table 17-13**, required attenuation levels were determined for all building sites. These values are shown in **Table 17-14**.

**Table 17- 13**  
**Minimum Building Attenuation to Comply With CEQR Requirements**

| Site           | Location   | Maximum L <sub>10(t)</sub> (dBA) | Required Building Attenuation (dBA) <sup>1</sup> |
|----------------|--|----------------------------------|--|
| 4              | Northern Boulevard between 127th Street and 127th Place            | 82.5                             | 39   |
| 5              | 126th Street between 36th Avenue and 37th Avenue                   | 75.9                             | 31   |
| 6 <sup>2</sup> | Willets Point Boulevard between 34th Avenue and Northern Boulevard | 76.6                             | 33   |
| 7 <sup>2</sup> | 126th Street between 39th Avenue and Roosevelt Avenue              | 79.7                             | 35   |
| 8              | Roosevelt Avenue between 114th Street and 126th Street             | 91.4                             | 43 <sup>3</sup>                                  |

**Notes:** <sup>1</sup>Required attenuation values shown are for residential, except where noted. Commercial uses would require 5 dBA less attenuation.  
<sup>2</sup>Future with the proposed project noise levels at these locations were calculated using the TNM modeling technique.  
<sup>3</sup>The projected land use adjacent to this site are commercial. Should residential or classroom uses be constructed instead, they would require 5 dBA more attenuation.

**Table 17-14**  
**Minimum Building Attenuation to Comply with CEQR Requirements at the Project Site (in dBA)**

| Block | Façade(s)                               | Representative Receptor Site | Maximum L <sub>10(t)</sub> (dBA) | Required Building Attenuation (dBA) <sup>1</sup> |
|-------|---|------------------------------|----------------------------------|--|
| 1787  | North, West                             | 4                            | 82.5                             | 34 <sup>2</sup>                                  |
|       | East                                    | 5                            | 75.9                             | 26 <sup>2</sup>                                  |
|       | South                                   | 8                            | 91.4                             | 43 <sup>2</sup>                                  |
| 1820  | North                                   | 4                            | 82.5                             | 39   |
|       | East, West                              | 6                            | 76.6                             | 33   |
|       | South                                   | 5                            | 75.9                             | 31   |
| 1821  | North                                   | 4                            | 82.5                             | 39   |
|       | East, West                              | 6                            | 76.6                             | 33   |
|       | South                                   | 5                            | 75.9                             | 31   |
| 1822  | All                                     | 5                            | 75.9                             | 31   |
| 1823  | All                                     | 5                            | 75.9                             | 31   |
| 1824  | All                                     | 5                            | 75.9                             | 31   |
| 1825  | All                                     | 5                            | 75.9                             | 31   |
| 1826  | North, East                             | 5                            | 75.9                             | 31   |
|       | South, West                             | 7                            | 79.7                             | 35   |
| 1827  | All                                     | 7                            | 79.7                             | 35   |
| 1828  | North                                   | 4                            | 82.5                             | 39   |
|       | East, West                              | 6                            | 76.6                             | 33   |
|       | South                                   | 5                            | 75.9                             | 31   |
| 1829  | North                                   | 4                            | 82.5                             | 39   |
|       | East, West, South                       | 6                            | 76.6                             | 33   |
| 1830  | North, East, South                      | 6                            | 76.6                             | 33   |
|       | West                                    | 5                            | 75.9                             | 31   |
| 1831  | North, South, West                      | 5                            | 75.9                             | 31   |
|       | East                                    | 6                            | 76.6                             | 33   |
| 1832  | North, West                             | 5                            | 75.9                             | 31   |
|       | East                                    | 6                            | 76.6                             | 33   |
| 1833  | All (north of 38th Avenue)              | 6                            | 76.6                             | 28 <sup>2</sup>                                  |
|       | North, East West (south of 38th Avenue) | 7                            | 79.7                             | 30 <sup>2</sup>                                  |
|       | South (south of 38th Avenue)            | 8                            | 91.4                             | 43 <sup>2</sup>                                  |

**Notes:** <sup>1</sup>Required attenuation values shown are for residential uses, except where noted. Commercial uses would require 5 dBA less attenuation.  
<sup>2</sup>The projected land use at these locations are commercial. Should residential or classroom uses be constructed instead, they would require 5 dBA more attenuation.

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. Normally, a building façade is composed of the wall, glazing, and any vents or louvers for HVAC/air conditioning units in various ratios of area. The proposed design for all project buildings includes the use of well-sealed double-glazed windows and air conditioning units. The proposed buildings' façades, including these elements, would be designed to provide a composite Outdoor-Indoor Transmission Class (OITC) rating greater than or equal to the attenuation requirements listed in **Table 17-14**. 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. By adhering to these design requirements, the proposed buildings will thus provide sufficient attenuation to achieve the CEQR interior noise level guideline of 45 dBA  $L_{10}$  for residential uses and 50 dBA  $L_{10}$  for commercial uses.

Specifically, the attenuation requirements shown for the District in **Table 17-14** would be implemented through the E-designations that are already in place; these requirements would supersede the requirements previously set forth for the E-designations. For lots outside of the District, the attenuation requirements shown in **Table 17-14** would be incorporated into the development agreements and/or amended leases for each lot. These lots are and would remain in City ownership.

## **K. NOISE LEVELS AT OPEN SPACE AREAS**

As with existing and No Action conditions, noise levels within the new public open spaces to be created within the District as part of the proposed project would be above the 55 dBA  $L_{10(1)}$ . This exceeds the noise level for outdoor areas requiring serenity and quiet contained in the *CEQR Technical Manual* noise exposure guidelines (see **Table 17-3**). There are no practical and feasible mitigation measures that could be implemented to reduce noise levels to below the 55 dBA  $L_{10(1)}$  guideline within the open space areas. Although noise levels in these new areas would be above the 55 dBA  $L_{10(1)}$  guideline noise level, they would be comparable to or lower than noise levels in a number of open space areas that are within range of substantial noise sources (e.g., roadways, aircraft, etc.), including Prospect Park, Brooklyn Bridge Park, and Fort Greene Park. The 55 dBA  $L_{10(1)}$  guideline is a worthwhile goal for outdoor areas requiring serenity and quiet. However, due to the level of activity present at most New York City open space areas and parks (except for areas far away from traffic and other typical urban activities), this relatively low noise level is often not achieved.

## **L. MECHANICAL EQUIPMENT**

The building mechanical systems (i.e., heating, ventilation, and air conditioning systems) would be designed to meet all applicable noise regulations (i.e., Subchapter 5, §24-227 of the New York City Noise Control Code addressing circulation devices and the New York City Department of Buildings and Mechanical Codes) to avoid producing levels that would result in any significant increase in ambient noise levels. \*