3.9 NOISE

This chapter evaluates the potential noise and groundborne vibration impacts resulting from implementation of the proposed project. This includes the potential for the proposed project to result in impacts associated with a substantial temporary and/or permanent increase in ambient noise levels in the vicinity of the project site; exposure of people in the vicinity of the project site to excessive noise levels, groundborne vibration, or groundborne noise levels; and whether this exposure is in excess of established standards. Mitigation measures are provided to reduce significant impacts related to noise and vibration. The following analysis is based on the *Noise Impact Analysis, Los Angeles State Historic Park Master Development Plan*, prepared by AECOM in November 2011. This report is included as Appendix F of this EIR.

3.9.1 ENVIRONMENTAL SETTING

NOISE CHARACTERISTICS AND EFFECTS

Sound is technically described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (dB). The decibel scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound. The pitch of the sound is related to the frequency of the pressure vibration. Since the human ear is not equally sensitive to a given sound level at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) provides this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Noise is typically defined as unwanted sound. A typical noise environment consists of a base of steady ambient noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These can vary from an occasional aircraft or train passing by to virtually continuous noise from, for example, traffic on a major highway. Sound pressure diminishes (attenuates) with distance. The degree to which sound pressure diminishes depends on geometric spreading, absorption, atmospheric effects, and shielding. Table 3.9-1 identifies the typical noise levels from common outdoor and indoor activities.

TABLE 3.9-1
REPRESENTATIVE ENVIRONMENTAL NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Fire Crackers[a]	—110—	Rock Band
Jet Fly-over at 1,000 feet		
	—100—	
Gas Lawn Mower at 3 feet		
	—90—	Orchestra at 10 feet[b]
Diesel Truck at 50 feet at 50 mph		Food Blender at 3 feet
	—80—	Garbage Disposal at 3 feet
Noisy Urban Area during Daytime		
Gas Lawnmower, 100 feet	—70—	Vacuum Cleaner at 10 feet
Commercial Area		Normal Speech at 3 feet
Heavy Traffic at 300 feet	—60—	
		Large Business Office
Quiet Urban Area during Daytime	—50—	Dishwasher in Next Room
Quiet Urban Area during Nighttime	—40—	Theater, Large Conference Room (background)
Quiet Suburban Area during Nighttime		
	—30—	Library
Quiet Rural Area during Nighttime		Bedroom at Night, Concert Hall (background)
	—20—	
		Broadcast/Recording Studio
	—10—	
Lowest Threshold of Human Hearing	—0—	Lowest Threshold of Human Hearing

[a] Berger 2010

[b] At 3 meters (approximately 10 feet), noise levels ranged from 103 to 122 L_{eq}, and peak noise levels ranged from 143 to 146 dBA L_{eq} (Berger 2010)

Source: Caltrans 2009, except where noted.

Noise Descriptors

The intensity of environmental noise typically fluctuates over time and several different descriptors of time-averaged noise levels are used. The selection of the noise descriptor depends on the noise source, the time of day it is generated, its duration, and the purpose for collecting or predicting the noise levels (e.g., to determine if the noise source is in compliance with noise regulations or standards). The noise descriptors used to describe environmental noise are defined below.

- L_{max} *(Maximum Noise Level)*: The highest A-weighted integrated noise level occurring during a specific period of time.
- L_{eq} *(Equivalent Noise Level)*: The energy mean (average) noise level. The steady-state sound level that, in a specified period of time, contains the same acoustical energy as a varying sound level over the same time period.

- *L_{dn} (Day-Night Noise Level)*: The L_{dn} is the average A-weighted sound level measured over a 24-hour time period that is adjusted by 10 dBA upwardly during the nighttime noise-sensitive hours of 10:00 p.m. through 7:00 a.m. The L_{dn} attempts to account for the fact that noise during this specific period of time is a potential source of disturbance with respect to normal sleeping hours.

- *CNEL (Community Noise Equivalent Level)*: CNEL is another average A-weighted sound level measured over a 24-hour time period, but it is adjusted during the evening and nighttime hours. A CNEL noise measurement is obtained after adding 5 dB to sound levels occurring during the evening from 7:00 p.m. to 10:00 p.m., and 10 dB to sound levels occurring during the nighttime from 10:00 p.m. to 7:00 a.m. The 5 dB and 10 dB are added to account for most people's increased noise sensitivity during the evening and nighttime hours.[1] The CNEL is used by the State of California to evaluate land-use compatibility with regard to noise.

- *SEL (Sound Exposure Level)*: The SEL describes the cumulative exposure to sound energy over a stated period of time.

- *SENEL (Single Event Noise Exposure Level)*: The SENEL is a SEL where the measurement period is defined by the start and end times of a single noise event, such as an automobile or train pass-by, aircraft flyover, or individual industrial operations.

VIBRATION CHARACTERISTICS AND EFFECTS

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration can be a serious concern, causing buildings to shake and rumbling sounds to be heard. The frequency of a vibrating object describes how rapidly it is oscillating. The number of cycles per second of oscillation is the vibration frequency, which is described in terms of hertz (Hz). The normal frequency range of most groundborne vibration that can be felt generally by the human body starts from a low frequency of less than 1 Hz to a high of approximately 200 Hz.

While people have varying sensitivities to vibrations at different frequencies, in general they are most sensitive to low-frequency vibration. Vibration in buildings from construction activities may cause rattling of windows, items on shelves, and pictures hanging on walls. Vibration of building components can also take the form of an audible low-frequency rumbling noise, which is referred to as groundborne noise. Groundborne noise is usually only a problem when the originating vibration spectrum is dominated by frequencies in the upper end of the range (60 to 200 Hz), or when foundations or utilities, such as sewer and water pipes, physically connect the structure and the construction activity.

Although groundborne vibration is sometimes noticeable in outdoor environments, it is almost never annoying to people who are outdoors. The primary concern from vibration is that it can be intrusive and

[1] The logarithmic effect of adding these decibels to the peak hour L_{eq} measurement results in a CNEL measurement that is within approximately 3 dBA (plus or minus) of the peak-hour L_{eq}.

annoying to building occupants and vibration-sensitive land uses. Vibration energy spreads out as it travels through the ground, causing the vibration level to diminish with distance away from the source.

Vibration Descriptors

Vibration levels are usually expressed as a single-number measure of vibration magnitude in terms of velocity or acceleration, which describes the severity of the vibration without the frequency variable. The peak particle velocity (PPV) is defined as the maximum instantaneous positive or negative peak of the vibration signal, usually measured in inches per second PPV.

EXISTING ENVIRONMENTAL SETTING

Existing Off-Site Noise Sources

The northbound and southbound Metro Gold Line light rail trains are a regular daily noise source adjacent to the project site from early morning to after midnight. The light rail line operates at headways of approximately 7 to 12 minutes daily. The light rail line operates at 12- to 20-minute headways during the weekend evenings, until midnight on weekdays, and to after 1:00 a.m. on Saturdays, Sundays, and holidays. Other predominant sources of off-site noise that are audible from within the project site include local bus traffic on Broadway, vehicular traffic (including heavy-duty truck traffic) along Spring Street, and activities in the light industrial area south of Spring Street. Less audible sources of off-site noise include passenger car traffic noise along Broadway; activities at the residential, commercial, and institutional uses along Broadway; and traffic along I-5 located to the east.

Over-flights of airplanes and helicopters are short-term sources of noise that become distinctly audible, peak, and then dissipate over the course of less than 40 seconds.[2] Airports nearest to the project site include the Burbank-Bob Hope Airport, approximately 12 miles northwest of the project site; and Los Angeles International Airport, approximately 14 miles southwest of the project site.

Existing On-Site Noise Levels

The project site currently serves approximately 125,000 people per year and hosts special events during the warmer months. Approximately 1,500 visit the project site each weekend, not including special events. Current daily sources of noise generated at the project site include routine maintenance activities, vehicles in the parking areas, children playing, picnicking, runners and joggers, skateboarding, informal play and ball games, and dogs barking. Additional noise sources that typically occur on Friday nights and weekends during the warmer seasons are smaller organized events, periodic concerts, and larger special events.

Noise from daily activities at the park is typical of a residential area and not incompatible with the residences located along Broadway. Noise from large special events as described above, however, is not

[2] Based on data from a helicopter overflight on September 30, 2010. Other types of aircraft would be noticeably audible for a lesser period of time because they would travel at a faster speed and at a higher elevation than a helicopter.

typical of most residential neighborhoods but is within the noise environment of the project site, which is composed of residential, commercial retail and restaurant, institutional, and light industrial uses. Large special event noise is compatible with the noise-generating attractions provided in Chinatown, located immediately southwest of the project site; the Cathedral High School football field, located approximately 375 feet northwest of the project site; and Dodger Stadium, located approximately 0.5 miles northwest of the project site.

Short-term ambient noise measurements were taken at seven locations on and near the project site on September 30, 2010, using a Larson-Davis sound level meter, which satisfies the American National Standards Institute for general environmental noise measurement instrumentation. The meter was mounted on a tripod approximately five feet above ground level to simulate the average height of the human ear, and was calibrated before and after each measurement. The weather was mostly sunny, approximately 90 degrees Fahrenheit, with wind speeds ranging from approximately 1 to 6.5 miles per hour. The monitoring locations are shown in Figure 3.9-1.

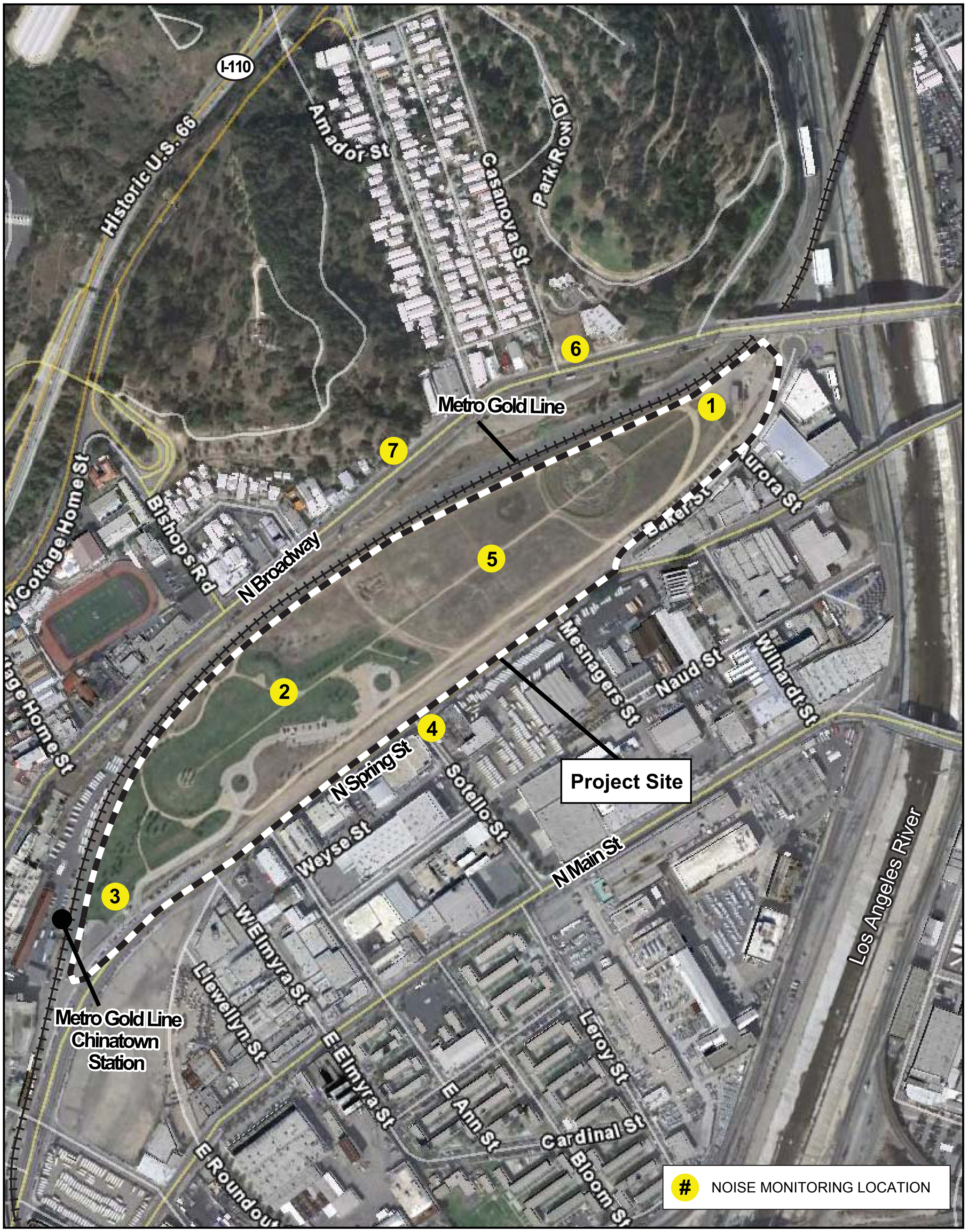
The existing noise measurement data for each location is summarized in Table 3.9-2. As shown in the table, noise levels at the project site ranged from 54 to 66 dBA L_{eq}, depending on the distance between the noise meter and predominant off-site noise sources. Measured ambient noise levels at off-site sensitive receptors along Broadway were 58 and 62 dBA L_{eq}, and higher than the on-site noise measurements. The measured noise level along Spring Street was 66 dBA L_{eq} due to the traffic along that roadway (particularly heavy-duty truck traffic) and the nearby light industrial activities. Noise levels in the surrounding project area are expected to be lower during the weekend when many businesses are likely to be closed.

Measured ambient noise levels during the frequent Metro Gold Line light rail train pass-bys ranged from 61 to 69 dBA L_{eq}. The duration of the train noise events depended upon whether a single train was passing the project site, or whether the northbound and southbound trains were passing at the same time. The weekday and weekend train schedules are very similar. As such, the frequency of occurrence of these train pass-by noise levels will be every day of the week, with a high likelihood of two trains passing the project site at the same time.

SENSITIVE RECEPTORS

Some land uses are considered more sensitive to elevated noise levels than others based on the types of activities they support. Residences, schools, motels and hotels, libraries, churches and religious institutions, hospitals, nursing homes, auditoriums, concert halls, amphitheaters, and parks are generally more sensitive to noise than commercial and industrial land uses.

Noise-sensitive receptors in the project area include residences, St. Peter Italian Church, St. Bridget's Chinese Catholic Church, Cathedral High School, and the Pho Da Son Quan Am PO Tat Tu Buddhist temple north of Broadway. The Ttokamsa Home Mission Church is another noise-sensitive receptor located south of the project site at the intersection of Spring and Sotello Streets. The locations of the nearby noise sensitive receptors in the project vicinity are shown in Figure 3.9-2.



Source: Google Earth

AECOM

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Figure 3.9-1

Noise Monitoring Locations

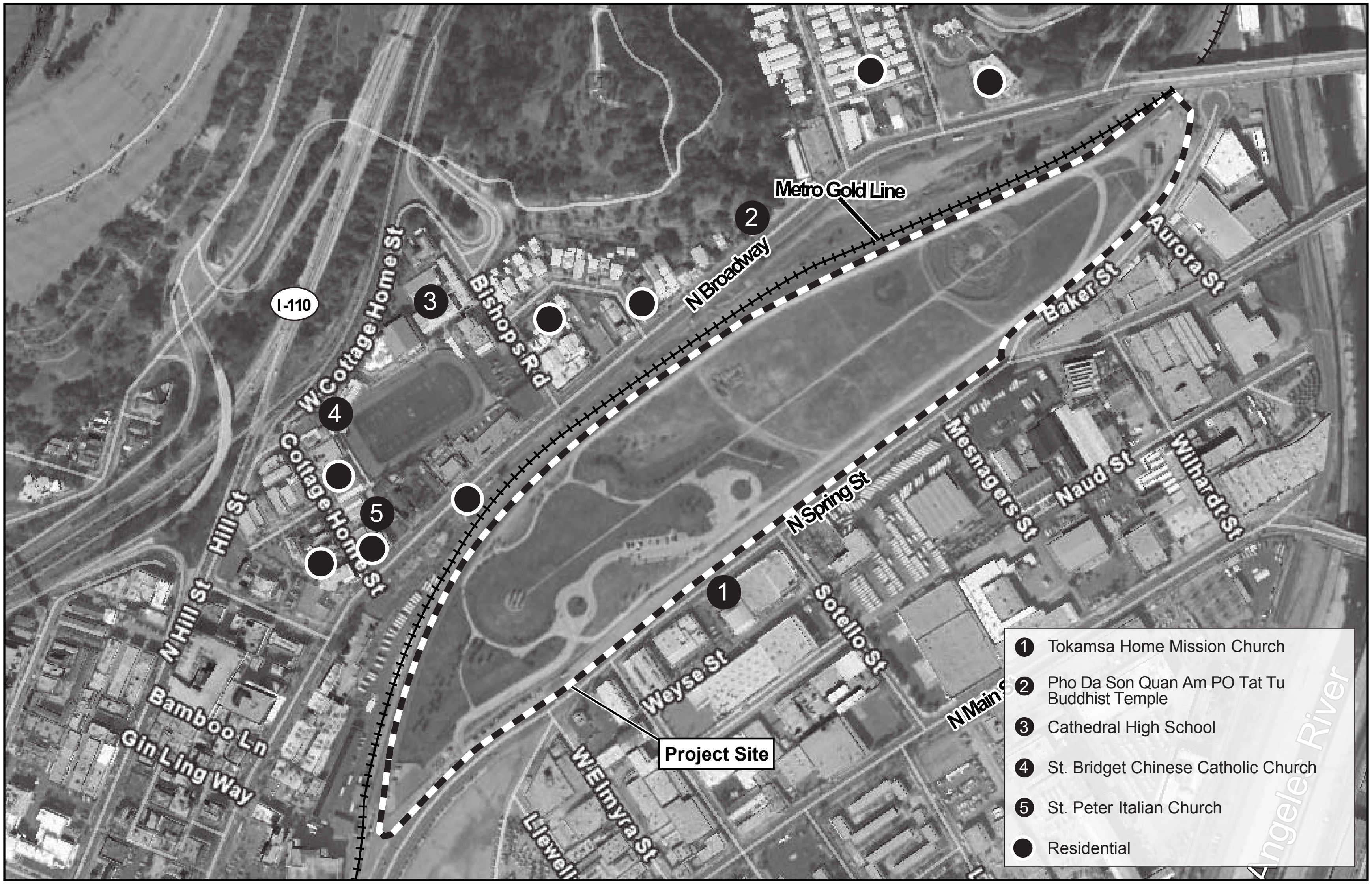
Los Angeles State Historic Park Master Development Plan Draft EIR
California Department of Parks and Recreation

TABLE 3.9-2
SHORT-TERM NOISE MEASUREMENT SUMMARY

Monitoring Location Number[a]	Primary Noise Sources	Monitoring Times	Distance (feet)		Sound Level		
			To Rail Line	To Spring Street Centerline	L_{eq}	L_{max}	L_{min}
1	On-site Measurement Traffic on Baker St., heavy-duty truck traffic, airplanes, helicopters, trains	11:20-11:30	102	235	54	73[b]	51
Averaged Ambient Noise Level during Train Pass-bys (4 events)					69	--	--
2	On-site Measurement Traffic on Broadway and Spring St., helicopters, heavy-duty truck idling along Spring St., trains	13:23-13:41	280	360	56	76[c]	54
Averaged Ambient Noise Level during Train Pass-bys (3 events)					64	--	--
3	On-site Measurement Airplanes, trains, helicopters, freeway in distance	13:56-14:14	80	160	57	70[b]	55
Averaged Ambient Noise Level during Train Pass-bys (2 events)					64	--	--
4	Off-site Measurement Traffic on Spring St., and Sotello St., and nearby industrial uses	14:28-14:43	690	45	66	85[d]	56
5	On-site Measurement Traffic on Spring St., airplanes, and nearby industrial uses	11:44-12:03	285	310	56	73[e]	52
Averaged Ambient Noise Level during Train Pass-bys (4 events)					61	--	--
6	Off-site Measurement Traffic on Broadway and Casanova St.	15:00-15:15	270	715	58	80[f]	49
7	Off-site Measurement Traffic on Broadway	15:24-15:34	210	840	62	88[g]	56

[a] Monitoring location number correlates to those shown in Figure 3.9-1
[b] Maximum noise level occurred during train pass-by.
[c] Maximum noise level occurred during helicopter fly-over.
[d] Maximum noise level was from heavy-duty truck traffic.
[e] Maximum noise level was from an ambulance on Spring Street.
[f] Maximum noise level was from a garbage truck.
[g] Maximum noise level was from a public bus.

Source: AECOM, 2011. Noise monitoring conducted on September 30, 2010. Noise measurement data are provided in Appendix F of this EIR.



Source: Google Earth

AECOM

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Figure 3.9-2

Nearby Noise-Sensitive Land Uses

Los Angeles State Historic Park Master Development Plan Draft EIR
California Department of Parks and Recreation

3.9.2 REGULATORY SETTING

FEDERAL

Federal Transit Administration Guidelines

Although not adopted, the Federal Transit Administration has published standards for airborne or groundborne vibration. The Federal Transit Administration threshold for architectural damage for nonengineered timber and masonry buildings (e.g., most residential units) is 0.2 inch per second PPV. This vibration threshold is used for the purposes of this EIR analysis.

STATE

California Noise Control Act

The State Guidelines were published in 1976 as a requirement of Health and Safety Code Section 46050(g), also known as the California Noise Control Act.[3] The guidelines recommend acceptable exterior noise levels for various land uses (Table 3.9-3). Under the State Guidelines, an exterior noise level of 70 dBA L_{dn}/CNEL is typically the dividing line between an acceptable and unacceptable exterior noise environment for all noise-sensitive uses, including schools, libraries, churches, hospitals, day care centers, and nursing homes of conventional construction. Noise levels below 75 dBA L_{dn}/CNEL are typically acceptable for office and commercial buildings, while levels up to 80 dBA L_{dn}/CNEL are typically acceptable for industrial uses.

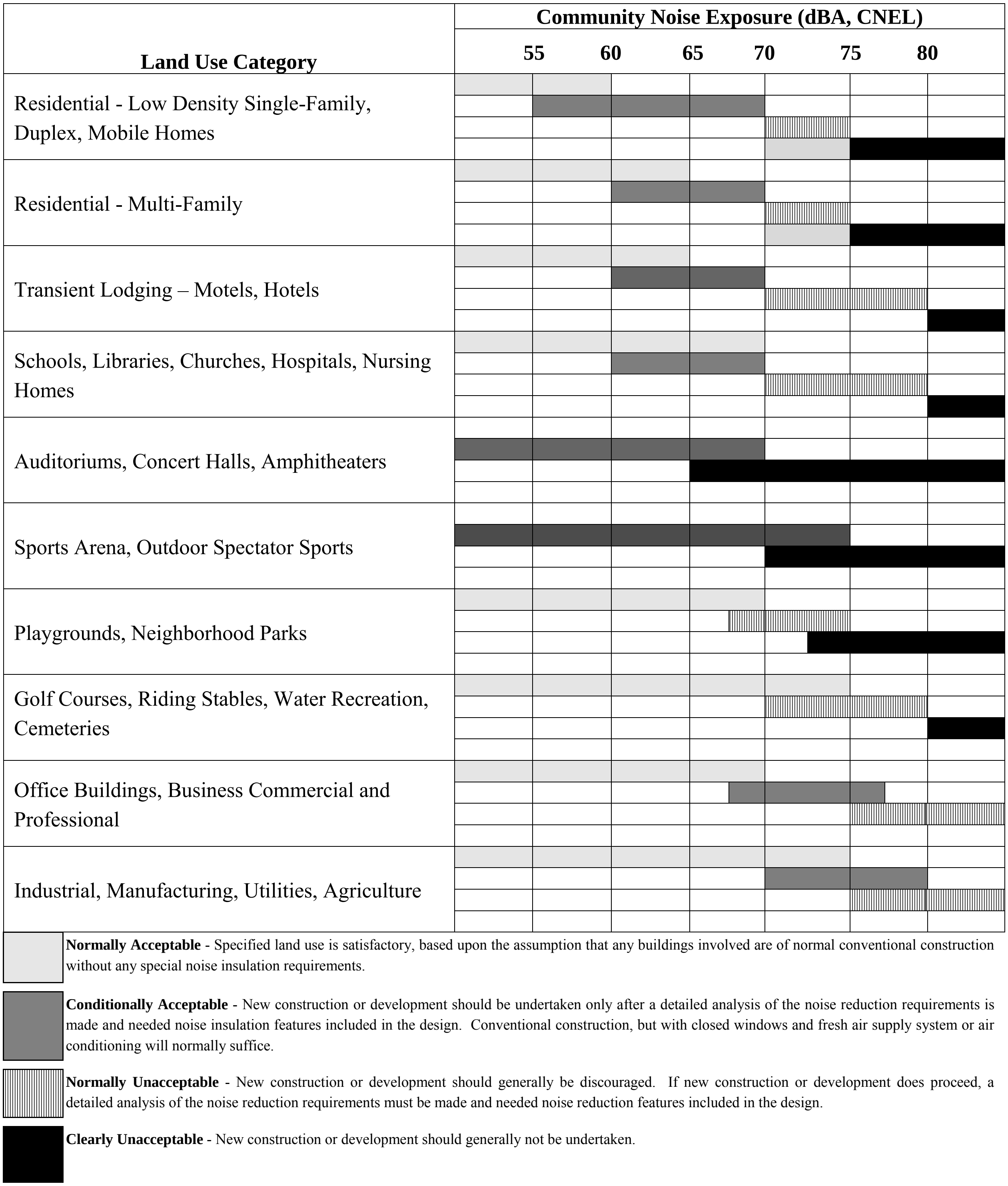
Section 65302(f)(1) of the California Government Code requires that each jurisdiction recognize the State Guidelines while preparing its general plan; however, the California Government Code does not mandate application of the compatibility matrix to development projects.

LOCAL

The project site is a state-owned property and, as such, is not subject to local regulations. Notwithstanding, the state does not have established noise thresholds; thus, the analysis contained in this chapter is based on local City regulations. Therefore, this chapter acknowledges the local plans, policies, regulations, and guides that pertain to the noise in the project area.

[3] These guidelines are most currently published by California Governor's Office of Planning and Research in *State of California General Plan Guidelines*, Appendix C: Guidelines for the Preparation and Content of the Noise Element of the General Plan, Office of Planning and Research, 2003.

TABLE 3.9-3
LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS



Normally Acceptable - Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

Conditionally Acceptable - New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply system or air conditioning will normally suffice.

Normally Unacceptable - New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise reduction features included in the design.

Clearly Unacceptable - New construction or development should generally not be undertaken.

Source: *L.A CEQA Thresholds Guide*, 2006.

City of Los Angeles General Plan

The Noise Element contained in the City of Los Angeles General Plan discusses the various sources of noise that affect land uses and land development within its jurisdiction, including airport and overhead flights, freight trains, light rail trains, vehicular traffic, and industrial activities. The Noise Element also lists goals, objectives, policies, and implementation programs that promote land use compatibility for noise-sensitive uses, which it defines as single-family and multi-unit dwellings, long-term care facilities (including convalescent and retirement facilities), dormitories, motels, hotels, transient lodgings, and other residential uses; houses of worship; hospitals; libraries; schools, auditoriums; concert halls; outdoor theaters; nature and wildlife preserves; and parks. While these goals, objectives, policies, and implementation programs do not directly apply to the project site, they are consistent with the State Guidelines published by the State Department of Health Services, and the implementation programs are consistent with the mitigation requirements under CEQA.

City of Los Angeles Municipal Code

Chapter XI, Articles 1 through 6 of the Los Angeles Municipal Code establishes acceptable ambient sound levels to regulate intrusive noise, and regulates noise by limiting hours of operation and setting performance standards for noise sources within various zones of the City. While the Los Angeles Municipal Code is not applicable to the project site itself, properties surrounding the project site are subject to the Los Angeles Municipal Code.

L.A. CEQA Thresholds Guide

The *L.A. CEQA Thresholds Guide* is the City's initial effort to develop citywide guidance for CEQA impact analyses. Guidance for assessing noise impacts within the City is provided in Chapter I, Noise of the guide, which incorporates the State Guidelines. This guide is not a regulatory mandate, but does provide guidance for the noise impact analysis contained within this chapter.

3.9.3 ENVIRONMENTAL IMPACTS

METHODOLOGY

The analysis for future noise levels presented in this section is based on noise monitoring, published reports and data, mobile source noise prediction modeling, and traffic volume data provided in the transportation impact analysis prepared for the proposed project.

Construction Noise

Noise impacts from construction are a function of the noise generated by equipment, the location and sensitivity of nearby land uses, and the timing and duration of the noise-generating activities. Prediction of project construction noise impacts is based on the Federal Highway Administration's Roadway Construction Noise Model. Maximum construction equipment noise levels used in the model are based on data collected during construction of the Central Artery/Tunnel in Boston, Massachusetts, which is the largest urban construction project ever conducted in the United States. These maximum construction equipment noise levels are shown in Table 3.9-4. The model also employs an acoustic usage factor to estimate the percentage of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction phase. As shown in Table 3.9-4, maximum noise levels generated by typical construction equipment operating at full power ranges from approximately 70 dBA to 95 dBA at 50 feet. Construction equipment noise attenuates at a rate of 4.5 to 6 dBA per doubling of distance over hard and soft sites, respectively.

TABLE 3.9-4
TYPICAL MAXIMUM CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Noise Level at 50 feet (dBA L_{max})	Acoustic Usage Factor[a] (%)
Auger Drill Rig	85	20
Backhoe	80	40
Blasting	94	1
Chain Saw	85	20
Clam Shovel	93	20
Compactor (ground)	80	20
Compressor (air)	80	40
Concrete Mixer Truck	85	40
Concrete Pump	82	20
Concrete Saw	90	20
Crane (mobile or stationary)	85	20
Dozer	85	40
Dump Truck	84	40
Excavator	85	40
Front End Loader	80	40
Generator (25 KVA or less)	70	50
Generator (more than 25 KVA)	82	50
Grader	85	40
Hydra Break Ram	90	10
Impact Pile Driver (diesel or drop)	95	20
Insitu Soil Sampling Rig	84	20
Jackhammer	85	20
Mounted Impact Hammer (hoe ram)	90	20
Paver	85	50
Pneumatic Tools	85	50
Pumps	77	50
Rock Drill	85	20
Roller	74	40
Scraper	85	40
Tractor	84	40
Vacuum Excavator (vac-truck)	85	40
Vibratory Concrete Mixer	80	20
Vibratory Pile Driver	95	20

a Acoustic Usage Factor represents the percent of time that the equipment is assumed to be running at full power.

Note: KVA = kilovolt amps

Source: Federal Transit Administration, 2006; Thalheimer, 2000. These values are also used in the Roadway Construction Noise Model, 2006.

Construction Vibration

The threshold of human annoyance from vibration is 0.10 inch per second PPV. Where construction vibration does cause structural damage, it is through direct damage and/or vibration-induced settlement. Various types of construction equipment have been measured under a wide variety of construction activities; average source levels reported in terms of velocity levels are provided in Table 3.9-5.

TABLE 3.9-5
VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV at 25 Feet (in/sec)	Approximate VdB at 25 Feet
Pile Driver (impact)		
Upper Range	1.518	112
Typical	0.644	104
Pile Driver (sonic)		
Upper Range	0.734	105
Typical	0.170	93
Clam Shovel Drop (slurry wall)	0.202	94
Hydro Mill (slurry wall)		
In Soil	0.008	66
In Rock	0.017	75
Large Bulldozer	0.089	87
Caisson Drilling	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58

Source: Federal Transit Administration, 2006.

Operational Noise

Prediction of future noise levels at the project site and the surrounding area are based on published reports and data, roadway segment traffic volumes derived from the traffic study (Appendix G of this EIR), and noise prediction modeling using the Federal Highway Administration's Highway Noise Prediction Model (FHWA-RD-77-108). This model calculates the mobile source noise levels at specific locations along roadways based on average daily traffic volumes, vehicle fleet mix, average speeds, roadway geometry, and sensitive receptor site conditions. Results from the model are reported in CNEL, which is compatible with the State Guidelines.

The noise impacts of the proposed project were determined using the following traffic scenarios from the proposed project's traffic study (Appendix G of this EIR): Existing Conditions (2010), Future (Year 2035) without Project Conditions, and Future (Year 2035) with Project Conditions. Future (2035) conditions represent the cumulative development scenario and are based on buildout of the CASP, which would add over 7,000 households, 26,000 people, and 2,600 jobs to the entire 663-acre CASP area.

THRESHOLDS OF SIGNIFICANCE

As part of the Initial Study (see Appendix A of this EIR), it was determined that the proposed project would not result in impacts related to a public airport or private airstrip. As previously discussed, the nearest airports to the project site include the Burbank-Bob Hope Airport and Los Angeles International Airport, located approximately 12 miles and 14 miles from the project site, respectively. Additionally, the proposed project is not located within two miles of a private airstrip. Accordingly, these issues are not further analyzed in this EIR.

In accordance with the CEQA Guidelines, the proposed project would have a significant impact related to noise if it would result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the proposed project; or
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the proposed project.

As previously discussed, the project site is a state-owned property and not subject to local regulations. However, there are no state thresholds of significance for construction or operational noise. As such, for purposes of this analysis, established local thresholds were used to determine the level of significance of potential noise impacts associated with project construction and operation.

Construction noise and vibration impacts would be significant if they would result in either of the following:

- Exceed the ambient noise level by 5 dBA at existing noise sensitive receptors between the hours of 9:00 p.m. and 7:00 a.m., Monday through Friday, or before 8:00 a.m. or after 6:00 p.m. on Saturday, or at any time on Sunday;[4] and/or
- Exceed the Federal Transit Administration vibration threshold for architectural damage of 0.2 inch per second PPV.[5]

As previously discussed, changes in noise levels of less than 3 dBA are generally not discernable to most people, while changes greater than 5 dBA are readily noticeable and a 10-dBA increase is perceived as a

4 These hours of construction activities are derived from the Los Angeles Municipal Code.
5 These thresholds are consistent with the noise thresholds found in the *L.A. CEQA Thresholds Guide*.

doubling of noise. Therefore, the significance thresholds for project-related noise are based on the average human response to changes in noise levels and the State Guidelines. A significant operational noise impact would occur if the project would result in any of the following:

- Expose project patrons to a noise level in excess of the normally acceptable noise level of 70 dBA CNEL/L_{dn} for parks per the State Guidelines, except during special events that may host concerts and/or fireworks;
- Temporarily expose nearby sensitive receptors to noise levels that are 10 dBA or greater over existing ambient noise levels during special events that may host concerts and/or fireworks;
- Cause the existing ambient noise levels at nearby noise-sensitive receptors to increase by 3 dBA in CNEL and change its land use noise category to "normally unacceptable" or "clearly unacceptable" as identified in the State Guidelines; and/or
- Cause the existing ambient noise levels at a nearby noise-sensitive receptor to increase by 5 dBA in CNEL and not change its land use noise category as identified in the State Guidelines.[6]

IMPACT ANALYSIS

NOISE-1 *The proposed project would not generate or expose persons to noise levels in excess of established standards. Impacts would be less than significant.*

Construction

Site grading and trenching to extend surrounding utilities onto the project site would generate the maximum noise levels during construction. Backhoes, dozers, dump trucks, excavators, graders, and scrapers are expected to operate throughout the project site for approximately 12 months until grading is complete. Noise levels from this equipment could generate maximum noise levels between 80 and 85 dBA at 50 feet.

There are a number of sensitive receptors north of the project site along Broadway. All of these receptors are elevated from 35 to 40 feet above the project site and some have a clear line-of-sight to the project site. Ambient noise levels along Broadway were measured at 58 and 62 dBA L_{eq} (see Table 3.9-2). The nearest sensitive receptor is St. Peter Italian Church, located approximately 200 feet north of the project site. Assuming an attenuate rate of 6 dBA per doubling of distance, the maximum anticipated project construction noise of 85 dBA L_{max} at 50 feet would attenuate to approximately 73 dBA L_{max} at 200 feet, which is equivalent to 49 dBA L_{eq} assuming a daily acoustic usage factor of 40 percent.[7] Project construction at this location along the project site represents the worst-case construction noise scenario

6 These thresholds are based on the L.A. CEQA Thresholds Guide and the Federal Transit Administration criteria for structural damage due to vibration.

7 Appendix F of this EIR contains construction noise calculations.

because individual pieces of construction equipment would be operating throughout the project site and at distances greater than 200 feet from the sensitive receptors along Broadway.

The maximum construction noise level of 73 dBA L_{max} would only be audible at St. Peter Italian Church when construction equipment operates at the project site property line and between light rail train pass-bys, which occur at 7- to 12-minute intervals daily. When a train passes the project site, it breaks the line-of-sight between the church and the project site boundary, and the noise levels from the construction equipment at this location would attenuate by at least 5 dBA. The likelihood of the northbound and southbound trains passing the project site at the same time is high. Thus, the intervals between train pass-bys would be shorter, thereby lessening the duration of maximum construction noise impacts at sensitive receptors along Broadway. Furthermore, the train noise, which produced an on-site noise level of 73 dBA L_{max} and 69 dBA L_{eq} at Monitoring Location 1 and 105 feet from the light rail line, would briefly exceed the attenuated construction noise level during the train pass-bys.

No project construction would occur on Sundays; therefore, no project construction noise impacts would occur at St. Peter Italian Church or the Ttokamsa Home Mission Church on Sundays. Ambient noise levels along Broadway were measured at 58 and 62 dBA L_{eq}. Project construction would only occur between the hours of 7:00 a.m. and 9:00 p.m. Monday through Friday and between 8:00 a.m. and 6:00 p.m. on Saturdays, and would generate average noise levels less than existing ambient noise levels at nearby noise sensitive receptors. Therefore, impacts related to construction noise would be less than significant.

Operation

As discussed, the project site is designated as Greenway under the proposed CASP. This designation allows for development of recreation and open space uses. Upon adoption by the City, the CASP's land use designations would become effective and govern development of the project site regardless of the underlying zoning established by the Community Plan. Park maintenance activities would continue and are expected to remain largely unchanged in terms of hours of operation and activities when compared to existing conditions. The types of day-to-day activities at the project site would also remain essentially unchanged. Most daily park activities would occur between 8:00 a.m. and 10:00 p.m. Future daily ambient noise levels at the project site, however, would be affected by increases in the number of visitors to the project site, changes in the surrounding land uses (with buildout of the CASP), and changes in surrounding roadway traffic.

At buildout of the proposed project, average daily park usage is expected to increase. There is potential for the increase in noise levels from typical daily activities to exceed 3 dBA and to be perceptible to sensitive receptors along Broadway. Given the distance between the project site and these sensitive receptors along Broadway (200 feet or more), light rail train noise levels, and the increase in noise from on-site day-to-day activities would not cause a doubling of stationary source sound energy. Existing ambient noise levels at the sensitive receptors would not increase by 3 dBA in CNEL. Off-site stationary source noise impacts from daily activities during project operation would be less than significant.

As shown in Table 3.9-6, future 2035 average daily trips would add traffic to several roadway segments surrounding the project site. Noise modeling using the Highway Noise Prediction Model and traffic data demonstrates that mobile source noise 100 feet from the centerline of Spring Street and along the southern boundary of the project site currently ranges from 68 to 69 dBA CNEL.[8]

TABLE 3.9-6
EXISTING AND PROJECTED MOBILE SOURCE CNEL AT 100 FEET

Roadway Segment	Existing dBA CNEL	Year 2035 without Project dBA CNEL	Year 2035 with Project dBA CNEL	Project Noise Contribution dBA
College Street to Sotello Street	69	69	69	0
Sotello Street to Mesnagers Street	69	69	69	0
Mesnagers Street to Avenue 18	68	70	70	2

Source: Data derived by AECOM from Fehr & Peers, 2011. Noise model results are contained in Appendix F of this EIR.

At CASP buildout with the proposed project, mobile source noise along Spring Street would not substantially increase. The normally acceptable noise level for parks under the State Guidelines is 70 dBA L_{dn}/CNEL.[9] Future mobile source noise on Spring Street would not cause existing noise levels on the southern park boundary to substantially increase and would not change the project site's noise category. Mobile source noise impacts during project operations would be less than significant.

NOISE-2 *The proposed project would not generate or expose persons to excessive groundborne noise or vibration levels. The impacts would be less than significant.*

Construction

Groundborne Noise

Groundborne noise may be substantial when the originating vibration spectrum is dominated by frequencies in the upper end of the range (60 to 200 Hz), or when foundations or utilities, such as sewer and water pipes, physically connect the structure and the construction activity. Project truck traffic and construction vibration frequencies are expected to range from 10 to 30 Hz and would not generate groundborne noise. Furthermore, the proposed project would not involve construction that would physically connect to structures occupied by off-site sensitive receptors. Project construction would not expose persons to or generate excessive groundborne noise. Impacts related to construction groundborne noise would be less than significant.

8 These noise levels are consistent with the ambient noise measurements taken at Monitoring Location 2 (see Table 3.9-2).
9 The State's Guidelines have been incorporated into the City's Noise Element and the *L.A. CEQA Thresholds Guide*.

Groundborne Vibration

The construction of the proposed project would employ loaded trucks, jackhammers, and small bulldozers, all of which have steady state vibration levels in the range of 0.003 to 0.076 inch per second PPV at 25 feet. Project construction equipment would not exceed the Federal Transit Administration's vibration threshold for architectural damage of 0.2 inch per second PPV or the threshold of human annoyance of 0.10 inch per second PPV at 25 feet. Additionally, construction would not exceed these thresholds at the nearest sensitive receptor, which is located 200 feet and upgradient from the project site. The construction of the proposed project would not expose persons to or generate excessive groundborne vibration. Impacts related to construction groundborne vibration would be less than significant.

Operation

Groundborne Noise

While low frequency noise levels from train pass-bys were not measured from within the project site, studies show a peak low frequency of 80 Hz for light rail transit. This frequency would be perceptibly audible to the average healthy human ear, which can detect sounds that range in frequency form approximately 20 to 20,000 Hz. Groundborne noise is not typically an annoyance to people who are outdoors. Adjacent light rail traffic would not generate excessive groundborne noise on the project site and the proposed project would not physically connect to off-site sources of low-frequency noise via foundations or utilities. The operation of the proposed project would not generate any new sources of groundborne noise. Therefore, impacts related to operational groundborne noise would be less than significant.

Groundborne Vibration

Day-to-day activities within the project site during operation would include routine maintenance operations, jogging, running, skateboarding, picnicking, informal play, and activities that require large open areas. None of these activities would generate groundborne vibration within the threshold of human annoyance (0.10 inch per second PPV at 25 feet). Therefore, daily activities at the project site would not expose persons to excessive groundborne vibration. Impacts related to operational groundborne vibration would be less than significant.

Although vibration generated from loaded heavy-duty trucks is below the threshold of human annoyance, there is potential for these trucks to generate perceptible vibration when traveling over rough roads or an instantaneous impact when a truck hits a pothole. In addition, heavy-duty trucks would occasionally travel to and from the proposed project in order to deliver and pick-up equipment for concerts and other special events. This impact analysis assumes that all project area roadways would be well maintained and potholes, when they occur, would be repaired within a reasonable period of time. Furthermore, heavy-duty truck traffic along project area roadways would decrease at CASP buildout, thereby further reducing the potential for perceptible vibration from heavy duty trucks. Heavy-duty trucks on Spring Street would not generate excessive groundborne vibration at the project site. In addition, heavy-duty trucks that would travel within the project site to facilitate the set-up or breakdown of special events or concerts would not generate an excessive level of groundborne vibration due to a slower speed of travel and the lack of rough roads and potholes within the proposed project. Therefore, operational groundborne vibration impacts related to heavy-duty trucks would be less than significant.

Light rail systems typically generate vibration levels that are just above the threshold of human perception. However, although groundborne vibration is sometimes noticeable in outdoor environments, it is almost never annoying to people who are outdoors. Adjacent rail traffic would not generate excessive groundborne vibration at the proposed project, nor would it cause human annoyance. Therefore, vibration impacts from the adjacent light rail system would be less than significant.

NOISE-3 *The proposed project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above existing levels. The impact would be less than significant.*

Noise generated from the construction of the proposed project would be temporary, lasting only during the approximate 12-month duration of the construction phase. Therefore, construction noise would not result in substantial permanent increases in ambient noise levels. No impact would occur.

The operation of the proposed project is anticipated to result in an increase in average daily park usage. As such, there is potential for noise levels from typical daily activities to increase. Additionally, buildout of the CASP with the proposed project would add traffic to the study roadway segments, which could increase mobile source noise. However, as discussed in NOISE-1, existing ambient noise levels at nearby noise-sensitive receptors would not substantially increase with daily park use during project operations. Further, future mobile source noise along Spring Street would not cause existing noise levels to substantially increase. The operation of the proposed project would not cause a substantial permanent increase in ambient noise levels in the project vicinity. As such, impacts would be less than significant.

NOISE-4 *The proposed project would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the proposed project. Mitigation measures are required to reduce potential impacts. However, noise impacts from fireworks displays would remain significant and unavoidable.*

Construction

During the 12-month construction phase, there would be a temporary increase in heavy-duty truck and worker commute traffic on Spring Street and other local roadways.[10] Heavy-duty trucks would be used to deliver construction equipment and materials to the project site and to haul away demolition and construction wastes. The larger pieces of construction equipment would be delivered to the site at the beginning of the construction phase and then removed when no longer necessary. Truck traffic to deliver materials to the project site and to haul away wastes would occur frequently throughout project

[10] A heavy-duty truck is defined as all cargo vehicles with three or more axles- generally with gross vehicle weight more than 26,400 pounds.

construction. There would also be an increase in traffic from construction worker commute trips. Project workers are expected to drive light-duty pick-up trucks and passenger vehicles. Construction traffic is expected to occur during project construction hours and would travel primarily along highways and major arterials where few noise sensitive uses are located, and is not expected to traverse residential areas.

Sensitive receptors with a direct line-of-sight to the heavy-duty trucks would experience temporary, instantaneous noise levels up to 80 dBA at 50 feet from the roadway. This is not unlike existing heavy-duty truck traffic noise along Spring Street in the project area. Sensitive receptors located farther away would experience less noise due to their greater distance from the roadway and due to any intervening topography and/or structures that may exist between them and the noise source. Noise impacts from heavy-duty trucks would be temporary and instantaneous as the trucks pass by these receptors, and would diminish rapidly as the trucks travel away from receptors.

Short-term heavy-duty truck and construction worker traffic would generate noise levels similar in nature to existing truck traffic along Spring Street and other roadways in the project area. Therefore, construction truck traffic would not result in a substantial or audible (3 dBA or greater) temporary or periodic increase in ambient noise levels along the traversed roadways. Noise impacts related to construction traffic would be less than significant.

Operation

The operation of the proposed project would include special events that would attract visitors from outside of the local area. As many as four daytime/evening/nighttime special events per year are expected with attendance of up to 25,000 people. Smaller events of 500 to 5,000 people are expected to occur monthly at the project site. Such events would occur until 10:00 p.m. Sunday through Thursday, and as late as 11:00 p.m. on Friday or Saturday nights.

Special evening events are expected to include live and recorded music concerts of contemporary bands (e.g., rock, country, rhythm and blues, soul, hip-hop, jazz) and classical symphony orchestras. Additionally, fireworks displays and the use of public address systems would also potentially occur at the project site during special events. The operators of these special events would be responsible for complying with all applicable local laws and ordinances related to the use of concerts, fireworks, and public address systems. Therefore, the operators of the special events would also be required to obtain the appropriate permits from the local authorities with jurisdiction over such uses. Potential noise impacts related to concerts, public address systems, and fireworks are further discussed below.

Concerts

Sound levels from contemporary (e.g., rock) concerts can be as loud at 104 dBA L_{eq} at 50 feet from concert amplifiers, with maximum sound pressure levels expected to range from 100 to 110 dBA L_{eq}. These noise levels include clapping, vocalizations, and other noise from the concert attendees. Sound levels from a jazz and/or symphony orchestra performance can reach 90 dBA L_{eq} at 50 feet with a maximum sound pressure level of 98 dBA L_{max}. These noise levels do not include noise from the audience as the audience typically reserves its applause and appreciation until the end of these performances. Sound levels from this latter source are not expected to exceed sound levels of the performance.

The degree to which these noise levels would attenuate at the nearest noise-sensitive receptors would depend on the distance between the concert amplifiers and receptors, intervening structures and/or topography, the ground surface (i.e., soft or hard) between the amplifiers and the receptors, the direction in which the amplifiers face, and wind speed and direction. Assuming the concert location is on the central northern half of the project site, the closest distance between the amplifiers and the nearest noise-sensitive receptor would be the residences at the intersection of Savoy Street and Broadway, approximately 350 feet north of the concert stage. Using an attenuation rate of 6 dBA for each doubling of distance over hard surfaces, noise levels of 104 and 90 dBA L_{eq} would attenuate to 87 and 70 dBA L_{eq}, respectively. Although the prevailing wind direction in the Los Angeles area is typically to the east-northeast, terrain north of the project site rises up 200 feet to Dodger Stadium and then another 200 feet to the highest point in Elysian Park. This terrain deflects evening wind currents in the project area to the south and could bend the path of the concert noise to concentrate it on the downwind side of the noise source to the south. This atmospheric effect could likely have a measureable effect on concert noise levels along Broadway.

Concert noise levels on the sensitive receptors would also be periodically attenuated through shielding by trains along the adjacent Metro Gold Line, which run at 12- to 20-minute intervals during the evenings to midnight on weekdays and to after 1:00 a.m. on Saturdays, Sundays, and holidays. When a light rail train passes the project site, it would break the line-of-sight between the concert and the noise-sensitive receptors, and would attenuate the noise level by at least 5 dBA. Additionally, train noise, which produced an on-site noise level of 73 dBA L_{max} and 69 dBA L_{eq} at 105 feet from the rail line, would briefly exceed the attenuated noise level during pass-bys. Sensitive receptors along Broadway may find the interruption in concert noise levels as a result of the train pass-bys more of any annoyance than a benefit.

The bass (low) end of the frequency spectrum is expected to be the most audible in the project area because low frequency sound is not mitigated by the atmosphere as much as mid- and high-frequency sound levels. The groundborne noise is not expected to be annoying to people at the concert, but may be perceptible in proximity to the concert location. Groundborne noise is not expected to adversely affect sensitive receptors along Broadway because there is no structural connection between these uses and the project site.

Measured ambient noise levels at sensitive receptors along Broadway were 58 and 62 dBA L_{eq}. Concert noise levels at the nearest sensitive receptor on Broadway are anticipated to attenuate to 70 to 87 dBA L_{eq}. These noise levels are considered to be a worst-case scenario because they are expected to further attenuate due to southerly wind patterns away from the receptors, and the potential for train pass-by noise to exceed concert noise. Furthermore, land uses, traffic volumes, and vehicle fleet mix surrounding the project site would change as the project area builds out under the CASP. With these changes, surrounding ambient noise levels would also change. Therefore, depending on the ambient noise levels surrounding the project site at the time of a concert, the concert may or may not expose nearby sensitive receptors to noise levels that are 10 dBA or greater than existing ambient noise levels. Nonetheless, the potential for such an increase exists along with the potential for annoyance to receptors on Broadway who would be exposed to frequent interruptions in concert noise levels during train pass-bys. Special event concerts at the project site would result in a short-term potentially significant noise impact. Mitigation measures NOISE-A and NOISE-B would be implemented to reduce impacts.

Public Address Systems

While no public address system or sound amplification systems would be permanently installed at the project site, these devices may be brought in by the special event organizer and set up at the project site for making announcements and/or providing music. As sound from portable amplification devices is highly variable, noise levels cannot be accurately predicted without specific knowledge of the equipment, its placement, and orientation in relation to surrounding sensitive receptors. Thus, the use of portable amplification devices could temporarily expose nearby sensitive receptors to noise levels that are 10 dBA or greater over existing ambient noise levels. This would result in a short term significant noise impact. Mitigation measures NOISE-A and NOISE-B would be implemented to reduce impacts.

Fireworks

Some special nighttime events at the proposed project may include fireworks. Fireworks are an impulsive noise source, which, for purposes of this analysis, means that they are of short duration (ranging from microseconds to anything less than two seconds), are of high intensity, and have an abrupt onset and rapid decay. Fireworks also generate a dense and complex nonharmonic combination of frequencies, including low frequencies that could generate perceptible vibration.

The maximum height of the fireworks' explosion at the project site would be 600 feet based on the size of the firework shells used (see Appendix F). While the distance of the midair explosion from the ground level at the project site would be 600 feet, the explosion would be approximately 725 feet from the nearest sensitive receptor along Broadway, which is approximately 350 feet away from the ground launching location and at an elevation 40 feet higher than the project site. At approximately three feet, fireworks can generate between 103 and 122 dBA L_{eq} for the duration of the display. At 725 feet, the fireworks noise would attenuate to between 55 and 74 dBA.

Land uses, traffic volumes, and vehicle fleet mix surrounding the project site would change as the project area builds out under the CASP. With these changes, surrounding ambient noise levels (measured at 58 and 62 dBA L_{eq}) are also expected to change. Therefore, depending on the ambient noise levels surrounding the project site at the time a fireworks display is planned, the display may or may not expose nearby noise-sensitive receptors to noise levels that are 10 dBA or greater over existing ambient noise levels. Nonetheless, the potential for such an increase exists. As such, fireworks displays associated with the proposed project would result in a potentially significant noise impact. Mitigation measures NOISE-A and NOISE-B would be implemented to reduce impacts.

3.9.4 MITIGATION MEASURES

NOISE-A Special events that would include the use of an audio system with amplifiers or fireworks displays within the project site shall require a special event permit from local authorities with jurisdiction. The permit shall require a noise management plan that includes the following:

- Short-term (no less than 20-minute) ambient noise measurements taken within one month of the event at the nearest sensitive receptors to the project site (sensitive receptors shall be defined in the most recent *L.A. CEQA Thresholds Guide*);
- A site plan showing placement of the stage (if used) and each amplifier, and/or showing the placement of the fireworks launch area;
- Predicted combined noise levels from the amplifiers or fireworks displays at the sensitive receptors; and
- If necessary, measures to reduce amplified or fireworks noise levels to less than 10 dBA over the ambient noise levels at the receptors.

The event-specific noise management plan shall be incorporated into the special event permit prior to its issuance by the local authorities with jurisdiction. CDPR shall receive a copy of the noise management plan.

NOISE-B No less than two weeks before a special event that involves amplified sound and/or fireworks, the event organizer(s) shall inform individual property owners/tenants within 1,000 feet of the project site of the date and location of the event, the activities that would take place at the event, and the potential for the event to be audible at off-site locations. A telephone number shall be provided where a representative of the event organizer or other party would respond to questions or comments regarding the event. This requirement shall be incorporated into the special event permit prior to its issuance by the local authorities with jurisdiction.

3.9.5 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Implementation of mitigation measures NOISE-A would reduce the short-term potential noise impacts from audio systems with amplifiers to less than significant. However, fireworks displays, which would occur at approximately 600 feet above the project site, could remain potentially significant at existing nearby noise-sensitive receptors and at future noise-sensitive receptors at buildout of the CASP. Furthermore, noise from fireworks may be considered a nuisance by nearby residents with small children, pets, and/or sensitive car alarms. The noise may be particularly annoying if the displays are not visible from their homes. Mitigation measure NOISE-B would ensure that residents within the area are informed about fireworks displays and other special events at the project site that could be audible at off-site locations. Nonetheless, even with the implementation of mitigation measure NOISE-B, fireworks noise at the project site during special events would remain significant and unavoidable.

All construction impacts, as well as operational impacts related to compliance with established noise standards, groundborne noise and vibration, and permanent noise level increases, would be less than significant without mitigation.