IV. Environmental Impact Analysis

E. Noise

1. Introduction

This section of the Draft EIR analyzes potential noise and vibration impacts of the Project. Included in this section are a description of the existing noise and vibration levels within the Project Site area, an estimation of future noise and vibration levels at surrounding sensitive land uses associated with construction and operation of the Project, a description of the potential significant impacts, and the inclusion of mitigation measures to address any identified potential significant impacts. Additionally, this section of the Draft EIR evaluates the Project's incremental contribution to potential cumulative noise and vibration impacts resulting from past, present, and probable future projects. This section summarizes the noise and vibration information analyses provided in the Noise Calculation Worksheets included in Appendix G of the Draft EIR.

2. Environmental Setting

Due to the technical nature of noise and vibration impacts, a brief overview of basic noise principles and descriptors is provided below.

a. Noise and Vibration Basics

(1) Noise Principles and Descriptors

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air). Noise is generally defined as undesirable (i.e., loud, unexpected, or annoying) sound. Acoustics is defined as the physics of sound and addresses its propagation and control.[1] In acoustics, the fundamental scientific model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determine the sound level and characteristics of the noise perceived by the receiver.

Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level) that is measured in decibels (dB), which is the standard unit of sound amplitude measurement and reflects the way people perceive changes in sound amplitude. The dB scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound, with 0 dB corresponding roughly to the threshold of human hearing and

[1] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.2.1, September 2013.

120 to 140 dB corresponding to the threshold of feeling pain. Pressure waves traveling through air exert a force registered by the human ear as sound.[2]

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but, rather, a broad band of frequencies varying in levels of magnitude. When all of the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequencies spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.[3]

The typical human ear is not equally sensitive to the frequency range from 20 to 20,000 Hz. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that deemphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to these extremely low and extremely high frequencies. This method of frequency filtering or weighting is referred to as A-weighting, expressed in units of A-weighted decibels (dBA), which is typically applied to community noise measurements.[4] Some representative common outdoor and indoor noise sources and their corresponding A-weighted noise levels are shown in **Figure IV.E-1: Decibel Scale and Common Noise Sources**.

(2) Noise Exposure and Community Noise

Community noise exposure is typically measured over a period of time; a noise level is a measure of noise at a given instant in time. Community noise varies continuously over a period of time with respect to the sound sources contributing to the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with many unidentifiable individual contributors. Single-event noise sources, such as aircraft flyovers, sirens, etc., may cause sudden changes in background noise level.[5] However, generally, background noise levels change gradually throughout the day, corresponding with the addition and subtraction of distant noise sources, such as changes in traffic volume.

[2] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.3, September 2013.
[3] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.3, September 2013.
[4] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.3, September 2013.
[5] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.2.1, September 2013.

Figure IV.E-1: Decibel Scale and Common Noise Sources

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock band
Jet flyover at 1,000 feet		
	100	
Gas lawnmower at 3 feet		
	90	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80	Garbage disposal at 3 feet
Noisy urban area, 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 daytime	**50**	Dishwasher in next room
Quiet urban nighttime	**40**	Theater, large conference room (background)
Quiet suburban nighttime		
	30	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20	
		Broadcast/recording studio
	10	
	0	

Source: State of California, Department of Transportation, Technical Noise Supplement, 2009.

These successive additions of sound to the community noise environment change the community noise level from moment to moment, requiring noise exposure to be measured over periods of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. The following noise descriptors are used to characterize environmental noise levels over time.[6]

L_{eq}: The equivalent sound level over a specified period of time, typically, 1 hour (L_{eq}). The L_{eq} may also be referred to as the energy-average sound level.

L_{max}: The maximum, instantaneous noise level experienced during a given period of time.

L_{min}: The minimum, instantaneous noise level experienced during a given period of time.

L_x: The noise level exceeded a percentage of a specified time period. For instance, L_{50} and L_{90} represent the noise levels that are exceeded 50 percent and 90 percent of the time, respectively.

L_{dn}: The average A-weighted noise level during a 24-hour day, obtained after an addition of 10 dBA to measured noise levels between the hours of 10:00 P.M. to 7:00 A.M. the next day to account for nighttime noise sensitivity. The L_{dn} is also termed the day-night average noise level (DNL).

CNEL: The Community Noise Equivalent Level (CNEL) is the time average A-weighted noise level during a 24-hour day that includes an addition of 5 dBA to measured noise levels between the hours of 7:00 P.M. to 10:00 P.M. and an addition of 10 dBA to noise levels between the hours of 10:00 P.M. to 7:00 A.M. the next day to account for noise sensitivity in the evening and nighttime, respectively.

(3) Effects of Noise on People

Noise is generally loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity that is a nuisance or disruptive. The effects of noise on people can be placed into four general categories:

- Subjective effects (e.g., dissatisfaction, annoyance);
- Interference effects (e.g., communication, sleep, and learning interference);
- Physiological effects (e.g., startled response); and
- Physical effects (e.g., hearing loss).

Although exposure to high noise levels has been demonstrated to cause physical and physiological effects, the principal human responses to typical environmental noise exposure are related to subjective effects and interference with activities. Interference effects interrupt daily activities and include interference with human communication activities, such as normal conversations, watching television, telephone conversations, and interference with sleep.

[6] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.2.2, September 2013.

The World Health Organization's Guidelines for Community Noise details the adverse health effects of high noise levels, which include hearing impairment, speech intelligibility, sleep disturbance, physiological functions (e.g., hypertension and cardiovascular effects), mental illness, performance of cognitive tasks, social and behavioral effects (e.g., feelings of helplessness, aggressive behavior), and annoyance.[7]

With regard to the subjective effects, the responses of individuals to similar noise events are diverse and influenced by many factors, including the type of noise, the perceived importance of the noise, the appropriateness of the noise to the setting, the duration of the noise, the time of day and the type of activity during which the noise occurs, and individual noise sensitivity. Overall, there is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction on people. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted (i.e., comparison to the ambient noise environment). In general, the more a new noise level exceeds the previously existing ambient noise level, the less acceptable the new noise level will be judged by those hearing it. With regard to increases in A-weighted noise levels, the following relationships generally occur:[8]

- Except in carefully controlled laboratory experiments, a change of 1 dBA in ambient noise levels cannot be perceived;
- Outside of the laboratory, a change of 3 dBA in ambient noise levels is considered to be a barely perceivable difference;
- A change of 5 dBA in ambient noise levels is considered to be a readily perceivable difference; and
- A change of 10 dBA in ambient noise levels is subjectively heard as doubling of the perceived loudness.

These relationships between change in noise level and human hearing response occur in part because of the logarithmic nature of sound and the dB scale. Because the dBA scale is based on logarithms, two noise sources do not combine in a simple additive fashion, but, rather, logarithmically. Under the dBA scale, a doubling of sound energy corresponds to a 3-dBA increase. In other words, when two sources are each producing sound of the same loudness, the resulting sound level at a given distance would be approximately 3 dBA higher than one of the sources under the same conditions. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA. Under the dB scale, three sources of equal loudness together produce a sound level of approximately 5 dBA louder than one source, and 10 sources of equal loudness together produce a sound level of approximately 10 dBA louder than the single source.[9]

[7] World Health Organization Team, edited by Berglund, Birgitta; Lindvall, Thomas; Schwela, Dietrich H, Guidelines for Community Noise, 1999.

[8] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.2.1, 2013.

[9] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.2.1.1, September 2013.

(4) Noise Attenuation

When noise propagates over a distance, the noise level reduces, or attenuates, with distance depending on the type of noise source and the propagation path. Noise from a localized source (i.e., point source) propagates uniformly outward in a spherical pattern, referred to as "spherical spreading." The rate of sound attenuation for a point source, such as a piece of mechanical or electrical equipment (e.g., air conditioner) or idling vehicle (e.g., bulldozer), is 6 dBA per doubling of distance from the noise source to the receptor over acoustically "hard" sites and 7.5 dBA per doubling of distance from the noise source to the receptor over acoustically "soft" sites.[10] Hard sites are those with a reflective surface between the source and the receiver, such as asphalt or concrete surfaces or smooth bodies of water. No excess ground attenuation is assumed for hard sites and the reduction in noise levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface, such as soft dirt, grass, or scattered bushes and trees, which in addition to geometric spreading, provide an excess ground attenuation value of 1.5 dBA (per doubling distance).[11] For example, an outdoor condenser fan that generates a sound level of 60 dBA at a distance of 50 feet from a point source at an acoustically hard site would attenuate to 54 dBA at a distance of 100 feet from the point source and attenuate to 48 dBA at 200 feet from the point source.

Roadways and highways consist of several localized noise sources on a defined path and, hence, are treated as "line" sources, which approximate the effect of several point sources.[12] Noise from a line source propagates over a cylindrical surface, often referred to as "cylindrical spreading."[13] Line sources (e.g., traffic noise from vehicles) attenuate at a rate between 3 dBA for hard sites and 4.5 dBA for soft sites for each doubling of distance from the reference measurement.[14] Therefore, noise due to a line source attenuates less with distance than that of a point source with increased distance.

Structures (e.g., buildings and solid walls) and natural topography (e.g., hills and berms) that obstruct the line-of-sight between a noise source and a receptor further reduce the noise level if the receptor is located within the "shadow" of the obstruction, such as behind a sound wall. This type of sound attenuation is known as "barrier insertion loss." If a receptor is located behind the wall but still has a view of the source (i.e., the line-of-sight is not fully blocked), barrier insertion loss would still occur but to a lesser extent. Additionally, a receptor located on the same side of the wall as a noise source may actually experience an increase in the perceived noise level as the wall can reflect noise back to the receptor, thereby compounding the noise. Noise barriers can provide noise level reductions ranging from approximately 5 dBA (where the barrier just breaks the line-of-sight between the source and receiver) to an upper range of 20 dBA with a

[10] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Sections 2.1.4.1 and 2.1.4.2, September 2013.
[11] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Sections 2.1.4.1 and 2.1.4.2, September 2013.
[12] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.4.1, September 2013.
[13] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.4.1, September 2013.
[14] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.4.1, September 2013.

larger barrier.[15] Additionally, structures with closed windows can further attenuate exterior noise by a minimum of 20 dBA to 30 dBA.[16]

Receptors located downwind from a noise source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels.[17] Atmospheric temperature inversion (i.e., increasing temperature with elevation) can increase sound levels at long distances. Other factors, such as air temperature, humidity, and turbulence, can, under the right conditions, also have substantial effects on noise levels.[18]

(5) Vibration Fundamentals

Vibration can be interpreted as energy transmitted in waves through the ground or man-made structures, which generally dissipate with distance from the vibration source. 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. Since energy is lost during its transfer from one particle to another, vibration becomes less perceptible with increasing distance from the source.

As described in the Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment Manual*, groundborne vibration can be a serious concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard.[19] In contrast to airborne noise, groundborne vibration is not a common environmental problem, as it is unusual for vibration from sources, such as rubber-tired buses and trucks, to be perceptible, even in locations close to major roads. Some common sources of groundborne vibration are trains, heavy trucks traveling on rough roads, and certain construction activities, such as blasting, pile-driving, and operation of heavy earth-moving equipment.[20] Groundborne vibration generated by man-made activities (e.g., road traffic, construction operations) typically weakens with greater horizontal distance from the source of the vibration.

Several different methods are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal in inches per second (in/sec) and is most frequently used to describe vibration impacts to buildings.[21] The root mean square (RMS) amplitude is defined as the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body.[22] Decibel notation (VdB) is commonly used to express RMS vibration velocity amplitude. The relationship of PPV to RMS velocity is expressed in terms of the "crest factor," defined as the ratio of the PPV amplitude to the RMS amplitude. PPV is typically a factor of 1.7 to 6 times greater than RMS vibration velocity;

[15] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Sections 2.1.4.24 and 5.1.1, September 2013.
[16] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 7.4.2, Table 7-1, September 2013.
[17] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.4.3, September 2013.
[18] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.4.3, September 2013.
[19] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 7, 2018.
[20] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 7, 2018.
[21] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 5.1, 2018.
[22] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 5.1, 2018.

FTA uses a crest factor of 4.[23] The decibel notation VdB acts to compress the range of numbers required to describe vibration. Typically, groundborne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration include buildings where vibration would interfere with operations within the building or cause damage (especially older masonry structures), locations where people sleep, and locations with vibration sensitive equipment.[24]

Groundborne noise specifically refers to the rumbling noise emanating from the motion of building room surfaces due to the vibration of floors and walls; it is perceptible only inside buildings.[25] The relationship between groundborne vibration and groundborne noise depends on the frequency of the vibration and the acoustical absorption characteristics of the receiving room. For typical buildings, groundborne vibration that causes low frequency noise (i.e., the vibration spectrum peak is less than 30 Hz) results in a groundborne noise level that is approximately 50 decibels lower than the velocity level. For groundborne vibration that causes mid-frequency noise (i.e., the vibration spectrum peak is between 30 and 60 Hz), the groundborne noise level will be approximately 35 to 37 decibels lower than the velocity level.[26] Therefore, for typical buildings, the groundborne noise decibel level is lower than the groundborne vibration velocity level at low frequencies.

According to the FTA, airborne noise levels would be greater than groundborne noise levels; therefore, if a project's airborne noise levels would not result in significant effects, then it is assumed that groundborne noise would similarly not result in significant effects.[27] Unless indoor receptors have substantial sound insulation (e.g., recording studio) and would be exposed to vibration velocities great enough to cause substantial levels of groundborne noise, groundborne noise does not need to be assessed.[28] Groundborne noise is typically assessed for locations where subway or tunnel operations, where there is no airborne noise path, are present.[29]

b. Regulatory Framework

There are several plans, regulations, and programs that include policies, requirements, and guidelines applicable to the Project regarding noise at the federal, State, regional, and local levels. As described below, these plans, guidelines, and laws include the following:

- Federal Noise Control Act of 1972
- Federal Transportation Administration Vibration Standards
- Federal Occupational Safety and Health Act of 1970
- California Governor's Office of Planning and Research Guidelines for Noise Compatible Land Use

[23] Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual, Section 5.1, 2018.
[24] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Sections 6.1, 6.2, and 6.3, 2018.
[25] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 5.4, 2018.
[26] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Table 6-3 and Table 6-14, September 2018.
[27] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018.
[28] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018.
[29] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018.

- Los Angeles County Airport Land Use Commission Comprehensive Land Use Plan
- City of Los Angeles Municipal Code
- City of Los Angeles General Plan Noise Element

(1) Federal

(a) Noise Control Act of 1972

Under the authority of the Noise Control Act of 1972, the United States Environmental Protection Agency (USEPA) established noise emission criteria and testing methods published in Parts 201 through 205 of Title 40 of the Code of Federal Regulations (CFR) that apply to some transportation equipment (e.g., interstate rail carriers, medium trucks, and heavy trucks) and construction equipment. In 1974, USEPA issued guidance levels for the protection of public health and welfare in residential areas of an outdoor L_{dn} of 55 dBA and an indoor L_{dn} of 45 dBA.[30] These guidance levels are not standards or regulations and were developed without consideration of technical or economic feasibility. There are no federal noise standards that directly regulate environmental noise related to the construction or operation of development projects. Moreover, the federal noise standards are not reflective of urban environments that range by land use, density, proximity to commercial or industrial centers, etc.

(b) Federal Transit Administration Vibration Standards

There are no federal vibration standards or regulations adopted by any agency that are applicable to evaluating vibration impacts from land use development projects, such as the Project. However, the FTA has adopted vibration criteria for use in evaluating vibration impacts from construction activities, as presented in its Transit Noise and Vibration Impact Assessment Manual.[31] The vibration damage criteria adopted by the FTA are shown in **Table IV.E-1: Construction Vibration Damage Criteria.**

Table IV.E-1: Construction Vibration Damage Criteria

Building Category	PPV (in/sec)
I. Reinforced-concrete, steel, or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12
Source: FTA, Transit Noise and Vibration Impact Assessment Manual, 2018.	

The FTA has also adopted standards associated with human annoyance for determining the groundborne vibration and noise impacts from groundborne noise on the following three off-site land-use categories: Vibration Category 1 – High Sensitivity; Vibration Category 2 – Residential; and Vibration Category 3 – Institutional.[32] The FTA defines Category 1 as buildings where vibration would interfere with operations within the building, including vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and university research operations. Vibration-sensitive equipment includes, but is not limited to, electron

[30] U.S. Environmental Protection Agency, EPA Identifies Noise Levels Affecting Health and Welfare, 1974.
[31] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Table 7-5, page 186, 2018.
[32] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Table 6-1, page 124, 2018.

microscopes, high-resolution lithographic equipment, and normal optical microscopes. Category 2 refers to all residential land uses and any buildings where people sleep, such as hotels and hospitals. Category 3 refers to institutional land uses, such as schools, churches, other institutions, and quiet offices (e.g., doctors' offices), that do not have vibration-sensitive equipment but that still potentially involve activities that could be disturbed by vibration. The vibration thresholds associated with human annoyance for these three land-use categories are shown in **Table IV.E-2**, **Groundborne Vibration and Groundborne Noise Impact Criteria for General Assessment**. No thresholds have been adopted or recommended for commercial or office uses.

Table IV.E-2: Groundborne Vibration and Groundborne Noise Impact Criteria for General Assessment

Land Use Category	Frequent Events [a]	Occasional Events [b]	Infrequent Events [c]
Category 1: Buildings where vibration would interfere with interior operations.	65 VdBd	65 VdBd	65 VdBd
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB

NOTES:
a "Frequent Events" is defined as more than 70 vibration events of the same source per day.
b "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.
c "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day.
d This criterion is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes.
Source: FTA, Transit Noise and Vibration Impact Assessment Manual, September 2018.

(c) Occupational Safety and Health Act of 1970

Under the Occupational Safety and Health Act of 1970 (29 United States Code [USC] Sections 1919 et seq.), the Occupational Safety and Health Administration (OSHA) has adopted regulations designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise level exposure as a function of the amount of time during which the worker is exposed. The regulations further specify a hearing conservation program that involves monitoring noise to which workers are exposed, ensuring that workers are made aware of overexposure to noise, and periodically testing the workers' hearing to detect any degradation.[33]

(2) State

(a) Office of Planning and Research Guidelines for Noise Compatible Land Use

The State of California has not adopted Statewide standards for environmental noise, but the Governor's Office of Planning and Research (OPR) has established guidelines for evaluating the compatibility of various land uses as a function of community noise exposure, as presented in **Figure IV.E-2: Guidelines for Noise Compatible Land Use**.[34] The purpose of these

[33] United States Department of Labor, Occupational Safety and Health Act, 1970.
[34] State of California, Governor's Office of Planning and Research, General Plan 2017 Guidelines, page 377, 2017.

guidelines is to maintain acceptable noise levels in a community setting for different land use types. Noise levels are divided into four general categories, which vary in range according to land use type: "normally acceptable," "conditionally acceptable," "normally unacceptable," and "clearly unacceptable." California Government Code Section 65302 requires each county and city in the State to prepare and adopt a comprehensive long-range general plan for its physical development, with Section 65302(f) requiring a noise element to be included in the general plan. The noise element must identify and appraise noise problems in the community and analyze and quantify current and projected noise levels.

The State has also established noise insulation standards for new multi-family residential units, hotels, and motels. These requirements are collectively known as the California Noise Insulation Standards (Title 24 of the California Code of Regulations [CCR]). The noise insulation standards set forth an interior standard of 45 dBA CNEL in any habitable room. The standards require an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to exterior noise levels greater than 60 dBA CNEL. Title 24 standards are typically enforced by local jurisdictions through the building permit application process.

The State of California's noise insulation standards for nonresidential uses are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 11, California Green Building Standards (CALGreen) Code. The CALGreen Code noise standards are applied to new or renovation construction projects in California to control interior noise levels resulting from exterior noise sources. Proposed projects may use either the prescriptive method (CALGreen Code Section 5.507.4.1) or the performance method (CALGreen Code Section 5.507.4.2) to show compliance. Under the prescriptive method, a project must demonstrate transmission loss ratings for the wall and roof-ceiling assemblies and exterior windows when located within a noise environment of 65 dBA CNEL or higher. Under the performance method, a project must demonstrate that interior noise levels do not exceed 50 dBA $L_{eq(1hr)}$. In addition, pursuant to PRC Section 21085, for residential projects, the effects of noise generated by project occupants and their guests on human beings is not a significant effect on the environment.

(b) Caltrans Criteria for Building Damage

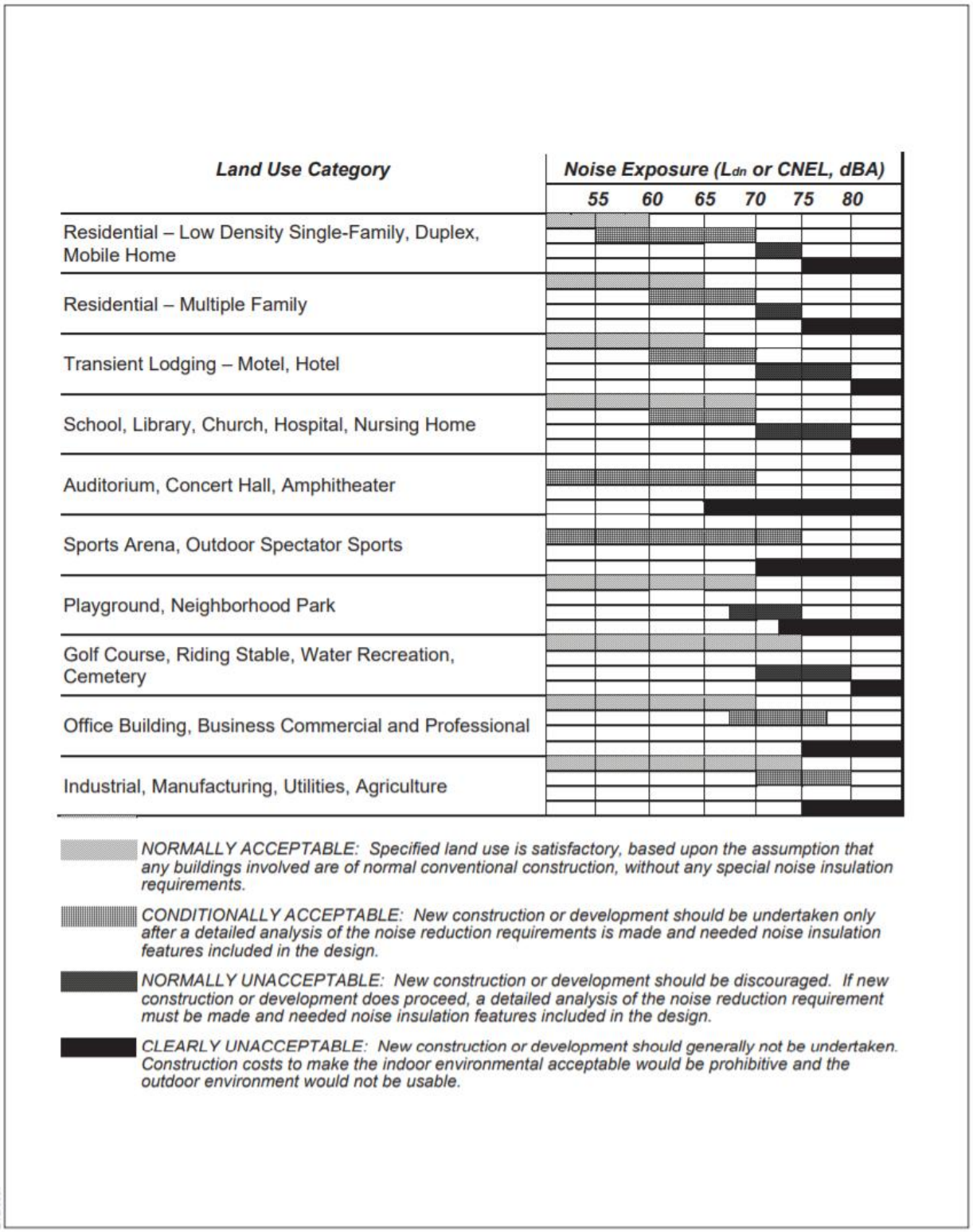
Caltrans uses specific criteria to assess potential building damage associated with construction activities. Specifically, Table 19 of its Transportation and Construction Vibration Guidance Manual includes the following criteria for building damage based on building type:[35]

- Fragile Buildings: 0.1 PPV
- Historic Buildings: 0.25 PPV
- Older Residential Structures: 0.3 PPV
- New Residential Structures: 0.5 PPV
- Modern Industrial/Commercial Buildings: 0.5 PPV

These criteria are used in the analysis below.

[35] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020.

Figure IV.E-2: Guidelines for Noise Compatible Land Use



Source: State of California, General Plan Guidelines, Governor's Office of Planning and Research, 2003.

(3) Regional

(a) Los Angeles County Airport Land Use Commission Comprehensive Land Use Plan

In Los Angeles County (County) the Regional Planning Commission has the responsibility for acting as the Airport Land Use Commission (ALUC) and for coordinating the airport planning of public agencies within the County. The ALUC coordinates planning for the areas surrounding public use airports. The Comprehensive Land Use Plan provides for the orderly expansion of Los Angeles County's public use airports and the area surrounding them. It is intended to provide for the adoption of land use measures that will minimize the public's exposure to excessive noise and safety hazards. In formulating the Comprehensive Land Use Plan, the Los Angeles County ALUC has established provisions for safety, noise insulation, and the regulation of building height within areas adjacent to each of the public airports in the County.

(4) Local

(a) Los Angeles Municipal Code

The City of Los Angeles Noise Regulations are provided in Chapter XI of the Los Angeles Municipal Code (LAMC). LAMC Section 111.02 provides procedures and criteria for the measurement of the sound level of "offending" noise sources. In accordance with the LAMC, a noise source that causes a noise level increase of 5 dBA over the existing average ambient noise level as measured at an adjacent property line creates a noise violation. This standard applies to radios, television sets, air conditioning, refrigeration, heating, pumping and filtering equipment, powered equipment intended for repetitive use in residential areas, and motor vehicles driven on-site. To account for people's increased tolerance for short-duration noise events, the Noise Regulations provide a 5-dBA allowance for a noise source that causes noise lasting more than 5 but less than 15 minutes in any one-hour period, and an additional 5-dBA allowance (for a total of 10 dBA) for a noise source that causes noise lasting 5 minutes or less in any one-hour period.[36]

The LAMC provides that in cases where the actual ambient conditions are not known, the City's presumed daytime (7:00 A.M. to 10:00 P.M.) and nighttime (10:00 P.M. to 7:00 A.M.) minimum ambient noise levels as defined in LAMC Section 111.03 should be used. The presumed ambient noise levels for these areas where the actual ambient conditions are not known as set forth in the LAMC Section 111.03 is provided in **Table IV.E-3: City of Los Angeles Presumed Ambient Noise Levels**. For example, for residential-zoned areas, the presumed ambient noise level is 50 dBA during the daytime and 40 dBA during the nighttime.

[36] Los Angeles Municipal Code, Chapter XI, Article I, Section 111.02-(b).

Table IV.E-3: City of Los Angeles Presumed Ambient Noise Levels

Zone	Daytime Hours (7 A.M. to 10 P.M.) dBA (L_{eq})	Nighttime Hours (10 P.M. to 7 A.M.) dBA (L_{eq})
Residential (A1, A2, RA, RE, RS, RD, RW1, RW2, R1, R2, R3, R4, and R5)	50	40
Commercial (P, PB, CR, C1, C1.5, C2, C4, C5, and CM)	60	55
Manufacturing (M1, MR1 and MR2)	60	55
Heavy Manufacturing (M2 and M3)	65	65
Source: LAMC Section 111.03.		

LAMC Section 112.01 limits noise from amplified voice and music and prohibits the operation of such devices (e.g., radio, musical instrument, phonograph, television receiver, or other machine) or other sounds in such a manner as to disturb the peace, quiet, and comfort of neighbors. Specifically, noise from such uses or operation which exceeds the ambient noise level on the premises of any other occupied property, or if a condominium, apartment house, duplex, or attached business, within any adjoining unit, by more than 5 dB.

LAMC Section 112.02 limits increases in noise levels from air conditioning, refrigeration, heating, pumping, and filtering equipment. Such equipment may not be operated in such a manner as to create any noise which would cause the noise level on the premises of any other occupied property, or, if a condominium, apartment house, duplex, or attached business, within any adjoining unit, to exceed the ambient noise level by more than 5 dB.

LAMC Section 112.05 sets a maximum noise level for construction equipment of 75 dBA at a distance of 50 feet when operated within 500 feet of a residential zone. Compliance with this standard shall not apply where compliance therewith is technically infeasible.[37] LAMC Section 41.40 prohibits construction between the hours of 9:00 P.M. and 7:00 A.M. Monday through Friday, 6:00 P.M. and 8:00 A.M. on Saturday or any national holiday, and at any time on Sunday (i.e., construction is allowed Monday through Friday between 7:00 A.M. to 9:00 P.M. and on Saturdays and national holidays between 8:00 A.M. to 6:00 P.M.). In general, the City's Department of Building and Safety enforces provisions of the City's noise regulations relative to equipment, and the Los Angeles Police Department (LAPD) enforces provisions relative to noise generated by people.

LAMC Section 113.01 prohibits collecting or disposing of rubbish or garbage, operating any refuse disposal truck, or collecting, loading, picking up, transferring, unloading, dumping, discarding, or disposing of any rubbish or garbage, as such terms are defined in LAMC Section 66.00, within 200 feet of any residential building between the hours of 9:00 P.M. and 6:00 A.M. of the following day, unless a permit has been duly obtained beforehand from the Board of Police Commissioners.

[37] In accordance with the City's noise regulations, "technically feasible" means that the established noise limitations can be complied with at a project site, with the use of mufflers, shields, sound barriers, and/or other noise reduction devices or techniques employed during the operation of equipment.

Section 91.1206.14.2 prohibits interior noise levels attributable to exterior sources from exceeding 45 dBA in any habitable room. The noise metric shall be either the day-night average sound level (L_{dn}) or the CNEL, consistent with the noise element of the local general plan.

With regard to vibration, LAMC Section 91.3307.1 states, "Adjoining public and private property shall be protected from damage during construction, remodeling, and demolition work. Protection must be provided for footings, foundations, party walls, chimneys, skylights, or roofs. Provisions shall be made to control water runoff and erosion during construction or demolition activities."

With respect to construction noise and vibration, the City published and adopted a Construction Noise and Vibration Updates to Thresholds and Methodology Report[38]. This document provides updated construction noise and vibration significance threshold criteria to be used in assessing environmental impacts of projects in accordance with CEQA. These updated criteria are included in Subsection 3.a, Thresholds of Significance, below.

(b) City of Los Angeles General Plan Noise Element

The Noise Element of the City's General Plan policies include the CNEL guidelines for land use compatibility as shown in **Table IV.E-4: City of Los Angeles Land Use Compatibility for Community Noise** and includes a number of goals, objectives, and policies for land use planning purposes. The overall purpose of the Noise Element is to guide policymakers in making land use determinations and in preparing noise ordinances that would limit exposure of citizens to excessive noise levels.[39] The following are applicable policies and objectives from the Noise Element.

- **Objective 2** (Non-airport): Reduce or eliminate non-airport related intrusive noise, especially relative to noise sensitive uses.
    - **Policy 2.2:** Enforce and/or implement applicable city, state, and federal regulations intended to mitigate proposed noise producing activities, reduce intrusive noise and alleviate noise that is deemed a public nuisance.
- **Objective 3** (Land Use Development): Reduce or eliminate noise impact associated with proposed development of land and changes in land use.
    - **Policy 3.1:** Develop land use policies and programs that will reduce or eliminate potential and existing noise impacts.

Exhibit I of the Noise Element also contains guidelines for noise compatible land uses.[40] The following table summarizes these guidelines, which are based on OPR guidelines from 1990.

[38] City of Los Angeles, Construction Noise and Vibration Updates to Threshold and Methodology Report, December 2025, adopted on September 25, 2024.
[39] City of Los Angeles, General Plan, Noise Element, Pages 1.1-2.4, 1999.
[40] City of Los Angeles, General Plan, Noise Element, Page I-1, 1999.

Table IV.E-4: City of Los Angeles Land Use Compatibility for Community Noise

Land Use	Community Noise Exposure CNEL (dBA)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Single-Family, Duplex, Mobile Homes	50 – 60	55 – 70	70 – 75	Above 70
Multi-Family Homes	50 – 65	60 – 70	70 – 75	Above 70
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 – 70	60 – 70	70 – 80	Above 80
Transient Lodging – Motels, Hotels	50 – 65	60 – 70	70 – 80	Above 80
Auditoriums, Concert Halls, Amphitheaters	--	50 – 70	--	Above 65
Sports Arena, Outdoor Spectator Sports	--	50 – 75	--	Above 70
Playgrounds, Neighborhood Parks	50 – 70	--	67 – 75	Above 72
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 – 75	--	70 – 80	Above 80
Office Buildings, Business, Professional Commercial	50 – 70	67 – 77	Above 75	--
Industrial, Manufacturing, Utilities, Agriculture	50 – 75	70 – 80	Above 75	--

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 systems 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 insulation features included in the design.
Clearly Unacceptable: New construction or development should generally not be undertaken.
Source: City of Los Angeles L.A. CEQA Thresholds Guide, 2006.

c. Existing Conditions

As discussed in Section II, Project Description, of this Draft EIR, the Project Site is in an urbanized area that is developed with a diverse mix of land uses. The Project Site is impacted by various noise sources. Mobile sources of noise, including traffic along South Figueroa Street, West 38th Street, South Flower Drive, West 39th Street, and Interstate 110 (Harbor Freeway) are the most common and prominent existing sources of noise at the Project Site and in the surrounding area. Other ambient existing sources of noise on and near the Project Site include parking lot noise and mechanical equipment noise (e.g., heating, ventilation, and air conditioning [HVAC] units) operating at the Project Site, noise from existing nearby commercial and residential uses, Exposition Park and its soccer and football stadiums, and other miscellaneous noise sources associated with typical urban activities (e.g., idling cars/trucks, pedestrians, car radios and music playing, dogs barking, etc.).

(1) Ambient Noise Levels

To establish baseline noise conditions at the Project Site in the immediately surrounding area, Kimley-Horn conducted four short-term (15-minute) measurements on Tuesday, October 22, 2024; see Appendix G of this Draft EIR for additional details regarding how the

ambient noise measurements were taken.[41] The noise measurement sites were selected to be representative of the existing ambient noise levels at the noise-sensitive uses adjacent to the Project Site. The 15-minute daytime measurements were taken between 12:16 p.m. and 2:01 p.m. Measurements of L_{eq} are considered representative of the noise levels throughout the day. The average noise levels measured at each location are listed in **Table IV.E-5: Existing Noise Measurement Locations and Measurements** and shown on **Figure IV.E-3: Noise Measurement Locations and Sensitive Receptors.**

Table IV.E-5: Existing Noise Measurement Locations and Measurements

Site	Location	Adjacent Land Use	Measurement Period	Duration	Daytime Average L_{eq} (dBA)
ST-1	Northwest corner of Project Site along West 38th Street	Residential	12:16 p.m. – 12:31 p.m.	15 minutes	60.8
ST-2	South Figueroa Street between West 38th Street and West 39th Street	Residential	12:35 p.m. – 12:50 p.m.	15 minutes	63.5
ST-3	Northwest corner of West 39th Street and South Flower Drive	Recreation	1:26 p.m. – 1:41 p.m.	15 minutes	63.7
ST-4	Southeast corner of Project Site along South Flower Drive	Residential	1:46 p.m. – 2:01 p.m.	15 minutes	58.9

Source: Noise measurements taken by Kimley-Horn and Associates, Inc., October 22, 2024.

Based on field observations, the current ambient noise at the measurement locations is dominated by local traffic and, to a lesser extent, other typical urban noises. As indicated in **Table IV.E-5**, the existing ambient noise levels at the off-site noise receptor locations ranged from 58.9 dBA (L_{eq}) at measurement location ST-4 to 63.7 dBA (L_{eq}) at measurement location ST-3.

In addition to the ambient noise measurements in the vicinity of the Project Site, the existing traffic noise levels on local roadway segments were calculated using the Federal Highway Administration's (FHWA's) Highway Noise Prediction Model (FHWA-RD-77-108). Four roadway segments were selected for the existing off-site traffic noise analysis included in this section based on proximity to the Project Site, as these roadways would experience the greatest potential increases in traffic volumes from Project operation. **Table IV.E-6: Existing Roadway Traffic Noise Levels** provides the calculated CNEL for the analyzed local roadway segments based on existing daily traffic volumes provided by the Transportation Assessment prepared for the Project and included in Appendix I of this Draft EIR. As shown therein, the existing CNEL due to surface street traffic volumes ranges from 50.9 dBA CNEL along West 38th Street between South Figueroa Street and South Flower Drive to 69.8 dBA CNEL along South Figueroa Street between South Flower Drive and West 39th Street. The existing traffic-related noise levels fall within the normally acceptable land use category for single-family residential uses (i.e., between 50 dBA and 60 dBA CNEL) along West 38th Street between South Figueroa Street and South Flower Drive and along South Flower Drive between West 38th Street and West 39th Street. The existing traffic-related noise levels fall within the conditionally acceptable land use category for single-family residential uses (i.e., between 55 dBA and 70 dBA CNEL) along West 39th Street between South Figueroa Street and South Flower Drive and along South Figueroa Street between South Flower Drive and West 39th Street.

[41] The ambient noise measurements were taken in accordance with the City's standards, which require ambient noise to be measured over a period of at least 15 minutes; See Section 111.01 of the LAMC.

SOURCE: Nearmap, 2024

N.T.S.

FIGURE IV.E-3: Noise Measurement Locations and Sensitive Receptors

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Kimley»Horn

Table IV.E-6: Existing Roadway Traffic Noise Levels

Roadway Segment	Adjacent Land Use	Calculated Traffic Noise Level (CNEL)[a]	Noise-Sensitive Land Uses	Existing Noise Compatibility
West 38th Street between South Figueroa Street and South Flower Drive	Multi-Family Residential, Single-Family Residential	51.8	Yes	Normally Acceptable
South Flower Drive between West 38th Street and West 39th Street	Single-Family Residential	50.9	Yes	Normally Acceptable
West 39th Street between South Figueroa Street and South Flower Drive	Single-Family Residential	64.8	Yes	Normally Acceptable
South Figueroa Street between South Flower Drive. and West 39th Street	Multi-Family Residential, Commercial, Recreation	69.8	Yes	Conditionally Acceptable

[a] Detailed calculation worksheets are included in Appendix G of this Draft EIR.
[b] Noise compatibility is based on the most stringent land use, per the City's land use compatibility guidelines
Source: Kimley-Horn, 2025.

(2) Noise-Sensitive Receptors

Noise exposure standards and guidelines for various types of land uses reflect the varying noise sensitivities associated with each of these uses. The L.A. CEQA Thresholds Guide states that noise-sensitive uses include residences, transient lodgings (hotels), schools, libraries, churches, hospitals, nursing homes, auditoriums, concert halls, amphitheaters, playgrounds, and parks.[42] Similarly, the City of Los Angeles General Plan Noise Element defines sensitive noise receptors as single-family and multi-unit dwellings, long-term care facilities (including convalescent and retirement facilities), dormitories, motels, hotels, transient lodging, and other residential uses; houses of worship; hospitals; libraries; schools; auditoriums; concert halls; outdoor theaters; nature and wildlife preserves; and parks.[43] Based on a review of the land uses in the vicinity of the Project Site, six noise receptor locations were selected to represent noise-sensitive uses within 500 feet of the property line of the Project Site. Sensitive receptors near the Project Site are shown in **Table IV.E-7: Sensitive Receptors** (see **Figure IV.E-3**), along with the Noise Measurement Location that represents each sensitive receptor. These locations represent areas with land uses that could qualify as noise-sensitive uses according to the definition of such uses in the City's L.A. CEQA Thresholds Guide and the General Plan.

[42] City of Los Angeles, L.A. CEQA Thresholds Guide, p. I.1-3.
[43] City of Los Angeles, General Plan Noise Element, 1999.

Table IV.E-7: Sensitive Receptors

Receptor Description	Distance[1] and Direction from the Project
Sensitive Receptor 1 – Residential (represented by ambient noise measurement ST-1 and ST-2)	Adjacent to the Project Site on the north/west
Sensitive Receptor 2 – Residential (represented by ambient noise measurement ST-2 and ST-4)	Adjacent to the Project Site on the south
Sensitive Receptor 3 – Residential (represented by ambient noise measurement ST-1)	50 feet to the north of Project Site
Sensitive Receptor 4 – Exposition Park (represented by ambient noise measurement ST-2)	200 feet to the west of Project Site
Sensitive Receptor 5 – Residential (represented by ambient noise measurement ST-4)	300 feet to the south of Project Site
Sensitive Receptor 6 – Dr. Theodore T. Alexander Jr. Science Center School (represented by ambient noise measurement ST-2)	550 feet to the northwest of Project Site

Source: Google Earth, 2024.
[1] Distance measured from the property line of the Project Site to the nearest receptor property line.

(3) Existing Groundborne Vibration Levels

Based on field observations during the noise measurements, the primary source of existing groundborne vibration in the vicinity of the Project Site is vehicular travel (e.g., standard cars, refuse trucks, delivery trucks, construction trucks, school buses, and buses) on nearby roadways. According to the FTA technical study "Federal Transit Administration: Transit Noise and Vibration Impact Assessments," typical road traffic-induced vibration levels are unlikely to be perceptible by people. Specifically, the FTA study reports that "[i]t is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads."[44] Trucks and buses typically generate groundborne vibration velocity levels of around 63 VdB (at a distance of 50 feet), and these levels could reach 72 VdB when trucks and buses pass over traffic speed bumps in the road. Per the FTA, 74 VdB is the dividing line between barely perceptible (with regard to ground vibration) and distinctly perceptible.[45] Therefore, existing groundborne vibration in the vicinity of the Project Site is generally below the perceptible level. However, groundborne vibration associated with heavy trucks traveling on road surfaces with irregularities, such as speed bumps and potholes, could reach the perceptible threshold.

3. Project Impacts

a. Thresholds of Significance

(1) State CEQA Guidelines Appendix G

In accordance with the State CEQA Guidelines Appendix G, the Project would have a significant impact related to noise if it would result in the following:

[44] FTA, Transit Noise and Vibration Impact Assessment, September 2018, p. 122.
[45] FTA, Transit Noise and Vibration Impact Assessment, September 2018, Table 5-5.

Threshold (a): Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

Threshold (b): Generation of excessive groundborne vibration or groundborne noise levels; or

Threshold (c): For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

(2) City of Los Angeles

For this analysis, the Appendix G Thresholds above are relied upon. The analysis utilizes factors and considerations identified in the City's 2024 Updates to Thresholds and Methodology for Construction Noise and Vibration (Thresholds Update) and 2006 L.A. CEQA Thresholds Guide, which is more conservative than the City's Thresholds Update, to assist in answering the Appendix G Threshold Questions.

(a) Construction Noise

In accordance with the Thresholds Update and Methodology for Construction Noise and Vibration, a project would normally have a significant impact on noise levels from construction if:

- Construction activities occurring during daytime hours (between 7:00 A.M. and 7:00 P.M. Monday through Friday, and 8:00 A.M. to 6:00 P.M. on Saturdays) would exceed an absolute threshold of 80 dBA $L_{eq\ (8\text{-}hour)}$ at sensitive uses[46] (at the property line with outdoor uses or at the exterior of the building), including outdoor public recreational areas;

- Construction activities occurring during nighttime hours (between 7:00 P.M. and 7:00 A.M. Monday through Friday, and between 6:00 P.M. and 8:00 A.M. on Saturdays, and anytime on Sundays or national holidays) would exceed the following thresholds at sensitive uses[47]:
  - 55 dBA $L_{eq(1\text{-}hour)}$ for sensitive uses within older buildings that would have operable windows that may be open,
  - 65 dBA $L_{eq(1\text{-}hour)}$ for sensitive uses with windows closed and are single-glazed, or

[46] Daytime noise-sensitive uses include single-family and multi-unit dwellings, long-term care facilities (including convalescent and retirement facilities), dormitories, motels, hotels, transient lodging, and other residential uses; places of assembly including churches or houses of worship; hospitals; libraries; schools; auditoriums; concert halls; outdoor theaters; nature and wildlife preserves; outdoor public recreational areas; and parks. This definition does not include private residential balconies which may or may not extend past the exterior of a building, or to private outdoor spaces.

[47] Nighttime noise sensitive uses include single-family and multi-unit dwellings, long-term care facilities (including convalescent and retirement facilities), dormitories, motels, hotels, transient lodging, and other residential uses; nature and wildlife preserves; outdoor public recreational areas; and parks. This definition does not apply to private residential balconies or private outdoor spaces.

- 70 dBA $L_{eq(1\text{-}hour)}$ for sensitive uses that have newer construction (i.e., the structures have been designed to ensure that an interior 45 dBA is obtained with double-paned windows);

Mat pour activities (and other types of concrete pour, which required an extended continuous pour beyond the allowable construction hours) that are required to occur during nighttime hours for less than five days are exempt from this threshold; or

- Construction activities occurring during nighttime hours (between 7:00 P.M. and 7:00 A.M. Monday through Friday, and between 6:00 P.M. and 8:00 A.M. on Saturdays, and anytime on Sundays or national holidays) would exceed 5 dBA above the ambient noise level at sensitive uses (at the property line with outdoor uses or at the exterior of the building). Mat pour activities (and other types of concrete pour, which required an extended continuous pour beyond the allowable construction hours) that are required to occur during nighttime hours for less than five days are exempt from this threshold.

Nighttime construction activities are not anticipated. Therefore, the nighttime threshold is not applicable and is not discussed herein.

(b) Operational Noise

The 2006 L.A. CEQA Threshold Guide identifies the following criteria to evaluate construction noise impacts:

A project would normally have a significant impact on noise levels from operation if:

- The Project causes the ambient noise levels measured at the property line of affected noise-sensitive uses to increase by 3 dBA in CNEL to or within the "normally unacceptable" or "clearly unacceptable" category; or
- The Project causes the ambient noise levels measured at the property line of affected noise-sensitive uses to increase by 5 dBA in CNEL or greater; or
- Project-related operational on-site (i.e., non-roadway) noise sources, such as outdoor building mechanical/electrical equipment, outdoor activities, loading trash compactor, or parking facilities, increase the ambient noise level (hourly Leq) at noise sensitive uses by 5 dBA.

The significance criterion used in the noise analysis for on-site operations presented below is an increase in ambient noise level of 5 dBA (hourly L_{eq}) at the analyzed noise-sensitive uses, in accordance with the LAMC. The LAMC does not apply to off-site traffic (i.e., pursuant to the 2006 L.A. CEQA Thresholds Guide, the significance criterion for off-site traffic noise associated with Project operations is an increase in the ambient noise level by 3 dBA or 5 dBA in CNEL (depending on the land use category) at noise-sensitive uses. In addition, the significance criterion for composite noise levels (on-site and off-site sources) is also based on the L.A. CEQA Thresholds Guide, which is an increase in the ambient noise levels of 3 dBA or 5 dBA in CNEL (depending on the land use category) for the Project's composite noise (both Project-related on-site and off-site sources) at noise-sensitive uses.

(3) Airport Noise

A project would normally have a significant impact on noise levels from airport noise if:

- Noise levels at a noise sensitive use attributable to airport operations exceed 65 dB CNEL and the project increases ambient noise levels by 1.5 dB CNEL or greater.

(4) FTA Groundborne Vibration Standards and Guidelines

The City currently does not have significance criteria to assess vibration impacts during construction. The Updates to Thresholds and Methodology for Construction Noise and Vibration provides vibration limits based on Caltrans' and FTA's guidelines to evaluate potential vibration impacts related to building damage and human annoyance, respectively.[48,49] Based on Caltrans' guidance, impacts relative to ground-borne vibration associated with potential building damage would be considered significant if any of the following events were to occur:

- Project construction activities cause groundborne vibration levels to exceed the following building damage thresholds for identified structures:
  - Fragile Buildings: 0.1 PPV
  - Historic Buildings: 0.25 PPV
  - Older Residential Structures: 0.3 PPV
  - New Residential Structures: 0.5 PPV
  - Modern Industrial/Commercial Buildings: 0.5 PPV

Based on FTA guidance, construction vibration impacts associated with human annoyance or building damage would be significant if the following were to occur:

- **Human Annoyance:** During nighttime hours (between 7:00 p.m. and 7:00 a.m. Monday through Friday, and between 6:00 p.m. and 8:00 a.m. on Saturdays), and anytime on Sundays or national holidays, construction activities shall not generate groundborne vibration levels that exceed 80 VdB at the exterior of a sensitive use building.
- **Architectural Building Damage:** Construction activities shall not exceed the following building damage thresholds for the identified structures:
  - Fragile Buildings: 0.1 PPV
  - Historic Buildings: 0.25 PPV
  - Older[50] Residential Structures: 0.3 PPV
  - New Residential Structures: 0.5 PPV
  - Modern Industrial/Commercial Buildings: 0.5 PPV

[48] Caltrans, Transportation and Construction Vibration Guidance Manual, September 2013.
[49] FTA, Transit Noise and Vibration Impact Assessment Manual, September 2018.
[50] A building over 50 years can be considered an "older" residential structure. Source: City of Los Angeles, Updates to Thresholds and Methodology for Construction Noise and Vibration, 2024.

b. Methodology

(1) On-Site Construction Activities

Construction noise levels were based on typical noise levels generated by construction equipment published by the FTA and FHWA. The FTA's Roadway Construction Noise Model (RCNM) was used to estimate construction noise levels at 50 feet from all pieces of equipment to determine the loudest construction phase. Utilizing the reference noise level data from RCNM, the construction phase with the highest calculated noise level (grading) was modeled using the SoundPLAN Model to determine how the sound from construction equipment would propagate and determine noise levels at the Project property line. In accordance with the noise thresholds, ambient noise levels are no longer a relevant measurement when analyzing daytime construction activities. Following the adoption of the City's Thresholds Update, noise from grading equipment was modeled as an area source across the entire Project Site. This analysis is appropriate because L_{eq} can be used to describe the noise level from the operation of each piece of equipment separately, and the levels can be combined to represent the noise level from all equipment operating at the Project Site concurrently during a given period.

(2) Off-Site Construction Activity

The Project includes the undergrounding of utility lines along West 38th Street, South Flower Drive, and West 39th Street. FHWA's Roadway Construction Noise Model (RCNM) was used to estimate construction noise levels. In addition to off-site utility undergrounding, off-Site construction noise impacts from haul trucks associated with the Project were analyzed utilizing reference noise data collected from published sources. The construction-related off-site truck volumes were obtained from the Transportation Assessment prepared for the Project, which is included in Appendix I of this Draft EIR. The construction phase with the highest assumed number of trucks would be building construction, when it is assumed there would be up to 27 daily delivery truck trips accessing the Project Site. As a reasonable worst-case assumption, the number of truck pass-bys occurring within a one-hour period accounts for all 27 daily trucks. Noise impacts were determined by comparing the predicted noise level of construction-related haul trucks plus the ambient noise levels along the Project's anticipated haul route.

(3) On-Site Stationary Noise Sources (Operation)

The analysis of the "existing" and "existing plus Project" noise environments is based on noise prediction modeling and empirical observations. Reference noise level data are used to estimate the Project operational noise impacts from stationary sources. Noise levels were collected from published sources from similar types of activities and used to estimate noise levels expected with the Project's stationary sources. The reference noise levels are used to represent a worst-case noise environment as noise levels from stationary sources can vary throughout the day. Operational noise is evaluated based on the City's noise standards (i.e., L.A. CEQA Thresholds Guide and LAMC).

(4) Off-Site Roadway Noise (Operation)

Off-Site roadway noise was analyzed using the FHWA's Highway Noise Prediction Model (FHWA-RD-77-108) and traffic data from the Project's Transportation Assessment, included as Appendix I of this Draft EIR. Roadway noise levels were calculated for various roadway segments at 50 feet from the roadway centerline accounting for roadway and median width. Attenuation provided by intervening structures or walls have not been accounted for. Potential Roadway noise conditions without the Project were calculated and compared to noise levels that would occur with implementation of the Project to determine Project-related noise impacts for operational off-site roadway noise.

(5) Construction Vibration

Groundborne vibration impacts due to the Project's construction activities were evaluated by identifying potential vibration sources (i.e., construction equipment), estimating the vibration levels at the receptor locations, and comparing the Project's activities to the applicable vibration significance threshold. Vibration levels were estimated utilizing FTA reference vibration levels and calculated at adjacent structures with the following formula:

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.1}$$

Where:

PPV_{equip} = the peak particle velocity of the equipment adjusted for distance (inches/second)

PPV_{ref} = the source reference vibration level at 25 ft (inches/second)

D = distance from the equipment to the receiver, (feet)

(6) Operational Vibration

The primary source of vibration related to operation of the Project would include vehicle circulation within the parking facilities and off-site vehicular trips. However, as discussed above, vehicular vibration is unlikely to be perceptible by people. The Project would also include typical commercial-grade stationary mechanical equipment, such as air-handling units and fans at roof level, that would include vibration-attenuation mounts to reduce the vibration transmission. The Project does not include land uses that would generate high levels of vibration. In addition, groundborne vibration attenuates rapidly as a function of distance from the vibration source.

c. Project Design Features

The following project design feature is proposed with regard to noise and vibration.

Project Design Feature NOI-PDF-1: Operation of permanently wired amplified sound systems at the rooftop pool deck and ground floor parklets shall be limited to between the hours of 7:00 a.m. and 10:00 p.m. and shall not exceed a volume of 80 dBA measured at 3 feet from any speaker. In addition, all speakers shall be designed and installed to direct sound toward the center of the Project terraces.

d. Analysis of Project Impacts

Threshold (a): Would the Project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

(1) Impact Analysis

(a) On-Site Construction Noise

Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., demolition, land clearing, grading, excavation). Noise generated by construction equipment, including earth movers and material handlers, can reach high levels that can affect noise-sensitive receptors near the construction site. Construction activities for the Project would include demolition, grading, excavation, paving, building construction, and architectural coating. Noise levels associated with individual construction equipment to be used during Project construction are listed in **Table IV.E-8: Project Construction Equipment Noise Levels**.[51] It should be noted that the noise level values shown in **Table IV.E-8** are for the equipment when operating at full power 50 feet from a sensitive receptor, without taking into account any intervening structures or topography that may reduce noise levels. Construction noise was calculated accounting for each piece of equipment's usage factor, or the fraction of time that the equipment would be in use at full power over a specific period of time, based on Table 1 of RCNM.[52] As shown on the table, individual pieces of construction equipment anticipated to be used during construction of the Project would produce maximum noise levels (L_{max}) of 74 to 90 dBA at a reference distance of 50 feet from the noise source. Other primary sources of acoustical disturbance may include random incidents, which would last less than one minute (such as dropping of materials or the hydraulic movement of machinery lifts). Following the City's Thresholds Update, construction noise was predicted at the nearest noise-sensitive receptors utilizing the FHWA's RCNM and SoundPLAN.[53]

Table IV.E-9: Project Maximum Construction Noise Levels, shows the estimated maximum exterior construction noise levels at the nearest sensitive receptors to the Project Site.[54] The receptors surrounding the Project Site consist of multiple stories. To determine the potential noise impacts at upper floors of sensitive receptors, the SoundPLAN model was utilized to calculate construction noise levels at all levels of the neighboring receptors.

Construction-related noise would be temporary and would not result in a permanent increase in ambient noise levels in the area. Construction activities would also be prohibited between the hours of 9:00 p.m. and 7:00 a.m. Monday through Friday and 6:00 p.m. to 8:00 a.m. on Saturdays, and at any time on Sunday (typical construction days will end before 9:00 p.m, as is customary).[55] The City's permitted hours of construction are required in recognition that

[51] Federal Highway Association, Roadway Construction Noise Model, User Guide 2005.
[52] Federal Highway Association, Roadway Construction Noise Model, User Guide 2005.
[53] City of Los Angeles, Updates to Thresholds and Methodology for Construction Noise and Vibration, 2024.
[54] For predicted construction noise levels for all construction phases, see Appendix G of this Draft EIR.
[55] Note that the City's Thresholds Update designates daytime hours as between the hours of 7:00 a.m. to 7:00 p.m. Monday through Friday. Project construction is not anticipated to occur after 7:00 p.m. Monday through Friday.

construction activities undertaken during daytime hours are a typical part of living in an urban environment and do not cause a significant impact. As shown in **Table IV.E-9**, Project construction noise would exceed the City's Thresholds Update significance criterion of 80 dBA L_{eq} at Receptor 1 (residential use to the west and north of the Project Site) and Receptor 2 (residential use to the south of the Project Site). **Therefore, as noted above, temporary noise impacts associated with the Project's on-site construction would be potentially significant.**

Table IV.E-8: Project Construction Equipment Noise Levels

Construction Phase	Equipment[1]	Typical Noise Level (dBA L_{max}) at 50 feet from Source	Usage Factor[2] (%)
Demolition	Concrete Saw	90	20
	Tractor	84	40
	Dozer	82	40
Site Preparation	Grader	85	40
	Tractor	84	40
	Dozer	82	40
Grading	Grader	85	40
	Tractor	84	40
	Dozer	82	40
Infrastructure Improvements	Forklift	85	50
	Tractor	84	40
	Crane	81	16
	Generator	81	50
	Welder	74	40
Building Construction	Forklift	85	50
	Tractor	84	40
	Crane	81	16
	Generator	81	50
	Welder	74	40
Architectural Coating	Compressor	78	40

Source: Federal Highway Association, Roadway Construction Noise Model, User Guide 2005

1. Equipment compiled based on air quality modeling defaults and contractor input.

2. Usage factor represents the percentage of time the equipment would be operating at full power.

(b) Off-Site Construction Noise

The Project includes the undergrounding of utility lines along West 38th Street, South Flower Drive, and West 39th Street. Construction noise from work within the public right of way was calculated accounting for each piece of equipment's usage factor in accordance with RCNM methodology. **Table IV.E-10: Off-Site Utility Installation Construction Noise Levels** summarizes the maximum noise levels associated with off-site utility installation. As shown, off-site utility installation would not exceed the City's Thresholds Update significance criterion of 80 dBA L_{eq} and impacts related to off-site construction would be less than significant.

Table IV.E-9: Project Maximum Construction Noise Levels (Unmitigated)

Receptor	Maximum Noise Level at Receptor (L_{eq} (dBA)) [1]	Noise Threshold (L_{eq} (dBA)) [2]	Exceeded?
1 – Residential (west and north)			
Floor 1	79.8	80	**Yes**
Floor 2	**80.4**		
Floor 3	**80.4**		
Floor 4	**80.2**		
Floor 5	79.9		
2 – Residential (south)			
Floor 1	**83.6**	80	**Yes**
Floor 2	**82.5**		
3 – Residential (north)			
Floor 1	73.4	80	No
Floor 2	74.6		
4 – Exposition Park (southwest)	57.2	80	No
5 – Residential (south)			
Floor 1	50.0	80	No
Floor 2	52.1		
6 – Dr. Theodore T. Alexander Jr. Science Center School (northwest)	51.0	80	No

[1] Per the methodology described in the City's Thresholds Update, construction equipment noise has been modeled as an area source covering the entire Project Site.
[2] Per the City's Thresholds Update.
Source: Federal Highway Administration, *Roadway Construction Noise Model,* 2006. Refer to Appendix G of the Draft EIR for noise modeling results for each construction phase.

Table IV.E-10: Off-Site Utility Installation Construction Noise Levels

Receptor	Maximum Noise Level at Receptor (L_{eq} (dBA)) [1]	Noise Threshold (L_{eq} (dBA)) [2]	Exceeded?
1 – Residential (west and north)	78.9	80	No
2 – Residential (south)	78.9	80	No
3 – Residential (north)	78.9	80	No
4 – Exposition Park (southwest)	59.7	80	No
5 – Residential (south)	78.9	80	No
6 – Dr. Theodore T. Alexander Jr. Science Center School (northwest)	58.7	80	No

[1] Per the methodology described in the City's Thresholds Update, construction equipment noise has been modeled assuming the loudest piece of equipment is located nearest to the receptor.
[2] Per the City's Thresholds Update.
Source: Federal Highway Administration, *Roadway Construction Noise Model,* 2006. Refer to Appendix G of this Draft EIR for noise modeling results for each construction phase.

The Project would also generate mobile-source noise from delivery/haul trucks and construction workers traveling to and from the Project Site during the Project's construction. Trucks would travel to and from the Project Site using South Figueroa Street. Haul and delivery

trucks and construction workers are expected to arrive at the Project Site before construction starts and leave when construction ends, and thus, would not overlap with the noise generated by the Project's construction equipment. Although construction workers would arrive from various directions, worker trips would likely all utilize South Figueroa Street to arrive at the Project Site. It is reasonable to assume that workers would already have arrived at the Project Site to begin construction activities prior to the arrival of haul and delivery trucks.

The greatest contributor to on-road traffic noise during construction would be haul and delivery trucks arriving from Harbor Freeway to the Project Site via South Figueroa Street. However, this analysis considers noise generated by both haul and delivery trucks and worker vehicles (passenger vehicles). According to default modeling assumptions based on the Air Quality Assessment included as Appendix B of this Draft EIR, the construction phase with the highest assumed number of trucks would be building construction, when it is anticipated that there would be up to 27 daily one-way delivery truck trips and 163 daily one-way worker trips accessing the Project Site. Assuming conservatively that all daily 27 delivery truck trips and 163 worker trips would pass through the same roadway segment within a one-hour period, the estimated noise level from the building construction trips would be 65.8 dBA L_{eq} at 20 feet from receptors. This worst-case noise level would not exceed the City's Thresholds Update significance criterion of 80 dBA L_{eq} for on- and off-site construction activities. **Therefore, temporary noise impacts from off-site utility installation and off-site mobile sources would be less than significant.**

(c) Operations

The proposed Project consists of a seven-story residential and commercial mixed-use development. Project operations would result in the generation of noise from mechanical equipment (e.g., HVAC, etc.), potential amplified music on the roof deck, parking and access noise, and trash/recycling truck pickup noise. Although these noise sources would be consistent with existing noise sources in the Project Site vicinity and with the noise generated by the existing uses on the Project Site, existing on-site operational noise has not been accounted for in the analysis below to provide a conservative analysis.

(i) On-Site Stationary Noise Sources

On-Site Mechanical Equipment

Potential stationary noise sources related to long-term Project operations would include mechanical equipment (e.g., HVAC equipment) located on the rooftop. Mechanical equipment (e.g., HVAC equipment) typically generates noise levels of approximately 52 dBA at 50 feet.[56] Pursuant to LAMC Section 112.02 (Air Conditioning, Refrigeration, Heating, Pumping, Filtering Equipment), the operation of any air conditioning, refrigeration, or heating equipment shall not create any noise which would cause the noise level at another occupied property to exceed the ambient noise level by more than 5 dBA. According to the Project's site plan, mechanical equipment would be located within the central and southeastern portion of the rooftop.

Noise levels that would be generated by the mechanical equipment have been calculated without accounting for shielding that would be provided by potential screening or architectural

[56] Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.

features and are shown in **Table IV.E-11: Mechanical Equipment Noise Levels.** As shown, mechanical equipment noise levels would not increase the ambient noise levels beyond the acceptable levels (5 dBA over ambient). Project mechanical equipment would not result in the generation of a substantial permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance. **Therefore, noise impacts from mechanical equipment would be less than significant.**

Open Space

The Project would include two outdoor courtyard areas on the first and second floors, a pool courtyard on the second floor, and two roof decks on the seventh floor. Per AB 1307, Section 21085 of the Public Resources Code, for residential uses, the effects of noise generated by Project occupants and their guests on human beings is not a significant effect on the environment. Therefore, no further analysis is required.

Amplified Music

Noise levels from the potential installation of an amplified sound system at the rooftop pool deck and ground floor parklets have been estimated. This analysis does not apply to personal speakers (i.e., personal stereos or speakers) that may be operated by residents of the Project.

Table IV.E-11: Mechanical Equipment Noise Levels

Receptor	Distance to Receptor (feet) [1]	Level at Receptor (dBA)[2]	Ambient Level (dBA)[3]	Ambient + Project Noise at Receptor (dBA)	Incremental Increase (dBA)	Incremental Increase Threshold (dBA)	Significant?
1 – Residential (west and north)	35	55.1	60.8	61.8	1.0	5.0	No
2 – Residential (south)	25	58.0	58.9	61.5	2.6	5.0	No
3 – Residential (north)	80	47.9	60.8	61.0	0.2	5.0	No
4 – Exposition Park (southwest)	230	38.7	63.5	63.5	0.0	5.0	No
5 – Residential (south)	315	36.0	58.9	58.9	0.0	5.0	No
6 – Dr. Theodore T. Alexander Jr. Science Center School (northwest)	600	30.4	63.5	63.5	0.0	5.0	No

[1.] Distance estimated assuming equipment location based on site plan.
[2.] Distance attenuation calculated assuming reference noise level of 52 dBA Leq at 50 feet for rooftop mechanical equipment: Source for reference level: Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, Noise Navigator Sound Level Database with Over 1700 Measurement Values, July 6, 2010.
[3.] Refer to **Table IV.E-5** and **Table IV.E-7** for representative ambient noise levels.

Under Project Design Feature NOI-PDF-1, the use of amplified sound systems would be allowable only during daytime hours (7:00 a.m. to 10:00 p.m.).

Notably, as is customary, the amplified music that would be utilized by the Project is ambient background music that would allow for conversations to take place. However, to provide a conservative analysis, it is assumed that sound levels would equate to amplified voice and

music from devices (e.g., radio, musical instrument, phonograph, television receiver, or other machine) or other sounds in such a manner as to disturb the peace, quiet, and comfort of neighbors. Music playing on a stereo generates maximum noise levels of approximately 80 dBA at 3 feet from the speaker.[57] The outdoor living spaces would be elevated and shielding would be provided by building walls and architectural features such as paneling. However, noise level reductions (for shielding or additional attenuation due to building height) have conservatively not been assumed in the modeling.

The courtyard located on the first floor would be enclosed by the Project building, and has not been included in this analysis. The second floor contains three courtyards. The internal courtyard in the southern portion of the building is enclosed on all four sides.. The pool courtyard would be shielded by the Project building on the north and east and by glass railings on the south and west. The open space courtyard would be enclosed by the project building on the west, north, and east sides. The roof decks on the seventh floor would be shielded by the Project building on the south, glass railings on the north, and either the Project building or a glass railing on the east and west. Where the Project building would provide shielding from a specific receptor, a highly conservative 10 dBA reduction has been applied to the noise level estimation.

As shown in **Table IV.E-12: Outdoor Amplified Music Noise Levels**, noise levels from the outdoor open spaces generated by a permanent amplified sound system would not increase ambient noise levels beyond the applicable threshold (5 dBA over ambient, pursuant to the City's Noise Regulations). Open space areas within the Project Site would not result in the generation of a substantial permanent increase in ambient noise levels due to amplified music in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. **Therefore, noise impacts from outdoor open space generated by amplified music would be less than significant.**

Table IV.E-12: Outdoor Amplified Music Noise Levels

Receptor[1]	Combined Amplified Noise Level at Receptor (dBA)	Ambient Level (dBA)[2]	Ambient + Amplified Noise at Receptor (dBA)	Incremental Increase (dBA)	Incremental Increase Threshold (dBA)	Significant?
1 – Residential (west and north)	60.6	60.8	63.7	2.9	5.0	No
2 – Residential (south)	58.8	58.9	61.9	3.0	5.0	No
3 – Residential (north)	52.3	60.8	61.4	0.6	5.0	No
4 – Exposition Park (southwest)	43.5	63.5	63.5	0.0	5.0	No
5 – Residential (south)	40.0	58.9	59.0	0.1	5.0	No
6 – Dr. Theodore T. Alexander Jr. Science Center School (northwest	37.9	63.5	63.5	0.0	5.0	No

1. Distance measured from the center of area to receptor property line.
2. See **Table IV.E-5** and **Table IV.E-6** for representative ambient noise levels.

57 Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.

On-Site Parking

Passenger vehicles would access the Project Site's ground floor enclosed parking via a driveway on South Flower Drive. Noises associated with parking activities include noise associated with vehicles starting and stopping, vehicle doors closing, car horns and car alarms, loading and unloading, and conversations. Noise levels within the parking facilities would fluctuate with the amount of automobile and human activity. The noise levels from these activities typically range from 53 to 61 dBA and are short-term.[58] Ground floor parking would be wrapped and shielded in by the Project building. When a noise barrier such as the Project building is located between a noise source and receiver, the line-of-sight is interrupted, which reduces the level of the noise that reaches the receiver. The amount of the reduction depends on the mass and rigidity of the barrier.[59] The noise level reaching the receiver can be reduced by approximately 15 dBA when a building stands between the noise source and receiver.[60] The parking spaces, which would be entirely enclosed, would not result in any measurable increases in ambient noise levels within the Project Site area. Therefore, noise levels generated by Project parking activities, vehicle access, and loading and unloading would not result in the generation of a substantial permanent increase in ambient noise levels in the vicinity of the Project Site in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. **Therefore, noise impacts from the parking facilities would be less than significant.**

Trash/Recycling Truck Pickups

The residential and retail trash and recycling rooms would be located within enclosed areas of the ground floor level of the proposed building. Trash/recycling trucks and pickup activities customarily generate noise levels of approximately 85 dBA.[61] Trash/recycling truck pickup activity that services the Project Site area currently occurs under existing conditions, and therefore, would not constitute a new noise source. The hours of trash/recycling pickup activity would depend on the service provider and would not be regulated by the Project. **Therefore, noise impacts from trash/recycling truck pickups would be less than significant.**

(ii) On-Site Composite Noise

An evaluation of the Project's composite noise levels, including all on-site Project-related noise sources plus the existing ambient level, was conducted to identify the potential maximum Project-related noise level increase that may occur at noise-sensitive receptor locations. The overall sound environment of the areas surrounding the Project Site would include contributions from each on-site noise source associated with the operation of the Project. On-site noise sources associated with operation of the Project would include the use of mechanical equipment and amplified music at outdoor spaces.[62] **Table IV.E-13: On-Site Composite Noise Levels**, presents the estimated composite noise from on-site Project-related noise sources at noise sensitive

[58] Kariel, H. G., *Noise in Rural Recreational Environments*, Canadian Acoustics 19(5), 3-10, 1991.
[59] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.
[60] Federal Highway Administration, *Roadway Construction Noise Model User Guide, Appendix A*. June 2017 Available at: https://www.fhwa.dot.gov/ENVIRonment/noise/construction_noise/rcnm/rcnm10.cfm#appa, accessed on August 2025.
[61] Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.
[62] On-site parking and trash/recycling rooms would be fully enclosed, and would not contribute to ambient noise levels. Therefore, they have not been included in the composite noise analysis.

receptors. As reported in **Table IV.E-13**, the Project would result in a maximum increase of 4.5 dBA at the residential uses to the south of the Project Site. Composite Project noise levels would be below the 5 dBA significance threshold. Composite operational noise levels would not result in the generation of a substantial permanent increase in ambient noise levels in the vicinity of the Project Site in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. **Therefore, noise impacts relating to the on-site composite noise level during Project operations would be less than significant.**

Table IV.E-13: On-Site Composite Noise Levels

Receptor[1]	Mechanical Equipment (dBA)	Amplified Noise (dBA)	Ambient Level (dBA)[1]	Ambient + Project Noise at Receptor (dBA)	Incremental Increase (dBA)	Incremental Increase Threshold (dBA)	Significant?
1 – Residential (west and north)	55.1	60.6	60.8	64.3	3.5	5.0	No
2 – Residential (south)	58.0	58.8	58.9	63.4	4.5	5.0	No
3 – Residential (north)	47.9	52.3	60.8	61.6	0.8	5.0	No
4 – Exposition Park (southwest)	38.7	43.5	63.5	63.6	0.1	5.0	No
5 – Residential (south)	36.0	40.0	58.9	59.0	0.1	5.0	No
6 – Dr. Theodore T. Alexander Jr. Science Center School (northwest	30.4	37.9	63.5	63.5	0.0	5.0	No

[1] See **Table IV.E-5** and **Table IV.E-7** for representative ambient noise levels.

(iii) Off-Site Traffic Noise

Implementation of the Project would generate increased traffic volumes along nearby roadway segments. According to the Average Daily Traffic (ADT) Volumes provided in Transportation Assessment included as Appendix I of this Draft EIR, the Project would increase the ADT volume, which would result in noise increases on Project Site study area roadways.[63, 64] Traffic noise levels on roadways primarily affected by Project-generated trips were calculated using the FHWA's Highway Noise Prediction Model (FHWA-RD-77-108). Traffic noise modeling was conducted for conditions with and without the Project, based on traffic volumes from the Transportation Assessment. As shown in **Table IV.E-14: Opening Year and Opening Year Plus Project Traffic Noise Levels**, Project traffic-generated noise levels on the Project Site study area roadways would range between 53.1 dBA CNEL along South Flower Drive between West 38th

[63] Kimley-Horn and Associates, Inc., 3822 Figueroa Transportation Assessment, March 2025.

[64] The Transportation Assessment for this Project, found in Appendix I, of this Draft EIR, notes that the Project would generate a total of 1,017 daily vehicle trips. This amount is derived using generation rates utilized in the LADOT VMT Calculator, however the Project estimated 975 daily vehicle trips which is derived using the ITE Trip Generation Manual generation rates. Pursuant to the City's Transportation Assessment Guidelines screening criteria, a project's daily vehicle trips may be estimated using the LADOT VMT Calculator tool or the most recent edition of the ITE Trip Generation Manual. A technical memorandum was prepared dated April 2026 that analyzes the relevant potential environmental impacts associated with the LADOT VMT Calculator trip generation figures, which confirmed impacts under that scenario remain less than significant. The technical memorandum is attached to as Appendix K of this Draft EIR.

Street and West 39th Street and 69.4 dBA CNEL along South Figueroa Street between South Flower Drive and West 39th Street at 50 feet from the roadway centerline. The Project would result in a maximum increase of 2.4 dBA CNEL along South Flower Drive between West 38th Street and West 39th Street, an increase of 1.9 dBA CNEL along West 38th Street between South Figueroa Street and South Flower Drive, an increase of 0.3 dBA CNEL along West 39th Street between South Figueroa Street and South Flower Drive, and an increase of 0.1 dBA CNEL along South Figueroa Street between South Flower Drive and West 39th Street. Increases in traffic noise would not result in an increase of 3 dBA in CNEL, causing ambient noise levels to rise to or within the "normally unacceptable" or "clearly unacceptable" category, as specified in the City's Noise Element, or causing an increase of 5 dBA in CNEL at noise-sensitive uses. **Therefore, noise impacts from off-site traffic noise would be less than significant.**

Table IV.E-14: Opening Year and Opening Year Plus Project Traffic Noise Levels

Roadway Segment	Existing Noise Compatibility	Opening Year		Opening Year + Project		Incremental Increase	Significant Impact?[2]
		ADT	dBA CNEL[1]	ADT	dBA CNEL[1]		
West 38th Street between South Figueroa Street and South Flower Drive	Normally Acceptable	1,135	51.9	1,757	53.8	1.9	No
South Flower Drive between West 38th Street and West 39th Street	Normally Acceptable	931	51.1	1,648	53.5	2.4	No
West 39th Street between South Figueroa Street and South Flower Drive	Normally Acceptable	11,774	64.9	12,447	65.2	0.3	No
South Figueroa Street between South Flower Drive and West 39th Street	Conditionally Acceptable	37,237	69.9	37,592	70.0	0.1	No

ADT = average daily trips
dBA = A-weighted decibels
CNEL= Community Noise Equivalent Level
1. Traffic noise levels are at 50 feet from the roadway centerline.
2. A significant impact would occur if the opening year plus project noise levels cause the ambient noise levels measured at the property line of affected noise-sensitive uses to increase by 3 dBA in CNEL to or within the "normally unacceptable" or "clearly unacceptable" category, or an increase of 5 dBA in CNEL if the opening year plus project noise levels fall within the "conditionally acceptable" or "normally acceptable" category at noise-sensitive uses.

Source: Based on traffic data provided by Kimley-Horn and Associates, Inc., March 2025. Refer to Appendix I of this Draft EIR for traffic noise modeling results.

Based on the above, Project operations would not result in the generation of a substantial permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the City's general plan or noise ordinance, or applicable standards of other agencies. **Therefore, the Project's operational noise impacts from on- and off-site sources would be less than significant.**

(2) Mitigation Measures

(a) On-Site Construction Noise

As analyzed above, construction of the Project would have the potential to result in significant noise impacts at sensitive receptor 1 and sensitive receptor 2 from on-site construction

activities. Therefore, the following mitigation measures are provided to reduce construction-related noise impacts:

Mitigation Measure NOI-MM-1: Noise Shielding and Muffling. Power construction equipment (including combustion engines), fixed or mobile, shall be equipped with noise shielding and muffling devices consistent with manufacturers' standards or the Best Available Control Technology. All equipment shall be properly maintained, and the Applicant or Owner shall require any construction contractor to keep documentation on-site during any earthwork or construction activities demonstrating that the equipment has been maintained in accordance with manufacturer's specifications.

Mitigation Measure NOI-MM-2: Enclosure or Screening of Outdoor Mechanical Equipment. All outdoor mechanical equipment (e.g., generators, compressors) shall be enclosed or visually screened. The equipment enclosure or screen shall be impermeable (i.e., solid material with minimum weight of two pounds per square feet) and break the line-of-sight between the equipment and any off-site Noise Sensitive Uses.

Mitigation Measure NOI-MM-3: Location of Construction Staging Areas. Construction staging areas shall be located as far from Noise-Sensitive Uses as reasonably possible and technically feasible in consideration of site boundaries, topography, intervening roads and uses, and operational constraints. The burden of proving what constitutes "as far as possible" shall be upon the Applicant or Owner, in consideration of the above factors.

Mitigation Measure NOI-MM-4: Temporary Walls. Noise barriers, such as temporary walls (minimum ½-inch thick plywood) or sound blankets (minimum STC 25 rating), that are a minimum of eight feet tall, shall be erected between construction activities and Noise-Sensitive Uses to achieve a minimum reduction of 5 dBA at sensitive residential receptors located adjacent to the west and south of the Project Site.

(b) Off-Site Construction Noise

Noise impacts associated with off-site construction noise sources were determined to be less than significant. Therefore, no mitigation is required.

(c) Operational Noise

Noise impacts associated with on-site and off-site operational noise sources were determined to be less than significant. Therefore, no mitigation is required.

(3) Level of Significance After Mitigation

(a) On-Site Construction Noise

Implementation of Mitigation Measures NOI-MM-1 through NOI-MM-4 provided above would reduce the Project's construction noise levels. Specifically, Mitigation Measure NOI-MM-1 requires the proper maintenance of construction equipment and the installation of noise

shielding/muffling devices. The FHWA states that muffler systems can reduce noise levels by 10 dBA or more.[65] Mitigation Measure NOI-MM-2 requires the enclosure or screening of outdoor mechanical equipment. Mitigation Measure NOI-MM-3 requires the use of temporary noise barriers such as plywood walls with a minimum ½-inch thickness or sound blankets meeting a sound transmission class (STC) rating of 25 to achieve a minimum noise level reduction of five dBA at the receptors located adjacent to the Project Site to the west and south. Sound blankets meeting a STC 25 rating can achieve a minimum seven to 10 dBA reduction for construction equipment with 200 Hz or lower frequency.[66] A reduction of 10 dBA has been applied to account for the use of noise muffling devices required by Mitigation Measure NOI-MM-1, and an eight-foot tall solid barrier surrounding the Project Site has been input into the SoundPLAN model. As the receptors surrounding the Project Site consist of multiple stories, the effectiveness of a temporary barrier to reduce construction noise impacts at upper floors would be minimal. To determine the potential noise impacts at upper floors of sensitive receptors, the SoundPLAN model was utilized to calculate construction noise levels at all levels of the neighboring receptors. As shown in **Table IV.E-15: Project Maximum Construction Noise Levels (Mitigated)**, on-site construction noise with implementation of mitigation would not exceed the City's Thresholds Update significance criterion of 80 dBA L_{eq}. **Therefore, construction noise impacts associated with on-site sources would be less than significant with mitigation incorporated.**

Table IV.E-15: Project Maximum Construction Noise Levels (Mitigated)

Receptor	Maximum Mitigated Noise Level at Receptor (L_{eq} (dBA)) [1]	Noise Threshold (L_{eq} (dBA)) [2]	Exceeded ?
1 – Residential (west and north)			
Floor 1	68.4	80	No
Floor 2	70.0		
Floor 3	70.1		
Floor 4	69.9		
Floor 5	63.9		
2 – Residential (south)			
Floor 1	74.8	80	No
Floor 2	72.3		
3 – Residential (north)			
Floor 1	60.9	80	No
Floor 2	62.1		
4 – Exposition Park (southwest)	45.7	80	No
5 – Residential (south)			
Floor 1	38.3	80	No
Floor 2	41.0		
6 – Dr. Theodore T. Alexander Jr. Science Center School (northwest)	39.8	80	No

1. Per the methodology described in the City's Thresholds Update, construction equipment noise has been modeled as an area source covering the entire Project Site.
2. Per the City's Thresholds Update.
Source: Federal Highway Administration, *Roadway Construction Noise Model,* 2006. Refer to Appendix G of this Draft EIR for noise modeling results for each construction phase.

65 Federal Highway Administration, *Special Report - Measurement, Prediction, and Mitigation*, Chapter 4 Mitigation, 2017.

66 Environmental Noise Control. *Portable Acoustic Panels*, 2024. https://environmental-noise-control.com/products/temporary-sound-walls/, accessed September 2024.

(b) Off-Site Construction Noise

Noise impacts associated with off-site construction were determined to be less than significant without mitigation. Therefore, no mitigation measures are required or included, and impacts would remain less than significant.

(c) Operational Noise

Noise impacts associated with operations were determined to be less than significant without mitigation. Therefore, no mitigation measures were required or included, and impacts would remain less than significant.

Threshold (b): Would the Project result in generation of excessive groundborne vibration or groundborne noise levels?

(1) Impact Analysis

(a) Construction

(i) Building Damage Impacts from On-Site Construction

Increases in groundborne vibration levels attributable to the Project would be primarily associated with short-term construction-related activities. Project construction would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved.

The FTA and Caltrans have published standard vibration velocities for construction equipment operations. Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and the underground geological layer between vibration source and the receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. Receptors susceptible to building damage include all structures located adjacent to the Project Site. According to the Historical Resources Technical Report prepared for the Project included as Appendix C of this Draft EIR, there are historic structures in the Project vicinity.[67] This evaluation uses the structural damage criteria proposed by the City's Noise and Vibration Thresholds Update of 0.25 in/sec PPV for historic structures, 0.3 in/sec PPV at older residential structures, and 0.5 in/sec for modern residential, industrial, and commercial structures.[68]

Table IV.E-16: Construction Vibration Impacts – Structural Damage lists the reference vibration levels for typical construction equipment (measured at 25 feet). The groundborne vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. As shown in **Table IV.E-16,** based on FTA data, vibration velocities from typical heavy construction equipment that would be used during Project construction range from 0.003 to 0.210 in/sec PPV at 25 feet from the source of activity.[69] Equipment expected to be used at the Project Site for which FTA guidance includes reference

[67] GPA Consulting, Historical Resources Technical Report, August 2024.
[68] City of Los Angeles, Updates to Thresholds and Methodology for Construction Noise and Vibration, 2024.
[69] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018, Table 7-4.

vibration levels for include bulldozers, haul trucks, and vibratory compactors/rollers.[70] Haul trucks would be staged at locations that would provide ease of access/egress from the Project Site and onto the roadway network. A vibratory compactor/roller would be used during the construction parking areas. As shown in **Table IV.E-16**, impacts at the Zobelein Courtyard Apartments and California African American Museum would be less than significant. However, at a distance of five feet, the operation of a vibratory compactor/roller, large bulldozer, and loaded trucks would exceed the City's thresholds for historic structures (sensitive receptor 2), older residential structures (sensitive receptor 5), and new residential structures (sensitive receptor 1). Impacts at the nearest adjacent receptor and the other identified receptors would be potentially significant. **Therefore, building vibration impacts from on-site construction would be significant.**

Table IV.E-16: Construction Vibration Impacts – Structural Damage

Receptor	Estimated Vibration Velocity Levels at the Outside of the Nearest Off-Site Structures from the Project Construction Equipment				Significance Criteria (PPV)	Significant Impact?
	Vibratory Compactor/ Roller	Large Bulldozer/ Caisson Drilling	Loaded Trucks	Small Bulldozer		
FTA Reference Vibration Levels at 25 Feet	0.210	0.089	0.076	0.003	--	--
1 - Residential use to the west of the Project Site (Hub Los Angeles Coliseum)[1]	**1.233**	**0.523**	0.446	0.018	0.50	**Yes**
2 - Residential uses to the south of the Project Site (Flower Drive Historic District)[2]	**1.233**	**0.523**	**0.446**	0.018	0.25	**Yes**
3 - Residential use to the north of the Project Site (Zobelein Courtyard Apartments)[2]	0.063	0.027	0.023	0.001	0.25	No
5 - Residential use to the south of the Project Site along South Figueroa Street[3]	**1.233**	**0.523**	**0.446**	0.018	0.30	**Yes**
6 - California African American Museum to the west of the Project Site[4]	0.021	0.009	0.008	<0.001	0.50	No

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.
1. City criteria for new residential structure.
2. City criteria for historic structure.
3. City criteria for older residential structure.
4. City criteria for modern industrial/commercial structure.

[70] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018. Equipment not listed in FTA guidance documentation are assumed to not require analysis.

(ii) Human Annoyance Impacts from On-Site Construction

The City has not established a quantitative human annoyance threshold during the permitted hours of construction, as construction activities that are undertaken during daytime hours are a typical part of living in an urban environment and construction vibration would not be anticipated to result in health impacts or to substantially affect the activities of the general public during daytime hours.[71] **Because Project construction will comply with the City's permitted hours of construction, vibration impacts for human annoyance would be less than significant, and no mitigation is required.**

(iii) Building Damage and Human Annoyance Impacts from Off-Site Construction

Construction activities associated with off-site utility installation would occur at approximately 50 feet from sensitive receptors 1, 2, 3, and 5. At this distance, the use of a vibratory roller would result in vibration velocities of 0.098 in/sec PPV. Therefore, vibration from off-site utility installation would not exceed the structural damage thresholds of 0.25 in/sec PVV for historic structures, 0.30 in/sec PPV for older residential structures, or 0.50 in/sec PPV for new residential structures. As there would be no nighttime construction activity, impacts related to human annoyance would be less than significant.

With regard to construction trucks, Project construction would involve truck travel along nearby roadways, generating vibration events with each passing truck. During excavation, soil would be stockpiled within designated areas of the Project Site prior to export. According to the FTA Manual, a truck rarely creates vibration levels that exceed 70 VdB (equivalent to 0.012 in/sec PPV) at the sources when on a roadway.[72] Therefore, vibration velocities would dissipate to below 0.012 in/sec PPV at all structures located along the haul route, and impacts would be less than significant with respect to structural damage. As there would be no nighttime deliveries, impacts related to human annoyance would be less than significant. The factors influencing levels of groundborne vibration include vehicle speed, vehicle suspension, and wheel condition and type. The frequency of vibration events is not listed as an influencing factor for vibration velocity by the FTA.[73] As such, multiple trucks traveling along the roadway would increase the frequency of vibration events but would not affect the vibration velocity experienced by receptors.

Therefore, vibration impacts pursuant to the significance criteria for building damage and human annoyance from off-site construction activities would be less than significant.

(iv) On-Site Groundborne Noise

The Project would not include a subway or tunnel, and all construction equipment would be located at grade. In addition, there are no substantially insulated indoor noise receptors located within the Project vicinity. Therefore, the effects of airborne noise would be greater than groundborne noise levels.

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71 City of Los Angeles, Construction Noise and Vibration Updates to Thresholds and Methodology, page 19, 2024.
72 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.
73 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

According to the FTA, groundborne A-weighted noise levels can be estimated utilizing the average vibration velocity level.[74] For low frequency ground vibration such as that generated by construction equipment, the groundborne noise level is estimated by subtracting 50 dB from the vibration velocities (VdB).[75] **Table IV.E-17: Construction Vibration Impacts – Groundborne Noise** shows the estimated groundborne noise levels at the nearest receptors located approximately five feet from the Project Site (receptors adjacent to the north and south of the Project Site). According to **Table IV.E-17**, the use of vibratory construction equipment would exceed the FTA's standard of 43 dBA at Category 2 Buildings (residences and buildings where people normally sleep) for infrequent vibration events.[76,77] **Therefore, impacts related to groundborne noise would be potentially significant.**

Table IV.E-17: Construction Vibration Impacts - Groundborne Noise

Equipment	Reference Level at 25 Feet (VdB)	Distance to Nearest Receptor (feet)[1]	Estimated Vibration Velocity Levels at Distance (VdB)	Groundborne Noise Level (dB)[2]	Significance Threshold[3]	Exceed Significance Thresholds?
Vibratory compactor/roller	94	5	115	**65**	43	**Yes**
Large Bulldozer/ Caisson Drilling	87	5	108	**58**		**Yes**
Loaded Trucks	86	5	87	**57**		**Yes**

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.
1. Nearest receptor is located approximately five feet from the Project construction area.
2. For low frequency ground vibration such as that generated by construction equipment, the groundborne noise level is estimated by subtracting 50 dB from the vibration velocities.
3. FTA Criteria for Category 2 Buildings (buildings where people normally sleep) for infrequent events.

(b) Operation Vibration Impacts

Operation of the Project would primarily involve personal automobiles used by employees, customers, and occasional loading and unloading. Due to the rapid drop-off rate of groundborne vibration and the short duration of the associated events, vehicular traffic-induced groundborne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity.[78] According to the FTA's Transit Noise and Vibration Impact Assessment, trucks such as delivery trucks, refuse collection trucks, and occasional moving trucks rarely create vibration levels that exceed 70 VdB (equivalent to 0.012 inches per second PPV) when they are on roadways.[79] Groundborne noise levels resulting from a vibration velocity of 70 VdB would be approximately 20 VdB. **As such, operation of the Project would not result in the generation of excessive ground-borne vibration or groundborne noise levels that would be perceptible in the vicinity of the Project Site.**

74 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.
75 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.
76 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.
77 The use of a drill is required to place piles for temporary shoring and support and would not be operated on a frequent basis.
78 Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018.
79 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

Therefore, vibration impacts associated with operation of the Project would be less than significant.

(2) Mitigation Measures

(a) Construction Vibration

As analyzed above, vibration impacts associated with off-site sources during construction would be less than significant. Therefore, no mitigation measures are required. However, on-site sources of vibration during construction would have the potential to result in significant temporary vibration impacts, and on-site sources of groundborne noise during construction would have the potential to result in significant temporary impacts. Therefore, the following mitigation measures are provided to reduce construction-related vibration impacts.

Mitigation Measure NOI-MM-5: Baseline Survey and Vibration Control Plan. Prior to demolition, grading/excavation, or construction, the Applicant shall retain the services of a Qualified Structural Engineer who shall prepare a survey establishing baseline structural conditions of potentially affected structures and a Vibration Control Plan, which shall include methods to minimize vibration, including, but not limited to:

- Documentation of a visual inspection of the potentially affected structures (by video and/or photography) to note the apparent physical condition of the buildings (e.g., cracks, broken panes, etc.);
- Details on types of equipment to be used, estimated vibration velocities, and distance to receptors;
- A shoring design to protect the identified structures from potential damage;
- Details on the equipment and/or alternative construction techniques to be used within the required setbacks to ensure that vibration velocities do not exceed potential structural damage thresholds of 0.25 in/sec PPV at the historic structures to the south of the Project Site (along South Flower Drive), 0.30 in/sec PPV at the older residential uses to the south of the Project Site (along South Figueroa Street), or 0.50 in/sec PPV at residential uses to the north of West 38th Street or the groundborne noise threshold of 93 VdB at adjacent residential uses.

Mitigation Measure NOI-MM-6: Construction Vibration (Except Shoring). Prior to construction, the Applicant shall retain a contractor to manage Project construction. The contractor shall ensure that when in operation, construction equipment such as vibratory compactors/rollers, large bulldozers/caisson drills, and loaded trucks are prohibited within 30 feet, 17 feet, and 16 feet, respectively, of any adjacent residential structures to ensure that vibration velocities would not exceed 93 VdB. This measure does not apply to temporary shoring activities or shoring infrastructure that must be installed to provide adequate physical support for excavation.

Mitigation Measure NOI-MM-7: Repair of Damage. In the event of damage to any non-historic building due to construction vibration, as verified by the Qualified Structural Engineer, a letter describing the damage to the impacted building(s) and recommendations for repair shall be prepared by the Qualified Structural Engineer within 60 days of the time when damage occurred. Repairs shall be undertaken and completed, at the Owner's or Applicant's expense, in conformance with all applicable codes.

In the event of vibration damage to any building that is designated or determined to be a historic resource pursuant to local or state law or that is determined to be potentially eligible for historic designation in a Historic Resources Survey, a letter describing the damage to the impacted building(s) and recommendations for repair shall be prepared by the Qualified Historian within 60 days of the time when damage occurred. Repairs shall be undertaken and completed, at the Owner's or Applicant's expense, in conformance with the California Historical Building Code (Title 24, Part 8) as well as the Secretary of the Interior's Standards for the Treatment of Historic Properties and associated guidelines, as applicable and as determined by the Qualified Historian.

(b) Operational Vibration

Groundborne vibration and noise impacts associated with on-site and off-site sources during Project operation would be less than significant. Therefore, no mitigation is required.

(3) Level of Significance After Mitigation

(a) On-Site Construction Vibration

With implementation of Mitigation Measures NOI-MM-5, NOI-MM-6, and NOI-MM-7, potential vibration impacts from building damage from on-site construction would be reduced to less-than-significant levels. With implementation of Mitigation Measure NOI-MM-5, a Vibration Control Plan would be prepared to document methods to reduce vibration velocities and Mitigation Measure NOI-MM-6 would require specific setbacks for vibratory equipment. As shown in **Table IV.E-18: Construction Vibration Impacts – Structural Damage (Mitigated)** operation of on-site construction equipment would not exceed applicable thresholds related to structural damage with the implementation of mitigation. **Therefore, the Project's vibration impacts from on-site construction activities with respect to building damage would be less than significant with the implementation of mitigation.**

Table IV.E-18: Construction Vibration Impacts – Structural Damage (Mitigated)

Equipment	Estimated Vibration Velocity Levels at the Outside of the Nearest Off-Site Structures from the Project Construction Equipment			Significance Criteria (PPV)	Significant Impact?
	Vibratory Compactor/ Roller	Large Bulldozer/ Caisson Drilling	Loaded Trucks		
Required Setback (NOI-MM-6)	30	17	16	--	--
1 - Residential use to the west of the Project Site (Hub Los Angeles Coliseum)	0.172	0.136	0.124	0.50[1]	No

Equipment	Estimated Vibration Velocity Levels at the Outside of the Nearest Off-Site Structures from the Project Construction Equipment			Significance Criteria (PPV)	Significant Impact?
	Vibratory Compactor/ Roller	Large Bulldozer/ Caisson Drilling	Loaded Trucks		
2 - Residential uses to the south of the Project Site (Flower Drive Historic District)	0.172	0.136	0.124	0.25[2]	No
5 - Residential use to the south of the Project Site along South Figueroa Street	0.172	0.136	0.124	0.30[3]	No

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.
[1.] City criteria for new residential structure.
[2.] City criteria for historic structure.
[3.] City criteria for older residential structure.

(b) Off-Site Construction Vibration

Vibration impacts associated with off-site construction vehicles were determined to be less than significant without mitigation. Therefore, no mitigation measures are required or included, and impacts would remain less than significant.

(c) Groundborne Noise – Construction

Groundborne noise impacts would be potentially significant during on-site construction activity. As shown in **Table IV.E-18**, implementation of MM NOI-6 would require setback distances for vibratory equipment. **Table IV.E-19: Construction Vibration Impacts – Groundborne Noise (Mitigated)** shows the estimated groundborne noise levels at the nearest receptors with incorporation of setbacks as required by Mitigation Measure NOI-MM-6. At the required distances, vibration velocities would be reduced to 92 VdB. According to the FTA, the groundborne noise level is estimated by subtracting 50 dB from the vibration velocities for low frequency ground vibration such as that generated by construction equipment. Project vibration velocities of 92 VdB would equate to groundborne noise levels of 42 VdB. **Therefore, the Project's vibration impacts from on-site construction activities with respect to groundborne noise would be less than significant**.

Table IV.E-19: Construction Vibration Impacts - Groundborne Noise (Mitigated)

Equipment	Reference Level at 25 Feet (VdB)	Distance to Nearest Receptor (feet)[1]	Estimated Vibration Velocity Levels at Distance (VdB)	Groundborne Noise Level (dB)[2]	Significance Threshold[3]	Exceed Significance Thresholds?
Vibratory compactor/roller	94	30	92	42	43	No
Large Bulldozer/Caisson Drilling	87	17	92	42		No
Loaded Trucks	86	16	92	42		No

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.
[1.] Nearest receptor is located approximately five feet from the Project construction area.
[2.] For low frequency ground vibration such as that generated by construction equipment, the groundborne noise level is estimated by subtracting 50 dB from the vibration velocities.
[3.] FTA Criteria for Category 2 Buildings (buildings where people normally sleep) for infrequent events.

(d) Groundborne Vibration and Groundborne Noise - Operation

Groundborne vibration and noise impacts associated with Project operations were determined to be less than significant without mitigation. Therefore, no mitigation measures are required or included, and impacts would remain less than significant.

Threshold (c): For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

As discussed in Section VI, Other CEQA Considerations, of this Draft EIR, and as evaluated in the Initial Study for the Project, which is included in Appendix A for this Draft EIR, there are no private airstrips in the vicinity of the Project Site. The nearest airport to the Project Site is the Los Angeles International Airport approximately nine miles southwest of the Project Site. As the Project Site is located further than two miles from a public airport, the Project would not expose people residing or working in the Project area to excessive noise levels. **Thus, the Project would have a less than significant impact with respect to Threshold (c). No further analysis of this issue is required.**

e. Cumulative Impacts

(1) Impact Analysis

(a) Construction Noise

The potential for cumulative construction noise impacts from on-site construction activities is based on the distance between the Project and each of the cumulative related projects (Related Projects). Noise from construction activities would normally affect the areas immediately adjacent to each of the construction sites, as well as areas that are less than 500 feet from a construction site.[80] Cumulative noise impacts could occur at receptors that are within 500 feet from two different construction sites. Therefore, based on the 500-foot distance, the cumulative construction noise impacts analysis is limited to Related Projects within 1,000 feet of the Project Site. The 1,000-foot distance is based on an assumption that a noise-sensitive receptor would be located halfway between the Project Site and the Related Project.

As indicated in Section III, Environmental Setting, of this Draft EIR, there are seven Related Projects within a 0.5-mile radius of the Project Site. The four Related Projects located within 1,000 feet of the proposed Project include Related Project 1 (California African American Museum located approximately 230 feet northwest of the Project Site), Related Project 6 (3900 South Figueroa Street approximately 350 feet to the south of the Project Site), Related Project 7 (3851 Grand Avenue approximately 440 southeast of the Project Site), and Related Project 5 (3801 South Grand Avenue approximately 488 feet to the east of the Project Site). If construction of any of these Related Projects were to overlap with construction of the Project, cumulative construction noise level increase could occur at sensitive uses surrounding the Project Site. Based on the distance of receptors to Related Projects and the Project Site, Related Projects

[80] City of Los Angeles, L.A. CEQA Thresholds Guide, 2006.

listed above are in close enough proximity that their individual or combined short-term construction noise levels could have a cumulative impact on sensitive receptors analyzed herein. Related Project 1 is located nearest to Project sensitive receptor 1, the residential use located adjacent to the north and west of the Project Site. As shown in **Table IV.E-9**, construction noise levels could reach up to 70.1 L_{eq} dBA at sensitive receptor 1. Assuming that construction activities from Related Project 1 and the Project would overlap and the noise level at sensitive receptor 1 from proposed Project and Related Project 1 construction would be the same (70.1 dBA L_{eq}), combined noise levels reaching sensitive receptor 1 could reach 73.1 dBA L_{eq}.[81] This combined noise level would not exceed the City's construction noise threshold of 80 dBA. All other Related Projects are located at greater distances from the Project Site. Based on the relative location of the proposed Project to the Related Projects and noise attenuation provided by distance and intervening structures, construction noise from Related Projects is not anticipated to contribute substantial levels of construction noise at the receptors most impacted by the proposed Project. In light of the proposed Project's less than significant impacts with incorporation of EPMs, the Project's contribution to a potential cumulative construction noise impact would not be considerable.

Project construction noise would not exceed applicable significance criteria and would result in less than significant impacts. Therefore, the Project's contribution to cumulative construction noise would not be cumulatively considerable.

(b) Operational Noise

(i) On-Site Stationary Noise Sources

Stationary noise sources of the Project would result in an incremental increase in non-transportation noise sources in the Project Site vicinity. However, as discussed above, operational noise caused by the Project would be less than significant. Similar to the Project, other planned and approved projects would be required to mitigate for stationary noise impacts at nearby sensitive receptors, if necessary. As stationary noise sources are generally localized, there is a limited potential for other projects to contribute to cumulative noise impacts.

No known past, present, or reasonably foreseeable projects would combine with the operational noise levels generated by the Project to increase noise levels above acceptable standards, because each project must comply with applicable City regulations that limit operational noise. Therefore, the Project, together with other projects, would not create a significant cumulative impact, and even if there were such a significant cumulative impact, the Project would not make a cumulatively considerable contribution to significant cumulative operational noises.

Given that noise dissipates as it travels away from its source, operational noise impacts from on-site activities and other stationary sources would be limited to the Project Site and vicinity. **Thus, cumulative operational noise impacts from Related Projects, in conjunction with Project specific noise impacts, would not be cumulatively significant.**

[81] When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than one source under the same conditions. (FHWA, *Noise Fundamentals,* 2017)

(ii) Off-Site Mobile Noise Sources

The Project and Related Projects in the area would produce traffic volumes (off-site mobile sources) that would generate roadway noise. Cumulative noise impacts due to off-site traffic were analyzed by comparing the projected increase in traffic noise levels from "Existing" conditions to "Cumulative Future Plus Project" conditions to the applicable significance criteria. Increases in local volumes from Related Projects within a half-mile radius of the Project Site have been estimated and included in cumulative traffic conditions. **Table IV.E-20: Cumulative Roadway Traffic Noise Impacts** identifies the traffic noise effects along roadway segments in the vicinity of the Project site for "Existing," "Cumulative Future Without Project," and "Cumulative Future Plus Project," conditions, and net cumulative impacts.

Table IV.E-20: Cumulative Roadway Traffic Noise Impacts

Roadway Segment	CNEL @ 50 feet from Centerline[1]			Combined Effects	Incremental Effects	Cumulatively Significant Impact?
	Existing	Cumulative Future Without Project	Cumulative Future Plus Project	dBA Difference Between Existing and Cumulative With Project	dBA Difference Between Cumulative With Project and Without Project	
West 38th Street between South Figueroa Street and South Flower Drive	51.8	51.9	53.8	2.0	1.9	No
South Flower Drive between West 38th Street and West 39th Street	50.9	51.1	53.5	2.6	2.4	No
West 39th Street between South Figueroa Street and South Flower Drive	64.8	64.9	65.2	0.4	0.3	No
South Figueroa Street between South Flower Drive and West 39th Street	69.8	69.9	70.0	0.2	0.1	No

dBA = A-weighted decibels; CNEL = day-night noise level

[1.] Traffic noise levels are at 50 feet from the roadway centerline.

Refer to Appendix G of this Draft EIR for traffic noise modeling assumptions and results.

First, it must be determined whether the "Cumulative With Project" 3.0 dB increase above existing conditions (*Combined Effects*) is exceeded. Next, under the *Incremental Effects* criteria, cumulative noise impacts are defined by determining if the forecast ambient ("Cumulative Without Project") noise level is increased by 1.0 dB or more. As shown in **Table IV.E-20**, none of the roadway segments exceed both the Combined Effects (3.0 dB) and Incremental Effects (1.0 dB) criteria. **Thus, the Project, in combination with cumulative background traffic noise levels,**

would result in a less than significant cumulative impact. The Project's contribution to cumulative traffic noise would not be cumulatively considerable.

(c) Construction Vibration

(i) On-Site Construction Vibration

Due to rapid attenuation characteristics of groundborne vibration, only Related Projects located adjacent to the same sensitive receptors would result in cumulatively considerable vibration impacts related to both structural damage and human annoyance. However, there are no structures adjacent to both the Project and any Related Projects that could be impacted by potential cumulative vibration from overlapping construction. **Therefore, construction of Related Projects would not contribute to the Project's construction vibration impacts and cumulative impacts would be less than significant.**

(ii) Off-Site Construction Vibration

Due to rapid attenuation characteristics of groundborne vibration, only Related Projects located adjacent to the same sensitive receptors would result in cumulatively considerable vibration impacts related to both structural damage and human annoyance. However, there are no structures adjacent to both the off-site utility installation activities and any Related Projects that could be impacted by potential cumulative vibration from overlapping construction.

As previously discussed, based on the FTA Manual, a truck rarely creates vibration levels that exceed 70 VdB (equivalent to 0.012 in/sec PPV) when on a roadway.[82] The vibration generated by a typical heavy truck would be approximately 63 VdB (0.00566 PPV) at a distance of 50 feet from the truck.[83] As Related Projects would be anticipated to use similar trucks as the Project, it is anticipated that construction trucks would generate similar vibration levels along the anticipated truck route(s). As discussed above, due to rapid attenuation characteristics of groundborne vibration, potential cumulative impacts associated with off-site truck travel would be less than significant regarding structural damage and human annoyance.

Therefore, construction of Related Projects would not contribute to the Project's construction vibration impacts and cumulative impacts would be less than significant.

(d) Operational Vibration

Due to the rapid attenuation characteristics of groundborne vibration and distance from each of the Related Projects to the Project Site, there is no potential for cumulative operational impacts with respect to groundborne vibration or groundborne noise. **Therefore, cumulative operational noise impacts would be less than significant.**

(2) Mitigation measures

(a) Construction Noise

As discussed above, there would be potential cumulative noise impacts at the nearby sensitive receptors located in proximity to the Project Site and Related Projects 1, 5, 6, and 7 in

[82] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.
[83] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018, Figure 5-4.

the event of concurrent construction activities. Similar to the Project, noise associated with cumulative construction activities would be reduced to the degree reasonably and technically feasible through standard City Conditions of Approval for each individual Related Project. Construction of the Project would not result in a cumulatively significant impact. Therefore, no mitigation measures are required.

(b) Operational Noise

As discussed above, operation of the Project and Related Projects would result in a less-then-significant noise impact. Therefore, no mitigation measures are required.

(c) Construction Vibration

As discussed above, construction of Related Projects would not contribute to the Project's construction vibration impacts and no cumulative impacts would occur. Therefore, no mitigation measures are required.

(d) Operational Vibration

Cumulative groundborne vibration and groundborne noise impacts associated with operation of the Project and Related Projects would be less than significant. Therefore, no mitigation measures are required.

(3) Level of Significance After Mitigation

(a) Construction Noise

Cumulative impacts related to construction noise were determined to be less than significant without mitigation. Therefore, no mitigation measures were required or included, and the impact level remains less than significant.

(b) Operational Noise

Cumulative impacts related to operational noise were determined to be less than significant without mitigation. Therefore, no mitigation measures were required or included, and the impact level remains less than significant.

(c) Construction Vibration

Cumulative impacts related to construction vibration were determined to be less than significant without mitigation. Therefore, no mitigation measures were required or included, and the impact level remains less than significant.

(d) Operational Vibration

Cumulative impacts related to operational groundborne vibration and groundborne noise were determined to be less than significant without mitigation. Therefore, no mitigation measures were required or included, and the impact level remains less than significant.