

IV. Environmental Impact Analysis

G. Noise

1. Introduction

This section of the Draft EIR analyzes potential noise and vibration impacts of the Project. Included in this section is a description of the existing noise environment 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 included in the Noise and Vibration Worksheets 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

¹ California Department of Transportation (Caltrans), Technical Noise Supplement (TeNS) to the Traffic Noise Analysis Protocol, Section 2.2.1, September 2013.

amplitude². 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 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.³

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.⁴

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.⁵ Some representative common outdoor and indoor noise sources and their corresponding A-weighted noise levels are shown in **Figure IV.G-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.⁶ 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.

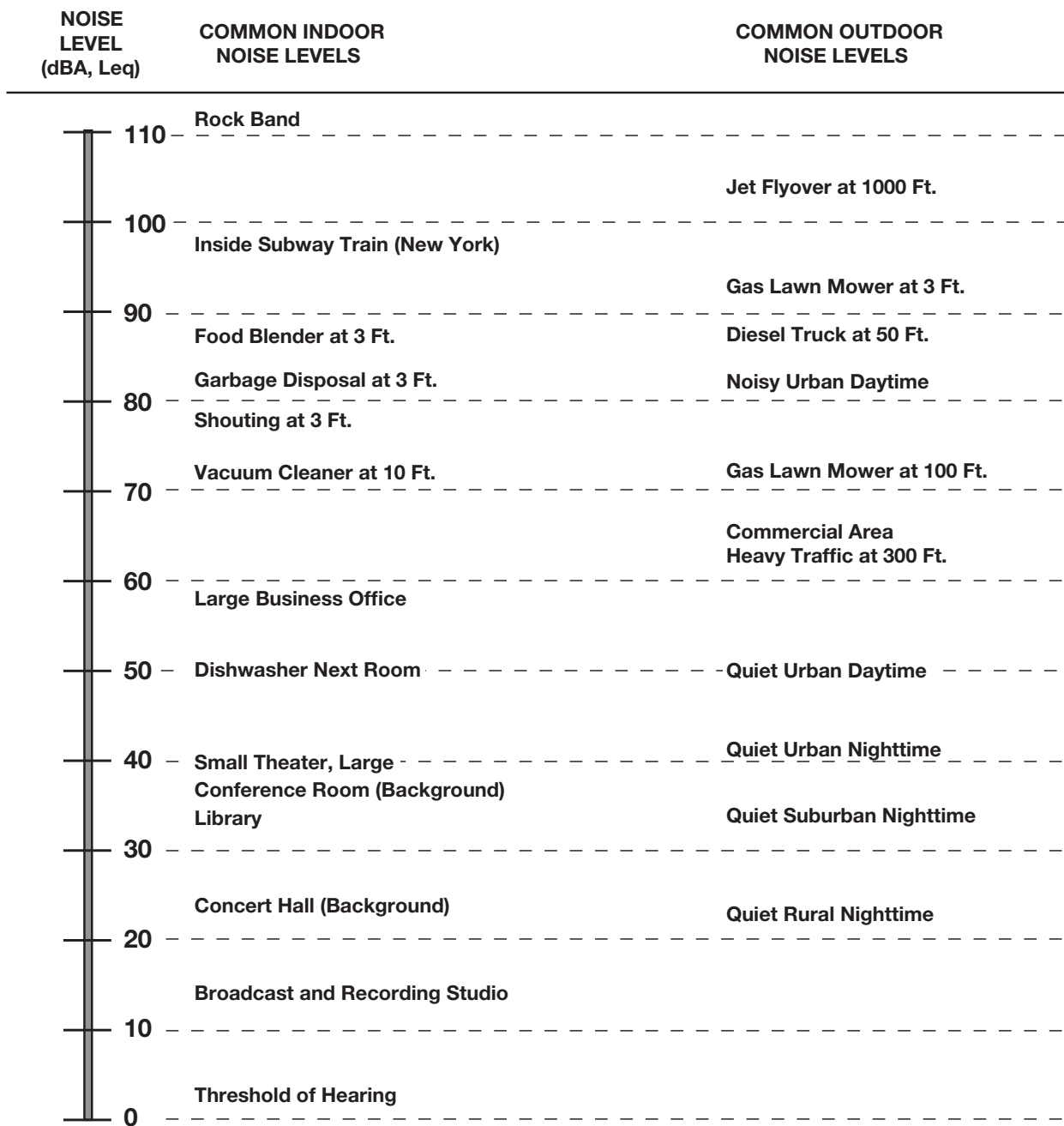
² All sound levels measured in decibel (dB), as identified in the noise calculation worksheets included in Appendix G of this Draft EIR and in this section of the Draft EIR, are relative to 2×10^{-5} N/m².

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 2.1.3, September 2013.

⁶ California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.2.1, September 2013.



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SOURCE: State of California, Department of Transportation (Caltrans), Technical Noise Supplement (TeNS). October 1998. Available: [http://www.dot.ca.gov/hq/env/noise/pub/Technical Noise Supplement.pdf](http://www.dot.ca.gov/hq/env/noise/pub/Technical%20Noise%20Supplement.pdf)

Fourth & Central Project

Figure IV.G-1
Decibel Scale and Common Noise Sources

These successive additions of sound to the community noise environment change the community noise level from moment to moment, requiring the 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.⁷

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 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, L₅₀ and L₉₀ 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

⁷ California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.2.2, September 2013.

activities, such as normal conversations, watching television, telephone conversations, and interference with sleep.

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.⁸

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 level, the following relationships generally occur:⁹

- 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

⁸ World Health Organization Team, edited by Berglund, Birgitta; Lindvall, Thomas; Schwela, Dietrich H, Guidelines for Community Noise, 1999.

⁹ California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.2.1, 2013.

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.¹⁰

(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.¹¹ 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, provides an excess ground attenuation value of 1.5 dBA (per doubling distance).¹² 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.¹³ Noise from a line source propagates over a cylindrical surface, often referred to as “cylindrical spreading.”¹⁴ 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.¹⁵ Therefore, noise due to a line source attenuates less with distance than that of a point source with increased distance.

¹⁰ California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.2.1.1, September 2013.

¹¹ Caltrans, TeNS to the Traffic Noise Analysis Protocol, Sections 2.1.4.1 and 2.1.4.2, September 2013.

¹² Caltrans, TeNS to the Traffic Noise Analysis Protocol, Sections 2.1.4.1 and 2.1.4.2, 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.

¹⁵ California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.4.1, 2013.

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 larger barrier.¹⁶ Additionally, structures with closed windows can further attenuate exterior noise by a minimum of 20 dBA to 30 dBA.¹⁷

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.¹⁸ 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.¹⁹

(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.²⁰ 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

¹⁶ Caltrans, TeNS to the Traffic Noise Analysis Protocol, Sections 2.1.4.24 and 5.1.1, September 2013.

¹⁷ Caltrans, TeNS to the Traffic Noise Analysis Protocol, Section 7.4.2, Table 7-1, September 2013.

¹⁸ California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.4.3, September 2013.

¹⁹ California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, Section 2.1.4.3, September 2013.

²⁰ Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 7, 2018.

operation of heavy earth-moving equipment.²¹ 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.²² 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.²³ 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; FTA uses a crest factor of 4.²⁴ 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.²⁵

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.²⁶ 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.²⁷ Therefore, for typical buildings, the groundborne noise decibel level is lower than the groundborne vibration velocity level at low frequencies.

²¹ Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 7, 2018.

²² Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 5.1, 2018.

²³ Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Section 5.1, 2018.

²⁴ FTA Transit Noise and Vibration Impact Assessment Manual, Section 5.1, 2018.

²⁵ FTA, Transit Noise and Vibration Impact Assessment Manual, Section 6.1, 6.2, and 6.3, 2018.

²⁶ FTA, Transit Noise and Vibration Impact Assessment Manual, Section 5.4, 2018.

²⁷ FTA, Transit Noise and Vibration Impact Assessment Manual, Table 6-3 and Table 6-14, September 2018.

b) Regulatory Framework

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

- Noise Control Act of 1972
- Federal Transportation Administration Vibration Standards
- Occupational Safety and Health Act of 1970
- Office of Planning and Research Guidelines for Noise Compatible Land Use
- 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.²⁸ 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 the Project. Moreover, the federal noise standards are not reflective of urban environments that range by land use, density, proximity to commercial or industrial centers, etc. As such, for purposes of determining acceptable sound levels to determine and evaluate intrusive noise sources and increases, this document utilizes the City of Los Angeles Noise Regulations, discussed below.

(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

²⁸ United States Environmental Protection Agency, EPA Identifies Noise Levels Affecting Health and Welfare, 1974.

impacts from construction activities.²⁹ The vibration damage criteria adopted by the FTA are shown in **Table IV.G-1, Construction Vibration Damage Criteria**.

**TABLE IV.G-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 ground-borne noise on the following three off-site land-use categories: Vibration Category 1 – High Sensitivity, Vibration Category 2 – Residential, and Vibration Category 3 – Institutional.³⁰ 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 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 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.G-2, Groundborne Vibration and Groundborne Noise Impact Criteria for General Assessment**. No thresholds have been adopted or recommended for commercial or office uses.

²⁹ Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Table 7-5, page 186, 2018.

³⁰ Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Table 6-1, page 124, 2018.

TABLE IV.G-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 VdB ^d	65 VdB ^d	65 VdB ^d
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.³¹

(2) State

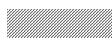
(a) Office of Planning and Research Guidelines for Noise Compatible Land Use


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.G-2, Guidelines for Noise Compatible Land Use**.³²


³¹ United States Department of Labor. OSH Act of 1970.


³² State of California, Governor's Office of Planning and Research, General Plan 2017 Guidelines, page 377, 2017.

Land Use Category	Noise Exposure (L_{dn} or CNEL, dBA)					
	55	60	65	70	75	80
Residential – Low Density Single-Family, Duplex, Mobile Home						
Residential – Multiple Family						
Transient Lodging – Motel, Hotel						
School, Library, Church, Hospital, Nursing Home						
Auditorium, Concert Hall, Amphitheater						
Sports Arena, Outdoor Spectator Sports						
Playground, Neighborhood Park						
Golf Course, Riding Stable, Water Recreation, Cemetery						
Office Building, Business Commercial and Professional						
Industrial, Manufacturing, Utilities, Agriculture						

 **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.

 **NORMALLY UNACCEPTABLE:** New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.

 **CLEARLY UNACCEPTABLE:** New construction or development should generally not be undertaken. Construction costs to make the indoor environmental acceptable would be prohibitive and the outdoor environment would not be usable.

The purpose of these 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.” The City has developed its own compatibility guidelines in the Noise Element of the General Plan based in part on OPR Guidelines. 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.

(3) Regional

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

In Los Angeles County, the Regional Planning Commission has the responsibility for acting as the Airport Land Use Commission and for coordinating the airport planning of public agencies within the county. The Airport Land Use Commission 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 Airport Land Use Commission 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.³³

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 Sections 111.03, are provided in **Table IV.G-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.

**TABLE IV.G-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 112.02 limits increases in noise levels from air conditioning, refrigeration, heating, pumping and filtering equipment. Such equipment may not be operated in such 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.³⁴

³³ Los Angeles Municipal Code, Chapter XI, Article I, Section 111.02(b).

³⁴ In accordance with the City's Noise Ordinances, "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.

LAMC Section 41.40 prohibits construction between the hours of 9:00 p.m. and 7:00 a.m. Monday through Friday, before 8:00 a.m. or after 6:00 p.m. on Saturdays and National Holidays, 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 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 Noise Ordinance provisions 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 therefore has been duly obtained beforehand from the Board of Police Commissioners.

Section 91.1207.14.2 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.

(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.G-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.³⁵ The following policies and objectives from the Noise Element apply to the Project.

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.

³⁵ City of Los Angeles. General Plan, Noise Element, Pages 1.1-2.4, 1999.

TABLE IV.G-4
CITY OF LOS ANGELES LAND USE COMPATIBILITY FOR COMMUNITY NOISE

Land Use	Normally Acceptable	Conditionally Acceptable	Community Noise Exposure CNEL (dBA)	
			Normally Unacceptable	Clearly Unacceptable
Single-Family, Duplex, Mobile Homes	50 to 60	55 to 70	70 to 75	Above 70
Multi-Family Homes	50 to 65	60 to 75	70 to 75	Above 70
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 to 70	60 to 75	70 to 80	Above 80
Transient Lodging – Motels, Hotels	50 to 65	60 to 70	70 to 80	Above 80
Auditoriums, Concert Halls, Amphitheaters	—	50 to 70	—	Above 65
Sports Arena, Outdoor Spectator Sports	—	50 to 75	—	Above 70
Playgrounds, Neighborhood Parks	50 to 70	—	67 to 75	Above 72
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 to 75	—	70 to 80	Above 80
Office Buildings, Business and Professional Commercial	50 to 70	67 to 77	Above 75	—
Industrial, Manufacturing, Utilities, Agriculture	50 to 75	70 to 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, 2006 L.A. CEQA Thresholds Guide, 2006.

Exhibit I of the Noise Element also contains guidelines for noise compatible land uses.³⁶ The following table summarizes these guidelines, which are based on OPR guidelines from 1990.

c) Existing Conditions

(1) Noise-Sensitive Receptor Locations

Some land uses are considered more sensitive to noise than others due to the types of activities typically involved at the receptor locations and the effect that noise can have on those activities and the persons engaged in them. The City of Los Angeles 2006 L.A. CEQA Thresholds Guide (Thresholds Guide) states that residences, schools, motels and

³⁶ City of Los Angeles. General Plan, Noise Element, Page I-1, 1999.

hotels, libraries, religious institutions, hospitals, nursing homes, and parks are generally more sensitive to noise than commercial and industrial land uses.³⁷

Six noise receptor locations were selected to represent noise sensitive uses in the vicinity of the Project Site. The noise-sensitive receptors include multi-family residences and hotels along 4th Street to the west, a church to the north along Central Avenue, multi-family residences to the east along 4th Street, and multi-family residences along 5th Street and Ceres Avenue, respectively, to the south of the Project Site. The locations of the noise-sensitive receptors are depicted in **Figure IV.G-3, Sensitive Receptors**.

(2) Vibration-Sensitive Receptor Locations

Typically, groundborne vibration generated by man-made activities (i.e., rail and roadway traffic, operation of mechanical equipment and typical construction equipment) diminishes rapidly with distance from the vibration source. Construction activities, such as the use of bulldozers, would have the greatest effect on vibration-sensitive land uses. Energy is lost during the transfer of energy from one particle to another, and, as a result, vibration becomes less perceptible with increasing distance from the source. With respect to potential structural damage, structures in close proximity (generally within approximately 100 feet) to the Project Site are considered vibration-sensitive. As shown in Table IV.G-1, the structural category/construction type (i.e., reinforced-concrete, engineered concrete, non-engineered timber, building susceptible to damage, and historic buildings) determines the vibration damage criteria for a specific building/structure.³⁸ The structures in the vicinity of the Project Site range from Category I to Category IV as follows:

- Category I:
 - Parking structure to the east of the Project's North Site.
- Category II:
 - Warehouse/industrial building north of the Project's North Site;
- Category III:
 - Commercial buildings to the south, west, and southwest of Project's West Site;
 - Multi-family residential building to the east of the Project's Upper South Site and North Site along 4th Street;
 - Hotel use and commercial/industrial buildings to the west of the Project's Upper South Site and North Site along 4th Street.

³⁷ City of Los Angeles, 2006 L.A. CEQA Thresholds Guide, 2006.

³⁸ Where the structural category/type of a vibration-sensitive receptor is unclear, the analysis herein utilizes a conservative assumption. For example, although structures where industrial processes take place would generally be constructed of concrete, the threshold for non-engineered timber and masonry has been applied due to the uncertainty of building construction.



SOURCE: ESRI Imagery.

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Figure IV.G-3
Sensitive Receptors

- Category IV:
 - Historic Produce Exchange Building to the northwest of the Project's North Site along Central Avenue.
 - Warehouse/industrial buildings to the east of the Project's Upper South and Lower South Sites located within the Downtown Los Angeles Historic District.

With respect to human annoyance, sensitive land uses include buildings where use of vibration-sensitive equipment is used (e.g., hospitals, research, and manufacturing), residential land uses and buildings where people normally sleep, schools, churches, and doctor's offices.³⁹ As shown in Figure IV.G-3, all the receptors identified as vibration-sensitive for structural damage are also considered vibration-sensitive for human annoyance (i.e., the buildings highlighted in green in Figure IV.G-3).

(3) Ambient Noise Levels

(a) Noise Measurements

The predominant existing noise source surrounding the Project Site is traffic noise from major roadways, such as Alameda Street to the east and Central Avenue. Secondary noise sources include local roadway traffic, landscaping equipment, and other typical urban noise from commercial and warehousing uses. Ambient daytime and nighttime noise measurements were taken at the six off-site sensitive receptor locations on April 6, 2022 (receptor locations R1, R2, R3, R4, R5, and R6).

The ambient noise monitoring program was conducted using Larson Davis LxT Integrating/Logging Sound Level Meters, which meet the minimum industry standard performance requirements for "Type 2" standard instruments as defined in the American National Standard Institute (ANSI) S1.4. Two 15-minute measurements were conducted at each of the off-site receptor locations with one taking place during the daytime hours (between 10:00 a.m. and 12:00 p.m.) and another during the evening hours (between 7:00 p.m. and 10:00 a.m.). The ambient noise measurements were taken in accordance with City's standards, which require ambient noise to be measured over a period of at least 15 minutes.⁴⁰ The microphone was placed at a height of five feet above the local grade at the following locations, as shown in **Figure IV.G-4, Noise Measurement Locations**:

- Measurement Location R1: Church along Central Avenue, approximately 380 feet north of the Project Site (measured from the North Site).
- Measurement Location R2: Multi-family residential uses along 4th Street, approximately 250 feet east of the Project Site (measured from the Upper South Site).

³⁹ FTA, Transit Noise and Vibration Impact Assessment Manual, Table 6-1, September 2018.

⁴⁰ LAMC Section 111.01.



SOURCE: ESRI Imagery.

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Figure IV.G-4
Noise Measurement Locations

- Measurement Location R3: Hotel uses along Ceres Avenue, approximately 560 feet southwest of the Project Site (measured from the Lower South Site).
- Measurement Location R4: Multi-family residential uses at the corner of 5th Street and Stanford Avenue, approximately 120 feet southwest of the Project Site (measured from the West Site).
- Measurement Location R5: Multi-family residential use along 4th Street, approximately 175 feet west of the Project Site (measured from the North Site).
- Measurement Location R6: Multi-family residential uses along 4th Street, approximately 470 feet west of the Project Site (measured from the North Site).

The results of the ambient sound measurements are summarized in **Table IV.G-5, Summary of Ambient Noise Measurements**. As indicated in Table IV.G-5, the existing ambient noise levels at the receptor locations ranged from 58.5 dBA L_{eq} (at receptor location R1) to 71.2 dBA L_{eq} (at receptor location R5). Based on field observation and measured sound data, the current ambient noise environment in the vicinity of the Project Site is controlled primarily by vehicular traffic on local roadways, commercial uses, and other typical urban noise. The existing ambient noise environment at all measurement locations currently exceed the City's presumed daytime ambient noise standard of 50 dBA (L_{eq}) for residential use. Therefore, consistent with LAMC procedures, the measured existing ambient noise levels are used as the baseline conditions for the purposes of determining Project impacts.

(b) *Roadway Noise Levels*

Existing roadway CNEL noise levels were calculated for 42 roadway segments located in the vicinity of the Project Site. The roadway segments selected for analysis are considered to be those that are expected to be the most directly impacted by Project-related traffic, which, for the purpose of this analysis, include the roadways that are located near and immediately adjacent to the Project Site. These roadways, when compared to roadways located farther away from the Project Site, would experience the greatest percentage increase in traffic generated by the Project (as distances are increased from the Project Site, traffic is spread out over a greater geographic area and its effects are reduced).

**TABLE IV.G-5
SUMMARY OF AMBIENT NOISE MEASUREMENTS**

Receptor Location	Approximate Distance to Project Site ^b (ft)	Measured Ambient Noise Levels (dBA) ^a	
		Daytime (10 a.m. to 12 p.m.) 15-min L _{eq}	Evening (7 p.m. to 10 p.m.) 15-min L _{eq}
R1: Church along Central Avenue, north of the Project Site.	380	67.7	60.6
R2: Multi-family residential uses at the along 4th Street, east of the Project Site.	250	70.5	64.8
R3: Hotel uses along Ceres Avenue, southwest of the Project Site.	560	58.5	61.8
R4: Multi-family residential uses at the corner of 5th Street and Stanford Avenue, southwest of the Project Site.	120	70.2	66.7
R5: Multi-family residential use along 4th Street, west of the Project Site.	175	69.7	71.2
R6: Multi-family residential uses along 4th Street, west of the Project Site.	470	66.7	62.7

^a Detailed measured noise data, including hourly L_{eq} levels, are included in Appendix G.

^b Distances are estimated based on Google Earth map and are referenced to the nearest receptor property boundary, and not the building or dwelling itself.

SOURCE: ESA 2022.

Existing roadway CNEL noise levels were calculated using the Federal Highway Administration's (FHWA) Transit Noise Model (FHWA TNM)⁴¹ methodology and traffic volumes at the study intersections analyzed in the Project's Transportation Assessment.⁴² The model calculates the average noise level at specific locations based on traffic volumes, average speeds, and site environmental conditions. The noise levels along these roadway segments are presented in **Table IV.G-6, *Calculated Existing Vehicular Traffic Noise Levels***. As shown in Table IV.G-6, the ambient noise environment of the Project vicinity can be characterized by 24-hour CNEL levels attributable to existing traffic on local roadways. The calculated CNEL (at a distance of 30 feet from the roadway centerline) from actual existing traffic volumes on the analyzed roadway segments ranged

⁴¹ The traffic noise model which was developed based on calculation methodologies provided in the Caltrans TeNS document and traffic data provided in the Project's Transportation Assessment provided in Appendix J to this Draft EIR. This methodology, considered an industry standard, allows for the definition of roadway configurations, barrier information (if any), and receiver locations.

⁴² Gibson Transportation Consulting, Inc., Transportation Assessment for the Fourth & Central Project, March 2022. Provided in Appendix J of the Project's Draft EIR.

from 56.5 dBA CNEL along Merrick Street/Molino Street (south of 4th Street) to 72.9 dBA CNEL along Alameda Street (north of 1st Street).

**TABLE IV.G-6
CALCULATED EXISTING VEHICULAR TRAFFIC NOISE LEVELS**

Roadway Segment	Adjacent Land Use	Existing CNEL (dBA CNEL)^a	Existing Noise Exposure Compatibility Category^b
1st Street			
Between Central Avenue and Alameda Street	Commercial/ Institutional	69.5	Conditionally Acceptable
East of Alameda Street	Residential/ Commercial	68.6	Conditionally Acceptable
2nd Street			
Between Central Avenue and Alameda Street	Commercial	67.0	Normally Acceptable
East of Alameda Street	Residential/ Commercial	65.2	Conditionally Acceptable
3rd Street			
Between Central Avenue and Alameda Street	Residential/ Commercial	71.8	Normally Unacceptable
Between San Pedro St and Central Avenue	Institutional/ Religious/ Commercial	71.8	Conditionally Acceptable
West of San Pedro St	Residential/ Commercial	70.9	Normally Unacceptable
3rd Street/4th Place			
Between Hewitt St and Merrick Street/Molino Street	Commercial/ Motel	69.8	Conditionally Acceptable
4th Street/4th Place			
Between Hewitt St and Merrick Street/Molino Street	Residential	72.1	Normally Unacceptable
4th Street			
Between Alameda Street and Hewitt St	Residential/ Commercial	71.0	Normally Unacceptable
Between Central Avenue and Alameda Street	Industrial/ Commercial	70.4	Conditionally Acceptable
Between San Pedro St and Central Avenue	Industrial/ Commercial	70.1	Conditionally Acceptable
East of Merrick Street/Molino Street	Industrial/ Commercial	72.3	Conditionally Acceptable
West of San Pedro St	Commercial	70.0	Conditionally Acceptable

**TABLE IV.G-6
CALCULATED EXISTING VEHICULAR TRAFFIC NOISE LEVELS**

Roadway Segment	Adjacent Land Use	Existing CNEL (dBA CNEL)^a	Existing Noise Exposure Compatibility Category^b
5th Street			
Between San Pedro St and Central Avenue	Commercial/ Residential	65.4	Conditionally Acceptable
West of San Pedro St	Commercial/ Residential	65.1	Conditionally Acceptable
6th Street			
Between Central Avenue and Alameda Street	Industrial/ Commercial	69.0	Normally Acceptable
East of Alameda Street	Industrial/ Commercial	68.5	Normally Acceptable
West of Central Avenue	Commercial/ Residential	67.6	Conditionally Acceptable
7th Street			
Between Central Avenue and Alameda Street	Industrial/ Commercial	69.6	Normally Acceptable
East of Alameda Street	Industrial/ Commercial	69.7	Normally Acceptable
West of Central Avenue	Commercial/ Residential	69.6	Conditionally Acceptable
Alameda Street			
Between 1st Street and 2nd Street	Commercial/ Residential	72.6	Conditionally Acceptable
Between 2nd Street and 3rd Street/4th Place	Commercial/ Residential	72.2	Conditionally Acceptable
Between 3rd Street/4th Place and 4th Street	Commercial/ Residential	72.3	Conditionally Acceptable
Between 4th Street and 6th Street	Industrial/ Commercial	72.0	Conditionally Acceptable
Between 6th Street and 7th Street	Industrial/ Commercial	71.8	Conditionally Acceptable
North of 1st Street	Institutional/ Commercial	72.9	Conditionally Acceptable
South of 7th Street	Industrial/ Commercial	72.0	Conditionally Acceptable

**TABLE IV.G-6
CALCULATED EXISTING VEHICULAR TRAFFIC NOISE LEVELS**

Roadway Segment	Adjacent Land Use	Existing CNEL (dBA CNEL)^a	Existing Noise Exposure Compatibility Category^b
Central Avenue			
Between 1st Street and 2nd Street	Commercial/ Residential	67.5	Conditionally Acceptable
Between 2nd Street and 3rd Street	Commercial/ Residential	70.0	Conditionally Acceptable
Between 3rd Street and 4th Street	Industrial/ Commercial	70.1	Conditionally Acceptable
Between 4th Street and 5th Street/Project South Site Driveway	Industrial/ Commercial	69.8	Normally Acceptable
Between 5th Street/Project South Site Driveway and 6th Street	Industrial/ Commercial	71.6	Conditionally Acceptable
Between 6th Street and 7th Street	Industrial/ Commercial	71.2	Conditionally Acceptable
South of 7th Street	Industrial/ Commercial	71.5	Conditionally Acceptable
Merrick Street/Molino Street			
North of 4th Street	Industrial/ Commercial	59.1	Normally Acceptable
South of 4th Street	Industrial/ Commercial	56.5	Normally Acceptable
San Pedro Street			
Between 3rd Street and 4th Street	Industrial/ Commercial	69.9	Normally Acceptable
Between 4th Street and 5th Street	Commercial/ Residential	70.1	Conditionally Acceptable
North of 3rd Street	Commercial/ Residential/ Religious	69.3	Conditionally Acceptable
South of 5th Street	Commercial/ Residential/ Religious	70.2	Conditionally Acceptable

NOTES:

^a Calculated based on existing traffic volumes.^b See Table IV.G-4 for a description of the compatibility categories.

SOURCE: ESA, 2022; Gibson Transportation Consulting, 2022

(4) Ambient Vibration Levels

(a) Groundborne Vibration Levels

Aside from periodic construction work, field observations noted that other sources of groundborne vibration in the Project Site vicinity are primarily limited to heavy-duty vehicular travel (e.g., refuse trucks, delivery trucks, etc.) on local roadways. Trucks traveling at a distance of 50 feet typically generate groundborne vibration velocity levels of 65 VdB (approximately 0.0068 in/sec PPV).⁴³

(b) Groundborne Noise Levels

As stated earlier, groundborne noise levels would generally be 20 to 50 decibels lower than the velocity level depending on the frequency level of the source.⁴⁴ With a background groundborne vibration level in residential areas of 50 VdB or lower, groundborne noise levels would be approximately 0 to 30 dBA. A bus traveling at a distance of 50 feet would generate groundborne noise levels of approximately 23 to 38 dBA. The approximate level of human perception of groundborne noise is 25 dBA for low frequency vibration (near 30 Hz) and 40 dBA for mid-frequency vibration (near 60 Hz).⁴⁵

3. Project Impacts

a) Thresholds of Significance

(1) Appendix G of the State CEQA Guidelines

In accordance with Appendix G of the CEQA Guidelines, a project would have a significant impact related to noise and vibration if it would result in the:

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.

⁴³ FTA, Transit Noise and Vibration Impact Assessment Manual, Figure 5-4, September 2018.

⁴⁴ FTA, Transit Noise and Vibration Impact Assessment Manual, September 2018, p. 146.

⁴⁵ FTA, Transit Noise and Vibration Impact Assessment Manual, September 2018, p. 120.

For this analysis, the Appendix G Thresholds are relied upon. The analysis utilizes factors and considerations identified in the City's 2006 L.A. CEQA Thresholds Guide and the FTA's groundborne vibration and noise criteria for assessing potential impacts relating to building damage and human annoyance were used, as appropriate, to assist in answering the Appendix G Threshold questions. The factors to evaluate noise impacts are listed below.

(2) Construction Noise

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

- Construction activities lasting more than one day would exceed existing ambient exterior noise levels by 10 dBA L_{eq} or more at a noise-sensitive use;
- Construction activities lasting more than 10 days in a three-month period would exceed existing ambient exterior noise levels by 5 dBA L_{eq} or more at a noise-sensitive use; or
- Construction activities would exceed the ambient noise level by 5 dBA L_{eq} at a noise-sensitive use between the hours of 9:00 p.m. and 7:00 a.m. Monday through Friday, before 8:00 a.m. or after 6:00 p.m. on Saturday, or at any time on Sunday.

As discussed in Chapter II, *Project Description*, of this Draft EIR, construction of the Project is anticipated to begin in 2025 and is estimated to be completed in 2029 under the most intensive schedule with overlapping construction on all the sites (i.e., North Site, South Site, and West Site). Under this most intensive schedule, construction would occur for approximately 56 months. Therefore, since construction activities would occur over a period longer than 10 days for all phases, the corresponding significance criteria used in the construction noise analysis presented in this section of the Draft EIR is an increase in the ambient exterior noise levels of 5 dBA L_{eq} or more at a noise-sensitive use.

(3) Operational Noise

The Project would normally have a significant noise impact if any of the following events were to occur:

- 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 on-site operational (i.e., non-roadway) noise sources, such as, outdoor mechanical equipment, parking facilities, loading, and outdoor activities, increase the ambient noise level (hourly L_{eq}) at noise-sensitive uses by 5 dBA.

The significance criteria used in the noise analysis for on-site operations presented below is an increase in the ambient noise level of 5 dBA (hourly L_{eq}) at the noise-sensitive uses, in accordance with the LAMC. The ambient noise level is based on the measured daytime

and evening noise levels shown in Table IV.G-5, and the lower value (daytime or evening) is used for the purposes of impact determination.

The LAMC does not apply to off-site traffic (i.e., vehicles traveling on public roadways). Therefore, based on the *L.A. CEQA Thresholds Guide*, the significance criteria 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 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 level 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.

(4) Groundborne Vibration

The City has not adopted criteria to assess vibration impacts during construction. Thus, for this Project, the City has determined that the use of FTA's criteria for structural damage and human annoyance, as described in Table IV.G-1 and Table IV.G-2, respectively, is appropriate to evaluate potential impacts related to Project construction and operation. The structures in the vicinity of the Project Site are Category I (reinforced-concrete, steel, or timber [no plaster]), Category II (engineered concrete and masonry [no plaster]), and Category III (non-engineered timber and masonry buildings).

- Potential Building Damage – Project construction activities that cause groundborne vibration levels to exceed the potential structural damage threshold of 0.5 in/sec PPV at the nearest off-site buildings or structures of Building Category I, Reinforced-concrete, steel, or timber (no plaster).
- Potential Building Damage – Project construction activities that cause groundborne vibration levels to exceed the potential structural damage threshold of 0.3 in/sec PPV at the nearest off-site buildings of Building Category II, Engineered concrete and masonry (no plaster).
- Potential Building Damage – Project construction activities that cause groundborne vibration levels to exceed the potential structural damage threshold of 0.2 in/sec PPV at the nearest off-site buildings of Building Category III, Non-engineered timber and masonry buildings.
- Potential Building Damage – Project construction activities that cause groundborne vibration levels to exceed the potential structural damage threshold of 0.12 in/sec PPV at the nearest off-site buildings of Building Category IV, Buildings extremely susceptible to building damage.

Based on FTA guidelines, construction and operational vibration impacts associated with human annoyance would be significant if the following were to occur (applicable to frequent events; 70 or more vibration events per day):

- Project construction and operational activities cause groundborne vibration levels to exceed 72 VdB at off-site sensitive uses, including residential and hotel uses.

b) Methodology

(1) On-Site Construction Noise

Noise impacts due to on-site construction activities associated with the Project were evaluated by calculating the noise levels at representative sensitive receptor locations and comparing these estimated construction noise levels to the existing ambient noise levels (i.e., noise levels without construction noise from the Project). Construction noise associated with the Project was analyzed based on the Project's potential construction equipment inventory, construction durations, and construction schedule. The construction equipment noise levels are based on the published noise data (equipment source levels) by the FHWA Roadway Construction Noise Model (RCNM).⁴⁶ The construction noise levels were then calculated for sensitive receptor locations based on the standard point source (e.g., generator or bulldozer) noise-distance attenuation factor of 6 dBA for each doubling of distance. Additional noise attenuation was assigned to receptor locations where the line-of-sight to the Project Site was interrupted by the presence of intervening structures. For the noise analysis, a 5-dBA attenuation was assigned for receptor locations where the acoustic line-of-sight is just interrupted (i.e., around the edge of a building) and up to a 15-dBA attenuation for receptor locations where the acoustic line-of-sight is fully interrupted (i.e., by intervening buildings).

Project construction would include the following construction sites and associated construction phases, some of which may overlap at the same time, as shown in **Table IV.G-7, Project Construction Phases**:

**TABLE IV.G-7
PROJECT CONSTRUCTION PHASES**

Site	Individual Phases	Overlapping Phases
Upper South Site	<ul style="list-style-type: none"> • Demolition • Site preparation • Below grade parking/trenching • Parking garage construction • Foundations/concrete pour • Building 3 construction • Building 3 architectural coating • Building 4 construction • Building 4 architectural coating • Building 5 construction • Paving • Building 5 architectural coating 	<ul style="list-style-type: none"> • Demolition + Site Preparation • Below Grade Parking + Parking Garage Construction • Building 3/4/5 Construction • Building 3/4/5 Construction + Building 3/4 Architectural Coating • Building 5 Construction + Architectural Coating + Paving

⁴⁶ FHWA, Roadway Construction Noise Model, 2006.

**TABLE IV.G-7
PROJECT CONSTRUCTION PHASES**

Site	Individual Phases	Overlapping Phases
Lower South Site	<ul style="list-style-type: none"> • Demolition • Site preparation • Below grade parking/trenching • Parking garage construction • Foundations/concrete pour • Building 6 construction • Building 6 architectural coating • Building 7 construction • Building 7 architectural coating • Building 8 construction • Building 8 architectural Coating • Building 9 construction • Paving • Building 9 architectural coating 	<ul style="list-style-type: none"> • Demolition + Site Preparation • Below Grade Parking + Parking Garage Construction • Building 6/7/8/9 Construction+ Architectural Coating • Building 6/7/8/9 Construction+ Architectural Coating + Paving
West Site	<ul style="list-style-type: none"> • Demolition • Site preparation • Below grade parking/trenching • Foundations/concrete pour • Building 10 construction • Paving • Building 10 architectural coating 	<ul style="list-style-type: none"> • Demolition + Site Preparation • Building 10 Construction + Paving • Building 10 Construction + Architectural Coating
North Site	<ul style="list-style-type: none"> • Demolition • Site preparation • Below grade parking/trenching • Foundations/concrete pour • Building 1 construction • Building 1 architectural coating • Building 2 construction • Paving • Building 2 architectural coating 	<ul style="list-style-type: none"> • Demolition + Site Preparation • Building 1 and 2 Construction • Building 1 Construction + Building 1 Architectural Coating + Building 2 Construction • Building 2 Construction + Architectural Coating + Paving

SOURCE: Studio One Eleven, 2022; ESA, 2022.

Construction of two or more of the components (i.e., the Upper South Component, Lower South Component, West Component, and/or North Component) may also occur at the same time. Therefore, the construction noise analysis assumes overlapping construction phases within each component as well as overlapping of all four components.

Since construction of the Project as a whole would last more than 10 days, based on the criteria provided in the 2006 L.A. CEQA Thresholds Guide, the construction noise significance threshold used in this analysis is an increase in the ambient exterior noise level of 5 dBA L_{eq} or more at a noise-sensitive use.

Types of construction equipment expected to be used during Project construction could produce maximum noise levels of 74 dBA L_{max} to 90 dBA L_{max} at a reference distance of 50 feet from the noise source according to FHWA reference noise levels. **Table IV.G-8, *Project Construction Equipment and Associated Noise Levels***, lists the construction equipment type assumed for Project construction and FHWA reference noise levels (L_{max}) at 50 feet. These maximum noise levels would occur when equipment is operating at full power. Construction equipment does not typically operate at full power consistently throughout the duration of a given construction stage. The estimated usage factor for the equipment is also shown in Table IV.G-8 and represents the percentage of a specified time period (i.e., an hour) that a piece of equipment is expected to be operational, allowing for the calculation of an average noise level (dBA L_{eq}). The usage factors are based on FHWA's RCNM.⁴⁷

The analysis of construction noise incorporates conservative assumptions to provide an environmentally protective analysis to avoid underestimating construction noise levels. These conservative assumptions include (1) assuming all pieces of construction equipment anticipated to be used for the specific construction stages and construction activities would be in use simultaneously; (2) assuming that the noisiest equipment used during the various construction stages and construction activities would be located on the Project Site in the applicable construction work area for the construction activity at the closest distance to the sensitive receptor location; (3) estimating noise levels at the property line of each sensitive receptor location and without benefit of any intervening walls, landscaping, windows, or structures; and (4) assuming the more conservative attenuation rate of 6 dBA per doubling of distance for acoustically “hard” sites (e.g., asphalt and concrete surfaces) instead of 7.5 dBA per doubling of distance for acoustically “soft” sites (e.g., soft dirt, grass or scattered bushes and trees).

To present a conservative impact analysis, the estimated noise levels were calculated with all pieces of construction equipment assumed to be operating simultaneously and located at the construction area nearest to the affected receptors. The noise model assumed the two noisiest pieces of construction equipment would operate in the construction area nearest to the affected receptors.

⁴⁷ FHWA, Roadway Construction Noise Model User's Guide, 2006.

TABLE IV.G-8
PROJECT CONSTRUCTION EQUIPMENT AND ASSOCIATED NOISE LEVELS

Type of Equipment^a	Reference Noise Level at 50 Feet, L_{max}	Estimated Usage Factor
Aerial Lift	75	20%
Air Compressor	78	40%
Bore/Drill Rig	84	20%
Cement/Mortar Mixer	80	50%
Concrete Saw	90	20%
Crane	81	16%
Crawler Tractor	84	40%
Crushing/Processing Equipment	85	50%
Excavator	81	40%
Forklift	75	20%
Graders	85	40%
Off-Highway Truck	84	40%
Paver	77	50%
Paving Equipment	77	50%
Plate Compactor	83	20%
Pumps	81	20%
Roller	80	20%
Rough Terrain Forklift	83	40%
Rubber Tired Loader	79	40%
Rubber Tired Loader	79	40%
Signal Board	79	40%
Skid Steer Loader	79	40%
Sweepers/Scrubbers	82	10%
Tractor/Loader/Backhoes	81	40%
Welders	74	40%

^a The number and types of equipment used would vary by the specific Project component being demolished or constructed. Certain types of equipment may only be used for limited durations or locations within each construction stage. Detailed equipment lists used during each construction stage during each month of construction activity are provided in Appendix G of this Draft EIR.

^b Reference noise level is based on the operation of one piece of equipment.

SOURCE: FHWA, 2006; ESA, 2022.

It should also be noted that the 2006 L.A. CEQA Thresholds Guide contains screening criteria, including (1) whether construction activities occur within 500 feet of a noise-sensitive use; and (2) whether construction occurs between the hours of 9:00 p.m. and 7:00 a.m. Monday through Friday, before 8:00 a.m. or after 6:00 p.m. on Saturday, or anytime on Sunday. A “no” response to these questions indicates that construction would not occur between these hours and there would normally be no significant construction noise impacts from the project. Construction would occur Monday through Friday between 7:00 a.m. and 6:00 p.m.; and Saturdays between 8:00 and 6:00 p.m., which is within the allowable hours per the LAMC. The Project would occur within 500 feet of a noise-sensitive use, therefore, requiring analysis of construction noise impacts. Noise-sensitive uses as defined in the Thresholds Guide located at distances greater than 500 feet from the Project Site would experience lower noise levels than the sensitive receptors described above in subsection IV.G.2.c(1) from potential sources of noise on the Project Site due to noise attenuation (e.g., noise reduction) from distance and intervening structures. Therefore, based on the reduction in Project Site-related noise levels that would occur at additional sensitive receptors beyond those identified above, additional receptors beyond those identified above are not necessary and were not evaluated.

(2) Off-Site Roadway Noise (Construction and Operation)

Roadway noise levels were projected using the FHWA’s TNM and the roadway traffic volume provided in the Transportation Assessment for the Project.⁴⁸ The FHWA TNM is the current Caltrans standard computer noise model for traffic noise studies. The model allows for the input of roadway parameters, noise receivers, and sound barriers (if any). Roadway noise attributable to Project development was calculated and compared to baseline noise levels that would occur under the “Without Project” condition. With respect to operational traffic noise, impacts are evaluated for the existing year and the buildout year of 2030.

The roadway segments considered in the analysis include those studied in the Transportation Assessment for the Project⁴⁹ that would be anticipated to accommodate haul trucks and concrete trucks traveling to and from the Project Site to off-site haul truck receiver locations or concrete vendor locations. Peak hour haul, vendor, and worker trips were estimated using modeling assumptions consistent with the construction vehicle and truck trip assumptions used in Section IV.B, *Air Quality*, Section IV.E, *Greenhouse Gas Emissions*, Section IV.J, *Transportation*, and of this Draft EIR.

(3) On-Site Stationary Point-Source Noise (Operation)

For purposes of providing a conservative noise analysis for outdoor spaces, the maximum occupant load of Project outdoor spaces was calculated based on an occupancy load factor of 15 square feet per person for an assembly area without fixed seats, according

⁴⁸ Gibson Transportation Consulting, Inc., Transportation Assessment for the Fourth & Central Project, March 2022. Provided in Appendix J of the Project’s Draft EIR.

⁴⁹ Gibson Transportation Consulting, Inc., Transportation Assessment for the Fourth & Central Project, March 2022. Provided in Appendix J of the Project’s Draft EIR.

to the California Building Code Table 1004.5 Maximum Floor Area Allowances Per Occupant.⁵⁰ Although this occupancy load factor provides an overestimation of the occupancy load and associated noise within passive landscaped areas, it has been applied to the square footage of the Project's outdoor spaces to provide a conservative worst-case noise analysis.

Actual capacities for the Project outdoor spaces would be lower and, in some cases substantially lower, due to design considerations, such as building ingress/egress limitations, elevator and stairwell capacities, fire escape route capacities, and other capacity considerations. Open space noise was calculated based on noise from people talking along the path. Noise from female adults, male adults, and children talking is approximately 55 dBA, 58 dBA, and 58 dBA, respectively, at a distance of three feet.⁵¹ As a conservative analysis, it is assumed that each outdoor space would be at full capacity and that half of the visitors would be adults (half male and half female) and half would be children. Of the adults and children, half would be talking simultaneously (assuming approximately half of the occupants talking and the other half listening). Several of the proposed outdoor spaces may include amplified sound. The type and level of noise from each space would vary based on the purpose and use of the space and the occupancy load. For purposes of providing a conservative assumption for amplified sound at outdoor spaces, it is assumed that amplified sound systems would be used for live music or similar amplified sound resulting in noise levels of up to 91 dBA L_{eq} at 25 feet from the source.⁵²

Sources of noise within the parking structures would primarily include vehicular movements and engine noise, doors opening and closing, and intermittent car alarms. Noise levels within the parking structure would fluctuate with the amount of automobile and human activity. Parking noise has been calculated for the Project based on the forecasted trip generation included in the Project's Transportation Assessment.

For noise associated with Project outdoor mechanical equipment, it was assumed that the Project would comply with the requirements of LAMC Section 112.02 to ensure that the maximum noise generated by any and all outdoor mechanical equipment would not exceed the ambient noise level by more than 5 dBA, which falls within the significance threshold identified below.

Operational noise, based on the above methodology and assumptions, would result in potentially significant impacts if noise levels exceed the significance threshold identified in Subsection 3.a, *Thresholds of Significance*, above.

⁵⁰ California Building Standards Commission, 2019 Title 24, Part 2, Volume 1 – California Building Code.

⁵¹ American Journal of Audiology Vol.7 21-25 October 1998. doi:10.1044/1059-0889(1998/012).

⁵² University of Michigan, Department of Environmental Health Science, August 22, 2016. *Noise Navigator Sound Level Database with Over 1700 Measurement Values*.

(4) Composite Noise (Operations)

Combined noise levels from each operational noise source were estimated by logarithmically adding together the noise levels from all the operational noise sources at the maximum impacted noise-sensitive receptor locations, assuming simultaneous contribution of noise from each source. As discussed previously, the dBA scale is based on logarithms, where a doubling of sound energy corresponds to a 3-dBA increase (e.g., if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA). Composite noise sources include off-site roadway noise and on-site stationary point-source noise, as listed above.

(5) Groundborne Vibration (Construction and Operation)

Groundborne vibration and noise impacts were evaluated for potential building damage and human annoyance impacts by identifying the Project's potential vibration sources, estimating the distance between the Project's vibration sources and the nearest structure and vibration annoyance receptor locations, and making a significance determination based on the significance thresholds described below.

The FTA guidance classifies the vibration impact levels based on whether the vibration-producing events are frequent, occasional, or infrequent. "Frequent Events" is defined as more than 70 vibration events of the same source per day. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. For the purposes of providing a conservative analysis, the vibration analysis provided herein for potential human annoyance compares the estimated vibration levels generated during construction and operation of the Project to the 72 VdB significance threshold for off-site residential uses for "Frequent Events." The vibration analysis for the Project conservatively used the closest distance to construction activity and the construction phase with the equipment mix that would result in the greatest potential vibration.

Construction activities may generate groundborne vibration and noise from transient sources due to the temporary and sporadic use of vibration-generating equipment. Operation of the Project has no potential to cause structure damage to the Project's own buildings or to off-site buildings that are farther away because the Project would not include any equipment that would generate substantial groundborne vibration or noise levels. Construction and operational activities may generate groundborne vibration and noise levels that could be felt by people as a result of trucks and vehicles driving to and from the Project Site, or from the operation of typical commercial-grade stationary mechanical and electrical equipment, such as air handling units, condenser units, and exhaust fans, which could produce groundborne vibration and noise.

(6) Groundborne Noise

According to the FTA, airborne noise levels would be higher than groundborne noise levels.⁵³ 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. There are no substantially insulated indoor receptors located within the area surrounding the Project Site; therefore, the effects of airborne noise would still be higher than groundborne noise levels. Accordingly, impacts related to groundborne noise have not been analyzed herein.

c) Project Design Features

The following project design features have been accounted for their potential noise reduction in the impact analysis:

NOI-PDF-1 (Impact Pile Drivers Prohibited): The Project will not require or allow the use of impact pile drivers. Lower noise- and vibration-generating augured, drilled, or vibratory piles are permitted.

NOI-PDF-2 (Construction Equipment Maintenance): During plan check for each phase of the Project, the contractor will provide a statement to the City indicating their powered construction equipment (including combustion engines), fixed or mobile, will be properly maintained to assure that no additional noise, due to worn or improperly maintained parts, would be generated.

NOI-PDF-3 (Mechanical Equipment Noise): All outdoor mounted building mechanical equipment and/or ventilation systems not fully enclosed will be designed to not exceed sound level limits of the noise level requirements of the City of Los Angeles through the use of quiet fans, duct silencers, parapets, enclosures, mufflers, or similar noise attenuation methods.

NOI-PDF-4 (Loading Dock Screening): All loading docks will be acoustically screened from off-site noise-sensitive receptors. Acoustical screening of loading docks will be achieved through the use of physical barriers (i.e., walls, buildings or other structures that fully block the line-of-sight between the loading dock and off-site noise-sensitive receptors), or with loading dock seals installed between the truck and loading dock. Acoustical screening may also be achieved by requiring loading activities to be conducted fully inside buildings, or by similar methods.

⁵³ FTA, Transit Noise and Vibration Impact Assessment Manual, September 2018, p. 124.

d) Analysis of Project Impacts

Threshold (a): Would the project result in the 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) Construction Impacts.

Construction noise is analyzed for on-site construction noise sources, which includes the use of construction equipment, and off-site construction noise sources, which includes construction trucks and vehicles traveling on roadways.

(i) On-Site Construction Noise

Construction of the Project is anticipated to begin in the first quarter of 2025, pending Project consideration and approval, and is estimated to be completed in the fourth quarter of 2029 (approximately 57 months). All construction staging of materials and equipment and worker parking would be confined to the Project Site.

Project construction activities would be required to comply with the City's Ordinance Nos. 144,331 and 161,574, which prohibit the emission or creation of noise beyond 75 dBA at 50 feet from the equipment, unless technically infeasible.⁵⁴ In addition, the Project would be subject to LAMC Section 91.106.4.8 (Construction Site Notice, City's Ordinance 178,048), which requires a construction site notice to be provided that includes the following information: job site address, permit number, name and phone number of the contractor and owner or owner's agent, hours of construction allowed by code or any discretionary approval for the site, and City telephone numbers where violations can be reported.

Noise impacts from Project construction activities would be a function of the noise generated by construction equipment, the type and location of the equipment, the timing and duration of the noise-generating construction activities, and the relative distance to noise-sensitive receptors. Construction activities for the Project would generally include demolition, site grading and excavation for the subterranean parking garage, stormwater capture system, pool, and building construction. Each stage of construction would involve the use of various types of construction equipment and would, therefore, have its own distinct noise characteristics. Equipment that would be used during the various

⁵⁴ As provided in LAMC Section 112.05, technical infeasibility shall mean that said noise limitations cannot be complied with despite the use of mufflers, shields, sound barriers, and/or other noise reduction devices or techniques during the operation of the equipment.

construction stages is shown previously in Table IV.G-8.⁵⁵ Per NOI-PDF-1, the Project will not require or allow the use of impact pile drivers; however, augured, drilled, or vibratory piles are permitted. Noise from construction equipment would generate both steady-state and episodic noise that could be heard within and adjacent to the Project Site.

Table IV.G-9, Estimate of Construction Noise Levels (L_{eq}) at Off-Site Sensitive Receptors, provides the estimated construction noise levels at the off-site noise sensitive receptors by phase (over the anticipated 57 months of construction). As indicated in Table IV.G-9, the estimated construction noise levels would exceed the Project significance threshold at all off-site noise receptor locations except for R1, prior to implementation of mitigation measures. **Therefore, the Project would result in the generation of a substantial temporary increase in ambient noise levels in the vicinity of the Project in excess of standards established by the City, and on-site construction noise impacts would be potentially significant.**

TABLE IV.G-9
ESTIMATE OF CONSTRUCTION NOISE LEVELS (L_{eq}) AT OFF-SITE SENSITIVE RECEPTORS

Site	Estimated Construction Noise Levels by Receptor, dBA (L_{eq}) ^a					
	R1	R2	R3	R4	R5	R6
A – Upper South Component	59.3	78.0	62.8	72.0	79.7	70.9
B – Lower South Component	60.5	65.8	75.3	75.9	72.3	62.5
C – West Component	57.3	68.6	62.7	78.2	78.8	61.1
D – North Component	66.1	75.0	61.1	68.6	82.5	74.2
Maximum Overlapping Noise Level	68.2	80.2	75.9	81.1	85.6	76.2
Ambient Daytime Noise Level	67.7	70.5	58.5	70.2	69.7	66.7
Threshold (Ambient + 5 dBA) ^b	72.7	75.5	63.5	75.2	74.7	71.7
Exceeds Threshold?	No	Yes	Yes	Yes	Yes	Yes

^a Noise levels are reported as a range based on the estimated 1-hour average noise level (L_{eq}) for the individual phases and overlapping phases of construction activity, for construction equipment used in each phase as shown in Table IV.G-8. **Bold** and shaded values represent an exceedance of the significance threshold.

^b Significance thresholds are equivalent to the measured daytime ambient noise levels plus 5 dBA.

SOURCE: ESA, 2022.

⁵⁵ The number and types of equipment used would vary by the specific Project component being demolished or constructed. Certain types of equipment may only be used for limited durations or locations within each construction stage. Detailed equipment lists used during each construction stage during each month of construction activity are provided in Appendix G of this Draft EIR.

(ii) *Off-Site Construction Traffic Noise*

In addition to on-site construction noise sources, other noise sources may include materials delivery, concrete mixing, haul trucks (construction trucks), and construction worker vehicles accessing the Project Site during construction. Typically, construction trucks generate higher noise levels than construction worker vehicles. The major noise sources associated with off-site construction trucks would be from the material delivery/concrete/haul trucks.

(a) *Haul Trucks*

Construction haul trucks for demolition material and soil hauling would generate haul truck travel between the Project Site and the Sunshine Canyon Landfill in the Sylmar neighborhood of the City of Los Angeles or potentially to locations in Irwindale via two predetermined haul routes, which are listed below. Incoming/outgoing trucks would travel to and from the Project Site using the same routes back and forth.

- The first haul route would travel from the Project Site east along 4th Street, and take Interstate 5 North towards the Sunshine Canyon Landfill or take the US 101 South, merge onto State Route 60 East, and take Interstate 605 North towards Irwindale.
- The second haul route would travel from the Project Site east along 4th Street, and take Interstate 5 North towards the Sunshine Canyon Landfill or merge onto the Interstate 10 east, and take the State Route 60 North towards Irwindale.

The peak period (i.e., daily number of truck trips) of construction with the highest number of construction haul trucks would occur as a result of grading and excavation activities. For the purposes of this analysis, it is conservatively assumed that grading and excavation activities for the Upper South, Lower South, North and West sites would be occurring at the same time, resulting in the maximum number of daily haul truck trips. In reality, grading and excavation activities for the Upper South, Lower South, North and West sites could occur at different times and daily haul truck trips could be lower than assumed in this analysis. Under the assumption that grading and excavation activities for the Upper South, Lower South, North and West sites would be occurring at the same time, there would be a total of 1,220 haul truck trips and 240 worker trips per day over an 8-hour timespan (equal to approximately 153 haul truck trips and 30 worker trips per hour).

Table IV.G-10, *Estimate of Off-Site Construction Traffic Noise Impacts*, provides the estimated noise levels along the haul routes for the roadway segments analyzed in the Project traffic study. As indicated in Table IV.G-10, the Project's haul truck trips and worker vehicle trips would increase existing traffic noise levels by a maximum of 2.9 dBA CNEL along 4th Street between Alameda Street and Hewitt Street, where noise-sensitive uses (e.g., residential uses) are located. This increase does not represent an exceedance of the significance threshold of an increase of 3 dBA CNEL to or within the "normally unacceptable" or "clearly unacceptable" categories. Therefore, the Project would not result in the generation of a substantial temporary increase in ambient noise levels in the vicinity of the Project in excess of standards established by the City, and off-site construction traffic noise impacts from haul trucks would be less than significant.

TABLE IV.G-10
ESTIMATE OF OFF-SITE CONSTRUCTION TRAFFIC NOISE LEVELS

Roadway Segment	Existing Land Uses Located along Roadway Segment	CNEL (dBA)			
		Existing (A)	Existing with Project (B)	Project Increment (B–A)	Exceed Threshold?
Haul Trucks					
4th Street					
Between Hewitt St and Merrick Street/Molino Street	Commercial/ Motel	72.1	74.2	2.1	No
Between Alameda Street and Hewitt St	Residential/ Commercial	71.0	73.9	2.9	No
Between Central Avenue and Alameda Street	Industrial/ Commercial	70.4	73.2	2.8	No
East of Merrick Street/Molino Street	Industrial/ Commercial	72.3	74.3	2.0	No
6th Street					
Between Central Avenue and Alameda Street	Industrial/Commercial	70.5	72.5	2.0	No
East of Alameda Street	Industrial/Commercial	70.0	72.3	2.3	No
7th Street					
Between Central Avenue and Alameda Street	Industrial/Commercial	71.1	72.8	1.7	No
East of Alameda Street	Industrial/Commercial	71.3	72.9	1.6	No
Alameda St					
Between 1st Street and 2nd Street	Commercial/Residential	72.6	73.6	1.0	No
Between 2nd Street and 3rd Street/4th Place	Commercial/Residential	72.2	73.4	1.1	No
Between 3rd Street/4th Place and 4th Street	Commercial/Residential	72.3	73.4	1.1	No
Between 4th Street and 6th Street	Industrial/Commercial	72.0	73.3	1.2	No
Between 6th Street and 7th Street	Industrial/Commercial	71.8	73.1	1.4	No
South of 7th Street	Industrial/Commercial	72.0	73.2	1.2	No

TABLE IV.G-10
ESTIMATE OF OFF-SITE CONSTRUCTION TRAFFIC NOISE LEVELS

Roadway Segment	Existing Land Uses Located along Roadway Segment	CNEL (dBA)			
		Existing (A)	Existing with Project (B)	Project Increment (B–A)	Exceed Threshold?
Foundation Concrete Pour Trucks					
1st Street					
Between Central Avenue and Alameda Street	Commercial/Institutional	71.1	73.4	2.3	No
East of Alameda Street	Residential/Commercial	70.2	73.1	2.9	No
4th Street					
Between Hewitt St and Merrick Street/Molino Street	Commercial/ Motel	72.1	74.7	2.6	No
Between Alameda Street and Hewitt St	Residential/ Commercial	71.0	74.1	3.1	Yes
Between Central Avenue and Alameda Street	Industrial/ Commercial	70.4	73.8	3.4	No
East of Merrick Street/Molino Street	Industrial/ Commercial	72.3	74.8	2.5	No
6th Street					
Between Central Avenue and Alameda Street	Industrial/Commercial	70.5	73.2	2.7	No
East of Alameda Street	Industrial/Commercial	70.0	73.1	3.1	No
7th Street					
Between Central Avenue and Alameda Street	Industrial/Commercial	71.1	73.5	2.4	No
East of Alameda Street	Industrial/Commercial	71.3	73.5	2.2	No
Alameda St					
Between 1st Street and 2nd Street	Commercial/Residential	72.6	74.1	1.5	No
Between 2nd Street and 3rd Street/4th Place	Commercial/Residential	72.2	73.9	1.7	No
Between 3rd Street/4th Place and 4th Street	Commercial/Residential	72.3	74.0	1.7	No
Between 4th Street and 6th Street	Industrial/Commercial	72.0	73.9	1.9	No

TABLE IV.G-10
ESTIMATE OF OFF-SITE CONSTRUCTION TRAFFIC NOISE LEVELS

Roadway Segment	Existing Land Uses Located along Roadway Segment	CNEL (dBA)			
		Existing (A)	Existing with Project (B)	Project Increment (B-A)	Exceed Threshold?
Between 6th Street and 7th Street	Industrial/Commercial	71.8	73.7	1.9	No
South of 7th Street	Industrial/Commercial	72.0	73.8	1.8	No
Central Avenue					
Between 1st Street and 2nd Street	Commercial/ Residential	67.5	72.3	4.8	Yes
Between 2nd Street and 3rd Street	Commercial/ Residential	70.0	73.0	3.0	Yes
Between 3rd Street and 4th Street	Industrial/ Commercial	70.1	73.1	3.0	No
Between 4th Street and 5th Street/Project South Site Driveway	Industrial/ Commercial	69.8	73.0	3.2	No
Between 5th Street/Project South Site Driveway and 6th Street	Industrial/Commercial	71.6	73.7	2.1	No
Between 6th Street and 7th Street	Industrial/Commercial	71.2	73.5	2.3	No
South of 7th Street	Industrial/Commercial	71.5	73.6	2.1	No

SOURCE: ESA 2022. Appendix G of this Draft EIR.

(b) Foundations Concrete Pour Trucks

For purposes of this off-site construction noise analysis, the foundations concrete pour stage was analyzed, which represents the worst-case day with the most off-site construction traffic. Foundations concrete pour would be a short-term occurrence (typically a few days per site) to allow for the construction of mass concrete foundations. Concrete trucks would not be subject to the City-approved haul truck route discussed above. Therefore, concrete trucks could travel along a variety of roadway segments. The roadway segments considered in the analysis include those studied in the Transportation Assessment for the Project⁵⁶ that would be anticipated to accommodate haul trucks and concrete trucks traveling to and from the Project Site to off-site haul truck receiver locations or concrete vendors. The concrete truck routes would be expected to include the primary routes to nearby freeways and include Central Avenue, Alameda Street, 1st Street, 4th Street, 6th Street, and 7th Street. Worker vehicle and concrete truck trips have been assumed for these expected roadway segments.

The peak period (i.e., daily number of truck trips) of construction with the highest number of construction trucks would occur during the foundations and concrete pour phases for the South site, building construction of Buildings 3 through 10, architectural coating for the North site, and paving for the West site. During these potential overlapping phases, there would be an estimated maximum of up to 2,016 concrete trucks into and out of the Project Site per day over a continuous 24-hour timespan (equal to 84 trips per hour). In addition, during these phases there would be a total of 360 haul trucks, 732 vendor trucks, and 3,458 worker trips per day over an 8-hour timespan (equal to approximately 45 haul trucks, 92 vendor trucks, and 433 worker trips per hour).

Table IV.G-10 provides the estimated noise levels along the anticipated truck routes for the segments analyzed in the traffic study. As discussed above, the roadway segments considered in the analysis include those studied in the Transportation Assessment for the Project that would be anticipated to accommodate concrete trucks traveling to and from the Project Site to off-site concrete vendor locations. As indicated in Table IV.G-10, the Project's foundations concrete pour truck trips and worker vehicle trips would increase existing traffic noise levels by a maximum of 4.8 dBA CNEL along Central Avenue between 1st Street and 2nd Street, where noise-sensitive uses (e.g., residential uses) are located. The noise would also be increased by more than 3 dBA CNEL on roadway segment with noise-sensitive uses (e.g., residential uses) and include Central Avenue between 2nd Street and 3rd Street and 4th Street between Alameda Street and Hewitt Street. These increases represent an exceedance of the significance threshold of an increase of 3 dBA CNEL to or within the "normally unacceptable" or "clearly unacceptable" categories or an increase of 5 dBA CNEL or greater within the "normally acceptable" or "conditionally acceptable" categories. **Therefore, the Project would result in the generation of a substantial temporary increase in ambient noise levels in the**

⁵⁶ Gibson Transportation Consulting, Inc., Transportation Assessment for the Fourth & Central Project, March 2022. Provided in Appendix J of the Project's Draft EIR.

vicinity of the Project in excess of standards established by the City, and off-site construction traffic noise impacts from foundations concrete pour trucks would be potentially significant.

(b) Operational Noise Impacts

Operational noise is analyzed for on-site operational noise sources, which includes the use of fixed mechanical equipment, activities and special events in outdoor spaces, and parking facilities, and off-site operational noise sources, which includes operational vehicles traveling on roadways. Per NOI-PDF-4, all loading docks will be acoustically screened from off-site noise-sensitive receptors, which would eliminate noise impacts from loading activities at off-site noise sensitive receptors.

(i) Fixed Mechanical Equipment

The Project would include new mechanical equipment (e.g., air ventilation equipment), which would be located at the roof level of all buildings. Mechanical equipment such as air conditioning equipment and emergency generators may generate audible noise levels. As required in NOI-PDF-3 (Mechanical Equipment Noise), Project-related outdoor mechanical equipment would be designed so as not to increase the existing ambient noise levels by 5 dBA in accordance with the City's Noise Regulations (Section 112.02 of the LAMC). Mechanical equipment compliance will be achieved through the use of quiet fans, duct silencers, parapets, enclosures, mufflers, or similar noise attenuation methods. Equipment such as emergency generators, would be located within enclosed mechanical rooms, which would shield the noise at off-site noise sensitive uses so as to avoid land use noise conflicts with adjacent uses and minimize audible increases in exterior noise levels at off-site noise sensitive uses. **Table IV.G-11, Mechanical Equipment Noise Levels**, presents the estimated on-site mechanical equipment noise levels at the off-site receptor locations. As shown on Table IV.G-11, the estimated noise levels from the mechanical equipment would range from 39.7 dBA (L_{eq}) at receptor location R1 to 50.3 dBA (L_{eq}) at receptor location R5, which would be below the existing ambient noise levels. As such, the estimated noise levels at all off-site receptor locations would be below the significance threshold of 5 dBA (L_{eq}) above ambient noise levels. **As such, the Project 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 by the City, and impacts from mechanical equipment noise would be less than significant.**

**TABLE IV.G-11
MECHANICAL EQUIPMENT NOISE LEVELS**

Receptor Location	Existing Ambient Noise Levels, ^a dBA (L _{eq})	Estimated Noise from Project Mechanical Equipment, ^b dBA (L _{eq})	Ambient + Project Noise Levels, dBA (L _{eq})	Significance Threshold ^c	Exceedance over Significance Threshold	Significant Impact?
R1	60.6	39.7	60.6	65.6	0.0	No
R2	64.8	44.2	64.8	69.8	0.0	No
R3	58.5	38.9	58.5	63.5	0.0	No
R4	66.7	49.1	66.8	71.7	0.0	No
R5	69.7	50.3	69.7	74.7	0.0	No
R6	62.7	41.3	62.7	67.7	0.0	No

NOTES:

- ^a The ambient noise level is based on the measured daytime and evening noise levels shown in Table IV.G-5, and the lower value (daytime or evening) is used for the purposes of impact determination.
- ^b Exterior reference noise levels for air condenser units, fans, and related equipment, the primary sources of noise from fixed mechanical equipment, would be 81.9 dBA Leq measured at a distance of 5 feet (based on noise data from large shopping center projects in Southern California). Refer to: City of Moreno Valley, Moreno Valley Walmart Noise Impact Analysis, Table 9-1, Page 71, February 10, 2015; and City of Pomona, Pomona Ranch Plaza Walmart Expansion Project, Table 4.4-5, Pg. 4.4-33, August 2014. Assumes mechanical equipment noise generated by the closest Project building to each sensitive receptor.
- ^c Significance thresholds are equivalent to the measured daytime or evening ambient noise levels, whichever is lower plus 5 dBA, per the City of Los Angeles Noise Regulations.

SOURCE: ESA 2022

(ii) Outdoor Spaces

As discussed in Chapter II, *Project Description*, of the Draft EIR, the Project would provide approximately 90,113 sf of publicly accessible open space, consisting of plazas and paseos passing between Central Avenue and Alameda Street and a Central Courtyard in the South Site. Amenities provided throughout the open space area would include trees, landscape, dining patios, raised planters, wood benches, umbrellas, cabanas, decking, artificial and natural turf, and a broad range of paver types (circular, pebble, concrete, etc.). There are a total of 12 individually curated publicly accessible open space areas.

The 4th Street Plazas would provide publicly accessible open space on the North and South Sites. They would feature cohesive hardscape, seating and bike racks, as well as provide visual and physical entrances into the publicly accessed interiors of the North and South Sites. Out of the total 10,176 sf of 4th Street Plazas, the North Site would provide a total of approximately 8,967 sf of publicly accessible open space. The South Site portion of the 4th Street Plazas would provide a total of approximately 1,209 sf of publicly accessible open space.

As shown in Figure II-10 of Chapter II, *Project Description*, numerous publicly accessible open space areas would be located throughout the South Site in addition to the 4th Street Plaza. The South Site would have a total of 81,146 sf of publicly accessible open space. There would be three east-west paseos between Central Avenue and Alameda Street. In addition, there would be access to the publicly accessible open space areas via 4th Street (4th Street Green) and from the south boundary of the South Site, referred to as the 5th Street Corridor. The 5th Street Corridor would be a publicly accessible pedestrian connection, providing an additional linkage between Alameda Street and Central Avenue.

Table IV.G-12, *Estimated Daytime Outdoor Open Space Noise Levels (L_{eq})*, shows the estimated noise levels at the nearest off-site sensitive receptor locations from outdoor open space and event-related activities. As indicated in Table IV.G-12, the estimated noise levels from the Project's individual outdoor open space related activities would range from 24.4 dBA L_{eq} at receptor location R3 to 45.7 dBA L_{eq} at receptor location R5.

(iii) *Special Events*

The Project would include outdoor public special events, which would be held at the Central Courtyard or the Pop-Up Plaza. Noise sources associated with special events typically include amplified sound systems and noise from people in attendance (voice and clapping). The special events at the Project Site may include the use of a temporary amplified sound system. It is assumed that an amplified sound system would be used for live music or similar amplified sound in the Central Courtyard or Pop-Up Plaza resulting in noise levels of up to 91 dBA L_{eq} at 25 feet from the speakers.⁵⁷ In addition, noise levels of 75 dBA and 71 dBA (L_{eq}) at a distance of 3.3 feet for males and females (speaking in loud voice), respectively, were assumed for the analysis.⁵⁸ To represent a worst-case noise scenario, it was assumed that 100 percent of the people (half of which would be male and the other half female) would be talking and clapping at the same time. The special event-related noise levels are provided in **Table IV.G-13, *Public Special Events Noise Levels***. The noise levels presented in Table IV.G-13 represent the maximum noise level from a special event occurring at either the Central Courtyard or the Pop-Up Plaza and assumes that simultaneous special events would not occur.

⁵⁷ University of Michigan, Department of Environmental Health Science, August 22, 2016. *Noise Navigator Sound Level Database with Over 1700 Measurement Values*.

⁵⁸ Harris, Cyril M., *Handbook of Acoustical Measurements and Noise Control*, Third Edition, Table 16.1, 1991.

TABLE IV.G-12
ESTIMATED DAYTIME OUTDOOR OPEN SPACE NOISE LEVELS (L_{EQ})

Open Space (primary noise source)	Receptor Location	Nearest Distance to Receptor (feet) ^a	Estimated Open Space Noise Levels, (L _{eq})	Existing Ambient Noise Levels, dBA (L _{eq}) ^b	Ambient + Project Noise Levels, dBA (L _{eq})	Significance Threshold, dBA (L _{eq})	Exceed Significance Threshold
4th Street Plazas (678 people)	R1	500	38.1	60.6	60.6	65.6	No
	R2	400	39.9	64.8	64.8	69.8	No
	R3	1,130	31.1	58.5	58.5	63.5	No
	R4	560	37.1	66.7	66.7	71.7	No
	R5	200	45.7	69.7	69.7	74.7	No
	R6	545	37.3	62.7	62.7	67.7	No
Flex Alley (North) (438 people)	R1	800	31.5	60.6	60.6	65.6	No
	R2	485	35.3	64.8	64.8	69.8	No
	R3	1,050	29.3	58.5	58.5	63.5	No
	R4	530	34.7	66.7	66.7	71.7	No
	R5	250	40.3	69.7	69.7	74.7	No
	R6	625	33.4	62.7	62.7	67.7	No
4th Street Green (365 people)	R1	775	31.4	60.6	60.6	65.6	No
	R2	330	41.3	64.8	64.8	69.8	No
	R3	1,175	27.9	58.5	58.5	63.5	No
	R4	780	31.3	66.7	66.7	71.7	No
	R5	490	35.1	69.7	69.7	74.7	No
	R6	860	30.5	62.7	62.7	67.7	No
Central Courtyard (1,062 people)	R1	825	35.1	60.6	60.6	65.6	No
	R2	370	41.3	64.8	64.8	69.8	No
	R3	1,080	32.9	58.5	58.5	63.5	No
	R4	640	37.1	66.7	66.7	71.7	No
	R5	435	40.0	69.7	69.7	74.7	No
	R6	800	35.3	62.7	62.7	67.7	No

TABLE IV.G-12
ESTIMATED DAYTIME OUTDOOR OPEN SPACE NOISE LEVELS (L_{EQ})

Open Space (primary noise source)	Receptor Location	Nearest Distance to Receptor (feet) ^a	Estimated Open Space Noise Levels, (L _{eq})	Existing Ambient Noise Levels, dBA (L _{eq}) ^b	Ambient + Project Noise Levels, dBA (L _{eq})	Significance Threshold, dBA (L _{eq})	Exceed Significance Threshold
Residential Paseo (162 people)	R1	830	27.1	60.6	60.6	65.6	No
	R2	270	35.7	64.8	64.8	69.8	No
	R3	1,150	24.4	58.5	58.5	63.5	No
	R4	790	27.5	66.7	66.7	71.7	No
	R5	540	30.5	69.7	69.7	74.7	No
	R6	915	26.3	62.7	62.7	67.7	No
The Mews (481 people)	R1	970	30.3	60.6	60.6	65.6	No
	R2	360	38.0	64.8	64.8	69.8	No
	R3	930	30.7	58.5	58.5	63.5	No
	R4	450	36.3	66.7	66.7	71.7	No
	R5	480	35.9	69.7	69.7	74.7	No
	R6	780	32.1	62.7	62.7	67.7	No
Fashion Plaza (514 people)	R1	1,000	30.3	60.6	60.6	65.6	No
	R2	500	35.8	64.8	64.8	69.8	No
	R3	850	31.6	58.5	58.5	63.5	No
	R4	650	33.7	66.7	66.7	71.7	No
	R5	540	35.2	69.7	69.7	74.7	No
	R6	915	31.0	62.7	62.7	67.7	No
Makers Alley (225 people)	R1	1,025	26.9	60.6	60.6	65.6	No
	R2	480	33.1	64.8	64.8	69.8	No
	R3	1,000	27.1	58.5	58.5	63.5	No
	R4	760	29.4	66.7	66.7	71.7	No
	R5	630	30.9	69.7	69.7	74.7	No
	R6	1,025	26.9	62.7	62.7	67.7	No

TABLE IV.G-12
ESTIMATED DAYTIME OUTDOOR OPEN SPACE NOISE LEVELS (L_{EQ})

Open Space (primary noise source)	Receptor Location	Nearest Distance to Receptor (feet) ^a	Estimated Open Space Noise Levels, (L _{eq})	Existing Ambient Noise Levels, dBA (L _{eq}) ^b	Ambient + Project Noise Levels, dBA (L _{eq})	Significance Threshold, dBA (L _{eq})	Exceed Significance Threshold
Flex Alley (South) (959 people)	R1	1,150	31.2	60.6	60.6	65.6	No
	R2	640	35.9	64.8	64.8	69.8	No
	R3	750	34.6	58.5	58.5	63.5	No
	R4	460	38.4	66.7	66.7	71.7	No
	R5	610	36.3	69.7	69.7	74.7	No
	R6	925	33.0	62.7	62.7	67.7	No
Pop-up Plaza (579 people)	R1	1,150	29.9	60.6	60.6	65.6	No
	R2	600	35.2	64.8	64.8	69.8	No
	R3	830	32.6	58.5	58.5	63.5	No
	R4	830	32.6	66.7	66.7	71.7	No
	R5	700	34.0	69.7	69.7	74.7	No
	R6	960	31.4	62.7	62.7	67.7	No
5th Street Pocket Park (320 people)	R1	1,300	26.4	60.6	60.6	65.6	No
	R2	680	31.6	64.8	64.8	69.8	No
	R3	845	29.9	58.5	58.5	63.5	No
	R4	700	31.4	66.7	66.7	71.7	No
	R5	775	30.6	69.7	69.7	74.7	No
	R6	1,135	27.5	62.7	62.7	67.7	No
5th Street Corridor (332 people)	R1	1,350	27.8	60.6	60.6	65.6	No
	R2	650	33.6	64.8	64.8	69.8	No
	R3	660	33.5	58.5	58.5	63.5	No
	R4	515	35.3	66.7	66.7	71.7	No
	R5	750	32.5	69.7	69.7	74.7	No
	R6	1,050	29.8	62.7	62.7	67.7	No

TABLE IV.G-12
ESTIMATED DAYTIME OUTDOOR OPEN SPACE NOISE LEVELS (L_{EQ})

Open Space (primary noise source)	Receptor Location	Nearest Distance to Receptor (feet) ^a	Estimated Open Space Noise Levels, (L _{eq})	Existing Ambient Noise Levels, dBA (L _{eq}) ^b	Ambient + Project Noise Levels, dBA (L _{eq})	Significance Threshold, dBA (L _{eq})	Exceed Significance Threshold
Building 1 Roof Amenity (1,239 people)	R1	536	49.0	60.6	60.9	65.6	No
	R2	546	48.8	64.8	64.9	69.8	No
	R3	1,303	41.3	58.5	58.6	63.5	No
	R4	655	47.3	66.7	66.7	71.7	No
	R5	200	57.6	69.7	70.0	74.7	No
	R6	516	49.3	62.7	62.9	67.7	No
Building 2 Roof Amenity (915 people)	R1	651	47.2	60.6	60.8	65.6	No
	R2	664	47.0	64.8	64.9	69.8	No
	R3	1,486	40.0	58.5	58.6	63.5	No
	R4	900	44.3	66.7	66.7	71.7	No
	R5	538	48.8	69.7	69.7	74.7	No
	R6	705	46.5	62.7	62.8	67.7	No
Building 5 Rooftop Deck (886 people)	R1	899	34.4	60.6	60.6	65.6	No
	R2	402	41.4	64.8	64.8	69.8	No
	R3	1,163	32.1	58.5	58.5	63.5	No
	R4	815	35.2	66.7	66.7	71.7	No
	R5	597	37.9	69.7	69.7	74.7	No
	R6	928	34.1	62.7	62.7	67.7	No
Building 6 Roof Amenity (493 people)	R1	1,085	42.5	60.6	60.7	65.6	No
	R2	633	47.2	64.8	64.9	69.8	No
	R3	722	46.1	58.5	58.7	63.5	No
	R4	470	49.8	66.7	66.8	71.7	No
	R5	505	49.2	69.7	69.7	74.7	No
	R6	836	44.8	62.7	62.8	67.7	No

TABLE IV.G-12
ESTIMATED DAYTIME OUTDOOR OPEN SPACE NOISE LEVELS (L_{EQ})

Open Space (primary noise source)	Receptor Location	Nearest Distance to Receptor (feet) ^a	Estimated Open Space Noise Levels, (L _{eq})	Existing Ambient Noise Levels, dBA (L _{eq}) ^b	Ambient + Project Noise Levels, dBA (L _{eq})	Significance Threshold, dBA (L _{eq})	Exceed Significance Threshold
Building 7 Rooftop Deck (307 people)	R1	1,058	28.4	60.6	60.6	65.6	No
	R2	482	35.2	64.8	64.8	69.8	No
	R3	983	29.0	58.5	58.5	63.5	No
	R4	751	31.3	66.7	66.7	71.7	No
	R5	662	32.4	69.7	69.7	74.7	No
	R6	1,008	28.8	62.7	62.7	67.7	No
Building 9 Level 5 Deck (720 people)	R1	1,152	31.3	60.6	60.6	65.6	No
	R2	683	35.8	64.8	64.8	69.8	No
	R3	588	37.1	58.5	58.5	63.5	No
	R4	518	38.2	66.7	66.7	71.7	No
	R5	727	35.3	69.7	69.7	74.7	No
	R6	1,032	32.3	62.7	62.7	67.7	No
Building 9 Rooftop Deck (681 people)	R1	1,185	30.8	60.6	60.6	65.6	No
	R2	737	35.0	64.8	64.8	69.8	No
	R3	651	36.0	58.5	58.5	63.5	No
	R4	589	36.9	66.7	66.7	71.7	No
	R5	779	34.5	69.7	69.7	74.7	No
	R6	1,069	31.7	62.7	62.7	67.7	No
Building 10 Rooftop Deck (367 people)	R1	909	30.4	60.6	60.6	65.6	No
	R2	782	31.8	64.8	64.8	69.8	No
	R3	899	30.5	58.5	58.5	63.5	No
	R4	293	40.3	66.7	66.7	71.7	No
	R5	342	38.9	69.7	69.7	74.7	No
	R6	603	34.0	62.7	62.7	67.7	No

TABLE IV.G-12
ESTIMATED DAYTIME OUTDOOR OPEN SPACE NOISE LEVELS (L_{EQ})

Open Space (primary noise source)	Receptor Location	Nearest Distance to Receptor (feet) ^a	Estimated Open Space Noise Levels, (L _{eq})	Existing Ambient Noise Levels, dBA (L _{eq}) ^b	Ambient + Project Noise Levels, dBA (L _{eq})	Significance Threshold, dBA (L _{eq})	Exceed Significance Threshold
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NOTES:

^a It has been assumed that crowds would be dispersed across each open space area at various distances from each receptor. See calculation worksheets included in Appendix G for details on distances to receptors.

^b The ambient noise level is based on the measured daytime and evening noise levels shown in Table IV.G-6, and the lower value (daytime or evening) is used for the purposes of impact determination.

SOURCE: ESA, 2022. Appendix G of this Draft EIR.

TABLE IV.G-13
PUBLIC SPECIAL EVENTS NOISE LEVELS

Receptor Location	Existing Ambient Noise Levels, ^a dBA (L _{eq})	Estimated Noise from Outdoor Uses, dBA (L _{eq})		Total Project Noise Levels, dBA (L _{eq})	Ambient + Project Noise Levels, dBA (L _{eq})	Significance Threshold	Exceedance over Significance Threshold	Significant Impact?
		Amplified Sound	People Voice & Clapping					
R1	60.6	60.6	51.1	61.1	63.9	65.6	0.0	No
R2	64.8	67.6	57.0	68.0	69.7	69.8	0.0	No
R3	58.5	60.6	48.6	60.8	62.8	63.5	0.0	No
R4	66.7	62.8	53.1	63.3	68.3	71.7	0.0	No
R5	69.7	66.2	56.1	66.6	71.4	74.7	0.0	No
R6	62.7	61.4	51.3	61.4	65.1	67.7	0.0	No

NOTES:

^a The ambient noise level is based on the measured daytime and evening noise levels shown in Table IV.G-5, and the lower value (daytime or evening) is used for the purposes of impact determination.

SOURCE: ESA, 2022

The combined open space noise level in Table IV.G-12 and Table IV.G-13 are provided in **Table IV.G-14, *Estimated Combined Outdoor Open Space and Event Noise Levels***. As indicated in Table IV.G-14, the estimated combined noise levels from the Project outdoor open spaces and events would be below the significance threshold of 5 dBA (L_{eq}) above ambient noise levels at all sensitive receptors except R2, which would experience noise levels 5.0 dBA greater than the ambient noise level of 64.8 dBA L_{eq} and equal to the significance threshold of 69.8 dBA L_{eq} . **As such, the Project may result in the generation of a substantial permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established by the City, and impacts from outdoor open spaces and events would be potentially significant.**

TABLE IV.G-14
ESTIMATED COMBINED OUTDOOR OPEN SPACE AND EVENT NOISE LEVELS (L_{eq})

Receptor	Existing Ambient, ^a dBA (L_{eq})	Combined Open Space and Event-Related Noise Level, dBA (L_{eq})	Project plus Ambient, dBA (L_{eq})	Significance Threshold, dBA (L_{eq})	Exceed Significance Threshold
R1	60.6	61.7	64.2	65.6	No
R2	64.8	68.2	69.8	69.8	Yes
R3	58.5	61.1	63.0	63.5	No
R4	66.7	63.8	68.5	71.7	No
R5	69.7	67.3	71.7	74.7	No
R6	62.7	62.0	65.4	67.7	No

^a The ambient noise level is based on the measured daytime and evening noise levels shown in Table IV.G-5, and the lower value (daytime or evening) is used for the purposes of impact determination.

SOURCE: ESA, 2022. Appendix G of this Draft EIR.

(iv) *Parking Facilities*

Vehicle parking to serve each of the buildings would be provided in several locations throughout the Project Site. Parking for the North Site would be provided within Building 2, in a four-level subterranean structure and six levels above grade. The South Site includes a three-level subterranean structure that runs underneath the entire South Site. Building 9 also includes four levels of above grade structured parking. Parking for Building 10 on the West Site is located within a one-level subterranean structure and surface parking. Sources of noise within the below-grade parking structure would primarily include vehicular movements and engine noise and vehicle door opening and closing. Noise generated within the underground parking structure would be effectively shielded from off-site sensitive receptor locations, as the structure would be fully enclosed on all sides. However, for purposes of this analysis peak hour trips from the Project are assumed to occur at the closest parking garage or parking lot to each sensitive receptor. **Table IV.G-15, *On-Site Parking Noise Levels***, presents the estimated noise levels from the surface parking lot at the off-site receptor locations. As indicated in Table IV.G-15, the estimated noise levels

from the Project surface parking lot would be well below existing ambient noise levels and the significance threshold of 5 dBA (L_{eq}) above ambient noise levels. **As such, the Project 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 by the City, and impacts from parking facilities would be less than significant.**

**TABLE IV.G-15
ON-SITE PARKING NOISE LEVELS**

Receptor Location	Existing Ambient Noise Levels, ^a dBA (L_{eq})	Estimated Noise from On-Site Project Parking, dBA (L_{eq})	Ambient + Project Noise Levels, dBA (L_{eq})	Significance Threshold	Exceedance over Significance Threshold	Significant Impact?
R1	60.6	39.6	60.6	65.6	0.0	No
R2	64.8	43.9	64.8	69.8	0.0	No
R3	58.5	35.6	58.5	63.5	0.0	No
R4	66.7	50.3	66.8	71.7	0.0	No
R5	69.7	47.0	69.7	74.7	0.0	No
R6	62.7	37.4	62.7	67.7	0.0	No

NOTES:

^a The ambient noise level is based on the measured daytime and evening noise levels shown in Table IV.G-5, and the lower value (daytime or evening) is used for the purposes of impact determination.

SOURCE: ESA, 2022

(v) *Off-Site Operational Traffic Noise*

Project-generated traffic noise impacts were evaluated by comparing the increase in noise levels from the “existing” condition to the “existing plus project” condition and the “future baseline” condition to the “future plus project” condition relative to the Project’s significance threshold. Traffic noise levels at the off-site noise sensitive receptors were calculated using FHWA’s TNM and the Project’s traffic volume data.

Table IV.G-16, Off-Site Roadway Traffic Noise Impacts – Existing plus Project Conditions, provides a summary of the off-site traffic noise analysis under the “existing plus project” condition. As shown in Table IV.G-16, traffic from the Project would result in a maximum noise increase of 0.9 dBA along Central Avenue (between 4th Street and 5th Street/Project South Driveway). Typically, a minimum 3 dBA change in the ambient environment (increase and/or decrease) is considered as a threshold of human perception.

TABLE IV.G-16
OFF-SITE ROADWAY TRAFFIC NOISE IMPACTS – EXISTING PLUS PROJECT CONDITIONS

Roadway Segment	Adjacent Land Use	CNEL (dBA)			Exceed Threshold? ^b
		Existing ^a (A)	Existing + Project (B)	Project Increment (B-A)	
1st Street					
Between Central Avenue and Alameda Street	Commercial/ Institutional	69.5	69.6	0.1	No
East of Alameda Street	Residential/ Commercial	68.6	68.8	0.2	No
2nd Street					
Between Central Avenue and Alameda Street	Commercial	67.0	67.1	0.1	No
East of Alameda Street	Residential/ Commercial	65.2	65.2	0.0	No
3rd Street					
Between Central Avenue and Alameda Street	Residential/ Commercial	71.8	71.8	0.0	No
Between San Pedro St and Central Avenue	Institutional/ Religious/ Commercial	71.8	71.9	0.1	No
West of San Pedro St	Residential/ Commercial	70.9	70.9	0.1	No
3rd Street/4th Place					
Between Hewitt St and Merrick Street/Molino Street	Commercial/ Motel	69.8	70.0	0.2	No
4th Street/4th Place					
Between Hewitt St and Merrick Street/Molino Street	Residential	72.1	72.4	0.3	No
4th Street					
Between Alameda Street and Hewitt St	Residential/ Commercial	71.0	71.4	0.4	No
Between Central Avenue and Alameda Street	Industrial/ Commercial	70.4	70.5	0.2	No
Between San Pedro St and Central Avenue	Industrial/ Commercial	70.1	70.3	0.3	No
East of Merrick Street/Molino Street	Industrial/ Commercial	72.3	72.6	0.2	No
West of San Pedro St	Commercial	70.0	70.2	0.2	No
5th Street					
Between San Pedro St and Central Avenue	Commercial/ Residential	65.4	65.7	0.3	No
West of San Pedro St	Commercial/ Residential	65.1	65.4	0.3	No

TABLE IV.G-16
OFF-SITE ROADWAY TRAFFIC NOISE IMPACTS – EXISTING PLUS PROJECT CONDITIONS

Roadway Segment	Adjacent Land Use	CNEL (dBA)			Exceed Threshold? ^b
		Existing ^a (A)	Existing + Project (B)	Project Increment (B-A)	
6th Street					
Between Central Avenue and Alameda Street	Industrial/ Commercial	69.0	69.1	0.1	No
East of Alameda Street	Industrial/ Commercial	68.5	68.6	0.2	No
West of Central Avenue	Commercial/ Residential	67.6	68.0	0.4	No
7th Street					
Between Central Avenue and Alameda Street	Industrial/ Commercial	69.6	69.7	0.1	No
East of Alameda Street	Industrial/ Commercial	69.7	69.9	0.2	No
West of Central Avenue	Commercial/ Residential	69.6	69.7	0.2	No
Alameda Street					
Between 1st Street and 2nd Street	Commercial/ Residential	72.6	72.9	0.3	No
Between 2nd Street and 3rd Street/4th Place	Commercial/ Residential	72.2	72.6	0.4	No
Between 3rd Street/4th Place and 4th Street	Commercial/ Residential	72.3	72.9	0.6	No
Between 4th Street and 6th Street	Industrial/ Commercial	72.0	72.6	0.6	No
Between 6th Street and 7th Street	Industrial/ Commercial	71.8	72.1	0.3	No
North of 1st Street	Institutional/ Commercial	72.9	73.2	0.3	No
South of 7th Street	Industrial/ Commercial	72.0	72.2	0.2	No
Central Avenue					
Between 1st Street and 2nd Street	Commercial/ Residential	67.5	68.3	0.8	No
Between 2nd Street and 3rd Street	Commercial/ Residential	70.0	70.5	0.5	No
Between 3rd Street and 4th Street	Industrial/ Commercial	70.1	70.8	0.7	No
Between 4th Street and 5th Street/Project South Site Driveway	Industrial/ Commercial	69.8	70.7	0.9	No
Between 5th Street/Project South Site Driveway and 6th Street	Industrial/ Commercial	71.6	72.1	0.6	No
Between 6th Street and 7th Street	Industrial/ Commercial	71.2	71.6	0.4	No
South of 7th Street	Industrial/ Commercial	71.5	71.8	0.2	No

TABLE IV.G-16
OFF-SITE ROADWAY TRAFFIC NOISE IMPACTS – EXISTING PLUS PROJECT CONDITIONS

Roadway Segment	Adjacent Land Use	CNEL (dBA)			Exceed Threshold? ^b
		Existing ^a (A)	Existing + Project (B)	Project Increment (B-A)	
Merrick Street/Molino Street					
North of 4th Street	Industrial/ Commercial	59.1	59.1	0.0	No
South of 4th Street	Industrial/ Commercial	56.5	56.5	0.0	No
San Pedro Street					
Between 3rd Street and 4th Street	Industrial/ Commercial	69.9	69.9	0.0	No
Between 4th Street and 5th Street	Commercial/ Residential	70.1	70.2	0.1	No
North of 3rd Street	Commercial/ Residential/ Religious	69.3	69.3	0.0	No
South of 5th Street	Commercial/ Residential/ Religious	70.2	70.3	0.1	No

NOTES:

^a Calculated based on existing traffic volumes.

^b See Table IV.G-4 for a description of the compatibility categories.

SOURCE: ESA 2022.

Table IV.G-17, Off-Site Roadway Traffic Noise Impacts – Future (2030) plus Project Conditions, provides a summary of the off-site traffic noise analysis under the “future (2030) plus project” condition. As shown in Table IV.G-17, traffic noise from the Project would result in an increase of 0.8 dBA along Central Avenue (between 4th Street and 5th Street/South Site Project Driveway).

TABLE IV.G-17
OFF-SITE ROADWAY TRAFFIC NOISE IMPACTS – FUTURE (2030) PLUS PROJECT CONDITIONS

Roadway Segment	Adjacent Land Use	CNEL (dBA)			Exceed Threshold? ^b
		Future Baseline ^a (A)	Future + Project (B)	Project Increment (B-A)	
1st Street					
Between Central Avenue and Alameda Street	Commercial/ Institutional	70.0	70.1	0.1	No
East of Alameda Street	Residential/ Commercial	69.1	69.3	0.1	No
2nd Street					
Between Central Avenue and Alameda Street	Commercial	67.7	67.8	0.1	No
East of Alameda Street	Residential/ Commercial	65.8	65.8	0.0	No
3rd Street					
Between Central Avenue and Alameda Street	Residential/ Commercial	72.5	72.5	0.0	No
Between San Pedro St and Central Avenue	Institutional/ Religious/ Commercial	72.5	72.6	0.1	No
West of San Pedro St	Residential/ Commercial	71.7	71.7	0.1	No
3rd Street/4th Place					
Between Hewitt St and Merrick Street/Molino Street	Commercial/ Motel	70.4	70.6	0.2	No
4th Street/4th Place					
Between Hewitt St and Merrick Street/Molino Street	Residential	73.0	73.2	0.2	No
4th Street					
Between Alameda Street and Hewitt St	Residential/ Commercial	72.1	72.3	0.3	No
Between Central Avenue and Alameda Street	Industrial/ Commercial	71.2	71.3	0.1	No
Between San Pedro St and Central Avenue	Industrial/ Commercial	71.0	71.2	0.2	No
East of Merrick Street/Molino Street	Industrial/ Commercial	73.3	73.5	0.2	No
West of San Pedro St	Commercial	70.9	71.0	0.2	No

TABLE IV.G-17
OFF-SITE ROADWAY TRAFFIC NOISE IMPACTS – FUTURE (2030) PLUS PROJECT CONDITIONS

Roadway Segment	Adjacent Land Use	CNEL (dBA)			Exceed Threshold? ^b
		Future Baseline ^a (A)	Future + Project (B)	Project Increment (B-A)	
5th Street					
Between San Pedro St and Central Avenue	Commercial/Residential	66.4	66.6	0.2	No
West of San Pedro St	Commercial/Residential	66.0	66.3	0.3	No
6th Street					
Between Central Avenue and Alameda Street	Industrial/Commercial	70.2	70.3	0.1	No
East of Alameda Street	Industrial/Commercial	70.7	70.8	0.1	No
West of Central Avenue	Commercial/Residential	68.9	69.2	0.3	No
7th Street					
Between Central Avenue and Alameda Street	Industrial/Commercial	71.0	71.0	0.1	No
East of Alameda Street	Industrial/Commercial	71.4	71.5	0.1	No
West of Central Avenue	Commercial/Residential	70.8	71.0	0.1	No
Alameda Street					
Between 1st Street and 2nd Street	Commercial/Residential	73.7	73.9	0.3	No
Between 2nd Street and 3rd Street/4th Place	Commercial/Residential	73.4	73.7	0.3	No
Between 3rd Street/4th Place and 4th Street	Commercial/Residential	73.7	74.1	0.4	No
Between 4th Street and 6th Street	Industrial/Commercial	73.6	74.0	0.4	No
Between 6th Street and 7th Street	Industrial/Commercial	73.2	73.5	0.3	No
North of 1st Street	Institutional/Commercial	74.1	74.3	0.2	No
South of 7th Street	Industrial/Commercial	73.2	73.3	0.2	No

TABLE IV.G-17
OFF-SITE ROADWAY TRAFFIC NOISE IMPACTS – FUTURE (2030) PLUS PROJECT CONDITIONS

Roadway Segment	Adjacent Land Use	CNEL (dBA)			Exceed Threshold? ^b
		Future Baseline ^a (A)	Future + Project (B)	Project Increment (B-A)	
Central Avenue					
Between 1st Street and 2nd Street	Commercial/ Residential	68.1	68.7	0.7	No
Between 2nd Street and 3rd Street	Commercial/ Residential	70.5	70.9	0.4	No
Between 3rd Street and 4th Street	Industrial/ Commercial	70.6	71.2	0.6	No
Between 4th Street and 5th Street/Project South Site Driveway	Industrial/ Commercial	70.4	71.2	0.8	No
Between 5th Street/Project South Site Driveway and 6th Street	Industrial/ Commercial	72.2	72.7	0.5	No
Between 6th Street and 7th Street	Industrial/ Commercial	72.1	72.5	0.3	No
South of 7th Street	Industrial/ Commercial	72.2	72.4	0.2	No
Merrick Street/Molino Street					
North of 4th Street	Industrial/ Commercial	59.4	59.4	0.0	No
South of 4th Street	Industrial/ Commercial	60.7	60.7	0.0	No
San Pedro Street					
Between 3rd Street and 4th Street	Industrial/ Commercial	70.6	70.6	0.0	No
Between 4th Street and 5th Street	Commercial/ Residential	70.8	70.8	0.1	No
North of 3rd Street	Commercial/ Residential/ Religious	70.0	70.0	0.0	No
South of 5th Street	Commercial/ Residential/ Religious	70.9	71.0	0.1	No

NOTES:

^a Calculated based on future (2030) traffic volumes.^b See Table IV.G-4 for a description of the compatibility categories.

SOURCE: ESA 2022.

The estimated noise increases, under existing plus Project and future (2030) plus project conditions would not exceed the significance threshold of an increase of 3 dBA CNEL to or within the “normally unacceptable” or “clearly unacceptable” categories or an increase of 5 dBA CNEL or greater within the “normally acceptable” or “conditionally acceptable” categories. **Therefore, the Project 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 by the City, and Project-related traffic noise increases would be less than significant.**

(vi) *Composite Noise Level Impacts from Project Operations*

An evaluation of composite noise levels, including all Project-related noise sources plus existing ambient noise levels, was conducted to identify the potential maximum Project-related noise level increase that may occur at the noise-sensitive receptor locations. The overall sound environment at the sensitive receptors surrounding the Project Site would include contributions from each on-site and off-site individual noise source associated with maximum daily operation of the Project. Principal on-site noise sources associated with the Project would include mechanical equipment, open space, parking facilities, and noise from occasional special events. **Table IV.G-18, Composite Noise Impacts**, presents the estimated noise from Project-related noise sources in terms of CNEL. As indicated in Table IV.G-18, the Project would result in a maximum increase of 5.0 dBA CNEL at receptor R2. **Therefore, the Project may result in the generation of a substantial permanent increase in ambient noise levels at receptor R2 in excess of standards established by the City, and the Project’s operational composite noise would be potentially significant.**

**TABLE IV.G-18
COMPOSITE NOISE IMPACTS**

Receptor Location	Calculated Project-Related Noise Levels (dBA)				Project Composite Noise Levels, (dBA)	Ambient Noise Levels, ^a (dBA)	Ambient Plus Project Composite Noise Levels, (dBA)	Increase in Noise Levels Due to Project, (dBA)	Significance Threshold	Significant Impact?
	Mechanical	Parking	Open Space	Special Events						
R1	39.7	39.6	52.4	61.1	61.7	60.6	64.2	3.6	65.6	No
R2	44.2	43.9	54.3	68	68.2	64.8	69.8	5.0	69.8	Yes
R3	38.9	35.9	49.7	60.8	61.2	58.5	63.0	4.5	63.5	No
R4	49.1	50.3	53.8	63.3	64.1	66.7	68.6	1.9	71.7	No
R5	50.3	47.0	59.2	66.6	67.5	69.7	71.7	2.0	74.7	No
R6	41.3	37.4	52.8	61.4	62.0	62.7	65.4	2.7	67.7	No

NOTES:

^a The ambient noise level is based on the measured daytime and evening noise levels shown in Table IV.G-5, and the lower value (daytime or evening) is used for the purposes of impact determination.

SOURCE: ESA, 2022.

(2) Mitigation Measures

As analyzed above, the Project's on-site construction activities and off-site improvement construction activities would result in significant noise impacts without the implementation of mitigation measures. Therefore, the following noise mitigation measures are recommended to reduce the Project's construction-related noise impacts to sensitive uses in the vicinity of the Project Site:

(a) Construction

NOI-MM-1: Temporary Noise Barriers. Temporary noise barriers shall be used along the western, northern, southern, and eastern property boundaries to block the line-of-sight between the construction equipment and the noise-sensitive uses.

- Temporary noise barriers shall be placed along the Project's North site eastern property line. The noise barrier shall be a minimum of 8 feet in height and provide a minimum 3-dBA noise reduction at the ground-level for the residences to the east (receptor location R2).
- Temporary noise barriers shall be placed along the Project's Upper South site and West site northern property lines. The noise barriers shall be a minimum of 12 feet in height and provide a minimum 12-dBA noise reduction at the ground-level for the hotel uses to the north/northwest of the Upper South site and West site (receptor locations R5 and R6) and to the residential uses to the east of the Upper South site (receptor location R2).
- Temporary noise barriers shall be placed along the Project's Upper South site and Lower South site eastern property line. The noise barriers shall be a minimum of 12 feet in height and provide a minimum 12-dBA noise reduction at the ground-level for the residences to the east of the Upper South site and Lower South site (receptor location R2).
- Temporary noise barriers shall be placed along the Project's North site, Upper South site, Lower South site, and West site western property lines. The noise barriers shall be a minimum of 12 feet in height and provide a minimum 13-dBA noise reduction at the ground-level for the residences and hotel uses to the west (receptor locations R3 through R6).
- Temporary noise barriers shall be placed along the Project's West site and Lower South site southern property line. The noise barrier shall be a minimum of 12 feet in height and provide a minimum 13-dBA noise reduction at the ground-level for the residential and hotel uses to the south of the West site and Lower South site (receptor locations R3 and R4).

These noise barriers shall be in-place during early Project construction phases (remain up to the start of building framing) and during paving when heavy equipment is used. Temporary barriers shall provide acoustically sealed gate access as needed for construction activities, deliveries, and site access by construction personnel.

NOI-MM-2: Compressors and Generators. Construction equipment whose specific location on the Project Site may be flexible (e.g., compressors and generators) shall be located at least 100 feet away from the nearest off-site sensitive land uses, or barriers (e.g., intervening construction trailers, walls, enclosures, etc.) shall be used to screen propagation of noise from such equipment towards these land uses.

NOI-MM-3: Construction Equipment Muffling and Shielding Devices. The Project contractor shall use power construction equipment with properly operating and maintained noise shielding and muffling devices, consistent with manufacturers' standards. Flexible sound control curtains shall be placed around all stationary compressors and generators, drilling apparatuses, drill rigs, and jackhammers when in use. The flexible sound control curtains shall have a minimum Sound Transmission Class (STC) rating of 25.

NOI-MM-4: Foundation Concrete Trucks. Contractors shall include in all concrete truck contracts used during the foundation pouring phase of construction a requirement for trucks traveling to and from the Project Site to prohibit travel on Central Avenue between 1st Street and 2nd Street, Central Avenue between 2nd Street and 3rd Street, and 4th Street between Alameda Street and Hewitt Street during the Project's foundation concrete pouring duration. The construction contractor shall provide a flag person along the segments identified above to ensure that all concrete trucks do not travel along the identified segments.

(b) Operation

The following mitigation measures would reduce on-site open space related noise levels:

NOI-MM-5: Amplified Speakers – Special Events. Outdoor amplified sound systems, if any, will be limited to a sound level equivalent to 90 dBA (L_{eq-1hr}) measured at a distance of 25 feet from the amplified speaker sound system during special events occurring at the Central Courtyard or Pop-Up Plaza. A qualified noise consultant shall provide written documentation that the design of the system complies with the maximum noise level. Compliance will be ensured through pre-performance noise tests/measurements for performances or ambient music speakers with potential to exceed the sound level, along with any necessary adjustments to the location and nature of proposed performances or ambient music speakers. Speakers will be downward or inward facing and shielded from off-site sensitive uses. The Applicant or Operator shall prepare standard operating procedures for the use of amplified speakers at this location consistent with this requirement. The standard operating procedures shall be provided to the City and the Los Angeles Police Department (LAPD) prior to the issuance of a special event permit for the Project and posted on-site in the event of LAPD response to noise complaints.

(3) Level of Significance After Mitigation

(a) Construction Noise

(i) On-Site Construction Noise

Implementation of Mitigation Measures NOI-MM-1, NOI-MM-2, and NOI-MM-3, as described above, would reduce the Project's on-site construction noise impacts at the off-site ground-level noise sensitive receptors, to the extent technically feasible.⁵⁹ Specifically, the ground-level construction noise levels would be reduced by a minimum of 12.1 dBA at receptor location R2, 7.8 dBA at receptor location R3, 11.7 dBA at receptor location R4, 17.4 dBA at receptor location R5, and 8.1 dBA at receptor location R6, which would reduce the construction noise impacts at receptor locations R2 through R6 to less-than-significant levels. **Table IV.G-19, On-Site Construction Noise Impacts – With Mitigation (Ground-level Receptors)**, presents the estimated, conservative construction noise levels at the ground-level off-site receptor locations with implementation of mitigation measures. As indicated in Table IV.G-19, the ground-level construction noise levels at receptor locations R2 through R6 would be reduced below the 5-dBA significance threshold. Noise barriers are not capable of blocking noise at noise-sensitive receptors that are elevated above a construction work site, such as residential units and hotel rooms located on the upper levels of a mid-rise or high-rise building. It is not feasible to install noise barriers with height sufficient block the line-of-sight for all noise-sensitive receptors located on the upper levels of a mid-rise or high-rise residential or hotel building due to barrier foundation and wind load restrictions. Because there could be receptors elevated above the construction work sites throughout the Project area within the upper levels of a noise-sensitive receptor building (receptor locations R2 through R6), construction noise would represent a temporary noise increase in excess of standards for these receptors. **Therefore, ground-level construction noise impacts associated with on-site noise sources would be less than significant with mitigation incorporated. However, construction noise impacts associated with on-site noise sources at elevated noise-sensitive receptor locations located on the upper floors of buildings at receptor locations R2 through R6 would be significant and unavoidable.**

⁵⁹ Technical infeasibility shall mean that said noise limitations cannot be complied with despite the use of mufflers, shields, sound barriers, and/or other noise reduction devices or techniques during the operation of the equipment. LAMC Chapter XI, Art. 1, Section 112.05.

TABLE IV.G-19
ON-SITE CONSTRUCTION NOISE IMPACTS – WITH MITIGATION (GROUND-LEVEL RECEPTORS)

Site	Estimated Construction Noise Levels by Receptor, dBA (Leq) Project ^a					
	R1	R2	R3	R4	R5	R6
A – Upper South Component	59.3	65.6	49.2	58.6	66.3	57.4
B – Lower South Component	60.5	53.5	61.9	62.7	59.1	49.3
C – West Component	57.1	68.4	49.5	65.1	65.7	48.0
D – North Component	65.9	71.8	47.9	55.5	69.4	61.1
Maximum Overlapping Noise Level	68.1	74.1	62.5	67.9	72.4	63.0
Ambient Daytime Noise Level	67.7	70.5	58.5	70.2	69.7	66.7
Threshold (Ambient + 5 dBA) ^b	72.7	75.5	63.5	75.2	74.7	71.7
Exceeds Threshold?	No	No	No	No	No	No

^a Noise levels are reported as a range based on the estimated 1-hour average noise level (Leq) for the individual phases and overlapping phases of construction activity, for construction equipment used in each phase as shown in Table IV.G-8. **Bold** and shaded values represent an exceedance of the significance threshold.

^b Significance thresholds are equivalent to the measured daytime ambient noise levels plus 5 dBA.

SOURCE: ESA, 2022.

(ii) Off-Site Construction Traffic Noise

For foundations concrete pour truck noise, Mitigation Measure NOI-MM-4 requires that contractors include in all concrete truck contracts a requirement to prohibit travel on Central Avenue between 1st Street and 2nd Street, Central Avenue between 2nd Street and 3rd Street, and 4th Street between Alameda Street and Hewitt Street. In addition, the contractors shall include a flag person near the identified segment to ensure that concrete trucks do not travel along the identified segments. With implementation of Mitigation Measure NOI-MM-4, impacts related to off-site construction concrete truck traffic would be reduced to less than significant along the impacted segments.. **Therefore, the Project's off-site concrete truck construction noise impacts would be less than significant with implementation of mitigation.**

(b) Operational Noise

Special Event related noise would exceed the ambient noise levels by 5 dBA at the receptor location R2. Mitigation Measure NOI-MM-5 limits all amplified sound systems used for special events to sound levels equivalent to 90 dBA measured at a distance of 25 feet from the amplified speaker sound system. As shown in **Table IV.G-20, Mitigated Daytime Combined Outdoor Open Space Event-Related Noise Levels (Leq)**, with implementation of Mitigation Measures NOI-MM-5, project noise from human conversation, applause, and amplified music during special events and combined

operation of Project open spaces during daytime and evening hours would not exceed the significance threshold of a 5 dBA increase over ambient conditions. **Therefore, impacts related to daytime operation of outdoor spaces would be less than significant after implementation of mitigation.**

TABLE IV.G-20
ESTIMATED MITIGATED COMBINED OUTDOOR OPEN SPACE AND EVENT NOISE LEVELS (L_{eq})

Receptor	Existing Ambient, ^a dBA (L _{eq})	Combined Open Space and Event-Related Noise Level, dBA (L _{eq})	Project plus Ambient, dBA (L _{eq})	Significance Threshold, dBA (L _{eq})	Exceed Significance Threshold
R1	60.6	60.9	63.7	65.6	No
R2	64.8	67.3	69.3	69.8	No
R3	58.5	60.3	62.5	63.5	No
R4	66.7	63.0	68.2	71.7	No
R5	69.7	66.6	71.4	74.7	No
R6	62.7	61.2	65.0	67.7	No

^a The ambient noise level is based on the measured daytime and evening noise levels shown in Table IV.G-5, and the lower value (daytime or evening) is used for the purposes of impact determination.

SOURCE: ESA, 2022. Appendix G of this Draft EIR.

On-site composite noise levels would exceed the threshold of a 5 dBA increase over ambient conditions at receptor R2 prior to implementation of mitigation. As shown in **Table IV.G-21, *Mitigated Composite Noise Impacts***, with implementation of Mitigation Measures NOI-MM-5 limiting amplified sound system volumes to 90 dBA at a distance of 25 feet at all special events during daytime and nighttime hours resulting in a mitigated decrease in ambient noise levels at receptor R2 of 0.5 dBA. This decrease would limit noise levels to within the threshold of a 5 dBA increase over ambient conditions. **Therefore, impacts related to on-site composite noise would be less than significant after implementation of mitigation.**

**TABLE IV.G-21
MITIGATED COMPOSITE NOISE IMPACTS**

Receptor Location	Calculated Project-Related Noise Levels (dBA)				Project Composite Noise Levels, (dBA)	Ambient Noise Levels, ^a (dBA)	Ambient Plus Project Composite Noise Levels, (dBA)	Increase in Noise Levels Due to Project, (dBA)	Significance Threshold	Significant Impact?
	Mechanical	Parking	Open Space	Special Events						
R1	39.7	39.6	52.4	60.2	60.9	60.6	63.8	3.2	65.6	No
R2	44.2	43.9	54.3	67.1	67.4	64.8	69.3	4.5	69.8	No
R3	38.9	35.9	49.7	59.9	60.3	58.5	62.5	4.0	63.5	No
R4	49.1	50.3	53.8	62.4	63.4	66.7	68.4	1.7	71.7	No
R5	50.3	47	59.2	65.7	66.7	69.7	71.5	1.8	74.7	No
R6	41.3	37.4	52.8	60.5	61.2	62.7	65.0	2.3	67.7	No

NOTES:

^a The ambient noise level is based on the measured daytime and evening noise levels shown in Table IV.G-5, and the lower value (daytime or evening) is used for the purposes of impact determination.

SOURCE: ESA, 2022.

As concluded above, under the Project, stationary noise associated with mechanical equipment, loading dock/refuse collection activity, emergency generator, parking structure noise, and off-site traffic noise would be less than significant prior to mitigation. Impacts associated with daytime and nighttime use of open spaces and the combined operational noise would be less than significant with mitigation incorporated.

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

(1) Impact Analysis

(a) Structural Damage

(i) Construction

Construction activities can generate varying degrees of ground vibration, depending on the construction procedures and the type of construction equipment used. The operation of construction equipment generates vibrations that travel through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the vicinity of the construction site often varies, depending on soil type, ground strata, and construction characteristics of the receptor buildings.

With regard to potential building damage, the Project would generate groundborne construction vibration forces during building demolition and site excavation/grading activities when heavy construction equipment, such as large bulldozers, drill rigs, and loaded trucks, would be used. Per NOI-PDF-1, the Project will not require or allow the use of impact pile drivers; however, augured, drilled, or vibratory piles are permitted. The FTA has published standard vibration velocity levels for various construction equipment operations. **Table IV.G-22, Construction Equipment Vibration Levels**, presents the typical vibration levels at a reference distance of 25 feet for construction equipment anticipated to be used during Project construction. Vibration impacts with regard to structures are evaluated at the nearest off-site buildings to the Project Site (north, south, east, and west), whereas the potential for human annoyance associated with construction-related vibration are evaluated at the two human annoyance vibration-sensitive receptor locations (receptor locations V5 and V6) for vibration sources from the Project Site. Vibration receptor locations V5 and V6 correspond to receptor locations R2 and R5, respectively.

TABLE IV.G-22
CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Equipment	Equipment vibration Levels at 25 feet, (PPV / VdB)
Vibratory Roller	0.210 / 94
Large Bulldozer	0.089 / 87
Caisson Drilling	0.089 / 87
Loaded Trucks (e.g., haul trucks)	0.076 / 86
Jackhammer	0.035 / 79
Small Bulldozer	0.003 / 58
SOURCE: FTA, 2018	

Table IV.G-23, Construction Vibration Impacts – Building Damage, provides the estimated vibration levels (in terms of inch per second PPV) at the nearest off-site structures adjacent to the Project Site. To present a worst-case analysis, the estimated vibration levels were calculated with the construction equipment assumed to be operating at the closest distance to the nearest off-site building structures. As indicated in Table IV.G-23, the estimated vibration velocity levels from all construction equipment would be below the building damage significance criteria at all off-site building structures except for V3 which would experience vibration levels greater than the FTA Category III threshold for non-engineered timber and masonry buildings. **Therefore, the Project could result in the generation of excessive groundborne vibration, and vibration impacts associated with structural damage from on-site construction activities would be potentially significant.**

**TABLE IV.G-23
CONSTRUCTION VIBRATION IMPACTS – STRUCTURAL DAMAGE**

Nearest Off-Site Building Structures	Distance to Receptor Building (ft)	Estimated Vibration Velocity Levels at the Nearest Off-Site Structures from Project Construction Equipment, ^b inch/second (PPV)					Significance Threshold, inch/second (PPV)	Maximum Exceedance over Significance Threshold (PPV)	Significant Impacts?
		Large Bulldozer	Caisson Drilling	Loaded Trucks	Jack-hammer	Small Bulldozer			
V1: Warehouse/industrial building north of the Project's North Site.	25	0.089	0.089	0.076	0.035	0.003	0.30 ^b	0.0	No
V2: Parking structure to the east of the Project's North Site.	25	0.089	0.089	0.076	0.035	0.003	0.50 ^c	0.0	No
V3: Commercial buildings to the south, west, and southwest of Project's West Site.	10	0.352	0.352	0.300	0.138	0.012	0.20 ^d	0.052	Yes
V4: Historic District Warehouse/industrial buildings to the east of the Project's Upper South and Lower South Sites.	95	0.012	0.012	0.010	0.005	<0.001	0.12 ^e	0.0	No
V5: Multi-family residential building to the east of the Project's Upper South Site and North Site along 4th Street.	250	0.003	0.003	0.002	0.001	<0.001	0.20 ^d	0.0	No
V6: Hotel use and commercial/industrial buildings to the west of the Project's Upper South Site and North Site along 4th Street.	175	0.005	0.005	0.004	0.002	<0.001	0.20 ^d	0.0	No
V7: Historic Produce Exchange Building to the northwest of the Project's North Site along Central Avenue	230	0.003	0.003	0.003	0.001	0.001	0.12 ^e	0.0	No

NOTES: Bolded values represent vibration levels over threshold

^a Vibration level calculated based on FTA reference vibration level at 25-foot distance.

^b FTA criteria for engineered concrete and masonry buildings.

^c FTA criteria for reinforced concrete, steel or timber buildings.

^d FTA criteria for non-engineered timber and masonry buildings.

^e FTA criteria for historic buildings.

SOURCE: ESA, 2022

(ii) *Operation*

Project operation would include typical commercial-grade stationary mechanical and electrical equipment, such as air handling units, condenser units, and exhaust fans, which would produce vibration. In addition, the primary sources of transient vibration would include passenger vehicle circulation within the Project's parking areas. Groundborne vibration generated by each of the above-mentioned activities would generate approximately up to 0.005 in/sec PPV adjacent to the Project Site.⁶⁰ The potential vibration levels from all Project operational sources at the closest existing sensitive receptor locations would be less than the significance threshold of 0.3 in/sec PPV for potential Category III building damage. **As such, the Project would not result in the generation of excessive groundborne vibration, and vibration impacts associated with operation of the Project would be less than significant.**

(b) *Human Annoyance*

(i) *On-Site Construction Vibration*

With respect to human annoyance, the FTA's *Transit Noise and Vibration Impact Assessment* identifies Category 2 uses, or buildings where people normally sleep as sensitive receptors. As discussed above, per FTA guidance, the significance criteria for human annoyance is 72 VdB for Category 2 uses for frequent events, assuming a minimum of 70 vibration events occurring during a typical construction day. **Table IV.G-24, Construction Vibration Impacts – Human Annoyance**, presents the estimated vibration velocity levels (in terms of inch per second VdB) due to construction equipment at the off-site vibration sensitive receptors. To present a worst-case analysis, the estimated vibration levels were calculated with the construction equipment assumed to be operating at the closest distance to the nearest off-site sensitive receptors. As indicated in Table IV.G-24, the estimated vibration levels due to on-site construction equipment would be below the significance threshold for human annoyance at all off-site receptor locations. **Therefore, the Project would not result in the generation of excessive groundborne vibration, and vibration impacts associated with human annoyance from on-site construction activities would be less than significant.**

⁶⁰ This vibration estimate is based on data presented in the USDOT FTA, *Transit Noise and Vibration Impact Assessment Manual*, 2018.

**TABLE IV.G-24
CONSTRUCTION VIBRATION IMPACTS – HUMAN ANNOYANCE**

Off-Site Receptor Location	Distance to Receptor (ft)	Estimated Vibration Velocity Levels at the Nearest Off-Site Sensitive Receptors from the Project Construction Equipment, ^a VdB					Significance Threshold, VdB	Maximum Exceedance over Significance Threshold	Significant Impacts?
		Large Bulldozer	Caisson Drilling	Loaded Trucks	Jack- hammer	Small Bulldozer			
V5	250	57	57	56	49	28	72	0	No
V6	175	62	62	60	54	32	72	0	No

NOTES: Bolded values represent vibration levels over threshold.

SOURCE: FTA, 2018; ESA, 2022

(ii) Off-Site Construction Traffic Vibration

In addition to the on-site construction equipment, heavy-duty construction trucks would generate groundborne vibration as they travel along the Project's anticipated haul route. As described above, construction haul trucks would travel between the Project Site and Irwindale via two predetermined haul routes. Incoming/outgoing trucks would travel from the Project the same routes back and forth. The first haul route would travel from the Project Site east along 4th Street, take Interstate 5 North towards the Sunshine Canyon Landfill or take the US 101 South, merge onto State Route 60 East, and take Interstate 605 North towards Irwindale. The second haul route would travel from the Project Site east along 4th Street, and take Interstate 5 North towards the Sunshine Canyon Landfill or merge onto the Interstate 10 east, and take the State Route 60 North towards Irwindale. The third haul route would travel from the Project Site north along Central Avenue, turn right on to 2nd Street, turn left on to Hewitt Street, turn right onto 1st Street, and then onto regional-serving arterial streets to Irwindale.. Vibration levels generated by the Project's construction trucks travelling along the anticipated haul routes would be well below the significance thresholds for building damage. The estimated vibration levels generated by the Project's construction trucks would range from 66 VdB to 70 VdB which would be below the 72-VdB significance criteria for residential uses. Furthermore, the vibration levels from the Project construction trucks would be similar to the existing conditions due to similar trucks that already travel along the surrounding roadways. **As such, the Project would not result in the generation of excessive groundborne vibration, and potential vibration impacts with respect to human annoyance from construction trucks traveling along the anticipated haul route would be less than significant.**

(iii) Operation

Project operation would include typical commercial-grade stationary mechanical and electrical equipment, such as air handling units, condenser units, and exhaust fans, which would produce vibration at low levels that would not cause damage or annoyance impacts

to the Project buildings or on-site occupants and would not cause vibration impacts to the off-site environment. According to America Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), pumps or compressor would generate groundborne vibration levels of 0.5 in/sec PPV at 1 foot.⁶¹ Project mechanical equipment, including air handling units, condenser units, and exhaust fans, would be located within enclosed mechanical rooms on basement levels and building rooftops. Therefore, groundborne vibration from the operation of such mechanical equipment would not impact any of the off-site sensitive receptors. Due to the rapid attenuation characteristics of groundborne vibration and distance from the Project Site to receptors, there is no potential for operational impacts with respect to groundborne vibration. **Therefore, the Project would not result in the generation of excessive groundborne vibration, and vibration impacts from the Project operation would be less than significant.**

(2) Mitigation Measures

(a) Construction

The following mitigation measures would reduce potentially significant impacts regarding structural vibration damage during construction:

NOIMM-6: Construction Vibration (Except Shoring). The operation of construction equipment that generates high levels of vibration, such as large bulldozers, loaded trucks, jackhammers, and small bulldozers shall be prohibited within 15 feet, 14 feet, eight feet, and two feet, respectively, of receptor V3 (commercial buildings to the south, west, and southwest of Project's West site). The contractor(s) shall require and document compliance with the minimum allowable setbacks in a construction vibration management plan, which shall be provided to the City prior to issuance of a demolition permit. The construction vibration management plan shall detail the specific types of equipment to be used during demolition, grading, and building construction, estimated vibration velocities, and distance to vibration receptor V3. Equipment and or alternative construction techniques to be used within the required setbacks for large bulldozers, loaded trucks, jackhammers, and small bulldozers shall be identified to ensure that vibration velocities will not exceed thresholds for potential structural damage. This measure does not apply to temporary shoring activities and shoring infrastructure that must be installed to provide adequate physical support for subterranean excavation.

NOI-MM-7: Inspections. Prior to the issuance of a demolition or building permit, the Applicant shall retain the services of a third-party licensed building inspector or structural engineer to inspect and document (video and/or photographic) vibration receptor V3 (Commercial buildings to the south, west, and southwest of Project's West site) for the physical condition of the building's readily-visible features. Daily inspections shall occur when construction activities involving vibration-generating

⁶¹ America Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., Heating, Ventilating, and Air-Conditioning Applications, 1999.

equipment such as bulldozers, jackhammers, loaded trucks, and drill rigs are used at 15 feet, 14 feet, eight feet, and two feet, respectively of V3. In the event that unanticipated or unexpected damage occurs due to construction vibration at receptor location V3's older structure based on assessment by the third-party inspector or engineer, the Applicant/or the Applicants designated representative, shall arrange for repairs during the construction phase. Such repairs, if needed shall be undertaken by a contractor licensed by the State of California to conduct commercial building repairs.

(b) *Operation*

Operational vibration impacts would be less than significant without mitigation. Therefore, no mitigation measures were required or included, and the impact level remains less than significant.

(3) **Level of Significance After Mitigation**

(a) *Construction Structural Damage*

Regarding impacts due to structural damage, Mitigation Measure NOI-MM-6 prohibits the use of vibratory construction equipment at distances that would result in significant impacts to the V3. Mitigated construction vibration velocities are shown in **Table IV.G-25, Mitigated Construction Vibration Impacts – Building Damage**. With implementation of Mitigation Measure NOI-MM-5, potential structural vibration impacts on receptor V3 would be mitigated to a less than significant level.

TABLE IV.G-25
MITIGATED CONSTRUCTION VIBRATION IMPACTS (EXCEPT SHORING) – BUILDING DAMAGE

Off-Road Construction Equipment ^a	FTA Reference Level at 25 feet (in/sec PPV)	Mitigated Distance (feet)	Estimated Vibration Velocity Levels at the Mitigated Distance (in/sec PPV) ^b	Significance Threshold ^c	Exceed Significance Thresholds?
V3					
Large Bulldozer	0.089	15	0.191	0.2	No
Loaded Trucks	0.076	14	0.181		No
Jackhammer	0.035	8	0.193		No
Small Bulldozer	0.003	2	0.133		No

NOTE(S):

^a Represents off-site building structures with unmitigated impacts (see Table IV.G-37).

^b Vibration level calculated based on FTA reference vibration level at 25-foot reference distance.

^c FTA criteria for non-engineered timber or masonry structures (0.2 in/sec PPV).

SOURCE(S): FTA, *Transit Noise and Vibration Impact Assessment*; ESA, 2022. Appendix G of this Draft EIR.

Mitigation Measure NOI-MM-7 provides additional protections by requiring that the physical condition of vibration receptor V3 be documented prior to the commencement of construction activity and that daily inspections of receptor V3 occur when construction activities involving vibration-generating equipment such as bulldozers, jackhammers, loaded trucks, and drill rigs are used within 15 feet of receptor V3. In the event that unanticipated or unexpected construction-related vibration or structural damage occurs, the contractor shall arrange for inspection and repair as necessary. With implementation of Mitigation Measures NOI-MM-6 and NOI-MM-7, impacts with regard to structural damage for receptor V3 would be mitigated to less than significant. However, because receptor V3 includes privately-owned structures, inspections and repairs pursuant to Mitigation Measure NOI-MM-7 would require the consent of the property owner, who may not agree. Thus, impacts to receptor V3 would be significant and unavoidable.

Therefore, short term construction groundborne vibration impacts associated with structural damage would be less than significant with mitigation incorporated for the majority of on-site construction activities, but would be significant and unavoidable for receptor V3.

(b) Construction Human Annoyance

(i) On-Site Construction Vibration

Impacts regarding the Project's on-site construction (human annoyance) 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.

(ii) Off-Site Construction Traffic Vibration

Impacts regarding the Project's off-site construction traffic (human annoyance) 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.

(c) Operation

Impacts regarding the Project's operational (structural damage and human annoyance) 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.

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 the Initial Study (Appendix A of this Draft EIR), the nearest airports to the Project Site are the Hawthorne Municipal Airport and LAX located approximately 10 and 10.5 miles, respectively, from the Project Site. **Therefore, the Project would not expose people residing or working in the Project Site area to excessive noise levels for a project within the vicinity of a public use airport or private airstrip, and no impact would occur with respect to Threshold (c). As such, no further analysis is required.**

e) Cumulative Impacts

(1) Impact Analysis

The Project, together with the related projects, could contribute to cumulative noise impacts. The potential for cumulative noise impacts to occur is specific to the distance between each related project and their stationary noise sources, as well as the cumulative traffic that these related projects would add to the surrounding roadway network. There are 39 related projects identified in the vicinity of the Project Site.

(a) Construction – Noise

(i) On-Site Construction Noise

Noise from the construction of development projects is typically localized and has the potential to affect noise-sensitive uses within 500 feet from the construction site, based on the *L.A. CEQA Thresholds Guide* screening criteria. Thus, noise from construction activities for two projects within 1,000 feet of each other can contribute to a cumulative noise impact for receptors located midway between the two construction sites. Of the 39 total related projects, 11 related projects are located within 1,000 feet of the Project Site and are listed in **Table IV.G-26, Related Projects within 1,000 Feet of the Project Site**.

TABLE IV.G-26
RELATED PROJECTS WITHIN 1,000 FEET OF THE PROJECT SITE

No.	Address	Distance to Project Site (ft)	Use	Size
5	1129 & 1101 E 5th St, 445-457 S. Colyton St, 450-456 S. Seaton St	345	Commercial	81,326 sf
			Hotel	113 rooms
			Apartment	129 du
9	719 E 5th St	275	Hotel	42 rooms
17	527 S. Colyton St	875	Apartments	310 du
			Commercial	11,375 sf
			Production Space	11,736 sf
18	713 E 5th St	370	Apartments	51 du
19	508 E 4th St	600	Apartments	41 du
20	405 S Hewitt St	780	Office	255,514 sf
			Retail	4,970 sf
			Restaurant	9,940 sf
			Museum	7,800 sf
22	1100 E 5th St	375	Live/Work	218 du
			Open Space/Recreation	21,975 sf
23	414 S Crocker St	435	Apartments	175 du
			Commercial	8,691 sf
24	400 S. Alameda Street	95	Hotel	66 rooms
			Restaurant/Retail	5,400 sf
27	501 E. 5 th Street	1,000	Apartments	98 du
29	803 E. 5 th Street	105	Apartments	95 du
			Commercial	9,210 sf

NOTES

du = dwelling unit; sf = square feet

SOURCE: Gibson Transportation Inc., 2022.

As analyzed above, the estimated Project ground-level construction noise level at receptor R2 would result in a noise level of up to 74.3 dBA L_{eq} with implementation of mitigation measures, which would not exceed the significance threshold of 75.5 dBA L_{eq} (5-dBA over the ambient). However, since receptor R2 along 4th Street has a direct line-of-sight to Related Project No.24 construction-related noise from this related project could contribute to cumulative noise impacts. For instance, if Related Project No. 24 contributes

a noise level identical to the Project, the combined noise level would be approximately 77.3 dBA L_{eq} given that two equal noise levels result in a 3-dBA increase when added together (i.e., 74.3 dBA + 74.3 dBA = 77.3 dBA). Furthermore, because noise barriers are not capable of blocking noise at noise-sensitive receptors that are elevated above a construction work site, such as residential units and hotel rooms located on the upper levels of a mid-rise or high-rise building, Project-related construction noise and construction-related noise from the related projects would combine at the residential units and hotel rooms located on the upper levels of a mid-rise or high-rise building and also increase the noise levels.

Based on the above, there would be potential cumulative noise impacts at the nearby sensitive uses (receptor locations R2, R3, R4, R5, and R6) in the event of concurrent construction activities with the related projects listed in Table IV.G-24 for those ground-level noise-sensitive uses located at location R2 and those located on the upper levels of a mid-rise or high-rise building at locations R2, R3, R4, R5, and R6. Construction-related noise levels from the related projects would be intermittent and temporary, and it is anticipated that, as with the Project, the related projects would comply with the construction hours and other relevant provisions set forth in the LAMC. In addition, noise associated with cumulative construction activities would be reduced to the degree reasonably and technically feasible through proposed mitigation measures for each individual related project and compliance with locally adopted and enforced noise ordinances. **However, there is potential for cumulative construction noise impacts even with mitigation measures. As such, cumulative noise impacts from construction would be potentially significant.**

(ii) *Off-Site Construction Traffic Noise*

If construction of the related projects identified above would overlap with Project construction and construction trucks would utilize the same roadway network as the Project, cumulative off-site construction noise level increases could occur in the Project area. The exact construction scheduling and timing of construction truck trips for these projects are not known. For the purposes of this analysis, the number of construction trucks from related projects that would be needed to exceed the significance threshold is estimated to determine the potential for impacts.

As shown in Table IV.G-10, the Project would result in potentially significant off-site construction noise impacts due to construction trips (i.e., noise from foundation concrete pour truck trips). The roadways in the vicinity of the Project Site that would have off-site construction noise levels from Project construction haul trucks and foundation concrete pour trucks that would exceed the significance threshold would be Central Avenue between 1st Street and 2nd Street, Central Avenue between 2nd Street and 3rd Street and 4th Street between Alameda Street and Hewitt Street. Related projects contributing any additional truck trips on the same roadway segments at the same time as the Project would generate a cumulative noise impact along these same roadway segments. However, NOI-MM-4 would reduce concrete truck trips along the identified segments to less than significant on a project-level. In addition, noise associated with cumulative

construction activities would be reduced to the degree reasonably and technically feasible through proposed mitigation measures for each individual related project and compliance with locally adopted and enforced noise ordinances. **However, there is potential for cumulative off-site construction noise impacts even with mitigation measures. As such, cumulative noise impacts from construction would be potentially significant.**

(b) *Operations – Noise*

(i) *On-Site Operational Noise*

With respect to on-site noise sources, as is the case for the Project, compliance with the LAMC-required provisions that limit stationary source noise from items such as mechanical equipment would ensure that noise levels would be less than significant at the property line for each related project. In addition, on-site noise generated by each related project would be sufficiently low and sufficiently distant from the Project Site that it would not result in an additive increase to Project-related noise levels. Further, noise from other on-site sources, including parking lots, open space activity, emergency generator, loading docks, and heliport noise would be limited to areas in the immediate vicinity of each related project. Although each related project could potentially impact an adjacent sensitive use, that potential impact would be localized to that specific area and would not contribute to cumulative noise conditions at or adjacent to the Project Site. **Therefore, the Project's contribution to on-site operational noise would not be cumulatively considerable, and cumulative on-site noise source impacts associated with operation of the Project and related projects would be less than significant**

(ii) *Off-Site Operational Traffic Noise*

The Project and related projects in the area would produce off-site traffic volumes 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 “future plus project” conditions to the applicable significance criteria. The “future plus project” conditions include traffic volumes from future ambient growth, related projects, and the Project. **Table IV.G-27, Cumulative Off-Site Roadway Traffic Noise Impacts**, provides a summary of the cumulative off-site traffic noise analysis under the “future (2030) plus project” condition. As indicated in Table IV.G-25, cumulative traffic noise would result in a maximum increase of 4.2 dBA along Merrick Street/Molino Street (south of 4th Street). **The estimated cumulative noise increases would be below the 5-dBA significance threshold. Therefore, the Project's contribution to off-site traffic noise would not be cumulatively considerable, and off-site cumulative traffic noise impacts associated with the Project would be less than significant.**

**TABLE IV.G-27
CUMULATIVE OFF-SITE ROADWAY TRAFFIC NOISE IMPACTS**

Roadway Segment	Adjacent Land Use	CNEL (dBA)			Project Increment	Exceed Threshold?
		Existing (A)	Cumulative Year (2030) + Project (B)	Increase over Existing (B-A)		
1st Street						
Between Central Avenue and Alameda Street	Commercial/ Institutional	69.5	70.1	0.6	0.1	No
East of Alameda Street	Residential/ Commercial	68.6	69.3	0.6	0.2	No
2nd Street						
Between Central Avenue and Alameda Street	Commercial	67.0	67.8	0.7	0.1	No
East of Alameda Street	Residential/ Commercial	65.2	65.8	0.7	0.0	No
3rd Street						
Between Central Avenue and Alameda Street	Residential/ Commercial	71.8	72.5	0.7	0.0	No
Between San Pedro St and Central Avenue	Institutional/ Religious/ Commercial	71.8	72.6	0.8	0.1	No
West of San Pedro St	Residential/ Commercial	70.9	71.7	0.9	0.1	No
3rd Street/4th Place						
Between Hewitt St and Merrick Street/Molino Street	Commercial/ Motel	69.8	70.6	0.8	0.2	No
4th Street/4th Place						
Between Hewitt St and Merrick Street/Molino Street	Residential	72.1	73.2	1.0	0.3	No
4th Street						
Between Alameda Street and Hewitt St	Residential/ Commercial	71.0	72.3	1.4	0.4	No
Between Central Avenue and Alameda Street	Industrial/ Commercial	70.4	71.3	1.0	0.2	No
Between San Pedro St and Central Avenue	Industrial/ Commercial	70.1	71.2	1.1	0.3	No
East of Merrick Street/Molino Street	Industrial/ Commercial	72.3	73.5	1.2	0.2	No
West of San Pedro St	Commercial	70.0	71.0	1.1	0.2	No

**TABLE IV.G-27
CUMULATIVE OFF-SITE ROADWAY TRAFFIC NOISE IMPACTS**

Roadway Segment	Adjacent Land Use	CNEL (dBA)			Project Increment	Exceed Threshold?
		Existing (A)	Cumulative Year (2030) + Project (B)	Increase over Existing (B-A)		
5th Street						
Between San Pedro St and Central Avenue	Commercial/Residential	65.4	66.6	1.2	0.3	No
West of San Pedro St	Commercial/Residential	65.1	66.3	1.2	0.3	No
6th Street						
Between Central Avenue and Alameda Street	Industrial/Commercial	69.0	70.3	1.3	0.1	No
East of Alameda Street	Industrial/Commercial	68.5	70.8	2.3	0.2	No
West of Central Avenue	Commercial/Residential	67.6	69.2	1.7	0.4	No
7th Street						
Between Central Avenue and Alameda Street	Industrial/Commercial	69.6	71.0	1.5	0.1	No
East of Alameda Street	Industrial/Commercial	69.7	71.5	1.8	0.2	No
West of Central Avenue	Commercial/Residential	69.6	71.0	1.4	0.2	No
Alameda Street						
Between 1st Street and 2nd Street	Commercial/Residential	72.6	73.9	1.3	0.3	No
Between 2nd Street and 3rd Street/4th Place	Commercial/Residential	72.2	73.7	1.5	0.4	No
Between 3rd Street/4th Place and 4th Street	Commercial/Residential	72.3	74.1	1.8	0.6	No
Between 4th Street and 6th Street	Industrial/Commercial	72.0	74.0	2.0	0.6	No
Between 6th Street and 7th Street	Industrial/Commercial	71.8	73.5	1.7	0.3	No
North of 1st Street	Institutional/Commercial	72.9	74.3	1.4	0.3	No
South of 7th Street	Industrial/Commercial	72.0	73.3	1.3	0.2	No

**TABLE IV.G-27
CUMULATIVE OFF-SITE ROADWAY TRAFFIC NOISE IMPACTS**

Roadway Segment	Adjacent Land Use	CNEL (dBA)				
		Existing (A)	Cumulative Year (2030) + Project (B)	Increase over Existing (B-A)	Project Increment	Exceed Threshold?
Central Avenue						
Between 1st Street and 2nd Street	Commercial/Residential	67.5	68.7	1.2	0.8	No
Between 2nd Street and 3rd Street	Commercial/Residential	70.0	70.9	0.9	0.5	No
Between 3rd Street and 4th Street	Industrial/Commercial	70.1	71.2	1.1	0.7	No
Between 4th Street and 5th Street/Project South Site Driveway	Industrial/Commercial	69.8	71.2	1.4	0.9	No
Between 5th Street/Project South Site Driveway and 6th Street	Industrial/Commercial	71.6	72.7	1.1	0.6	No
Between 6th Street and 7th Street	Industrial/Commercial	71.2	72.5	1.2	0.4	No
South of 7th Street	Industrial/Commercial	71.5	72.4	0.9	0.2	No
Merrick Street/Molino Street						
North of 4th Street	Industrial/Commercial	59.1	59.4	0.4	0.0	No
South of 4th Street	Industrial/Commercial	56.5	60.7	4.2	0.0	No
San Pedro Street						
Between 3rd Street and 4th Street	Industrial/Commercial	69.9	70.6	0.7	0.0	No
Between 4th Street and 5th Street	Commercial/Residential	70.1	70.8	0.7	0.1	No
North of 3rd Street	Commercial/Residential/Religious	69.3	70.0	0.7	0.0	No
South of 5th Street	Commercial/Residential/Religious	70.2	71.0	0.8	0.1	No

SOURCE: ESA 2022.

(c) *Construction – Groundborne 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. None of the related projects are located adjacent to the sensitive receptors identified for the Project. The Project and Related Project Nos. 9, 18, and 29 are both adjacent to sensitive receptor V3. At this distance, the vibration levels from the Project could result together in cumulatively considerable vibration levels at receptor location V3 when combined with Related Project Nos. 9, 18, and 29. At the distances described above, operation of vibratory construction equipment could exceed structural damage or human annoyance thresholds. Other related projects are further away from the Project Site and sensitive receptors and would experience lower levels of vibration. **Therefore, construction of the Project, when considered together with Related Project Nos. 9, 18, and 29, the Project's contribution to construction-related groundborne vibration impacts would be cumulatively considerable, and cumulative construction-related groundborne vibration impacts (structural damage and human annoyance) at receptor location V3 associated with the Project and related projects would be potentially significant.**

(d) *Operation – Groundborne Vibration*

At the distances described in Table IV.G-24, above, operation of vibratory operational equipment would not exceed structural damage or human annoyance thresholds. Other related projects are further away from the Project Site and sensitive receptors and would experience lower levels of 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. **Therefore, operation of the Project, when considered together with Related Projects would not result in a cumulatively considerable contribution and would have a less-than-significant cumulative impact with regard to groundborne vibration.**

(2) Mitigation Measures

Refer to Mitigation Measures NOI-MM-1, NOI-MM-2, NOI-MM-3, and NOI-MM-4 to reduce cumulative construction noise impacts.

Cumulative impacts related to off-site construction traffic noise levels could occur if the related projects contribute any additional truck trips along 1st Street east of Alameda Street, Central Avenue between 1st Street and 2nd Street, Central Avenue between 2nd and 3rd Street, 4th Street between Hewitt Street and Merrick/Molino Street, and 4th Street between Alameda Street and Hewitt Street at the same time as the Project. Residential land uses comprise the majority of existing sensitive uses in the Project Site vicinity that could be impacted by the temporary increase in construction traffic generated noise levels. With implementation of Mitigation Measure NOIMM-4, Project-level impacts would be reduced to less-than-significant levels. However, if related projects were to add an additional 130 trips per hour along 1st Street east of Alameda Street, 137 truck trips per

hour along Central Avenue between 1st Street and 2nd Street, 122 trips per hour along Central Avenue between 2nd Street and 3rd Street, 171 trips per hour along 4th Street between Hewitt Street and Merrick/Molino Street, and 112 trips per hour along 4th Street between Alameda Street and Hewitt Street when combined with the Project's vendor and worker trips the impact would be cumulatively significant. Thus, there are no feasible mitigation measures that could be implemented to reduce the temporary cumulative off-site construction traffic noise impacts and impacts would remain significant.

Cumulative impacts related to construction vibration (structural damage and human annoyance) and operational noise and vibration (both structural and human annoyance) would be less than significant. Therefore, no additional mitigation measures are required.

(3) Level of Significance After Mitigation

(a) Construction – Noise

(i) On-Site Construction Noise

Cumulative construction noise impacts associated with on-site construction equipment could be significant in the event that construction activities as part of related projects listed in Table IV.G-26, above, occur within 1,000 feet of the Project Site. The Project would implement Mitigation Measures NOI-MM-1, NOI-MM-2, and NOI-MM-3 to reduce construction noise impacts. Implementation of these mitigation measures would reduce the Project's ground-level construction noise impacts at receptor locations R2 through R6 to less than significant at the ground-level. However, construction noise impacts at elevated noise-sensitive receptor locations associated with on-site Project construction noise sources would be significant and unavoidable.

Although it is expected that the related projects listed in Table IV.G-26 with identified significant impacts would implement mitigation that would reduce construction noise impacts similar to the Project, overlapping construction activities could result in significant cumulative impacts. As previously explained, the Project and the related projects in Table IV.G-26 could together contribute to construction noise at the ground-level noise-sensitive uses located at location R2 and those located on the upper levels of a mid-rise or high-rise building at locations R2, R3, R4, R5, and R6 that may exceed the significance threshold. **Thus, it is conservatively concluded that the Project's contribution to cumulative construction noise associated with on-site construction equipment would be cumulatively considerable and would represent a significant and unavoidable cumulative impact.**

(ii) Off-Site Construction Traffic Noise

Cumulative construction noise impacts associated with off-site construction truck traffic from multiple related projects could potentially overlap with the Project on some days and generate noise in excess of the significance thresholds.

For Project-related haul trucks, with implementation of Mitigation Measure NOI-MM-4, Project haul trucks would be prohibited from traveling on Central Avenue between 1st Street and 2nd Street, which would mitigate the Project-level impact to less than significant. However, if the related projects would contribute 31 truck trips per hour or more and travel along the same roadway segments as the Project (see roadway segments in Table IV.G-10), the combined off-site construction noise from Project haul trucks and related project trucks could exceed the significance threshold.

For Project-related foundation concrete pour trucks, there is no feasible mitigation measure that would reduce the Project-level impact to below the significance thresholds. Therefore, related projects contributing any additional truck trips on the same roadway segments at the same time as the Project (see roadway segments in Table IV.G-10) would generate a cumulative noise impact along these same roadway segments.

Residential land uses comprise the majority of existing noise-sensitive uses within the Project Site area that could be impacted by the increase in traffic generated noise levels. Construction of sound barriers would be inappropriate for residential land uses that face the roadway as they would be impractical (i.e., due to their placement on street frontages) and create aesthetic and access concerns. **Thus, given that it is possible that the Project and related projects could contribute to cumulative off-site construction traffic noise levels and could exceed a significance threshold with sufficiently high cumulative traffic levels, it is conservatively concluded that the Project's contribution to cumulative construction noise associated with off-site construction truck traffic would be cumulatively considerable and would represent a significant and unavoidable cumulative impact.**

(b) Operations – Noise

(i) On-Site Operational Noise

Cumulative impacts regarding the Project's on-site 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.**

(ii) Off-Site Operational Traffic Noise

Cumulative impacts regarding the Project's off-site operational traffic 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 – Groundborne Vibration

The Project would implement Mitigation Measures NOI-MM-6 and NOI-MM-7 to reduce construction vibration impacts. Implementation of these mitigation measures would reduce, but not eliminate, the Project's ground-level construction vibration impacts at receptor location V3 but impacts would remain significant and unavoidable.

Although it is expected that the related projects listed in Table IV.G-26 with identified significant impacts would implement mitigation that would reduce construction vibration impacts similar to the Project, overlapping construction activities could result in significant cumulative impacts. As previously explained, the Project and the related projects in Table IV.G-26 could together contribute to construction vibration at receptor V3 that may exceed the significance threshold. **Thus, it is conservatively concluded that the Project's contribution to cumulative construction vibration associated with on-site construction equipment would be cumulatively considerable and would represent a significant and unavoidable cumulative impact.**

(d) Operation – Groundborne Vibration

Cumulative impacts regarding the Project's operational (structural damage and human annoyance) groundborne vibration levels 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.**