# Appendix H
## Noise Technical Report

# 7940 LANKERSHIM BOULEVARD MIXED-USE PROJECT
# DRAFT NOISE TECHNICAL REPORT

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# Acronyms and Abbreviations

| | |
|---|---|
| µPa | microPascal |
| ADT | average daily traffic |
| AIA | Airport Influence Area |
| Caltrans | California Department of Transportation |
| City | City of Los Angeles |
| CNEL | Community Noise Equivalent Level |
| dB | decibel |
| dBA | A-weighted decibel |
| FHWA | Federal Highway Administration |
| FTA | Federal Transit Administration |
| HVAC | heating, ventilation, and air conditioning |
| Hz | Hertz |
| in/s | inches per second |
| kHz | kilohertz |
| LAMC | City of Los Angeles Municipal Code |
| $L_{dn}$ | day-night sound level |
| $L_{eq}$ | equivalent sound level |
| $L_{max}$ | maximum sound level |
| $L_{min}$ | minimum sound level |
| LT | long-term |
| $L_V$ | vibration velocity level |
| $L_{xx}$ | percentile-exceeded sound level |
| OSHA | Occupational Safety and Health Administration |
| PDF | project design feature |
| PPV | peak particle velocity |
| Project | 7940 Lankershim Boulevard Mixed-Use Project |
| rms | root-mean-square |
| SLM | sound level meter |
| SPL | sound pressure level |
| ST | short-term |
| TIS | Transportation Impact Study |

# Chapter 1
# **Introduction**

The purpose of this Noise Technical Report is to analyze potential noise or vibration impacts that would result from the proposed 7940 Lankershim Boulevard Mixed-Use Project (Project) in the Sun Valley-La Tuna Canyon Community Plan area within the City of Los Angeles (City). The analysis provided in this report evaluates the potential for short- and long-term noise and vibration impacts associated with the construction and operation of the Project. The analysis includes a description of the environmental setting for the Project, including existing noise conditions, as well as applicable laws and regulations. It also documents the assumptions, methodologies, and findings used to evaluate the impacts. Further, this report discusses the Project's contribution to potential cumulative noise impacts, and details project design features implemented as part of the Project.

## 1.1 Project Description

The approximately 4.69-acre Project Site is an irregularly shaped group of parcels bordered by North Lankershim Boulevard to the west and West Strathern Street to the north. The Project Site currently contains a one-story commercial building, a one-story office building, and associated surface parking and storage areas. The Project would demolish the existing on-site structures prior to new construction.

The Project proposes the development of a seven-story mixed-use development consisting of 432 multi-family residential units and approximately 22,000 square feet of commercial uses. The Project would be approximately 87 feet in height and would include a total square footage of approximately 678,328 square feet and a Floor Area Ratio of 3.32:1. The residential component would include 72 one-bedroom units, 180 two-bedroom units, and 180 three-bedroom units. A total of 11 percent of the proposed residential units (48 units) would be designated as restricted affordable housing for either Extremely Low Income households or Very Low Income households. Five percent of the proposed residential units (22 dwelling units) would be designated as restricted affordable housing for Extremely Low Income households, and 6 percent of the proposed residential units (26 dwelling units) would be designated as restricted affordable housing for Very Low Income households.

Up to 541 parking spaces (432 residential and 109 commercial parking spaces) would be provided in a parking structure located within one subterranean level and one at-grade level. All parking would be fully enclosed and screened from public view. The Project would provide 224 bicycle spaces in the parking structure (30 short-term bicycle spaces and 194 long-term bicycle spaces).

Open space areas and amenities for residents would include a central courtyard that would be landscaped and open to the sky. Other amenities would include a community room, recreational room, swimming pool and spa area, multi-use sport court, pet park, and private balconies.

The Project would be designed to meet the California Green Building Standards and Title 24 Building Standards Code. The Project would emphasize energy and water conservation, which would be achieved through the use of energy-efficient heating, ventilation, and air conditioning (HVAC) and lighting systems, Energy Star appliances, and low-flow plumbing fixtures. The Project would be prewired for electrical vehicle charging at 20 percent of its parking capacity for future use, of which 5 percent would be installed with chargers for immediate use by electrical vehicles, and rooftop solar uses in accordance with the California Green Building Standards. The Project would also include solar panels on 15 percent of the rooftop space.

Chapter 2
# Noise Fundamentals

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) to a hearing organ, such as a human ear. Noise is often defined as sound that is objectionable because it is unwanted, disturbing, or annoying.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receptor, and the propagation path between the two. The loudness of the noise source and the obstructions or atmospheric factors, which affect the propagation path to the receptor, determine the sound level and the characteristics of the noise perceived by the receptor.

The following sections provide an explanation of key concepts and acoustical terms used in the analysis of environmental and community noise.

## 2.1 Frequency, Amplitude, and Decibels

Continuous sound can be described by its *frequency* (pitch) and *amplitude* (loudness). A low-frequency sound is perceived as low in pitch; a high-frequency sound is perceived as high-pitched. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

The amplitude of pressure waves generated by a sound source correlates with the loudness of that source. The amplitude of a sound is typically described in terms of *sound pressure level* (SPL), also referred to simply as the sound level. The SPL refers to the root-mean-square (rms)[1] pressure of a sound wave and is measured in units called microPascals (μPa). One μPa is approximately one hundred-billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to over 100,000,000 μPa. Because of this large range of values, sound is rarely expressed in terms of μPa. Instead, a logarithmic scale is used to describe the SPL in terms of decibels, abbreviated dB. The decibel is a logarithmic unit that describes the ratio of the actual sound pressure to a reference pressure (20 μPa is the standard reference pressure level for acoustical measurements in air). Specifically, an SPL, in decibels, is calculated as follows:

$$SPL = 20 \times \log_{10}\left(\frac{X}{20\mu Pa}\right)$$

where *X* is the actual sound pressure and 20 μPa is the reference pressure. The threshold of hearing for young people is about 0 dB, which corresponds to 20 μPa.

1 Root-mean-square (rms) is defined as the square root of the mean (average) value of the squared amplitude of the noise signal.

### 2.1.1 Decibel Calculations

Because decibels represent noise levels using a logarithmic scale, SPLs cannot be added, subtracted, or averaged through ordinary arithmetic. On the dB scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, their combined sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one bulldozer produces an SPL of 80 dB, two bulldozers would not produce a combined sound level of 160 dB. Rather, they would combine to produce 83 dB. The cumulative sound level of any number of sources, such as excavators, can be determined using decibel addition. The same decibel addition is used for A-weighted decibels described below.

Similarly, the arithmetic mean (average) of a series of noise levels does not accurately represent the overall average noise level. Instead, the values must be averaged using a linear scale before converting the result back into a logarithmic (dB) noise level. This method is typically referred to as calculating the "energy average" of the noise levels.

### 2.1.2 A-Weighting

The dB scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000 to 8,000 Hz and perceive sounds within that range better than sounds of the same amplitude at higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted (i.e., adjusted), depending on human sensitivity to those frequencies. The resulting SPL is expressed in A-weighted decibels, or dBA.

The A-weighting scale approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments regarding the relative loudness or annoyance of a sound, their judgments correlate well with the A-weighted sound levels of those sounds. Table 2-1 describes typical A-weighted sound levels for various noise sources.

**Table 2-1. Typical A-Weighted Sound Levels**

| Common Outdoor Noise Source | Sound Level (dBA) | Common Indoor Noise Source |
|---|---|---|
| | — 110 — | Rock band |
| Jet flying at 1,000 feet | | |
| | — 100 — | |
| Gas lawn mower at 3 feet | | |
| | — 90 — | |
| Diesel truck at 50 feet at 50 mph | | Food blender at 3 feet |
| | — 80 — | Garbage disposal at 3 feet |
| Noisy urban area, daytime | | |
| Gas lawn mower at 100 feet | — 70 — | Vacuum cleaner at 10 feet |
| Commercial area | | Normal speech at 3 feet |
| Heavy traffic at 300 feet | — 60 — | |
| | | Large business office |
| Quiet urban daytime | — 50 — | Dishwasher in next room |
| Quiet urban nighttime | — 40 — | Theater, large conference room (background) |
| Quiet suburban nighttime | | |
| | — 30 — | Library |
| Quiet rural nighttime | | Bedroom at night |
| | — 20 — | |
| | | Broadcast/recording studio |
| | — 10 — | |
| Lowest threshold of human hearing | — 0 — | Lowest threshold of human hearing |

Source: Caltrans 2013.

# 2.2 Noise Descriptors

Because sound levels can vary markedly over a short period of time, various descriptors or noise “metrics” have been developed to quantify environmental and community noise. These metrics generally describe either the average character of the noise or the statistical behavior of the variations in the noise level. Some of the most common metrics used to describe environmental noise, including those metrics used in this report, are described below.

- **Equivalent Sound Level ($L_{eq}$)** is the most common metric used to describe short-term average noise levels. Many noise sources produce levels that fluctuate over time; examples include mechanical equipment that cycles on and off, or construction work, which can vary sporadically. The $L_{eq}$ describes the average acoustical energy content of noise for an identified period of time, commonly 1 hour. Thus, the $L_{eq}$ of a time-varying noise and that of a steady noise are the same if they deliver the same acoustical energy over the duration of the exposure. For many noise sources, the $L_{eq}$ will vary, depending on the time of day. A prime example is traffic noise, which rises and falls, depending on the amount of traffic on a given street or freeway.

- **Maximum Sound Level ($L_{max}$)** and **Minimum Sound Level ($L_{min}$)** refer to the maximum and minimum sound levels, respectively, that occur during the noise measurement period. More specifically, they describe the rms sound levels that correspond to the loudest and quietest 1-second intervals that occur during the measurement.[2]
- **Percentile-Exceeded Sound Level ($L_{xx}$)** describes the sound level exceeded for a given percentage of a specified period. For example, the $L_{50}$ is the sound level exceeded 50 percent of the time (such as 30 minutes per hour), and $L_{25}$ is the sound level exceeded 25 percent of the time (such as 15 minutes per hour).
- **Community Noise Equivalent Level (CNEL)** is a measure of the 24-hour average A-weighted noise level that is also time-weighted to "penalize" noise that occurs during the evening and nighttime hours when noise is generally recognized to be more disturbing (because people are trying to rest, relax, and sleep during these times). In order to account for this in calculating the CNEL, 5 dBA is added to the $L_{eq}$ during the evening hours of 7 p.m. to 10 p.m.; 10 dBA is added to the $L_{eq}$ during the nighttime hours of 10 p.m. to 7 a.m.; and the energy average is then taken for the whole 24-hour day.
- **Day-Night Sound Level ($L_{dn}$)** is similar to the CNEL described above. $L_{dn}$ is also a time-weighted average of the 24-hour A-weighted noise level. The only difference is that no "penalty" is applied to the evening hours of 7 p.m. to 10 p.m. 10 dBA is added to the $L_{eq}$ during the nighttime hours of 10 p.m. to 7 a.m., and the energy average is then taken for the whole 24-hour day.

It is noted that various federal, state, and local agencies have adopted CNEL or $L_{dn}$ as the measure of community noise. While not identical, CNEL and $L_{dn}$ are normally within 1 dBA of each other when measured in typical community environments, and many noise standards/regulations use the two interchangeably.

# 2.3 Sound Propagation

When sound propagates over a distance, it changes in both level and frequency content. The manner in which noise is reduced with distance depends on the following important factors.

- **Geometric Spreading**. Sound from a single source (i.e., a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates (or drops off) at a rate of approximately 6 dBA for each doubling of distance. Highway noise is not a single stationary point source of sound. The movement of vehicles on a highway makes the source of the sound appear to emanate from a line (i.e., a "line" source) rather than from a point. This results in cylindrical spreading rather than the spherical spreading resulting from a point source. The change in sound level (i.e., attenuation or decrease) from a line source is approximately 3 dBA doubling of distance.
- **Ground Absorption**. Usually the noise path between the source and the observer is very close to the ground. The excess noise attenuation from ground absorption occurs due to acoustic energy losses on sound wave reflection. Traditionally, the excess attenuation has also been

[2] 1-second intervals correspond to a "slow" time weighting on a sound level meter. For a sound level meter set to a "fast" time weighting, the corresponding interval is 1/8-second.

expressed in terms of attenuation per doubling of distance. This approximation is done for simplification only; for distances of fewer than 200 feet, prediction results based on this scheme are sufficiently accurate. For acoustically "hard" sites (i.e., sites with a reflective surface, such as a parking lot or a smooth body of water, between the source and the receptor), no excess ground attenuation is assumed because the sound wave is reflected without energy losses. For acoustically absorptive or "soft" sites (i.e., sites with an absorptive ground surface, such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dBA per doubling of distance is normally assumed. When added to the geometric spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dBA per doubling of distance for a line source and 7.5 dBA per doubling of distance for a point source.

- **Atmospheric Effects**. Research by the California Department of Transportation (Caltrans) and others has shown that atmospheric conditions can have a major effect on noise levels. Wind has been shown to be the single most important meteorological factor within approximately 500 feet, whereas vertical air temperature gradients are more important over longer distances. Other factors, such as air temperature, humidity, and turbulence, may also have a major effect on sound. Receptors downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas receptors upwind can have lower noise levels. Increased sound levels can also occur because of temperature inversion conditions (i.e., increasing temperature with elevation, with cooler air near the surface) as the warmer air at the higher elevation acts as a cap and causes a reflection of sound that is generated below at the ground level.
- **Shielding by Natural or Human-Made Features**. A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by this shielding depends on the size of the object, proximity to the noise source and receptor, surface weight, solidity, and the frequency content of the noise source. Natural terrain features (such as hills and dense woods) and human-made features (such as buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receptor with the specific purpose of reducing noise. A barrier that breaks the line of sight between a source and a receptor will typically result in at least 5 dB of noise reduction. A higher barrier may provide as much as 20 dB of noise reduction.

## 2.4 Human Response to Noise

Noise can have a range of effects on people including hearing damage, sleep interference, speech interference, performance interference, physiological responses, and annoyance. Each of these is briefly described below:

- **Hearing Damage.** A person exposed to high noise levels can suffer hearing damage, either gradual or traumatic. Gradual hearing loss occurs with repeated exposure to excessive noise levels and is most commonly associated with occupational noise exposures in heavy industry or other very noisy work environments. Traumatic hearing loss is caused by sudden exposure to an extremely high noise level, such as a gunshot or explosion at very close range. The potential for noise-induced hearing loss is not generally a concern in typical community noise environments. Noise levels in neighborhoods, and even in very noisy airport environments, are not sufficiently loud as to cause hearing loss.

- **Sleep Interference.** Exposure to excessive noise levels at night has been shown to cause sleep disturbance. Sleep disturbance refers not only to awakening from sleep, but also to effects on the quality of sleep, such as altering the pattern and stages of sleep. Interior noise levels between 50 and 55 dBA $L_{max}$ during nighttime hours (10 p.m. to 7 a.m.) were found to result in sleep disturbance and annoyance (Nelson 1987).
- **Speech Interference.** Speech interference can be a problem in any situation where clear communication is desired, but is often of particular concern in learning environments (such as schools) or situations where poor communication could jeopardize safety. Normal conversational speech is in the range of 60 to 65 dBA and any noise in this range or louder may interfere with speech. As background noise levels rise, the intelligibility of speech decreases and the listener will fail to recognize an increasing percentage of the words spoken. A speaker may raise his or her voice in an attempt to compensate for higher background noise levels, but this in turn can lead to vocal fatigue for the speaker.
- **Performance Interference.** Excessive noise has been found to have various detrimental effects on human performance, including information processing, concentration, accuracy, reaction times, and academic performance. Intrusive noise from individual events can also cause distraction. These effects are of obvious concern for learning and work environments.
- **Physiological Responses.** Noise has been shown to cause measureable physiological responses in humans, including changes in stress hormone levels, pulse rate, and blood pressure. The extent to which these responses cause harm or are signs of harm is not clearly defined, but they could contribute to stress-related diseases, such as hypertension, anxiety, and heart disease.
- **Annoyance.** The subjective effects of annoyance, nuisance, and dissatisfaction are possibly the most difficult to quantify, and no completely satisfactory method exists to measure these effects. This difficulty arises primarily from differences in individual sensitivity and habituation to sound, which can vary widely from person to person. What one person considers tolerable can be unbearable to another of equal hearing acuity. An important tool in estimating the likelihood of annoyance due to a new sound is by comparing it to the existing baseline or "ambient" environment to which that person has adapted. In general, the more the level or tonal (frequency) variations of a sound exceed the previously existing ambient sound level or tonal quality, the less acceptable the new sound will be.

In most cases, effects from sounds typically found in the natural environment would be limited to annoyance or interference. Physiological effects and hearing loss would be more commonly associated with human-made noise, such as in an industrial or occupational setting.

Studies have shown that under controlled conditions in an acoustics laboratory, a healthy human ear is able to discern changes in sound levels of 1 dBA. In the normal environment, the healthy human ear can detect changes of about 2 dBA. However, it is widely accepted that a doubling of sound energy, which results in a change of 3 dBA in a normal environment, is considered to be barely perceptible to most people. A change of 5 dBA is readily perceptible, and a change of 10 dBA is perceived as being twice as loud. Accordingly, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) resulting in a 3 dBA increase in sound would generally be barely detectable.

# 2.5 Noise-Sensitive Land Uses

Noise-sensitive land uses are the locations most likely to be adversely affected by excessive noise levels, as well as places where quiet is an essential element of their intended purpose. As defined in the Noise Element of the City of Los Angeles General Plan, land uses that are sensitive to noise include single- and multi-family dwellings, long-term care facilities (including convalescent and retirement facilities), dormitories, motels, hotels, transient lodgings, and other residential uses; houses of worship; hospitals; libraries; schools; auditoriums; concert halls; outdoor theaters; nature and wildlife preserves; and parks (City of Los Angeles 1999).

# Chapter 3
# **Groundborne Vibration Fundamentals**

This chapter describes basic concepts related to groundborne vibration. Groundborne vibration is a small, rapidly fluctuating motion transmitted through the ground. The effects of groundborne vibrations are typically limited to causing nuisance or annoyance to people, but at extreme vibration levels, damage to buildings may also occur.

In contrast to airborne sound, groundborne vibration is not a phenomenon that most people experience every day. The ambient groundborne vibration level in residential areas is usually much lower than the threshold of human perception. Most perceptible indoor vibration is caused by sources within buildings, such as mechanical equipment while in operation, people moving, or doors slamming. Typical outdoor sources of perceptible groundborne vibration are heavy construction activity (such as blasting, pile driving, or earthmoving), steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is rarely perceptible, even in locations close to major roads. The strength of groundborne vibration from typical environmental sources diminishes (or attenuates) fairly rapidly over distance.

For the prediction of groundborne vibration, the fundamental model consists of a vibration source, a receptor, and the propagation path between the two. The power of the vibration source and the characteristics and geology of the intervening ground, which affect the propagation path to the receptor, determine the groundborne vibration level and the characteristics of the vibration perceived by the receptor.

The following sections provide an explanation of key concepts and terms used in the analysis of environmental groundborne vibration.

## 3.1 Displacement, Velocity, and Acceleration

When a vibration source (blasting, dynamic construction equipment, train, etc.) impacts the ground it imparts energy to the ground, creating vibration waves that propagate away from the source along the surface and downward into the earth. As vibration waves travel outward from a source, they excite the particles of rock and soil through which they pass and cause them to oscillate. The distance that these particles move is referred to as the *displacement* and is typically very small, usually only a few ten-thousandths to a few thousandths of an inch. *Velocity* describes the instantaneous speed of the motion, and *acceleration* is the instantaneous rate of change of the speed. Each of these measures can be further described in terms of *frequency* and *amplitude*, as discussed below.

Although displacement is generally easier to understand than velocity or acceleration, it is rarely used to describe groundborne vibration because most transducers used to measure vibration directly measure velocity or acceleration, not displacement.

# 3.2 Frequency and Amplitude

The frequency of a vibrating object describes how rapidly it is oscillating. The unit of measurement for the frequency of vibration is Hz (the same as used in the measurement of noise), which describes the number of cycles per second.

The amplitude of displacement describes the distance that a particle moves from its resting (or equilibrium) position as it oscillates and can be measured in inches. The amplitude of vibration velocity (the speed of the movement) can be measured in inches per second (in/s). The amplitude of vibration acceleration (the rate of change of the speed) can be measured in inches per second per second.

# 3.3 Vibration Descriptors

As noted above, there are various ways to quantify groundborne vibration based on its fundamental characteristics. Because vibration can vary markedly over a short period of time, various descriptors have been developed to quantify vibration. The two most common descriptors used in the analysis of groundborne vibration are peak particle velocity and vibration velocity level, each of which are described below:

- **Peak Particle Velocity (PPV)** is defined as the maximum instantaneous positive or negative peak amplitude of the vibration velocity. The unit of measurement for PPV is in/s. Unlike many quantities used in the study of environmental acoustics, PPV is typically presented using linear values and does not employ a dB scale. Because it is related to the stresses that are experienced by buildings, PPV is generally accepted as the most appropriate descriptor for evaluating the potential for building damage (both Federal Transit Administration [FTA] and Caltrans guidelines recommend using PPV for this purpose). It is also used in many instances to evaluate the human response to groundborne vibration (Caltrans guidelines recommend using PPV for this purpose).
- **Vibration Velocity Level ($L_V$)** describes the rms vibration velocity. Due to the typically small amplitudes of groundborne vibrations, vibration velocity is often expressed in decibels, calculated as follows.

$$L_V = 20 \times \log_{10}\left(\frac{V}{V_{ref}}\right)$$

where $V$ is the actual rms velocity amplitude and $V_{ref}$ is the reference velocity amplitude. It is important to note that there is no universally accepted value for $V_{ref}$, but the accepted reference quantity for vibration velocity in the U.S. is 1 micro-inch per second ($1\times10^{-6}$ inches/second). The abbreviation VdB is commonly used for vibration decibels to distinguish from noise level decibels. $L_V$ is often used to evaluate human response to vibration levels (FTA guidelines recommend using $L_V$ for this purpose).

# 3.4 Vibration Propagation

Vibration energy spreads out as it travels through the ground, causing the vibration level to diminish with distance away from the source. High-frequency vibrations reduce much more rapidly than low frequencies so that low frequencies tend to dominate the spectrum at large distances from the source. The propagation of groundborne vibration is not as simple to model as airborne noise. This is because noise in the air travels through a relatively uniform medium, while groundborne vibrations travel through the earth, which may contain significant geological differences. Geological factors that influence the propagation of groundborne vibration include the following:

- **Soil conditions.** The type of soil is known to have a strong influence on the levels of groundborne vibration. Among the most important factors are the stiffness and internal damping of the soil. Hard, dense, and compacted soil, stiff clay soil, and hard rock transmit vibration more efficiently than loose, soft soils, sand, or gravel.
- **Depth to bedrock.** Shallow depth to bedrock has been linked to efficient propagation of groundborne vibration. One possibility is that shallow bedrock acts to concentrate the vibration energy near the surface, reflecting vibration waves back toward the surface that would otherwise continue to propagate farther down into the earth.
- **Soil strata.** Discontinuities in the soil strata (i.e., soil layering) can also cause diffractions or channeling effects that affect the propagation of vibration over long distances.
- **Frost conditions.** Vibration waves typically propagate more efficiently in frozen soils than in unfrozen soils. Propagation also varies depending on the depth of the frost.
- **Water conditions.** The amount of water in the soil can affect vibration propagation. The depth of the water table in the path of the propagation also appears to have substantial effects on groundborne vibration levels.

Specific conditions at the source and receptor locations can also affect the vibration levels. For instance, how the source is connected to the ground (e.g., direct contact, through rails, or via a structure) will affect the amount of energy transmitted into the ground. There are also notable differences when the source is underground (such as in a tunnel) versus on the surface. At the receptor, vibration levels can be affected by variables such as the foundation type, the building construction, and the acoustical absorption inside the rooms where people are located. When vibration encounters a building, a ground-to-foundation coupling loss will usually reduce the overall vibration level. However, under certain circumstances, the ground-to-foundation coupling may also amplify the vibration level due to structural resonances of the floors and walls.

# 3.5 Effects of Groundborne Vibration

Vibration can result in effects that range from annoyance to structural damage. Annoyance or disturbance of people may occur at vibration levels substantially below those that would pose a risk of damage to buildings. Each of these effects is discussed below.

### 3.5.1 Potential Building Damage

When groundborne vibration encounters a building, vibrational energy is transmitted to the structure, causing it to vibrate. If the vibration levels are high enough, damage to the building may occur. Depending on the type of building and the vibration levels, this damage could range from cosmetic architectural damage (e.g., cracked plaster, stucco, or tile) to more severe structural damage (e.g., cracking of floor slabs, foundations, columns, beams, or wells). Buildings can typically withstand higher levels of vibration from transient sources than from continuous or frequent intermittent sources. Transient sources are those that create a single, isolated vibration event, such as blasting or drop balls. Continuous or frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment. Older, fragile buildings (which may include important historical buildings) are of particular concern. Modern commercial and industrial buildings can generally withstand much higher vibration levels before potential damage becomes a problem.

### 3.5.2 Human Disturbance or Annoyance

Groundborne vibration can be annoying to people and can cause serious concern for nearby neighbors of vibration sources, even when vibration is well below levels that could cause physical damage to structures. Groundborne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors, where the motion may be discernible but there is less adverse reaction without the effects associated with the shaking of a building. The normal frequency range of most groundborne vibration that can be felt generally starts from a low frequency of less than 1 Hz to a high of about 200 Hz.

When groundborne vibration waves encounter a building, vibrational energy is transmitted to the building foundation and then propagates throughout the remainder of the structure, causing building surfaces (walls, floors, and ceilings) to vibrate. This movement may be felt directly by building occupants and may also generate a low-frequency rumbling noise as sound waves are radiated by the vibrating surfaces. At higher frequencies, building vibration can cause other audible effects, such as the rattling of windows, building fixtures, or items on shelves or hanging on walls. These audible effects due to groundborne vibration are referred to as groundborne noise. Groundborne vibration levels that result in groundborne noise are often experienced as a combination of perceptible vibration and low-frequency noise. However, sources that have the potential to generate groundborne noise are likely to produce airborne noise impacts that mask the radiated groundborne noise. Any perceptible effect (vibration or groundborne noise) can lead to annoyance. The degree to which a person is annoyed depends on the activity in which they are participating at the time of the disturbance. For example, someone sleeping or reading will be more sensitive than someone who is engaged in any type of physical activity. Reoccurring vibration effects often lead people to believe that the vibration is damaging their home, even though vibration levels are well below minimum thresholds for damage potential (Caltrans 2013).

Numerous studies have been conducted to characterize the human response to vibration, and, over the years, numerous vibration criteria and standards have been suggested by researchers, organizations, and governmental agencies. These studies suggest that the thresholds for perception and annoyance vary according to duration, frequency, and amplitude of vibration. For transient vibration sources (single, isolated vibration events such as blasting), the human response to vibration varies from barely perceptible at a PPV of 0.04 in/s, to distinctly perceptible at a PPV of 0.25 in/s, and severe at a PPV of 2.0 in/s. For continuous or frequent intermittent vibration sources (such as impact pile driving or vibratory compaction equipment), the human response to vibration varies from barely perceptible at a PPV of 0.01 in/s, to distinctly perceptible at a PPV of 0.04 in/s, and severe at a PPV of 0.4 in/s (Caltrans 2013).

## 3.6 Vibration-Sensitive Land Uses

As noted above, the potential effects of groundborne vibration can be divided into two categories: building damage and potential human annoyance. Because building damage would be considered a permanent negative effect at any building, regardless of land use, any type of building would typically be considered sensitive to this type of impact. Fragile structures, which often include historical buildings, are most susceptible to damage and are of particular concern.

Human annoyance effects from groundborne vibration are typically only considered inside occupied buildings and not at outside areas such as residential yards, parks, or open space. Buildings that would be considered sensitive to human annoyance caused by vibration are generally the same as those that would be sensitive to noise and would typically include residences, schools, hospitals, assisted living facilities, mental care facilities, places of worship, libraries, performing arts facilities, and hotels and motels.

Chapter 4
# Existing Noise Environment

The Project Site is located in an urbanized area surrounded by a mix of land uses, including commercial, residential, industrial, office, and school uses. Immediately northwest of the Project Site, at the southeast corner of North Lankershim Boulevard and West Strathern Street, is a fast food restaurant (Burger King), beyond which are various automotive, restaurant, and retail uses along North Lankershim Boulevard and Webb Avenue. Single-family residential uses are located to the north, across West Strathern Street, and immediately adjacent to the eastern and southern boundaries of the Project Site. An automotive repair shop (Schiro's Collision Repairs) also borders the Project Site to the south and is located at the northeast corner of North Lankershim Boulevard and West Arminta Street. Land uses along North Lankershim Boulevard to the southwest of the Project Site include office, motel, commercial, and automotive uses. To the west, across North Lankershim Boulevard, are automotive and commercial uses, beyond which are single-family residential uses. The Arminta Street Elementary School and the Arminta Street Early Education Center are approximately 715 feet east of the Project Site, along Beck Avenue between West Strathern Street and West Arminta Street.

The existing noise environment in the Project vicinity is dominated by traffic noise on local streets, with the loudest noise levels generated along North Lankershim Boulevard. Other secondary noise sources observed near the Project Site include vehicles at the fast food restaurant, power tools used at the automotive repair businesses, aircraft overflights, children playing outdoors from afar at the Arminta Street Elementary School, residential-generated noise (e.g., dogs barking, vehicle operation), and natural background noise (e.g., birds and rustling leaves). In order to document existing noise levels in the study area, a total of seven noise measurements were obtained in the Project vicinity. Five short-term (ST) measurements were obtained in the surrounding area on Wednesday, April 24, 2019, and Friday, April 26, 2019. In addition, two long-term (LT) noise measurements were conducted within the Project Site along the Project boundary adjacent to existing off-site residential dwellings. The noise-monitoring locations were selected to document the existing noise levels at the Project Site and at various neighboring noise-sensitive receptor locations.

Each of the ST measurements was conducted over a period of at least 20 minutes, while the LT measurements were conducted over a 24-hour period from midnight to midnight. All measurement locations are indicated on Figure 4-1.

The instrumentation used to obtain the ST noise measurements consisted of a Type 1 Larson Davis (Model 831) integrating sound level meter (SLM). The instrumentation used to obtain the LT noise measurements consisted of Type 2 Piccolo (Model SLM-P3) SLMs. Both the Type 1 and Type 2 SLMs were field-calibrated prior to each measurement to ensure accuracy, using a Larson Davis CAL200 acoustical calibrator; the calibration was also re-checked at the conclusion of each measurement. The instruments are maintained to manufacturer specifications to ensure accuracy, in accordance with American National Standards Institute standard S1.4-2006. For all measurements, the SLM microphone was mounted at a height of 5 feet above the ground. The noise measurement results are summarized in Table 4-1. Field noise survey sheets are included in Appendix A of this report. Noise measurements indicate that the daytime ambient noise levels generally ranged between approximately 48 and 70 dBA $L_{eq}$ in the Project area. The LT noise measurements indicate that the average daily noise levels ranged between approximately 53 dBA CNEL in the southeastern portion of the Project Site south of Blythe Street (LT2) and 61 dBA CNEL in the northeastern portion of the Project Site between Strathern Street and Blythe Street (LT1). The higher average daily noise level at the northeastern portion of the Project Site is mainly due to its proximity to Strathern Street, which experiences higher daily vehicular traffic than Blythe Street.

**Table 4-1. Measured Existing Noise Levels in Project Area**

| Location Number: Description | Date | Time[a] | Noise Levels (dBA) | | | |
|---|---|---|---|---|---|---|
| | | | $L_{eq}$ | $L_{max}$ | $L_{min}$ | CNEL |
| LT1: Eastern property line of Project Site, south of Strathern Street, adjacent to single-family residence. | 4/25/2019 to 4/26/2019 | Daytime<br>Nighttime | 55.8[b]<br>53.1[c] | 57.3[b]<br>57.3[c] | 54.0[b]<br>48.1[c] | 60.5 |
| LT2: Eastern property line of Project Site, south of Blythe Street, adjacent to single-family residence. | 4/25/2019 to 4/26/2019 | Daytime<br>Nighttime | 48.2[b]<br>45.2[c] | 52.1[b]<br>49.7[c] | 44.1[b]<br>42.0[c] | 52.7 |
| ST1: In front of single-family residence, 11669 Strathern Street, north of the Project Site. | 4/24/2019 | 10:23 a.m. to 10:43 a.m. | 67.9 | 79.3 | 49.7 | NM |
| ST2: Adjacent to single-family residence, 11713 Blyth Street, west of the Project Site. | 4/24/2019 | 10:59 a.m. to 11:19 a.m. | 58.5 | 77.6 | 46.8 | NM |
| ST3: Adjacent to Arminta Elementary School property line along Beck Avenue, east of the Project Site. | 4/26/2019 | 10:38 a.m. to 10:58 a.m. | 55.2 | 67.0 | 48.0 | NM |
| ST4: Northern property line of single-family residence, 7858 Troost Avenue, south of the Project Site. | 4/26/2019 | 9:58 a.m. to 10:18 a.m. | 52.2 | 46.1 | 65.4 | NM |
| ST5: Adjacent to Village Inn Motel, 7833 Lankershim Boulevard, southwest of the Project Site. | 4/24/2019 | 11:29 a.m. to 11:49 a.m. | 70.1 | 48.5 | 80.7 | NM |

Note: NM = Not measured
[a] Daytime = 7 a.m. to 10 p.m. Nighttime = 10 p.m. to 7 a.m.
[b] The value represents the noise level for the noise metric (i.e., $L_{eq}$, $L_{max}$, and $L_{min}$) across the daytime period (i.e., 7 a.m. to 10 p.m.).
[c] The value represents the noise level for the noise metric (i.e., $L_{eq}$, $L_{max}$, and $L_{min}$) across the nighttime period (i.e., 10 p.m. to 7 a.m.).


**Figure 4-1**
**Noise Measurement Locations**
**7940 Lankershim Blvd. Project**

# Chapter 5
# Regulatory Framework

## 5.1 Federal

There are no federal noise standards or regulations that directly regulate environmental noise related to the construction or operation of the proposed Project. There are also no federal vibration standards or regulations adopted by an agency that are applicable to evaluating vibration impacts from land use development projects such as the proposed Project. As such, noise impacts produced by the Project would be regulated or evaluated by State and City of Los Angeles standards designed to protect public well-being and health.

## 5.2 State

### 5.2.1 Noise

The state of California has not adopted statewide standards for environmental noise. However, the *State of California General Plan Guidelines,* published and updated by the Governor's Office of Planning and Research, provides guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. These are guidelines for general land use planning that describe noise acceptability categories for different types of land uses considered by the state. The evaluation contained in the guidelines has been incorporated into the City of Los Angeles Guidelines for Noise Compatible Land Use provided in Table 5-3 below.

California also requires each local government entity to perform noise studies and implement a noise element as part of its general plan. The purpose of the noise element is to limit the exposure of the community to excessive noise levels; the noise element must be used to guide decisions concerning land use. A discussion of relevant noise-related policies in the Noise Element of the City of Los Angeles General Plan is provided in Section 5.3.1 below.

### 5.2.2 Vibration

#### California Department of Transportation

There are no state vibration standards that directly apply to the Project. As noted below, there are also no quantitative local standards that can be used to assess project-related vibration. Therefore, while the Project would not be subject to Caltrans oversight, guidance published by the agency nonetheless provides groundborne vibration criteria that are useful in establishing thresholds for significant impacts. Caltrans' widely referenced *Transportation and Construction Vibration Guidance Manual* (Caltrans 2013) provides guidance for two types of potential vibration impacts: (1) damage to structures, and (2) annoyance to people. Guideline criteria for each are provided in Tables 5-1 and 5-2.

**Table 5-1. Caltrans Guideline Vibration Damage Criteria**

| Structure and Condition | Maximum PPV (in/s) Transient Sources | Maximum PPV (in/s) Continuous/Frequent Intermittent Sources |
|---|---|---|
| Extremely fragile historic buildings, ruins, ancient monuments | 0.12 | 0.08 |
| Fragile buildings | 0.2 | 0.1 |
| Historic and some old buildings | 0.5 | 0.25 |
| Older residential structures | 0.5 | 0.3 |
| New residential structures | 1.0 | 0.5 |
| Modern industrial/commercial buildings | 2.0 | 0.5 |

Source: Caltrans 2013.
Notes:
Transient sources create a single, isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

**Table 5-2. Caltrans Guideline Vibration Annoyance Criteria**

| Human Response | Maximum PPV (in/s) Transient Sources | Maximum PPV (in/s) Continuous/Frequent Intermittent Sources |
|---|---|---|
| Barely perceptible | 0.04 | 0.01 |
| Distinctly perceptible | 0.25 | 0.04 |
| Strongly perceptible | 0.9 | 0.10 |
| Severe | 2.0 | 0.4 |

Source: Caltrans 2013.
Notes:
Transient sources create a single, isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

# 5.3 Local

## 5.3.1 Noise

### Noise Element of the City of Los Angeles General Plan

The Noise Element of the General Plan serves to identify sources of noise and provide objectives and policies that ensure that noise from various sources does not create an unacceptable noise environment. Overall, the City's Noise Element describes the noise environment (including noise sources) in the City; addresses noise mitigation regulations, strategies, and programs; and delineates federal, state, and City jurisdiction relative to rail, automotive, aircraft, and nuisance noise. The goal, objectives, and policies of the Noise Element that are relevant to the Project are provided below.

## Goal

A city where noise does not reduce the quality of urban life.

## Objectives and Policies

**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 impacts 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.

## Implementation Programs

**P11:** For a proposed development project that is deemed to have a potentially significant noise impact on noise sensitive uses, as defined by this chapter, require mitigation measures, as appropriate, in accordance with California Environmental Quality Act and city procedures.

Examples of mitigation measures to consider:

a) increase the distance from the noise source and the receptor by providing land use buffers, e.g., parking lots, landscaped setbacks or open areas, utility yards, maintenance facilities, etc.;

b) orient structures, use berms or sound walls, utilize terrain or use other means to block or deflect noise, provided it is not deflected to other noise-sensitive uses and that the barrier does not create a hiding place for potential criminal activity;

c) require projects with noise generating components (e.g., auto repair and maintenance facilities) to have no openings in building walls that face sensitive uses;

d) limit the hours of operation of a noise generating use;

e) limit the use of the site to prohibit potential noise generating uses that otherwise are allowed by right within the zone classification of the project site;

f) require that potential noise impacts associated with project construction be minimized by such measures as designating haul routes, requiring less noisy equipment, enclosing or orienting noisy equipment (e.g., electrical generators) away from noise sensitive uses, imposing construction hours that are more restrictive than those set forth in the Los Angeles Municipal Code, requiring vehicle parking and deployment activities to be separated and buffered from sensitive uses; or

g) determine impacts on noise sensitive uses, such as public school classrooms, which are active primarily during the daytime and evening hours, by weighting the impact measurement to the potential interior noise level (or for exterior uses, e.g., outdoor theaters, to the exterior noise level) over the typical hours of use, instead of using a 24-hour measurement.

h) Other appropriate measures.

**P12:** When issuing discretionary permits for a proposed noise-sensitive use (as defined by this chapter) or a subdivision of four or more detached single-family units and which use is determined to be potentially significantly impacted by existing or proposed noise sources, require mitigation measures, as appropriate, in accordance with procedures set forth in the California Environmental Quality Act so as to achieve an interior noise level of a CNEL of 45 dB, or less, in any habitable room, as required by Los Angeles Municipal Code Section 91.

Examples of mitigation measures to consider:

a) Impose project orientation and buffering measures similar to those cited in the prior program;

b) orient the project so as to use structures, terrain or building design features (e.g., windowless walls or non-opening windows facing the noise source) so as to block or reduce noise impacts;

c) orient interior features of the project to reduce or eliminate noise impacts on particularly noise sensitive portions of the project (e.g., locate bedrooms and balconies away from the noise source);

d) require insulation and/or design measures, attested to by an acoustical expert, to the satisfaction of the city's Department of Building and Safety, to identify and mitigate potential noise impacts;

e) determine impacts on noise sensitive uses, such as public school classrooms, which are active primarily during the daytime and evening hours, by weighting the impact measurement to the potential interior noise level (or for exterior uses, e.g., outdoor theaters, to the exterior noise level) over the typical hours of use, instead of using a 24-hour measurement.

f) Other appropriate measures.

The Noise Element also provides land use/noise compatibility guidelines, as shown in Table 5-3. These are not strict standards, but rather are intended to help guide the determination of appropriate land use and mitigation measures relative to existing or anticipated ambient noise levels. These guidelines are most commonly applied to noise from mobile (transportation) noise sources, such as traffic, rail, and aircraft noise. Stationary noise sources are most commonly addressed using the municipal code standards described below.

**Table 5-3. City of Los Angeles Guidelines for Noise Compatible Land Use**

| | Day-Night Average Exterior Sound Level (CNEL dB) | | | | | | |
|---|---|---|---|---|---|---|---|
| **Land Use Category** | **50** | **55** | **60** | **65** | **70** | **75** | **80** |
| Residential Single-Family, Duplex, Mobile Home | A | C | C | C | N | U | U |
| Residential Multi-Family | A | A | C | C | N | U | U |
| Transient Lodging, Motel, Hotel | A | A | C | C | N | U | U |
| School, Library, Church, Hospital, Nursing Home | A | A | C | C | N | N | U |
| Auditorium, Concert Hall, Amphitheater | C | C | C | C/N | U | U | U |
| Sports Arena, Outdoor Spectator Sports | C | C | C | C | C/U | U | U |

| Land Use Category | Day-Night Average Exterior Sound Level (CNEL dB) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 50 | 55 | 60 | 65 | 70 | 75 | 80 |
| Playground, Neighborhood Park | A | A | A | A/N | N | N/U | U |
| Golf Course, Riding Stable, Water Recreation, Cemetery | A | A | A | A | N | A/N | U |
| Office Building, Business, Commercial, Professional | A | A | A | A/C | C | C/N | N |
| Agriculture, Industrial, Manufacturing, Utilities | A | A | A | A | A/C | C/N | N |

Source: City of Los Angeles General Plan, Noise Element, 1999.
Notes:
A = Normally acceptable. Specified land use is satisfactory, based on the assumption that the buildings involved are conventional construction, without any special noise insulation.
C = Conditionally acceptable. New construction or development only after a detailed analysis of noise mitigation is made and needed noise insulation features are included in project design. Conventional construction; closed windows and fresh air supply systems or air-conditioning normally will suffice.
N = Normally unacceptable. New construction or development generally should be discouraged. A detailed analysis of noise reduction requirements must be made and noise insulation features included in the design of a project.
U = Clearly unacceptable. New construction or development generally should not be undertaken.

## City of Los Angeles Municipal Code

### Construction Noise

Section 41.40(a) of the City of Los Angeles Municipal Code (LAMC) prohibits the use, operation, repair, or servicing of construction equipment, as well as job-site delivery of construction materials, between the hours of 9:00 p.m. and 7:00 a.m. where such activities would disturb "persons occupying sleeping quarters in any dwelling hotel or apartment or other place of residence." Construction noise emanating from property zoned for manufacturing or industrial uses is exempted from the Section 41.40(a) standards. In addition, Section 41.40(c) prohibits construction, grading, and related job-site deliveries on or within 500 feet of land developed with residential structures before 8:00 a.m. or after 6:00 p.m. on any Saturday or national holiday or at any time on Sunday.

Section 112.05 of the LAMC places a noise level limit of 75 dBA at a distance of 50 feet for powered equipment or tools, which includes construction equipment in, or within 500 feet of, any residential zone between the hours of 7 a.m. and 10 p.m. Under the code, the limit shall not apply where compliance is technically infeasible. Technical infeasibility means that the noise limit cannot be achieved despite the use of mufflers, shields, sound barriers, and/or other noise reduction devices or techniques during operation of the equipment. Section 111.02 of the LAMC provides guidance on conducting sound level measurements pursuant to City noise regulations. The guidance from this section states, in part:

> "…the level of a particular noise being measured shall be the numerical average of noise measurements taken at a given location during a given time period."

The LAMC does not state a specific averaging time to be used for a noise measurement conducted pursuant to City noise regulations. However, as indicated in Section 111.02(b) of the LAMC in regard to sound level measurement procedure and criteria, the City references a period of "60 consecutive minutes" as a criterion in assessing an alleged offensive noise. Therefore, for the purpose of assessing construction activities, the $L_{eq}$ for a 1-hour period is appropriate to assess Project impacts.

## Operational Noise

Chapter XI, Noise Regulation (Noise Ordinance), of the LAMC regulates noise from non-transportation noise sources such as commercial or industrial operations, mechanical equipment, or residential activities. Although these regulations do not apply to vehicles operating on public rights-of-way, it is noted that they do apply to noise generated by vehicles on private property, such as in parking lots or parking structures. The exact noise standards vary, depending on the type of noise source; however, the allowable noise levels are generally determined relative to the existing ambient noise levels at the affected location. Section 111.01(a) defines ambient noise as "the composite of noise from all sources near and far in a given environment, exclusive of occasional and transient intrusive noise sources and the particular noise source or sources to be measured. Ambient noise shall be averaged over a period of at least 15 minutes." Section 111.03 provides minimum ambient noise levels for various land uses, as described in Table 5-4 below. In the event that the actual measured ambient noise level at a subject location is lower than that provided in the table, the level in the table shall be assumed.

**Table 5-4. City of Los Angeles Assumed Minimum Ambient Noise Levels**

| Zone | Assumed Minimum Ambient Noise ($L_{eq}$), dBA[a,b] | |
|---|---|---|
| | Daytime (7 a.m. – 10 p.m.) | Nighttime (10 p.m. – 7 a.m.) |
| A1, A2, RA, RE, RS, RD, RW1, RW2, R1, R2, R3, R4, and R5 | 50 | 40 |
| P, PB, CR, C1, C1.5, C2, C4, C5, and CM | 60 | 55 |
| M1, MR1, and MR2 | 60 | 55 |
| M2 and M3 | 65 | 65 |

Source: Los Angeles Municipal Code, Section 111.03.
[a] At the boundary line between two zones, the allowable noise level of the quieter zone shall be used.
[b] The allowable noise levels listed in this table are adjusted when the following conditions apply to the alleged offensive noise:
For steady-tone noise with an audible fundamental frequency or overtones (except for noise emanating from any electrical transformer or gas-metering and pressure-control equipment existing and installed prior to September 8, 1986), reduce the allowable noise level by 5 dBA.
For repeated impulsive noise, reduce the allowable noise level by 5 dBA.
For noise occurring fewer than 15 minutes in any period of 60 consecutive minutes between the hours of 7:00 a.m. and 10:00 p.m., increase the allowable noise level by 5 dBA.

As discussed previously, the LAMC is not explicit with respect to defining the length of time over which an average noise level should be assessed. However, based on the noted reference to "60 consecutive minutes" in Table 5-4 above, the LAMC indicates that the 1-hour $L_{eq}$ metric should be used.

Section 112.01 of the Noise Ordinance addresses noise from radios, television sets, and similar devices that are used for the producing, reproducing, or amplification of the human voice, music, or any other sound. This section states that any noise level caused by these devices that is audible to the human ear at a distance in excess of 150 feet from the property line of the noise source, within any residential zone of the City or within 500 feet thereof, would be a noise violation. Additionally, these devices may not generate noise that exceeds the ambient noise level at any adjacent property by more than 5 dBA.

Section 112.02 of the Noise Ordinance addresses noise from air-conditioning, refrigeration, heating, pumping, and filtering equipment. This section states that such equipment may not generate noise that would exceed the ambient noise level at any adjacent property by more than 5 dBA.

Section 112.04 of the Noise Ordinance addresses noise from powered equipment intended for repetitive use in residential areas (e.g., lawn mower, backpack blower, lawn edger, riding tractor) and other machinery, equipment, and devices. This section states that the operation of said equipment between the hours of 10:00 p.m. and. 7:00 a.m. within any residential zone or within 500 feet of a residence is prohibited. Additionally, noise levels associated with the operation of this type of equipment may not generate noise that would exceed the ambient noise level at any adjacent property by more than 5 dBA.

Section 114.02 of the Noise Ordinance addresses noise from motor-driven vehicles. (It is noted that the code applies to vehicles on private property only, and does not apply to vehicles operated within public rights-of-way.) This section states that such vehicles may not generate noise that would exceed the ambient noise level at any occupied residential property by more than 5 dBA.

Section 114.03 of the Noise Ordinance addresses noise from vehicle loading and unloading. This section prohibits the loading or unloading of any vehicle, or operation of any dollies, carts, forklifts, or other wheeled equipment, between the hours of 10:00 p.m. and 7:00 a.m. of the following day that causes any impulsive sound or raucous or unnecessary noise within 200 feet of any residential building.

### 5.3.2 Vibration

There are currently no local regulatory standards for groundborne vibration that are applicable to the Project.

Chapter 6
# Impacts and Mitigation Measures

## 6.1 Methodology

### 6.1.1 Construction Noise and Vibration

A combination of existing literature, baseline noise level measurements, and application of accepted noise and vibration prediction and propagation algorithms were used for the prediction of short-term construction and long-term non-transportation and transportation source noise levels, as well as for the evaluation of groundborne vibration impacts. The evaluation of potential noise and vibration impacts associated with Project construction was based on the construction schedule, phasing, and equipment assumptions provided by the Applicant for the Project.

Using the construction assumptions provided for the Project, noise and vibration levels were estimated using the methods described below.

#### Noise

Construction-related noise was analyzed using data and modeling methodologies from the Federal Highway Administration's (FHWA's) Roadway Construction Noise Model (FHWA 2008), which predicts average noise levels at nearby receptors by analyzing the type of equipment, the distance from source to receptor, usage factor (the fraction of time the equipment is operating in its noisiest mode while in use), and the presence or absence of intervening shielding between source and receptor. This methodology is conservative, as it calculates the composite average noise levels for all equipment items scheduled during each construction phase to be operated at the same time, which would seldom, if ever, occur during construction. Construction noise levels were predicted assuming an average noise attenuation rate of 6 dB per doubling of distance from the source. Based on guidance from Section 111.02(a) of the LAMC (which indicates an average value should be used to describe sound levels), Section 111.02(b) of the LAMC (which references a period of "60 consecutive minutes") and Section 112.05 of the LAMC (which describes a noise limit of 75 dBA for construction equipment), a noise limit of 75 dBA 1-hour $L_{eq}$ is used as the criterion to define a noise exceedance associated with construction activities. Thus, to analyze the Project's potential noise impacts, the average 1-hour $L_{eq}$ construction noise level generated during each phase of construction was estimated at each analyzed receptor based on their distance to the construction phase activity. To reflect the assumed distribution of equipment across the Project Site, source-to-receptor distances used in the analysis were the acoustical average distances between the Project Site and each receptor.[3]

[3] The acoustical average distance is used to represent noise sources that are mobile or distributed over an area (such as the analyzed construction area within the Project Site); it is calculated by multiplying the shortest distance between the receptor and construction area boundary by the farthest distance and then taking the square root of the product.

During Project construction, noise levels would also be generated from construction-related traffic associated with worker trips and haul truck trips on local roadways. The analysis of roadway noise levels from the Project's construction traffic was conducted using a proprietary traffic noise model, with calculations based on data from the FHWA Traffic Noise Model, Version 2.5, Look-Up Tables (FHWA 2004). This model allows for the calculation of noise levels at specific distances from the center of the roadway based on traffic volumes, average speeds, and site environmental conditions. For the purpose of this analysis, the highest daily worker and haul truck trips that would occur during Project construction are assessed. The construction-related off-site worker trip volumes were obtained from the Applicant and the haul truck volumes were derived from data provided by the Applicant regarding the amount of materials that would need to be exported from the Project Site (Gibson Transportation Consulting, Inc. 2019). The predicted roadway noise levels resulting from the addition of the Project's construction-related traffic volumes to existing traffic volumes along segments of the potential haul routes used during Project construction were assessed against the existing roadway noise levels without the Project's construction traffic.

### Vibration

Construction-related vibration resulting from the Project was analyzed using data and modeling methodologies provided by Caltrans' *Transportation and Construction Vibration Guidance Manual* (Caltrans 2013). This guidance manual provides typical vibration source levels for various types of construction equipment, as well as methods for estimating the propagation of groundborne vibration over distance. The Project would not require high-impact construction methods, such as pile driving or blasting. Therefore, the highest groundborne vibration levels would be associated with conventional heavy construction equipment, such as bulldozers, backhoes, and loaders. According to Caltrans data, the largest generally available models of each of these heavy pieces of equipment can generate a PPV of 0.089 in/s at a reference distance of 25 feet, while smaller versions of this equipment can generate a PPV of 0.003 in/s at a reference distance of 25 feet. All of the analyzed equipment is classified as continuous/frequent intermittent vibration sources based on Caltrans' vibration criteria.

The following equation from the guidance manual was used to estimate the change in PPV levels over distance:

$$PPV_{rec} = PPV_{ref} \times (25/D)^{n}$$

where $PPV_{rec}$ is the PPV at a receptor; $PPV_{ref}$ is the reference PPV at 25 feet from the equipment; D is the distance from the equipment to the receptor, in feet; and n is a value related to the vibration attenuation rate through ground (the default recommended value for n is 1.1). This equation was used to estimate the PPV at each of the closest vibration-sensitive receptors based on the worst-case (closest) distance between each source and receptor.

## 6.1.2 Operational Noise

The analysis of traffic noise in the study area was based on data from the Transportation Impact Study (TIS) for the Project (Gibson Transportation Consulting, Inc. 2019). The analysis was conducted using a proprietary traffic noise model, with calculations based on data from the FHWA Traffic Noise Model, Version 2.5, Look-Up Tables (FHWA 2004). The inputs used in the traffic noise modeling included average daily traffic (ADT) volumes, assumed traffic mix and daily distribution (the percentage of automobiles versus medium trucks and heavy trucks during each hour of the day), and traffic speeds, based on the posted speed limits. The TIS does not directly analyze ADT; therefore, based on guidance from Gibson Transportation Consulting, Inc., these values were estimated by assuming that the peak PM traffic volumes reported in the TIS represented 10 percent of the ADT. To quantify the effects of the Project, traffic noise was analyzed using four different scenarios: (1) existing, (2) existing plus Project, (3) future (2023) without Project, and (4) future (2023) with Project. The first two scenarios were used to analyze the direct traffic noise impacts of the Project; scenarios 3 and 4 were used to analyze the future/cumulative impacts. The noise modeling is provided in Appendix B.

Aside from traffic noise associated with the Project that would be generated off-site, on-site noise levels would also be generated by stationary noise sources such as mechanical equipment (HVAC equipment), the on-site parking structure, the loading area serving the proposed retail use and refuse collection at the Project Site, and the outdoor amenity areas (e.g., activities at the outdoor swimming pool and spa area, outdoor kitchen, community garden, pet park). Using noise level data from published sources as well as from noise measurements, impacts from these on-site stationary noise sources are evaluated by estimating the noise levels that each noise source would generate at the nearest noise-sensitive receptors to the Project Site. The estimated noise level from each noise source takes into account the distance from source to receptor and the presence or absence of intervening shielding between source and receptor.

For the Project's HVAC equipment, noise level data from an industry manufacturer were obtained based on the general specifications of the HVAC units that would be used for the Project, which would be 3-ton HVAC units (Tabrizi pers. comm.).

The Project's on-site parking structure noise level was estimated using FTA's recommended methodology for stationary source general assessment, which uses the following equation to estimate noise levels for parking garages:

$$L_{eq}(h) = SEL_{ref} + 10\log(N_A/1000) - 35.6$$

where $L_{eq}(h)$ is the hourly $L_{eq}$ noise level at 50 feet; $SEL_{ref}$ is the reference noise level for a stationary noise source represented in sound exposure level at 50 feet from the noise source;[4] and $N_A$ is the number of automobiles per hour.

For the Project's loading area, which would be used by both delivery and refuse collection vehicles serving the Project, previously measured noise level data collected at a loading dock for a retail warehouse were used to estimate the noise levels at the nearest off-site sensitive receptors.

As the Project's noise levels associated with the outdoor amenities (pool deck and spa area, outdoor kitchen, community garden, tot lot, etc.) would consist primarily of people congregating and conversing in those areas, published data for human speech noise levels for males, females, and children were obtained and noise levels were estimated based on assumptions of the number of people who are expected to gather in each of the Project's outdoor amenity areas. The speech noise

[4] A $SEL_{ref}$ of 92 dBA is cited by the FTA for a parking garage with 1,000 cars during the peak activity hour. Although the Project's peak hour vehicle trips would be much less than 1,000 vehicles, the 92 dBA $SEL_{ref}$ is used for the noise analysis of the Project's on-site parking garage for the purposes of conducting a conservative analysis.

levels for people in various noise environments used for analysis in this report are shown in Table 6-1. For the Project's pet park, previously measured noise level data collected at a dog park were used to estimate the noise levels at the nearest off-site sensitive receptors.

**Table 6-1. Average A-Weighted Sound Levels of Speech for Different Vocal Efforts[a]**

| | Sound Levels (dBA $L_{eq}$) | | |
|---|---|---|---|
| **Voice Effort** | **Male** | **Female** | **Children** |
| Casual | 53 | 50 | 50 |
| Normal | 58 | 55 | 55 |
| Raised | 65 | 62 | 62 |
| Loud | 75 | 71 | 71 |
| Shout | 88 | 82 | 82 |

Sources: Harris 1998; U.S. Environmental Protection Agency 1977.
[a] Measured at a distance of 1 meter.

# 6.2 Project Design Features

The following project design feature (PDF) would be implemented as part of the Project:

**PDF-NOI-1**: No pile driving activities or blasting will be allowed at the Project Site during construction.

**PDF-NOI-2:** All noise-generating mechanical equipment during Project operations will be equipped with noise-muffling devices or shielding (e.g., enclosures) to minimize noise levels at neighboring properties in accordance with Section 112.02 of the LAMC, which prohibits noise from air conditioning, refrigeration, heating, pumping, and filtering equipment from exceeding the ambient noise level on the premises of other occupied properties by more than 5 dBA. The noise control methods that will be implemented by the Project to reduce its mechanical equipment noise levels may include, but will not be limited to:

a) Selecting mechanical equipment designed to produce low noise levels. This includes the mechanical equipment for heating and cooling interior spaces (i.e., HVAC) as well as equipment associated with the swimming pool;

b) Shielding mechanical equipment with screens, acoustical louvers, or other noise barriers; and

c) Installing a parapet wall around the perimeter of the rooftop of the mixed-use building to minimize noise levels from HVAC equipment.

**PDF-NOI-3:** The Project will implement operational restrictions to limit excessive noise generated by residents at the outdoor amenity areas located at the ground floor level, which includes the pool deck and spa, game lounge, outdoor kitchen, BBQ and sitting area, tot lot, community garden, and pet park. Such restrictions will include limiting the hours of use at these outdoor areas to between 7:00 a.m. and 10:00 p.m. (to correspond with the daytime hours specified by the City's noise ordinance), enforcing all applicable capacity limits on the number of residents using each amenity area (for example, as required by fire or safety codes), and restricting the exterior use of amplified music. Building management staff would be required to ensure that operations remain in compliance with the daytime noise limits set forth in the LAMC.

# 6.3 Thresholds of Significance

Appendix G of the California Environmental Quality Act Guidelines presents screening questions lead agencies can utilize to analyze the significance of project impact, and are as follows:

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.

b) Generation of excessive groundborne vibration or groundborne noise levels.

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 2 miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels.

## 6.3.1 Short-term Construction Noise Criteria

As discussed previously in Section 5.3, the City regulates construction noise levels per the requirements of the LAMC, which establishes permissible hours for construction activities under Section 41.40 and noise level limits for construction equipment under Section 112.05. As such, the construction noise levels generated by the Project would be assessed against these noise regulations and standards of the LAMC to determine whether potential noise impacts would occur. Therefore, construction activities that either occur outside of the City's permitted construction hours and days identified in Section 41.40 of the LAMC or generate noise levels in excess of the 75 dBA 1-hour $L_{eq}$ noise limit established under Section 112.05 of the LAMC are considered to result in significant impacts. Section 112.05 of the LAMC indicates that the 75 dBA $L_{eq}$ noise limit applies at a distance of 50 feet. However, for this analysis, the noise limit is conservatively applied at the nearest sensitive receptors to the Project Site in recognition of the fact that there are existing noise-sensitive receptors fewer than 50 feet from the Project Site.

## 6.3.2 Long-Term Operational Noise Criteria

In accordance with Chapter XI, Noise Regulation, of the LAMC, a noise level increase of 5 dBA over the existing average ambient noise level at an adjacent property line is considered a noise violation for most operational noise sources (City of Los Angeles 2019). This standard applies to: (1) radios, television sets, and similar devices defined in LAMC Section 112.01; (2) air conditioning, refrigeration, heating, pumping, and filtering equipment defined in LAMC Section 112.02; (3) powered equipment intended for repetitive use in residential areas and other machinery, equipment, and devices defined in LAMC Section 112.04; and (4) motor vehicles driven on site as defined in LAMC Section 114.02. As such, based on the regulations of the LAMC, a significant operational noise impact would occur if Project-related operational on-site (i.e., non-roadway) noise sources such as building mechanical/electrical equipment, parking facilities, outdoor gathering areas, and loading dock areas increase the existing ambient noise level at noise-sensitive uses by more than 5 dBA.

### 6.3.3 Traffic Noise Criteria

With respect to roadway noise, which is a continual noise source that occurs throughout the day, a 24-hour average noise level metric (i.e., dBA CNEL) is used to assess noise impacts associated with the Project based on the City's land use/noise compatibility guidelines shown in Table 5-3.[5] With respect to the community noise assessment, changes in noise levels of fewer than 3 dBA are generally not discernable to most people, while changes greater than 5 dBA are readily noticeable and would be considered a significant increase. For the purpose of this analysis, a significant impact related to an increase in traffic noise levels resulting from Project-induced vehicle trips during construction and operations would occur if the Project causes the ambient noise level measured at the property line of affected sensitive land uses to increase by 3 dBA in CNEL to or within the "normally unacceptable" or "clearly unacceptable" category identified in Table 5-3, or any 5 dBA or greater noise increase.

### 6.3.4 Groundborne Vibration Criteria

As there are currently no local regulatory standards for groundborne vibration that are applicable to the Project, the lead agency has determined to use the quantitative criteria published by Caltrans to assess potential structural damage risks and human annoyance resulting from groundborne noise and vibration (refer to Tables 5-1 and 5-2) as the threshold of significance for this analysis.

## 6.4 Project Impacts

### Impact Noise-1: Would the project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?

### Construction Noise

#### On-site Construction Activities

Construction activities associated with the Project are anticipated to last approximately 39 months, with completion anticipated in 2023. During this time, temporary increases in noise levels in the Project area would occur during certain phases of the construction period due to the operation of various large construction equipment within the Project Site. Construction of the Project would involve demolition of the existing single-story office, single-story commercial building, and associated surface parking lot followed by construction of a seven-story mixed-use building with 432 apartment units above 22,000 square feet of commercial retail and restaurant uses. Grading activities would include cut and fill with approximately 89,000 cubic yards of soil being exported from the Project Site. For any individual off-site receptor adjacent or in proximity to the Project,

[5] As discussed in Section 5.3.1 above, the City's land use/noise compatibility guidelines are most commonly applied to noise from mobile (transportation) noise sources, such as traffic, rail, and aircraft noise. Stationary noise sources are most commonly addressed using the municipal code standards.

noise levels experienced over the construction period would fluctuate depending on the type of construction activity and the location of that activity occurring within the Project Site. The noise levels generated by each individual piece of construction equipment associated with each of the different construction activities that would occur as part of the Project are shown in Table 6-2.

**Table 6-2. Project Construction Activities and Equipment Noise Levels**

| | | | Individual Equipment Noise Levels (dBA) at 50 Feet |
|---|---|---|---|
| **Activity** | **Equipment** | **Quantity[a]** | $L_{eq}$ |
| Demolition | Concrete Saw | 1 | 83 |
| | Dozer | 2 | 78 |
| | Excavator | 2 | 77 |
| Site preparation | Backhoe | 1 | 74 |
| | Dozer | 1 | 78 |
| | Excavator | 1 | 77 |
| | Loader | 1 | 75 |
| Grading | Backhoe | 1 | 74 |
| | Dozer | 1 | 78 |
| | Excavator | 1 | 77 |
| | Loader | 2 | 75 |
| Building Construction | Crane | 1 | 73 |
| | Forklift | 1 | 68 |
| | Generator | 1 | 78 |
| | Loader | 1 | 75 |
| | Welder | 1 | 70 |
| Paving | Backhoe | 1 | 74 |
| | Cement/mortar mixer | 1 | 75 |
| | Paver | 2 | 74 |
| | Roller | 1 | 73 |
| Architectural Coatings | Air Compressor | 1 | 74 |

Source: FHWA 2008.
[a] The quantity of each type of equipment that is anticipated to operate at the Project Site during each construction activity.

For the purpose of this analysis, the composite hourly average noise levels for the multiple equipment items associated with each construction activity shown in Table 6-2 were first calculated at a reference distance of 50 feet as part of an intermediary step for use in estimating the noise levels at sensitive off-site receptors. The composite hourly average noise levels for each construction activity are shown in Table 6-3.

**Table 6-3. Composite Noise Levels for Each Construction Activity**

| Construction Activity | Average Composite Hourly Noise Level ($L_{eq}$) at 50 feet, dBA |
|---|---|
| Demolition | 86 |
| Site preparation | 82 |
| Grading | 83 |
| Building Construction | 81 |
| Paving | 81 |
| Architectural Coatings | 74 |

As shown in Table 6-3, the average hourly noise levels for the Project's construction activities would range from 74 to 86 dBA $L_{eq}$ at the reference distance of 50 feet. The highest noise levels would be associated with the demolition activities.

The nearest sensitive land uses in the Project Site vicinity that could be exposed to increased noise levels during Project construction are be the single-family residences to the north, across Strathern Street and the single family residences directly adjacent to the eastern and southern Project Site boundaries. Additional single-family residences farther away that could also be exposed to increased noise levels during Project construction include those to the west, across Lankershim Boulevard and behind the automotive and commercial uses that front the roadway, and farther south, across Arminta Street. Additionally, other noise-sensitive land uses in the Project vicinity include the Village Inn Motel approximately 450 feet southwest of the Project Site and the Arminta Street Elementary School approximately 715 feet east of the Project Site. For the purposes of this analysis, potential construction-related noise impacts were assessed at each of these sensitive receptor locations, which are shown on Figure 6-1.

The highest construction noise levels at each of the analyzed receptor locations were estimated based on the composite noise levels shown in Table 6-3 and the distance of each analyzed receptor from the Project's construction activities. The estimated construction noise levels experienced by the nearby sensitive receptors are shown in Table 6-4. Detailed calculations are provided in Appendix B.


**Figure 6-1**
**Off-Site Sensitive Receptor Locations Analyzed**
**7940 Lankershim Blvd. Project**

**Table 6-4. Estimated Construction Noise Levels at Nearby Sensitive Receptors – Unmitigated**

| Receptor Description/Location | Highest Estimated Average Hourly Noise Level (dBA $L_{eq}$)[a] |
|---|---|
| 1. Single-family residences along West Strathern Street, approximately 90 feet north of Project Site | 70 |
| 2. Single-family residences directly east of, and adjacent to, the northeastern portion of the Project Site (north of Blythe Street) | 83 |
| 3. Single-family residence directly east of, and adjacent to, the southeastern portion of the Project Site (south of Blythe Street) | 82 |
| 4. Single-family residences directly south of, and adjacent to, the Project Site | 84 |
| 5. Single-family residences along Arminta Street, approximately 215 feet south of the Project Site | 66[b] |
| 6. Single-family residences approximately 230 feet west of the Project Site, across North Lankershim Boulevard | 66[b] |
| 7. Village Inn Motel approximately 450 feet southwest of the Project Site, across North Lankershim Boulevard | 61[b] |
| 8. Arminta Street Elementary School approximately 715 feet east of the Project Site, along Beck Avenue between Strathern Street and Arminta Street | 47[c] |

[a] The noise levels are estimated using a source-to-receptor distance that represents the acoustical average distance between the construction area and each receptor location.
[b] The estimated construction noise level at this location takes into account an additional 5 dBA reduction in noise levels due to the presence of intervening building structures that obstruct the line of sight between the receptor and the Project Site.
[c] The estimated construction noise level at this location takes into account an additional 10 dBA reduction in noise levels due to the presence of numerous rows of intervening single-family residential structures that obstruct the line of sight between the receptor and the Project Site.

As shown in Table 6-4, the highest estimated construction-related noise levels that could result at nearby sensitive receptors over the course of Project's construction period would range from 47 dBA $L_{eq}$ at sensitive receptor 8 to 84 dBA $L_{eq}$ at sensitive receptor 4. The construction noise levels at sensitive receptors 2, 3, and 4 would exceed 75 dBA $L_{eq}$, while the construction noise levels at the other analyzed sensitive receptors would be below 75 dBA $L_{eq}$. It should be noted that the noise levels shown in Table 6-4 are considered to be a conservative estimate, as they account for the concurrent operation of all construction equipment for the highest noise-generating construction activity. Throughout the course of a construction day, it would be seldom if ever that all construction equipment would be run simultaneously. Instead, the operation of each piece of construction equipment at the Project Site is expected to be staggered throughout the construction day and each piece would be turned off when not in use. Furthermore, during the quieter phases of construction or when construction activity moves farther away from a receptor, the noise levels would decrease. As such, the highest construction noise levels experienced at each off-site sensitive receptor would only occur over a temporary period within the Project's overall construction schedule.

Nonetheless, because the construction noise levels at sensitive receptors 2, 3, and 4 would exceed 75 dBA $L_{eq}$, Mitigation Measure NOI-1 is recommended to reduce the noise levels at these affected receptors by requiring the implementation of various noise-minimizing measures during Project construction. Amongst these measures are the erection of a 15-foot-high temporary noise barrier along the eastern and southern boundaries of the Project Site, scheduling high noise-producing construction activities during periods that are least sensitive at off-site sensitive receptors, positioning stationary construction equipment as far away as practical from adjacent noise-sensitive receptors, and limiting on-site vehicle speeds and truck idling, among other measures. The estimated construction noise levels experienced by the nearby sensitive receptors with implementation of Mitigation Measure NOI-1 are shown in Table 6-5. Detailed calculations are provided in Appendix B.

**Table 6-5. Estimated Construction Noise Levels at Nearby Sensitive Receptors – Mitigated[a]**

| Receptor Description/Location | Highest Estimated Average Hourly Noise Level (dBA $L_{eq}$)[b] |
|---|---|
| 1. Single-family residences along West Strathern Street, approximately 90 feet north of Project Site | 70 |
| 2. Single-family residences directly east of, and adjacent to, the northeastern portion of the Project Site (north of Blythe Street) | 73 |
| 3. Single-family residence directly east of, and adjacent to, the southeastern portion of the Project Site (south of Blythe Street) | 72 |
| 4. Single-family residences directly south of, and adjacent to, the Project Site | 74 |
| 5. Single-family residences along Arminta Street, approximately 215 feet south of the Project Site | 56[c] |
| 6. Single-family residences approximately 230 feet west of the Project Site, across North Lankershim Boulevard | 66[c] |
| 7. Village Inn Motel approximately 450 feet southwest of the Project Site, across North Lankershim Boulevard | 61[c] |
| 8. Arminta Street Elementary School approximately 715 feet east of the Project Site, along Beck Avenue between Strathern Street and Arminta Street | 37[d] |

[a] The mitigated construction noise levels account primarily for the erection of a 15-foot-high temporary noise barrier with a minimum sound transmission class (STC) rating of 28 along the eastern and southern boundaries of the Project Site that would provide a minimum of 10 dBA noise attenuation.
[b] The noise levels are estimated using a source-to-receptor distance that represents the acoustical average distance between the construction area and each receptor location.
[c] The estimated construction noise level at this location takes into account an additional 5 dBA reduction in noise levels due to the presence of intervening building structures that obstruct the line of sight between the receptor and the Project Site.
[d] The estimated construction noise level at this location takes into account an additional 10 dBA reduction in noise levels due to the presence of numerous rows of intervening single-family residential structures that obstruct the line of sight between the receptor and the Project Site.

As shown in Table 6-5, with implementation of Mitigation MeasureNOI-1, the highest estimated construction-related noise levels at sensitive receptors 2, 3 and 4 would be 73, 72, and 74 dBA $L_{eq}$, respectively, which would all be below 75 dBA $L_{eq}$. The noise levels shown in Table 6-5 take into consideration the noise attenuation provided by the distance between the sources and the receptors, and the 15-foot-high noise barrier with a minimum sound transmission class (STC) rating of 28 that would be constructed around the eastern and southern perimeter of the Project Site boundary, which would be capable of reducing noise levels by a minimum of 10 dBA. The other noise control methods listed as part of Mitigation Measure NOI-1 are more difficult to quantify and, as such, are not factored into the estimated noise levels. Therefore, actual noise levels would be lower than what is shown in Table 6-5. Thus, with the implementation of Mitigation Measure NOI-1, the Project would not expose any of the nearest off-site sensitive receptors to noise levels that exceed 75 dBA $L_{eq}$. Therefore, construction noise impacts would be reduced to a less-than-significant level.

**Mitigation Measure NOI-1**: The following measures shall be employed during Project construction to reduce short-term noise levels:

a) Construction activities will comply with the hourly restrictions for noise-generating construction activities, as specified in Section 41.40(a) of the LAMC. Accordingly, construction activities will be prohibited between the hours of 9:00 p.m. and 7:00 a.m. on weekdays, and between 6:00 p.m. and 8:00 a.m. on any Saturday or national holiday or at any time on Sunday.

b) A 15-foot-high temporary noise barrier with a minimum STC rating of 28 will be erected along the eastern and southern boundaries of the Project Site to provide a minimum of 10 dBA noise attenuation.

c) Equipment staging and laydown areas will be located at the farthest practical distance from nearby residential land uses.

d) High noise-producing construction activities will be scheduled during periods that are least sensitive, such as during daytime hours when neighboring residents are generally away at work.

e) Construction equipment will be fitted with noise-reduction features such as mufflers and engine shrouds that are no less effective than those originally installed by the manufacturer.

f) Stationary construction equipment, such as compressors, will be positioned as far away as practical from adjacent noise-sensitive receptors.

g) All construction equipment not in use will be switched off.

h) Haul trucks will not be allowed to idle for periods greater than 5 minutes, except as needed to perform a specified function (e.g., concrete mixing). Signs will be posted in delivery loading areas specifying this idling restriction.

i) On-site vehicle speeds will be limited to 15 miles per hour or less (except in cases of emergency).

j) Construction-related truck traffic will be routed away from noise-sensitive areas to the extent feasible.

k) Back-up beepers for all construction equipment and vehicles will be broadband sound alarms or adjusted to the lowest noise levels possible, provided that Occupational Safety and Health Administration (OSHA) and California OSHA safety requirements are not violated. On vehicles where back-up beepers are not available, alternative safety measures such as escorts and spotters will be employed.

l) A designated point of contact will be identified to address noise-related complaints during construction. The noise disturbance coordinator will be responsible for responding to any local complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., starting too early, bad muffler) and will be required to implement reasonable measures such that the complaint is resolved.

## Construction Traffic

Construction worker vehicles and haul trucks, which would transport equipment and materials to and from the Project Site, would incrementally increase noise levels on the local roads in the Project area. The trucks traveling to and from the Project Site would be required to travel along the haul route approved by the City of Los Angeles for the Project. While the specific haul route has not been finalized at this stage, it is likely that construction traffic would access the Project Site using either Strathern Street and/or Lankershim Boulevard from either Interstate 5 or State Route 170.

Based on construction-related information provided by the Applicant, it was determined that the grading construction phase for the Project would require the most heavy truck trips per day, which would contribute most to increased roadway noise levels in the Project area. During this phase, an estimated 278 daily truck trips (139 inbound and 139 outbound), 55 daily vendor trips (28 inbound and 28 outbound), and 14 daily worker trips (7 inbound and 7 outbound) would occur. To assess the potential traffic noise increase resulting from Project construction, the additional daily traffic volumes generated from Project construction (i.e., 278 truck trips, 55 vendor trips, and 14 worker trips) were added to the existing daily traffic volumes on the segments of Strathern Street and Lankershim Boulevard in the Project vicinity to assess the increase in noise levels. The estimated roadway noise levels resulting from the addition of the Project's construction-related traffic on these two analyzed roadways are shown in Table 6-6.

**Table 6-6. Off-Site Construction Traffic Noise Levels**

| Roadway | Roadway Segment | Existing Traffic Volume Noise Levels (dBA CNEL)[a] | Existing + Project Construction Traffic Volume Noise Levels (dBA CNEL)[a] | Increase (dBA CNEL) |
|---|---|---|---|---|
| Lankershim Boulevard | South of Tuxford Street | 67.6 | 68.2 | 0.6 |
| | North of Strathern Street | 67.4 | 68.0 | 0.6 |
| | South of Strathern Street | 67.6 | 68.2 | 0.6 |
| | North of Stagg Street | 67.8 | 68.3 | 0.5 |

| | | | | |
|---|---|---|---|---|
| | South of Stagg Street | 67.8 | 68.3 | 0.5 |
| | North of Saticoy St. | 67.8 | 68.3 | 0.5 |
| | South of Saticoy St. | 67.8 | 68.4 | 0.6 |
| Strathern Street | West of Laurel Canyon Boulevard | 63.5 | 64.8 | 1.3 |
| | East of Laurel Canyon Boulevard | 63.2 | 64.6 | 1.4 |
| | West of Lankershim Boulevard | 62.8 | 64.3 | 1.5 |
| | East of Lankershim Boulevard | 64.9 | 65.9 | 1.0 |
| | West of Tujunga Ave. | 64.8 | 65.8 | 1.0 |
| | East of Tujunga Ave. | 63.7 | 65.0 | 1.3 |
| | West of Vineland Ave. | 63.2 | 64.6 | 1.4 |
| | East of Vineland Ave. | 60.9 | 63.1 | 2.1 |

Existing Traffic Information Source: Gibson Transportation Consulting, Inc., 2019.
[a] Noise levels are estimated at 50 feet from the roadway centerline.

As shown in Table 6-6, the increase in traffic noise levels on both Strathern Street and Lankershim Boulevard that could potentially be used as the Project's haul route would all be below the most stringent criterion of 3 dBA CNEL. As such, the Project's effect on daily average ambient noise levels related to construction traffic would be barely noticeable and impacts would be less than significant.

## Project Operation

### Operational Traffic

The Project would generate new vehicle trips that would incrementally add to traffic levels on surrounding streets and could change the associated traffic noise levels. Based on the Project's TIS, it is estimated that a total net increase of 3,473 daily trips to and from the Project Site would occur as a result of the Project (Gibson Transportation Consulting, Inc., 2019). Table 6-7 summarizes the predicted existing and future noise levels, both with and without the Project, from the roadway segments considered in the TIS. The results indicate that future traffic noise levels with the Project would be 0.2 to 0.8 dB higher than existing baseline conditions, with Project-generated increases contributing 0 to 0.5 dB. This small level of noise increase is considered imperceptible to the human ear. Therefore, impacts associated with traffic noise levels from implementation of the Project would be less than significant.

**Table 6-7. Predicted Traffic Noise Levels**

| Roadway/Segment | Estimated Traffic Noise Levels at 50 feet from Roadway Centerline (dB CNEL) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Existing (Baseline) | Existing with Project | Increase over Existing (Project Only) | Future without Project | Future with Project | Increase over Existing (Cumulative) | Increase over Future without Project |
| **Strathern Street** | | | | | | | |
| West of Laurel Canyon Road | 63.5 | 63.6 | 0.1 | 63.8 | 63.9 | 0.4 | 0.1 |
| East of Laurel Canyon Road | 63.2 | 63.5 | 0.3 | 63.5 | 63.8 | 0.6 | 0.3 |
| West of Lankershim Boulevard | 62.8 | 63.1 | 0.3 | 63.1 | 63.4 | 0.6 | 0.3 |
| East of Lankershim Boulevard | 64.9 | 65.2 | 0.3 | 65.1 | 65.4 | 0.5 | 0.3 |
| West of Tujunga Avenue | 64.8 | 65.0 | 0.2 | 65.0 | 65.2 | 0.4 | 0.2 |
| East of Tujunga Avenue | 63.7 | 63.9 | 0.2 | 64.0 | 64.1 | 0.4 | 0.2 |
| West of Vineland Avenue | 63.2 | 63.4 | 0.2 | 63.5 | 63.7 | 0.5 | 0.2 |
| East of Vineland Avenue | 60.9 | 61.1 | 0.2 | 61.2 | 61.4 | 0.5 | 0.2 |
| **Stagg Street** | | | | | | | |
| West of Lankershim Boulevard | 54.9 | 55.5 | 0.6 | 55.3 | 55.7 | 0.8 | 0.5 |
| East of Lankershim Boulevard | 53.9 | 54.3 | 0.4 | 54.2 | 54.6 | 0.7 | 0.3 |
| **Saticoy Street** | | | | | | | |
| West of Lankershim Boulevard | 64.3 | 64.3 | 0.0 | 64.6 | 64.6 | 0.3 | 0.0 |
| East of Lankershim Boulevard | 63.8 | 63.9 | 0.1 | 64.1 | 64.1 | 0.3 | 0.0 |
| West of Tujunga Avenue | 63.4 | 63.4 | 0.0 | 63.7 | 63.7 | 0.3 | 0.0 |
| East of Tujunga Avenue | 62.2 | 62.3 | 0.1 | 62.5 | 62.6 | 0.4 | 0.1 |
| **Roscoe Boulevard** | | | | | | | |
| West of Webb Avenue | 68.4 | 68.4 | 0.0 | 68.6 | 68.6 | 0.2 | 0.0 |
| East of Webb Avenue | 68.1 | 68.1 | 0.0 | 68.3 | 68.3 | 0.2 | 0.0 |
| **Laurel Canyon Boulevard** | | | | | | | |
| North of Strathern Street | 67.3 | 67.4 | 0.1 | 67.6 | 67.7 | 0.4 | 0.1 |
| South of Strathern Street | 67.2 | 67.3 | 0.1 | 67.4 | 67.5 | 0.3 | 0.1 |

| Roadway/Segment | Estimated Traffic Noise Levels at 50 feet from Roadway Centerline (dB CNEL) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Existing (Baseline) | Existing with Project | Increase over Existing (Project Only) | Future without Project | Future with Project | Increase over Existing (Cumulative) | Increase over Future without Project |
| **Webb Avenue** | | | | | | | |
| North of Roscoe Boulevard | 60.1 | 60.1 | 0.0 | 60.4 | 60.4 | 0.3 | 0.0 |
| South of Roscoe Boulevard | 61.6 | 61.6 | 0.0 | 61.8 | 61.8 | 0.2 | 0.1 |
| North of Strathern Street | 61.0 | 61.0 | 0.0 | 61.2 | 61.2 | 0.2 | 0.1 |
| **Lankershim Boulevard** | | | | | | | |
| South of Tuxford Street | 67.6 | 67.7 | 0.1 | 67.9 | 68.0 | 0.4 | 0.1 |
| North of Strathern Street | 67.4 | 67.4 | 0.0 | 67.7 | 67.7 | 0.3 | 0.1 |
| South of Strathern Street | 67.6 | 67.8 | 0.2 | 67.9 | 68.1 | 0.5 | 0.2 |
| North of Stagg Street | 67.8 | 68.0 | 0.2 | 68.1 | 68.3 | 0.5 | 0.2 |
| South of Stagg Street | 67.8 | 67.9 | 0.1 | 68.1 | 68.2 | 0.4 | 0.1 |
| North of Saticoy Street | 67.8 | 67.9 | 0.1 | 68.1 | 68.2 | 0.4 | 0.1 |
| South of Saticoy Street | 67.8 | 67.9 | 0.1 | 68.1 | 68.2 | 0.4 | 0.1 |
| **Tujunga Avenue** | | | | | | | |
| South of Strathern Street | 65.8 | 65.9 | 0.1 | 66.0 | 66.1 | 0.3 | 0.1 |
| North of Saticoy Street | 66.0 | 66.0 | 0.0 | 66.2 | 66.2 | 0.2 | 0.1 |
| South of Saticoy Street | 66.2 | 66.3 | 0.1 | 66.4 | 66.5 | 0.3 | 0.0 |
| **Vineland Avenue** | | | | | | | |
| South of Strathern Street | 68.2 | 68.2 | 0.0 | 68.4 | 68.5 | 0.3 | 0.1 |

## Stationary Noise Sources

Once operational, the Project would introduce stationary on-site noise sources at the Project Site. These would include the on-site parking structure, retail drive-through, HVAC mechanical equipment, loading/unloading and trash pick-up activities, and activities at the outdoor amenity areas such as the swimming pool deck, game lounge, outdoor kitchen, tot lot, BBQ and sitting area, pet park, and community garden.

### Parking/Drive-Through

The Project would include a parking structure consisting of one subterranean level and one at-grade level that provides up to 541 parking spaces (432 residential and 109 commercial parking spaces). All parking would be fully enclosed and screened from public view. Access to the parking structure would be provided via a full-access driveway on West Strathern Street and a limited-access driveway on North Lankershim Boulevard that accommodates only right-turn ingress and right-turn egress movements. The driveway on West Strathern Street would provide access to the residential uses, while the driveway on North Lankershim Boulevard would provide access to both the residential and commercial uses on site. In addition, the retail drive-through would be accessed via a separate driveway along North Lankershim Boulevard. Activities at the parking structure would generate sporadic noise from vehicles starting, car doors slamming, car alarms, people talking, etc. However, with the exception of the entrance and exit driveways, the parking structure would be fully enclosed and screened as part of the Project design. As such, any noise that is generated within the structure would be shielded from adjacent land uses and would not result in any substantial increase in long-term noise levels at nearby off-site receptors. Nonetheless, noise levels would still be generated as vehicles enter and exit the parking structure. The nearest noise-sensitive uses to the full-access driveway on West Strathern Street would be the single-family residences directly adjacent to the Project Site on the east and north of Blythe Street, while the nearest noise-sensitive uses to the limited-access driveway on North Lankershim Boulevard would be the single-family residences directly adjacent to the Project Site on the south.

Based on the Project's TIS, the Project is estimated to result in a total net increase of 3,473 daily trips to and from the Project Site, with an anticipated 210 new trips and 295 new trips during the AM and PM peak hours, respectively (Gibson Transportation Consulting, Inc., 2019). For the purposes of this analysis, the PM peak-hour traffic volumes were used to estimate noise levels generated at the parking structure's driveways, as they are higher than the traffic volumes for the AM peak hour. Of the total PM peak-hour trips that would be generated by the proposed residential uses (171 trips), it was assumed that 75 percent of these peak-hour trips would access the driveway on West Strathern Street, which only provides access to residential uses, while the remaining 25 percent of the peak-hour residential trips would access the limited-access driveway on North Lankershim Boulevard, which provides access to both residential and commercial uses at the Project Site. Additionally, it was assumed that all of the PM peak-hour trips generated by the proposed restaurant use (54 trips) and 75 percent of the PM peak-hour trips generated by the proposed retail use (56 trips) would also access the limited access driveway on North Lankershim Boulevard. Finally, it was assumed that the remaining 25 percent of the PM peak-hour trips associated with the retail use (19 trips) would access the separate driveway along North Lankershim Boulevard for the retail drive-through. Based on these assumptions and the distance to the nearest off-site sensitive receptors from the Project's driveways, it was determined, using FTA's recommended methodology for stationary source general assessment, that the Project's highest peak-hour vehicle trips would generate noise levels of approximately 45 dBA $L_{eq}$ and 37 dBA $L_{eq}$ at the single-family residences directly adjacent to the eastern and southern Project Site boundaries, respectively (FTA, 2018). Because these noise levels would not exceed either the daytime or nighttime ambient noise levels measured at the neighboring single-family residences (locations LT1 and LT2 as shown in Table 4-1), the noise levels generated by the Project's parking-related activity would not result in any substantial increase in long-term noise levels at these off-site receptors. As these nearest receptors would not be exposed to a substantial increase in long-term noise levels from the Project's parking structure, the noise levels experienced at receptors that are farther from the Project Site would also not be substantial. Therefore, this impact would be less than significant.

Aside from vehicle-related noise levels, the proposed retail use would also periodically generate noise if it were to use a drive-through window speaker system. However, if such a system were used, the proposed retail drive-through is not adjacent to any off-site sensitive receptors. The nearest receptors to this drive-through would be the single-family residential uses approximately 200 feet away to the northeast, across West Strathern Street, and the single-family residential uses approximately 235 feet west of the Project Site, across North Lankershim Boulevard and behind the automotive servicing uses fronting that roadway. The nearest off-site residences to the northeast would be partially shielded from the drive-through by the northern portion of the proposed mixed-use building as well as the existing fast food restaurant. In addition, the retail drive-through would be enclosed along that northern side of the Project Site boundary, which would further reduce the emanation of noise levels from the window speaker. The nearest off-site residences to the west would be provided with noise shielding from the buildings associated with the automotive service uses that front North Lankershim Boulevard. Additionally, when existing traffic noise levels on North Lankershim Boulevard are taken into consideration, the noise generated by the Project's drive-through window speaker system is not expected to be perceptible at these off-site residences. Therefore, noise impacts associated with the proposed retail drive-through would be less than significant.

### Mechanical Equipment

As part of the Project, the HVAC equipment for the mixed-use building would be located on the roof level. Noise would be generated when the HVAC equipment is in operation throughout the day. However, because the proposed mixed-use building would be seven stories in height, the HVAC equipment would be situated much higher than the immediately surrounding sensitive receptor buildings, which range from one story to two stories in height. This vertical distance would attenuate noise levels generated by the HVAC equipment. Additionally, as an industry practice and required under PDF-NOI-2, the design of the on-site HVAC equipment and other noise-generating mechanical equipment associated with the Project would be equipped with noise-muffling devices or shielding (e.g., enclosures, parapet walls) to reduce noise levels that may affect nearby noise-sensitive uses. Such design of on-site mechanical equipment at the Project Site would be required to comply with Section 112.02 of the LAMC, which prohibits noise from air conditioning, refrigeration, heating, pumping, and filtering equipment from exceeding the ambient noise level on the premises of other occupied properties by more than 5 dBA. Given compliance with Section 112.02 of the LAMC and the height of the new mixed-use building, noise levels generated from HVAC or other related equipment would not generate substantial noise level increases at nearby off-site sensitive uses.

For the purpose of this analysis, the HVAC equipment noise levels at the nearest off-site receptors to the proposed mixed-use building, which include the single-family residences directly adjacent to the Project Site on the east and north of Blythe Street and the single-family residences directly adjacent to the southern Project Site boundary, are estimated under a scenario where half of the rooftop HVAC equipment (i.e., a total of 216 HVAC units) are in operation at the same time. This is considered to be a representative scenario with respect to HVAC operation at the Project Site, as not all of the total 432 rooftop HVAC units would be running at the same time and each unit would be cycling on and off at various times throughout the day. While the make and model of the HVAC units have not been determined at this juncture, it is anticipated that these would be 3-ton units. Based on the specifications sheet for a 3-ton HVAC unit obtained from an HVAC industry manufacturer, these units can generate noise levels of approximately 45 dBA at 50 feet. Given this reference noise level and assuming that 216 HVAC units would be operating concurrently, a composite noise level of approximately 68 dBA at 50 feet would result. Using this composite noise level and the distance from the approximate center of the mixed-used building's rooftop to the nearest off-site receptors, the resulting noise levels were estimated. Additionally, because the rooftop HVAC units would be installed with screens or other noise barriers and a parapet would also be provided along the perimeter of the rooftop, as required under PDF-NOI-2, a noise attenuation level of 10 dBA was accounted for in the noise level estimates. Based on these assumptions, the estimated HVAC-related noise levels at the single-family residences directly adjacent to the Project Site on the east and north of Blythe Street and the single-family residences directly adjacent to the Project Site on the south would be approximately 47 and 46 dBA $L_{eq}$, respectively. The 47 dBA $L_{eq}$ noise level that would result at the single-family residences to the east would not exceed either the daytime or nighttime ambient noise levels measured at location LT1 (refer to Table 4-1), while the 46 dBA $L_{eq}$ noise level that would result at the single-family residences to the south would only exceed the nighttime ambient noise level measured at location LT2 by 1 dBA (the daytime ambient noise level at this location would not be exceeded). As such, the operation of HVAC equipment at the Project Site would not exceed the noise limit identified under Section 112.02 of the LAMC (i.e., 5 dBA increase over existing ambient noise levels on the premises of other occupied properties) at these nearest off-site receptors. Therefore, the Project's rooftop HVAC equipment would not result in any substantial increase in long-term noise levels at these off-site receptors. As these nearest receptors would not be exposed to a substantial increase in long-term noise levels from the Project's HVAC equipment, the noise levels experienced at receptors farther from the Project Site would also not be substantial. As such, this impact would be less than significant.

### Loading/Trash Pick-up Area

A loading area serving the Project's proposed retail use and a storage area for trash receptacles serving the mixed-use building would be located on the ground level within the new parking structure, behind the retail space that fronts North Lankershim Boulevard. The driveway along North Lankershim Boulevard that serves the retail drive-through would serve as the ingress point for delivery and refuse collection vehicles accessing this loading area. While the loading area would generate noise levels from activities such as truck movements and idling along with general loading/unloading operations, including refuse collection, the location of this area within an enclosed portion of the building's parking structure would shield the nearby off-site sensitive uses from this noise source. Although noise levels generated at the loading area are expected to be mostly contained within the parking structure, some of the noise levels could still emanate from within the parking structure through the vehicle driveways on the eastern and southern sides of the mixed-use building where neighboring residential properties are located.

Based on previously measured noise level data collected at a loading dock serving a retail warehouse, noise levels generated by loading/unloading activities were measured at approximately 62 dBA $L_{eq}$ at a distance of 66 feet. The nearest off-site sensitive receptors that would be exposed to noise levels generated by the Project's loading area would be the single-family residences directly adjacent to the Project Site on the east (north of Blythe Street) and south, which are approximately 220 feet and 320 feet away from the loading area, respectively. Given these distances, and accounting for a 5 dBA attenuation provided by the parking structure, the resulting noise levels at the nearest single-family residences to the east and south of the Project Site would be 46 and 43 dBA $L_{eq}$, respectively. The 46 dBA $L_{eq}$ noise level that would result at the single-family residences to the east would not exceed either the daytime or nighttime ambient noise levels measured at location LT1, while the 43 dBA $L_{eq}$ noise level that would result at the single-family residences to the south would not exceed either the daytime or nighttime ambient noise levels measured at location LT2 (refer to Table 4-1). As such, the noise levels generated at the loading area serving the mixed-use building would not result in any substantial increase in long-term noise levels at these off-site receptors. As these nearest receptors would not be exposed to a substantial increase in long-term noise levels from the Project's loading area, the noise levels experienced at receptors farther from the Project Site would also not be substantial. Therefore, this impact would be less than significant.

### Outdoor Amenity Areas

The Project would include outdoor residential amenity spaces at the podium and ground levels. The podium-level amenity space would be on the second floor of the mixed-use building and would include courtyards, residential patios, an outdoor kitchen, entertainment lounge, outdoor fireplace, and outdoor fire pit and sitting area. These outdoor amenity spaces at the podium level would be entirely within the mixed-use building and would be situated between the building's residential units on all sides. As such, noise levels generated by tenants using these amenities would be contained within the building and would not result in a substantial increase in noise levels at any off-site sensitive receptors.

The outdoor residential amenity spaces at the ground level of the Project Site would include the pool deck and spa, game lounge, outdoor kitchen, BBQ and sitting area, tot lot, community garden, and pet park. With the exception of the pet park, which would be located in the northern portion of the Project Site, all of the other outdoor spaces would be within the southeastern portion of the Project Site adjacent to the western terminus of the Blythe Street (which would be completed as a cul-de-sac as part of the Project). The closest noise-sensitive uses to this area would be the neighboring single-family residences to the east (both north and south of Blythe Street) and to the south. As such, the noise levels generated at these ground floor outdoor areas, with the exception of the pet park, would be readily perceptible at these nearest off-site receptors. The single-family residence to the east of the Project site and south of Blythe Street is a one-story building that would be separated from the outdoor spaces by the proposed two-story recreation room building that would be in the southeastern corner of the Project Site. Because the footprint of this two-story building would entirely obstruct the line of sight between the Project's outdoor amenity areas and this residence, the building would act as a substantial noise barrier. As a result, the worst-case noise levels are expected to occur at the closest residences north of Blythe Street and at the residences immediately south of the Project. These are the two locations considered in the analysis of noise levels generated at the southeastern ground floor outdoor amenity areas. The noise levels for the pet park, which would be on the opposite side of the Project's seven-story mixed-use building, are analyzed separately for its nearest off-site receptors, which would be the single-family residences to the north of the Project Site, across West Strathern Street.

Noise levels generated at the outdoor amenity areas on the ground floor would primarily consist of conversational speech among residential tenants and guests. To conduct a conservative analysis for the nearest off-site receptors to the east and south of the Project Site, it is assumed that the various outdoor amenity areas in the southeastern portion of the site would all be used concurrently by tenants and guests, and as such are treated as a single noise source. For this analysis scenario, the following assumptions regarding the number of people at each outdoor area and their voice levels at each outdoor area, which ranges from "normal" to "raised," was used:

- <u>Pool deck and spa</u> – 15 people (half male/half female), with 50 percent of the people talking at a "raised" voice level at any given moment
- <u>Game lounge</u> – Four people (half male/half female), with 50 percent of the people talking at a "raised" voice level at any given moment
- <u>Outdoor kitchen</u> – 10 people (half male/half female), with 50 percent of the people talking at a "normal" voice level at any given moment
- <u>Tot lot</u> – Eight people (half male/half children), with 50 percent of the people talking at a "raised" voice level at any given moment
- <u>BBQ and sitting area</u> – Eight people (half male/half female), with 50 percent of the people talking at a "normal" voice level at any given moment
- <u>Community garden</u> – Six people (half male/half female), with 50 percent of the people talking at a "normal" voice level at any given moment

Overall, this analysis scenario assumes a total of 51 people are using the outdoor amenity areas in the southeastern portion of the Project Site at a given moment. Based on the acoustical average distance from the nearest off-site sensitive receptors to each of the outdoor areas listed above and published data for human speech noise levels for males, females, and children, the resulting noise levels at these receptors were estimated.

As discussed previously, the nearest off-site sensitive receptors that would be exposed to noise levels generated from the Project's pet park would be the single-family residences to the north of the Project Site, across West Strathern Street. Based on previously measured noise level data collected at a dog park, noise levels generated by activities at the park were measured at approximately 50 dBA $L_{eq}$ at a distance of 145 feet. Based on this reference noise level and the acoustical average distance from the proposed pet park to the nearest off-site receptor location, the resulting noise levels were estimated.

The noise levels generated by the Project's outdoor amenity areas at their respective nearest off-site receptors are shown in Table 6-8. As part of the Project, PDF-NOI-3 would be implemented that requires the Project to include operational restrictions to limit excessive noise from the outdoor amenity areas by limiting the hours of use at these areas to between 7:00 a.m. and 10:00 p.m. (to correspond with the daytime hours specified by the City's noise ordinance), enforcing all applicable capacity limits on the number of residents using each amenity area (for example, as required by fire or safety codes), and restricting the exterior use of amplified music. Compliance with the daytime noise limits set forth in the LAMC would be enforced by the Project's building management staff.

**Table 6-8. Estimated Noise Levels from Ground Floor Outdoor Amenity Areas at Nearby Sensitive Receptors**

| Receptor Location | Estimated Noise Level from Outdoor Amenity Areas (dBA $L_{eq}$) | Existing Daytime (7 a.m. to 10 p.m.) Ambient Noise Levels (dBA $L_{eq}$) | Existing Ambient + Project (dBA $L_{eq}$) | Exceed Ambient Noise Level by 5 dBA? |
|---|---|---|---|---|
| Single-family residences along West Strathern Street, approximately 90 feet north of Project Site[a] | 48 | 68 | 68 | No |
| Single-family residences directly east of, and adjacent to, the northeastern portion of the Project Site (north of Blythe Street)[b] | 50 | 56 | 57 | No |
| Single-family residences directly south of, and adjacent to the Project Site[b] | 55 | 50[c] | 56 | **Yes** |

[a] The noise levels are estimated for the pet park only, as this is the closest outdoor amenity area to these off-site receptors.
[b] The noise levels are estimated for all proposed outdoor amenity areas at the ground floor with the exception of the pet park, which would be entirely shielded by the Project's seven-story mixed-used building from these off-site receptors.
[c] As the actual measured daytime ambient noise level at this residentially zoned location is lower than 50 dBA $L_{eq}$ (i.e., 48 dBA $L_{eq}$ based on noise measurement LT2 shown in Table 4-1), the assumed daytime ambient noise level of 50 dBA $L_{eq}$ is used at this location in accordance with LAMC Section 111.03.

As shown in Table 6-8, the noise levels generated by the Project's outdoor amenity areas could exceed the existing ambient noise level at the single-family residences directly south of, and adjacent to, the Project Site by 6 dBA. The noise levels at all other analyzed off-site receptors would be lower than the corresponding ambient noise levels.

As the single-family residences directly south of the Project Site could be exposed to a perceptible noise increase to their existing ambient noise levels, Mitigation Measure NOI-2 is recommended to reduce these noise levels by requiring the erection of a solid wall with a minimum height of 8 feet to serve as a noise barrier along the portion of the Project Site's southern boundary where the outdoor amenity areas are located. This noise barrier, which would be of sufficient height to break the single-family residences' line-of-sight of the Project Site's ground-level outdoor amenity areas, would reduce noise levels by approximately 5 dBA, which would reduce the noise levels experienced by these off-site residences from the Project's outdoor amenity areas to a less-than-significant level (FHWA, 2017).

**Mitigation Measure NOI-2.** A solid wall with a minimum height of 8 feet shall be erected to serve as a noise barrier along the portion of the Project Site's southern boundary where the outdoor amenity areas are located to reduce noise levels at the adjacent off-site single-family residences.

## Composite Operational Noise Levels

The composite noise levels experienced by the nearby sensitive receptors due to all of the Project's operational noise sources occurring concurrently are also evaluated to assess the potential maximum overall increase in ambient noise levels at these off-site receptor locations. For the purpose of this analysis, the composite noise levels generated during Project operations are assessed at the nearest off-site sensitive receptors, which include the single-family residences directly adjacent to the east (north of Blythe Street) and south of the Project Site. Both of these two off-site receptor locations would experience noise levels generated by the Project's parking structure, on-site mechanical equipment, loading area, and residential outdoor amenity areas (with the exception of the proposed pet park, which would be completely shielded from these receptors by the Project's seven-story, mixed-use building). It should be noted that this analysis of the Project's composite operational noise levels is conservative in nature because it assumes that all of the Project's stationary noise sources are generating noise at the same time. In practice, such occurrences are generally rare, as the timing of peak noise levels generated by one noise source typically does not coincide with that of another noise source. For instance, the highest noise levels from the Project's parking structure are expected to be generated during the peak weekday morning and evening hours when residents depart for and return from work, which would not normally coincide with the hours when the Project's residential tenants are expected to use the outdoor amenity areas. Additionally, during the daytime work hours, the majority of the Project's rooftop HVAC units are not expected to be active and generate noise levels that would coincide with the noise levels generated by the other on-site stationary noise sources. Nonetheless, for the purpose of conducting a conservative analysis, the composite noise levels generated from all of the Project's on-site noise sources at the nearest off-site sensitive receptors have been estimated and are shown in Table 6-9.

**Table 6-9. Composite Noise Levels from Unmitigated Project Operations at Nearby Sensitive Receptors**

| Operational Noise Source | Noise Levels (dBA $L_{eq}$) | |
|---|---|---|
| | Single-family residences directly east of Project Site (north of Blythe Street) | Single-family residences directly south of Project Site |
| Outdoor Amenity Areas | | |
| Game Lounge | 34 | 50 |
| Pool Deck and Spa | 40 | 52 |
| Outdoor Kitchen | 31 | 45 |
| Tot Lot | 40 | 45 |
| BBQ and Sitting Area | 46 | 26 |
| Community Garden | 46 | 24 |
| Parking Structure | 44 | 37 |
| On-site Mechanical (Rooftop HVAC) Equipment | 47 | 46 |
| Loading Area | 46 | 43 |

| Operational Noise Source | Noise Levels (dBA $L_{eq}$) | |
|---|---|---|
| | **Single-family residences directly east of Project Site (north of Blythe Street)** | **Single-family residences directly south of Project Site** |
| **Project Composite Noise Level** | **53** | **56** |
| Existing Daytime Ambient Noise Level[a] | 56[b] | 50[c] |
| **Existing Daytime Ambient Plus Project Composite Noise Level** | **58** | **57** |
| Increase Over Existing Ambient Noise Level | 2 | 7 |
| Exceed 5 dBA? | No | **Yes** |

[a] The Project's composite operational noise levels are evaluated against the daytime (i.e., 7 a.m. to 10 p.m.) ambient noise levels at the nearest off-site sensitive receptors because it will be during these hours of the day when all of the Project's stationary noise sources (i.e., outdoor amenity areas, parking structure, rooftop HVAC equipment, and loading area) could potentially be operating concurrently. As implementation of PDF-NOI-3 would restrict the hours of use at the Project's outdoor amenity areas to between 7:00 a.m. and 10:00 p.m. (to correspond with the daytime hours specified by the City's noise ordinance), these noise sources would not occur during nighttime (i.e., 10 p.m. to 7 a.m.) hours. Therefore, the highest composite operational noise levels from the Project would occur during daytime hours.

[b] Based on the daytime noise levels measured at location LT1 (refer to Table 4-1), which are considered to be representative of the ambient noise levels at the single-family residences directly adjacent to, and east of, the Project site.

[c] Based on the noise measurement conducted at location LT2 (refer to Table 4-1), the daytime noise level was measured to be 48 dBA $L_{eq}$. In accordance with LAMC Section 111.03, the minimum daytime ambient noise level of 50 dBA $L_{eq}$ in a residential zone should be used if the measured noise level is below this noise level. As such, a daytime ambient noise level of 50 dBA $L_{eq}$ was used for location LT2. The measured noise levels at LT2 are considered to be representative of the ambient noise levels at the single-family residences directly adjacent to, and south of, the Project site.

As shown in Table 6-9, the composite noise levels generated by the Project's operational noise sources would exceed the existing daytime ambient noise levels at the nearest single-family residences to the east and south of the Project Site by 2 dBA and 7 dBA, respectively. Of these two nearest off-site receptor locations, only the residences to the south would be exposed to an increase in ambient noise levels of more than 5 dBA. However, with implementation of Mitigation Measure NOI-2, which would require the erection of a solid wall with a minimum height of 8 feet along the portion of the Project Site's southern boundary where the outdoor amenity areas are located, the noise levels at these neighboring residences would be reduced by approximately 5 dBA for all of the individual operational noise sources with the exception of the rooftop HVAC equipment. The composite noise level generated by Project operations at the single-family residences to the south of the Project Site with implementation of Mitigation Measure NOI-2 is shown in Table 6-10.

**Table 6-10. Composite Noise Levels from Mitigated Project Operations at Sensitive Receptors South of Project Site**

| Operational Noise Source | Noise Levels (dBA $L_{eq}$) |
|---|---|
| | **Single-family residences directly south of Project Site** |
| Outdoor Amenity Areas | |
| Game Lounge | 45 |
| Pool Deck and Spa | 47 |
| Outdoor Kitchen | 40 |
| Tot Lot | 40 |

| Operational Noise Source | Noise Levels (dBA $L_{eq}$) Single-family residences directly south of Project Site |
|---|---|
| BBQ and Sitting Area | 21 |
| Community Garden | 19 |
| Parking Structure | 32 |
| On-site Mechanical (Rooftop HVAC) Equipment | 46 |
| Loading Area | 38 |
| **Project Composite Noise Level** | **52** |
| Existing Daytime Ambient Noise Level[a] | 50[b] |
| **Existing Daytime Ambient Plus Project Composite Noise Level** | **54** |
| Increase Over Existing Ambient Noise Level | 4 |
| Exceed 5 dBA? | No |

[a] The Project's composite operational noise levels are evaluated against the daytime (i.e., 7 a.m. to 10 p.m.) ambient noise levels at the nearest off-site sensitive receptors because it will be during these hours of the day when all of the Project's stationary noise sources (i.e., outdoor amenity areas, parking structure, rooftop HVAC equipment, and loading area) could potentially be operating concurrently. As implementation of PDF-NOI-3 would restrict the hours of use at the Project's outdoor amenity areas to between 7:00 a.m. and 10:00 p.m. (to correspond with the daytime hours specified by the City's noise ordinance), these noise sources would not occur during nighttime (i.e., 10 p.m. to 7 a.m.) hours. Therefore, the highest composite operational noise levels from the Project would occur during daytime hours.

[b] Based on the noise measurement conducted at location LT2 (refer to Table 4-1), the daytime noise level was measured to be 48 dBA $L_{eq}$. In accordance with LAMC Section 111.03, the minimum daytime ambient noise level of 50 dBA $L_{eq}$ in a residential zone should be used if the measured noise level is below this noise level. As such, a daytime ambient noise level of 50 dBA $L_{eq}$ was used for location LT2. The measured noise levels at LT2 are considered to be representative of the ambient noise levels at the single-family residences directly adjacent to, and south of, the Project site.

As shown in Table 6-10, with implementation of Mitigation Measure NOI-2 the composite noise level generated by the Project's operational noise sources would exceed the existing daytime ambient noise levels at the nearest single-family residences to the south of the Project Site by 4 dBA. Therefore, because implementation of Mitigation Measure NOI-2 would reduce the increase in daytime ambient noise levels at these off-site residences to less than 5 dBA, this impact would be reduced to a less-than-significant level.

## Impact Noise-2: Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

### Project Construction

The operation of heavy construction equipment at the Project Site would generate groundborne vibration that could affect structures immediately adjacent to the Project Site. These vibration levels could also cause an annoyance to people at those locations. The closest structures to the Project Site are the single-family residences directly adjacent to the eastern and southern Project Site boundaries, the fast food restaurant (Burger King) immediately northwest of the Project Site, and the automotive repair shop (Schiro's Collision Repairs) immediately southwest of the Project Site.

Based on a review of the City's Zone Information and Map Access System, all of the residential buildings adjacent to the east and south of the Project Site were built prior to 1960. As such, for the purpose of this analysis, these residential buildings are considered to be "older residential structures" under Caltrans vibration guidelines. Based on visual inspection, the fast food restaurant and automotive repair shop buildings are considered to be modern commercial buildings. Referring to the Caltrans guideline criteria in Table 5-1, the PPV thresholds for potential building damage are 0.5 in/s for modern commercial buildings and 0.3 in/s for older residential structures.

As part of PDF-NOI-1 that would be implemented by the Project, no high-impact activities such as pile driving or blasting would occur at the Project Site during construction. As such, groundborne vibration would be generated from conventional heavy construction equipment, such as bulldozers, backhoes, loaders, and excavators, during Project construction. Table 6-11 shows the estimated construction-related groundborne vibration levels that could occur at the nearest off-site structures to the Project Site, based on the use of either large (full-size) or smaller (mini-size) mobile equipment (e.g., bulldozers, backhoes, loaders), and the resulting vibration impacts at these locations related to potential building damage and human annoyance.

**Table 6-11. Groundborne Vibration Levels at Off-Site Receptor Locations**

| Off-Site Receptor Location | Approximate Distance to Project Site | Large Mobile Equipment[a] | | | Small Mobile Equipment[b] | | |
|---|---|---|---|---|---|---|---|
| | | Estimated PPV (in/s) | Building Damage?[c] | Human Response[d] | Estimated PPV (in/s) | Building Damage?[c] | Human Resonse[d] |
| Fast food restaurant directly northwest of, and adjacent to, the Project Site | 50 | 0.042 | No | Distinctly perceptible | 0.001 | No | Below barely perceptible |
| Single-family residences along the Project Site's eastern boundary | 5 | 0.523 | Yes | Severe | 0.018 | No | Barely perceptible |
| Single-family residences along the Project Site's southern boundary | 5 | 0.523 | Yes | Severe | 0.018 | No | Barely perceptible |
| Automotive repair shop directly southwest of, and adjacent to, the Project site | 5 | 0.523 | Yes | Severe | 0.018 | No | Barely perceptible |

[a] Representative of any full-size/large excavator, dozer, loader, etc.
[b] Representative of any small excavator, dozer, loader, etc.
[c] Based on Caltrans vibration guidelines, the fast food restaurant and automotive repair shop are considered to be modern commercial buildings while the single-family residences are considered to be "older residential structures." Referring to the Caltrans guideline criteria shown in Table 5-1, the PPV threshold for modern commercial buildings is 0.5 in/s, and the PPV threshold for older residential structures is 0.3 in/s.
[d] Refer to Table 5-2 for Caltrans vibration annoyance criteria.

As shown in Table 6-11, the use of large, full-size mobile equipment at the Project Site could generate vibration levels that exceed the applicable vibration criteria for building damage at the single-family residential buildings directly adjacent to the east and south Project Site boundaries, and the commercial building associated with the automotive repair shop. Vibration levels at the fast food restaurant would not exceed the applicable vibration criteria for building damage at commercial buildings. Additionally, the vibration velocity levels generated by large mobile equipment at the Project Site could result in "severe" annoyance to the occupants at the adjacent residences and automotive repair shop, while the vibration velocity levels would be "distinctly perceptible" at the fast food restaurant. However, none of the applicable vibration criteria for building damage at the identified nearest structures would be exceeded when smaller-sized mobile equipment is used for Project construction. Furthermore, the vibration velocity levels generated by the smaller-sized mobile equipment would be "barely perceptible" at the adjacent residences and automotive repair shop, and well below "barely perceptible" at the fast food restaurant. Although the sizes of the mobile construction equipment that would be operating at the Project Site have not been determined at this juncture, for the purpose of this analysis it is assumed that large, full-sized mobile equipment would be used during Project construction. Under this scenario, and as shown in Table 6-11, the groundborne vibration levels generated by the construction equipment could exceed the applicable vibration criteria for building damage and result in annoyance to the occupants at the immediately surrounding residential and commercial uses. As such, impacts related to groundborne vibration during Project construction would be potentially significant.

To reduce the groundborne vibration impacts at the affected receptors, **Mitigation Measure NOI-3** is recommended. This measure prohibits the use of large mobile equipment within 25 feet of off-site structures adjacent to the Project Site and requires the use of smaller-sized mobile equipment for construction work occurring within 25 feet of an off-site structure. At a distance of 25 feet, large-sized mobile equipment would generate vibration levels of approximately 0.1 in/s PPV, which would not exceed the applicable vibration criteria for building damage to "older residential structures" (0.3 in/s PPV) and commercial structures (0.5 in/s PPV), and would only be "distinctly perceptible" by occupants at these off-site structures. With implementation of Mitigation Measure NOI-3, the nearest off-site receptors to the Project Site would not be exposed to excessive groundborne vibration or groundborne noise levels during Project construction. Consequently, off-site receptors farther from the Project Site would also not be exposed to excessive groundborne vibration or noise levels during Project construction. Therefore, implementation of Mitigation Measure NOI-3 would reduce impacts to a less-than-significant level.

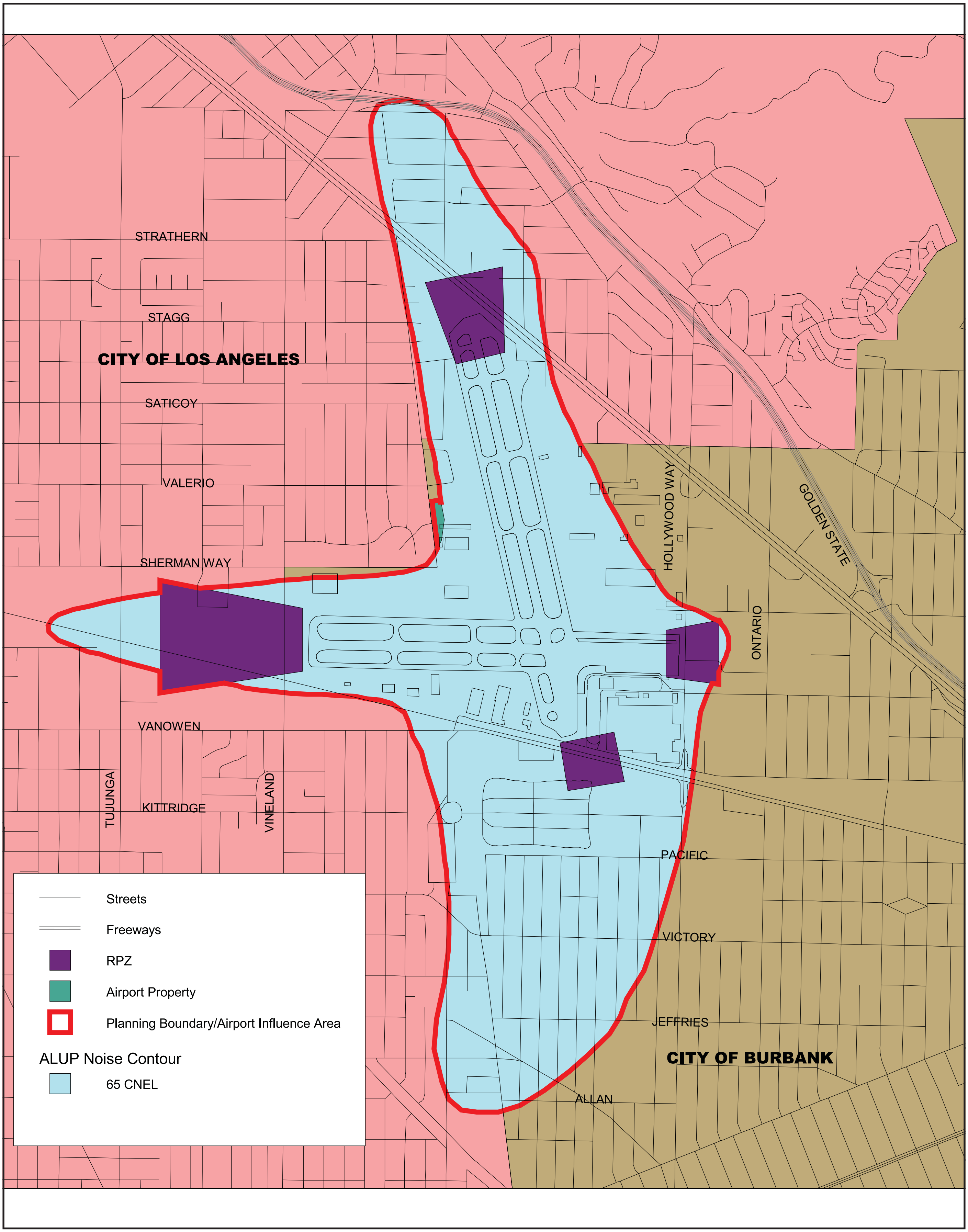
> **Mitigation Measure NOI-3**: During Project construction the use of large, full-size mobile construction equipment, such as bulldozers, excavators, loaders, etc., shall be prohibited within 25 feet of the existing residential and commercial structures directly adjacent to the Project Site boundary. Instead, small-sized mobile equipment (e.g., Bobcats/skidsteers, compact or mini model versions of bulldozers, excavators, small loaders) shall be used for construction work that needs to take place within this distance to off-site structures during all phases of construction.

## Project Operation

As the Project is a mixed-use development, there would be no major sources of vibration resulting from operation of the Project. While operation of on-site mechanical equipment such as HVAC equipment and exhaust fans could produce low levels of vibration, these vibration levels would only occur in the immediate area where the equipment is located and would not result in any impacts at nearby off-site structures. Therefore, impacts related to groundborne vibration and noise during Project operations would be less than significant.

## Impact Noise-3: 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 2 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?

There are no private airstrips in the vicinity of the Project area; however, the Hollywood Burbank (Bob Hope) Airport, at 2627 North Hollywood Way in the City of Burbank, is approximately 1.4 miles southeast of the Project Site. While the Project is within 2 miles of the Hollywood Burbank Airport, the Project is well beyond the airport influence area (AIA) of this airport, which is shown on Figure 6-2. The Los Angeles County Airport Land Use Commission defines an AIA as the area within which current or future airport-related noise, overflight, safety, and/or airspace protection factors may significantly affect land uses or necessitate restrictions on those uses. Therefore, because the Project Site is well beyond the Hollywood Burbank Airport's AIA, the Project would not expose people residing or working in the Project area to excessive noise levels generated from this airport, and no impacts would occur.




\\PDCCITRDSGIS1\Projects_1\DLAPIPER\Lankershim_7940\Figures\DocNoise

**Figure 6-2**
**Burbank/Glendale/Pasadena Airport Influence Area**
**7940 Lankershim Blvd. Project**

ICF

# Chapter 7
# **Cumulative Conditions**

Cumulative noise or vibration impacts can occur when two or more projects are under construction simultaneously or generate operational noise or vibration at the same time. Because noise and vibration are localized effects that decrease with distance from the source, significant cumulative impacts do not typically occur unless two or more projects are close to a single receptor. The presence of any natural or manmade barriers (e.g., hills, topography, walls, buildings) between a project site and a receptor will increase the rate of noise reduction over distance and will further reduce any cumulative noise levels.

Related projects in the vicinity of the noise- and vibration-sensitive receptors considered in this analysis include construction activities that could occur simultaneously with construction of the Project, depending on project timing. For the reasons discussed above, construction noise and vibration levels at any single receptor are typically dominated by the closest construction activity. As a result, the chances of construction noise from more distant related project sites making a substantial contribution to overall noise levels at the same receptor is generally low. Nonetheless, incremental increases in total construction noise levels could occur. Based on the related projects list provided in the Project's TIS, the nearest related project to the Project Site would be the proposed residential project at 7660 North Lankershim Boulevard, which is approximately a quarter-mile away to the south. Given this distance of this related project from the Project Site, and along with the numerous intervening structures between this site and the Project Site that would serve to reduce construction-related noise levels, a substantial increase in construction noise levels would not occur should construction of this related project occur at the same time as the Project. In addition, each of the related projects would be subject to LAMC Section 41.40, which limits the hours of allowable construction activities. Each of the related projects would also be subject to Section 112.05 of the LAMC, which prohibits any powered equipment or powered hand tool from producing noise levels that exceed 75 dBA at a distance of 50 feet from the noise source within 500 feet of a residential zone. Noise levels are only allowed to exceed this noise limitation under conditions where compliance is technically infeasible. With conformance to LAMC Sections 41.40 and 112.05, construction-related noise levels generated by related projects would not exceed City noise regulations or standards. As part of the Project, PDF-NOI-1 would be implemented to ensure that the Project's construction activities would comply with the hourly limitations set under LAMC Section 41.40. Additionally, under PDF-NOI-1, the Project would erect a 15-foot-high temporary noise barrier along the eastern and southern boundaries of the Project Site that is capable of reducing noise levels by a minimum of 10 dBA, which would ensure that the Project's construction noise levels would not expose any of the nearest off-site sensitive receptors to noise levels that exceed 75 dBA $L_{eq}$. Therefore, the Project would not result in a cumulatively considerable contribution to construction noise impacts in the vicinity of the Project.

Because vibration impacts are assessed based on instantaneous peak levels (PPV), worst-case groundborne vibration levels from construction are generally determined by whichever individual piece of equipment generates the highest vibration levels. As a result, the vibration from multiple construction sites, even if the sites are near each other, does not generally combine to raise the maximum PPV, and the cumulative effect is no more severe than the effect from the largest individual contribution. As discussed above, the nearest related project to the Project Site is approximately a quarter-mile away. Due to this distance, and the rapid attenuation of groundborne vibration, the Project and this related project are not close enough to each other to affect the same sensitive receptors should construction of this related project occur at the same time as the Project. Only receptors in the immediate vicinity of each construction site would be potentially affected by each development. Therefore, future development would result in a less-than-significant cumulative impact in terms of groundborne vibration.

Cumulative mobile source noise impacts would occur primarily as a result of increased traffic on local roadways due to the Project and related projects within the study area. However, as shown in Table 6-7, cumulative development along with the Project (i.e., “future with project” traffic noise levels) would increase local noise levels by a maximum of 0.8 dBA CNEL at the roadway segment of Stagg Street, west of North Lankershim Boulevard. As the increase in noise levels at all of the analyzed roadway segments would not exceed the applicable thresholds of either 3.0 dBA CNEL or 5.0 dBA CNEL, the noise increase would not be substantial. Therefore, the cumulative impact associated with mobile source noise would be less than significant.

Chapter 8
# References

## 8.1 References Cited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# 8.2 Persons Consulted

Tabrizi, Kamran, Architect & Associates. Woodland Hills, CA. June 17, 2019—personal communication to Terrance Wong.

# Appendix A
# **Noise Measurement Field Surveys**

# FIELD NOISE MEASUREMENT DATA

PROJECT: Lankershim Blvd project PROJ. # 00047.19

SITE IDENTIFICATION: LT 1 | OBSERVER(S): Jakob R., Terrance W.
ADDRESS: 7934 Lankershim Blvd. (east End)
START DATE / TIME: 6:00 AM 4/24/19 | END DATE / TIME:

**METEROLOGICAL CONDITIONS:**
TEMP: ____ °F HUMIDITY: ____ %R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: ____ MPH DIR: N NE E SE S SW W NW STEADY GUSTY
SKY: SUNNY CLEAR OVRCST PRTLY CLOUDY FOG RAIN OTHER:

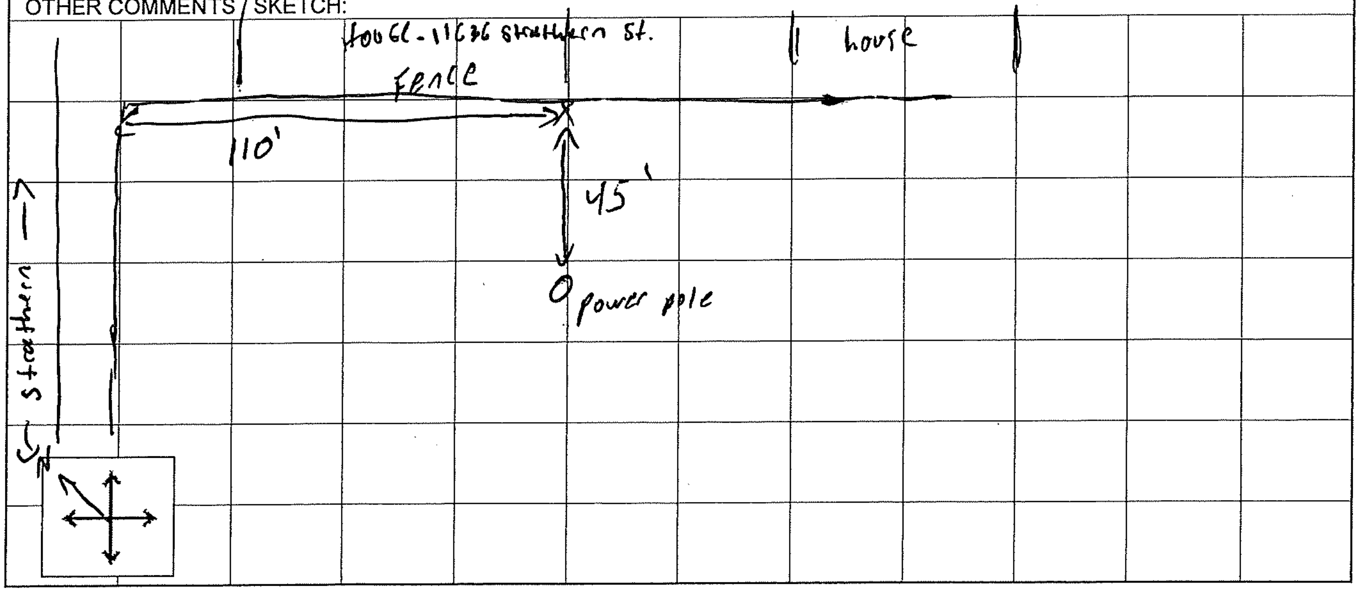
**ACOUSTIC MEASUREMENTS:**
INSTRUMENT: Pic. #4 TYPE: 1 2 SERIAL #: 15032 6014
CALIBRATOR: CAL 200 SERIAL #: 6645
CALIBRATION CHECK, BEFORE: 94.0 AFTER 94.4 WINDSCREEN X
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER:

| FILE / MEAS # | START TIME | END TIME | $L_{eq}$ | max | $L$ 1.67 | $L$ 8.33 | $L$ 25 | $L$ 50 | $L$ 90 | $L$ 99 | min |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6.00 AM | 9:15 | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

COMMENTS: Arrived 9:20 AM, Attached 9:30, cleared 9:40 AM
pick-up: 9:07 Arrival, Stopped: 9:15,

**NOISE SOURCE INFO:**
PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER:
ROADWAY TYPE:
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

**DESCRIPTION / SKETCH:**
TERRAIN: HARD SOFT MIXED FLAT OTHER:
PHOTOS:
OTHER COMMENTS / SKETCH:



Location LT1

**Leq to CNEL Conversion**

| **Start time (hour)** | **Leq dB(A)** |
|---|---|
| 0:00 | 50.9 |
| 1.00 | 49.4 |
| 2.00 | 48.1 |
| 3.00 | 48.3 |
| 4.00 | 51.3 |
| 5.00 | 53.2 |
| 6.00 | 57.3 |
| 7.00 | 57.2 |
| 8.00 | 56.9 |
| 9.00 | 55.8 |
| 10.00 | 54.1 |
| 11.00 | 54.0 |
| 12.00 | 54.7 |
| 13.00 | 54.8 |
| 14.00 | 54.6 |
| 15.00 | 57.3 |
| 16.00 | 55.9 |
| 17.00 | 55.2 |
| 18.00 | 55.1 |
| 19.00 | 56.2 |
| 20.00 | 56.8 |
| 21.00 | 55.9 |
| 22.00 | 56.6 |
| 23.00 | 52.0 |

Night Hrs

Evening Hrs

Daytime Hrs

| | |
|---|---|
| **24 hour cumulative value (CNEL)** | **60.5** |

# FIELD NOISE MEASUREMENT DATA

OJECT: 7940 Lankershim Blvd. Project PROJ. # 60047.19

DENTIFICATION: LT2 OBSERVER(S): Jakob R.
RESS: 7934 Lankershim Blvd. (eastern) Terrance W.
ART DATE / TIME: 9:09 AM - 4/24/19 END DATE / TIME:

**METEROLOGICAL CONDITIONS:**
TEMP: ________ °F HUMIDITY: ________ %R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: ________ MPH DIR: N NE E SE S SW W NW STEADY GUSTY
SKY: SUNNY CLEAR OVRCST PRTLY CLOUDY FOG RAIN OTHER:

**ACOUSTIC MEASUREMENTS:**
INSTRUMENT: Pic #5 TYPE: 1 2 SERIAL #: 150320016
CALIBRATOR: CAL 200 SERIAL #: 6645
CALIBRATION CHECK, BEFORE: 94.0 AFTER 93.6 WINDSCREEN X

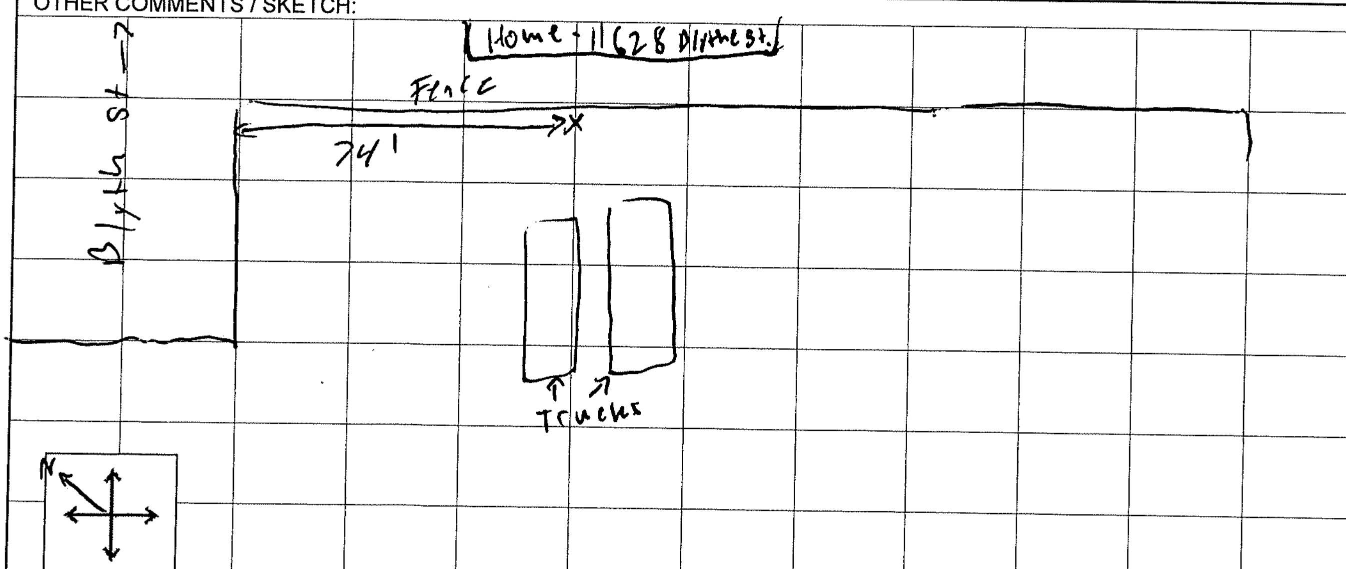
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER:

| FILE / MEAS # | START TIME | END TIME | $L_{eq}$ | max | L 1.67 | 8.33 | 25 | 50 | 90 | 99 | min |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9:04 | 9:27 | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

COMMENTS: Started: 9:09 Attached 9:57, cleared 10:00 Am
Pickup: Arrived: 9:24 Am, Stopped: 9:27 Am

**NOISE SOURCE INFO:**
PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER:
ROADWAY TYPE:
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

**DESCRIPTION / SKETCH:**
TERRAIN: HARD SOFT MIXED FLAT OTHER:
PHOTOS:
OTHER COMMENTS / SKETCH:



Location LT2

**Leq to CNEL Conversion**

| **Start time (hour)** | **Leq dB(A)** |
|---|---|
| 0:00 | 46.2 |
| 1.00 | 42.0 |
| 2.00 | 42.4 |
| 3.00 | 43.2 |
| 4.00 | 45.3 |
| 5.00 | 44.5 |
| 6.00 | 44.8 |
| 7.00 | 45.1 |
| 8.00 | 49.2 |
| 9.00 | 47.8 |
| 10.00 | 48.5 |
| 11.00 | 52.1 |
| 12.00 | 50.1 |
| 13.00 | 45.3 |
| 14.00 | 44.1 |
| 15.00 | 50.2 |
| 16.00 | 45.9 |
| 17.00 | 46.0 |
| 18.00 | 44.9 |
| 19.00 | 47.5 |
| 20.00 | 49.9 |
| 21.00 | 47.4 |
| 22.00 | 49.7 |
| 23.00 | 42.7 |

Night Hrs

Evening Hrs

Daytime Hrs

| | |
|---|---|
| **24 hour cumulative value (CNEL)** | **52.7** |

# FIELD NOISE MEASUREMENT DATA

PROJECT: 7940 Lankershim Blvd. Project PROJ. # 00047.19

**SITE IDENTIFICATION:** ST1
**ADDRESS:** Near Strathern St. and Troost Ave
**START DATE / TIME:** 4/24/19 – 10:23 AM
OBSERVER(S): Jakob R. Terrance W.
END DATE / TIME: 4/24/19 - 10:43 Am

**METEROLOGICAL CONDITIONS:**
TEMP: 73 °F HUMIDITY: 56 %R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 4-6 MPH DIR: N NE E SE S SW W NW STEADY GUSTY
SKY: SUNNY CLEAR OVRCST PRTLY CLOUDY FOG RAIN OTHER:

**ACOUSTIC MEASUREMENTS:**
INSTRUMENT: LD 831 TYPE: 1 2 SERIAL #: 3786
CALIBRATOR: CAL 200 SERIAL #: 6645
CALIBRATION CHECK, BEFORE: 114.0 AFTER 114.0 WINDSCREEN X

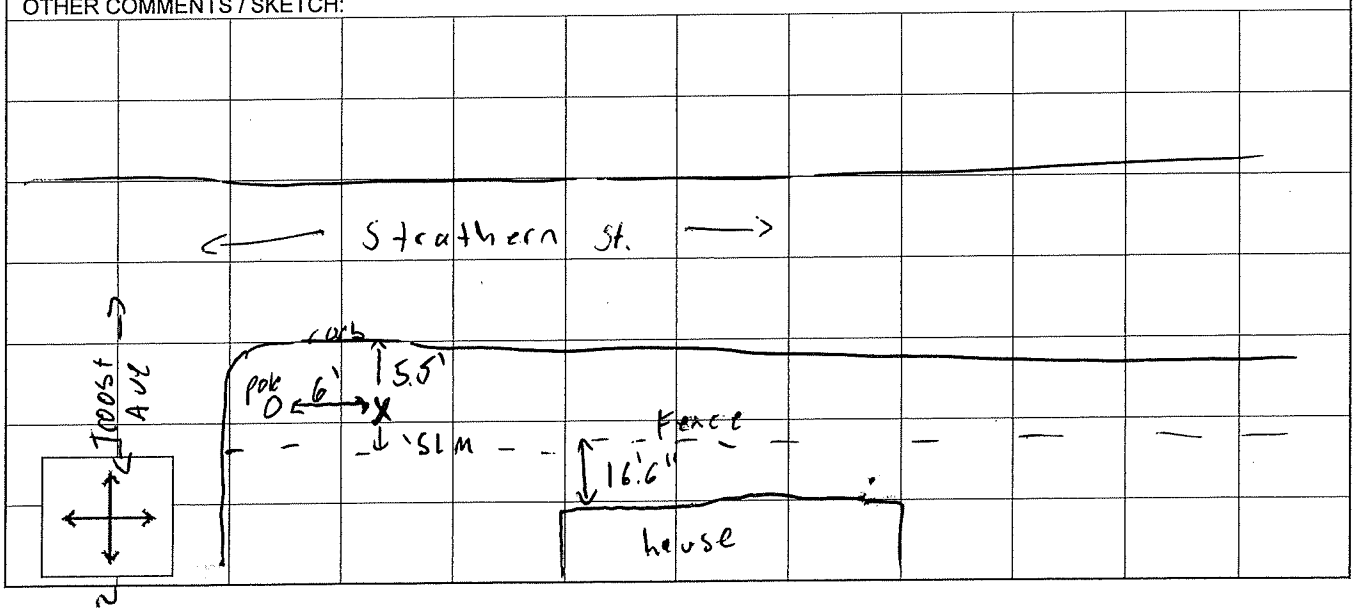
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER: ________

| FILE / MEAS # | START TIME | END TIME | $L_{eq}$ | max | L 1.67 | L 8.33 | L 25 | L 50 | L 90 | L 99 | min |
|---|---|---|---|---|---|---|---|---|---|---|---|
| .872 | 10:23 Am | 10:43 Am | 67.9 | 79.3 | 74.8 | 71.9 | 69.3 | 66.0 | 56.4 | 52.8 | 49.7 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

COMMENTS:

**NOISE SOURCE INFO:**
PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER: ______________
ROADWAY TYPE:
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

**DESCRIPTION / SKETCH:**
TERRAIN: HARD SOFT MIXED FLAT OTHER:
PHOTOS:
OTHER COMMENTS / SKETCH:



# FIELD NOISE MEASUREMENT DATA

PROJECT: 7940 Lankershim Blvd. Project PROJ. # ______

SITE IDENTIFICATION: ST2
ADDRESS: infront of 11713 Blythe St.
START DATE / TIME: 4/24/19 - 10:59 Am

OBSERVER(S): Jakob R. Terrance W.
END DATE / TIME: 4/24/19 - 11:19 Am

**METEROLOGICAL CONDITIONS:**

TEMP: 78 °F HUMIDITY: 48 %R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 5-7 MPH DIR: N NE E SE S SW W NW STEADY GUSTY
SKY: SUNNY CLEAR OVRCST PRTLY CLOUDY FOG RAIN OTHER:

**ACOUSTIC MEASUREMENTS:**

INSTRUMENT: LD 831 TYPE: 1 2 SERIAL #: 3786
CALIBRATOR: CAL 200 SERIAL #: 6645
CALIBRATION CHECK, BEFORE: 114.0 AFTER 113.99 WINDSCREEN X

SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER: ______

| FILE / MEAS # | START TIME | END TIME | $L_{eq}$ | max | $L_{1.67}$ | $L_{8.33}$ | $L_{25}$ | $L_{50}$ | $L_{90}$ | $L_{99}$ | min |
|---|---|---|---|---|---|---|---|---|---|---|---|
| .873 | 10:59 Am | 11:19 Am | 58.5 | 77.6 | 67.5 | 60.9 | 57.4 | 54.9 | 50.5 | 48.0 | 46.8 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

COMMENTS: paused out helicopter,
paused out dogs barking

**NOISE SOURCE INFO:**

PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER: ______

ROADWAY TYPE:

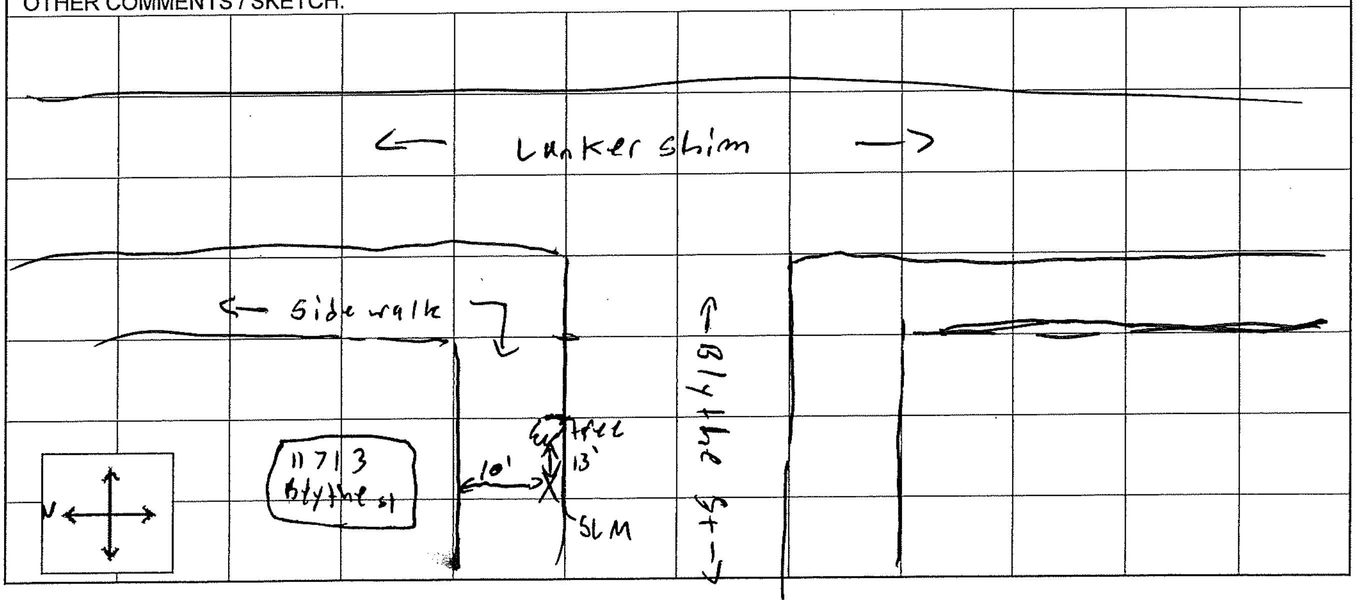
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

**DESCRIPTION / SKETCH:**

TERRAIN: HARD SOFT MIXED FLAT OTHER:

PHOTOS:

OTHER COMMENTS / SKETCH:



# FIELD NOISE MEASUREMENT DATA

PROJECT: 7940 Lankershim Blvd. Project PROJ. # 00047.19

SITE IDENTIFICATION: ST 3
OBSERVER(S): Jakob R.
ADDRESS: Beck Ave, south of Strathern (school)
START DATE / TIME: 4/26/19 - 10:38am
END DATE / TIME: 4/26/19 - 10:58am

**METEROLOGICAL CONDITIONS:**

TEMP: 74 °F HUMIDITY: 54 %R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 3-4 MPH DIR: N NE E SE S SW W NW STEADY GUSTY
SKY: SUNNY CLEAR OVRCST PRTLY CLOUDY FOG RAIN OTHER:

**ACOUSTIC MEASUREMENTS:**

INSTRUMENT: LD 831 TYPE: 1 2 SERIAL #: 3786
CALIBRATOR: CAL 200 SERIAL #: 6645
CALIBRATION CHECK, BEFORE: 114.0 AFTER 113.98 WINDSCREEN X

SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER:

| FILE / MEAS # | START TIME | END TIME | $L_{eq}$ | max | L 1.67 | L 8.33 | L 25 | L 50 | L 90 | L 99 | min |
|---|---|---|---|---|---|---|---|---|---|---|---|
| .877 | 10:38 Am | 10:58 Am | 55.2 | 67.0 | 61.9 | 57.7 | 55.4 | 53.7 | 51.0 | 49.5 | 48.0 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

COMMENTS: paused out passing airplane

**NOISE SOURCE INFO:**

PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER:

ROADWAY TYPE:

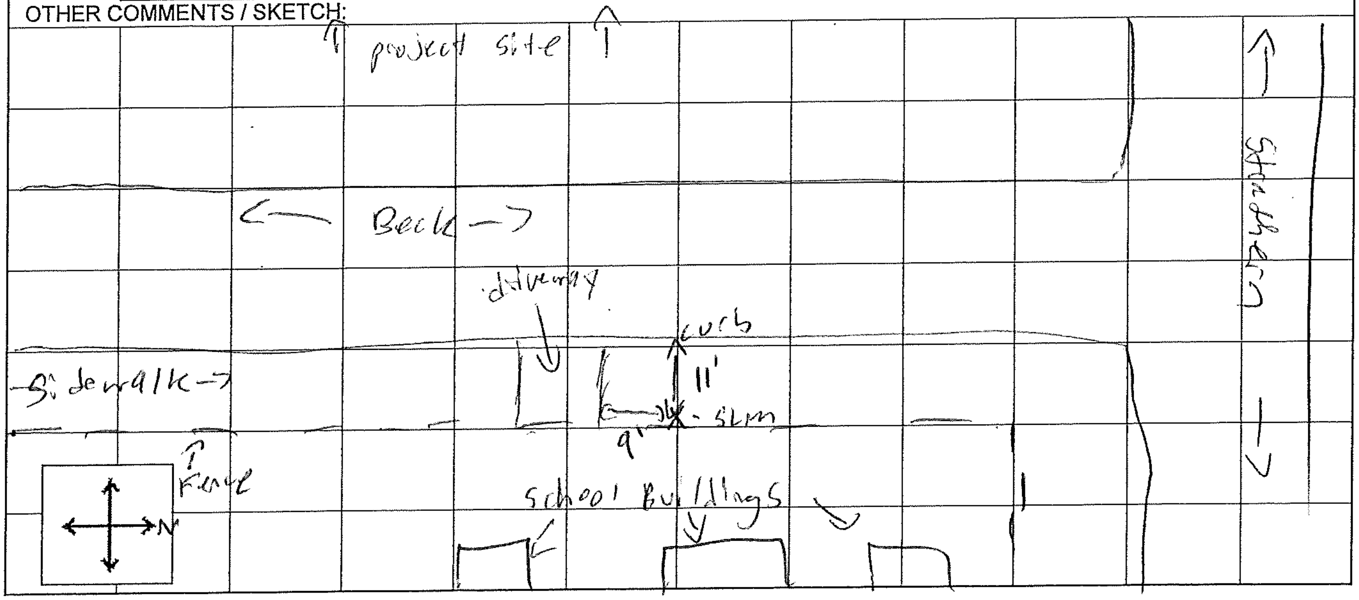
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

**DESCRIPTION / SKETCH:**

TERRAIN: HARD SOFT MIXED FLAT OTHER:

PHOTOS:

OTHER COMMENTS / SKETCH:



# FIELD NOISE MEASUREMENT DATA

PROJECT: 7940 Lankershim Blvd. Project PROJ. # 00047.19

**SITE IDENTIFICATION:** ST 4 OBSERVER(S): Jacob R.
**ADDRESS:** Near 7855 Arminta Terrance W.
**START DATE / TIME:** 4/24/19 - 11:57 Am END DATE / TIME: 4/24/19 - 12:17 Am

**METEROLOGICAL CONDITIONS:**
TEMP: 84 °F HUMIDITY: 39 %R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 0-1 MPH DIR: N NE E SE S SW W NW STEADY GUSTY
SKY: SUNNY CLEAR OVRCST PRTLY CLOUDY FOG RAIN OTHER:

**ACOUSTIC MEASUREMENTS:**
INSTRUMENT: LD 831 TYPE: 1 2 SERIAL #: 3786
CALIBRATOR: CAL 200 SERIAL #: 6645
CALIBRATION CHECK, BEFORE: 114.0 AFTER 113.98 WINDSCREEN X

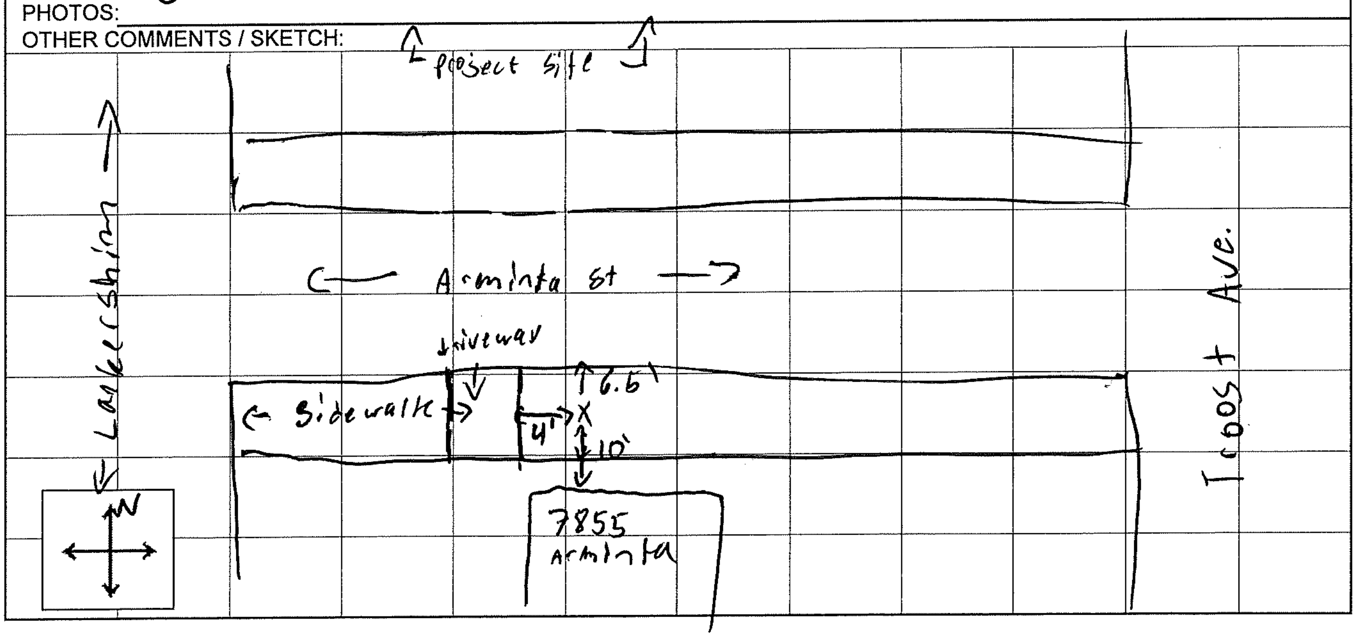
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER:

| FILE / MEAS # | START TIME | END TIME | $L_{eq}$ | max | L 1.67 | L 8.33 | L 25 | L 50 | L 90 | L 99 | min |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 875 | 11:57 Am | 12:17 | 57.7 | 70.6 | 64.0 | 60.2 | 57.7 | 56.4 | 54.4 | 53.4 | 52.9 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

COMMENTS:

**NOISE SOURCE INFO:**
PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER:
ROADWAY TYPE:
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

**DESCRIPTION / SKETCH:**
TERRAIN: HARD SOFT MIXED FLAT OTHER:
PHOTOS:
OTHER COMMENTS / SKETCH:



# FIELD NOISE MEASUREMENT DATA

PROJECT: 7940 Lankershim Blvd. Project PROJ. # 00047.19

**SITE IDENTIFICATION:** ST 4 OBSERVER(S): Jakob R.
ADDRESS: Arminta St. @ East of Troost
START DATE / TIME: 4/26/19 - 9:58 Am END DATE / TIME: 4/26/19 - 10:18

**METEROLOGICAL CONDITIONS:**
TEMP: 76 °F HUMIDITY: 47 %R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 0-2 MPH DIR: N NE E SE S SW W NW STEADY GUSTY
SKY: SUNNY CLEAR OVRCST PRTLY CLOUDY FOG RAIN OTHER:

**ACOUSTIC MEASUREMENTS:**
INSTRUMENT: LD 831 TYPE: 1 2 SERIAL #: 3786
CALIBRATOR: CAL 200 SERIAL #: 6646
CALIBRATION CHECK, BEFORE: 114.0 AFTER 114.00 WINDSCREEN X

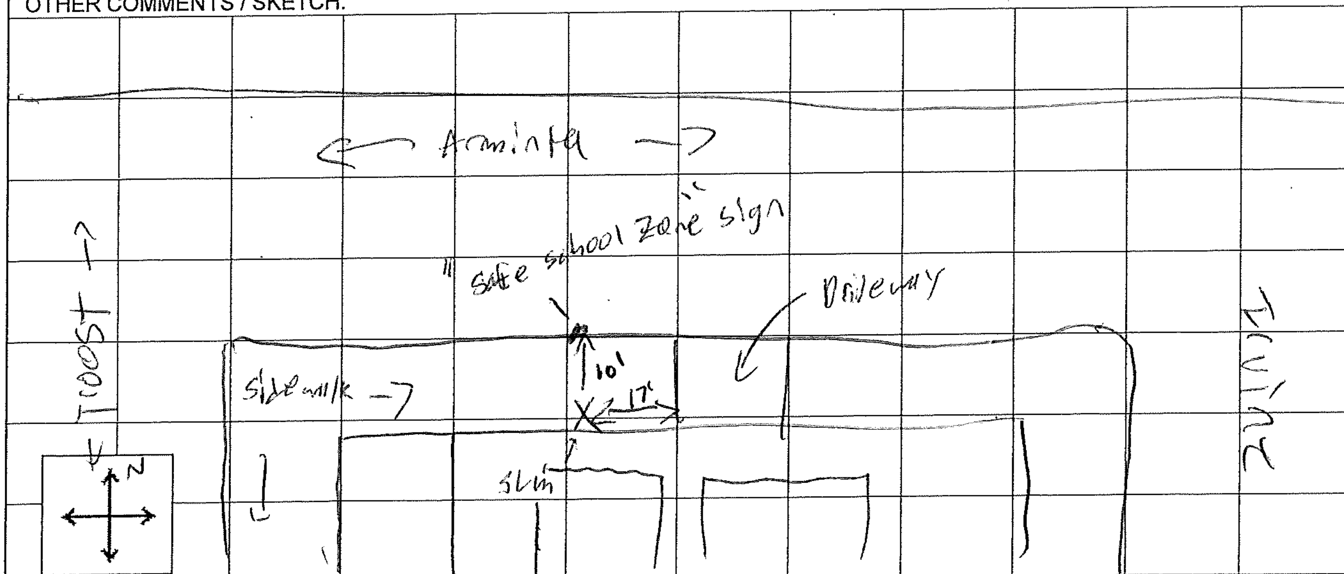
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER:

| FILE / MEAS # | START TIME | END TIME | $L_{eq}$ | max | 1.67 | 8.33 | 25 | L 50 | 90 | 99 | min |
|---|---|---|---|---|---|---|---|---|---|---|---|
| .876 | 9:58AM | 10:18 | 52.2 | 65.4 | 59.5 | 54.6 | 52.1 | 50.4 | 48.4 | 46.9 | 46.1 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

COMMENTS: paused out vehicle backup signal

**NOISE SOURCE INFO:**
PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER:
ROADWAY TYPE:
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

**DESCRIPTION / SKETCH:**
TERRAIN: HARD SOFT MIXED FLAT OTHER:
PHOTOS:
OTHER COMMENTS / SKETCH:



# FIELD NOISE MEASUREMENT DATA

PROJECT: 7940 Lankershim Blvd. Project PROJ. # 00047.19

**SITE IDENTIFICATION:** ST #5
ADDRESS: Near village inn motel
START DATE / TIME: 11:29 Am - 4/24/19
OBSERVER(S): Jakob K. Terrence V.
END DATE / TIME: 4/24/19 - 11:49

**METEROLOGICAL CONDITIONS:**
TEMP: 70 °F HUMIDITY: 49 %R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 2-3 MPH DIR: N NE E SE S SW W NW STEADY GUSTY
SKY: SUNNY CLEAR OVRCST PRTLY CLOUDY FOG RAIN OTHER:

**ACOUSTIC MEASUREMENTS:**
INSTRUMENT: LD 831 TYPE: 1 2 SERIAL #: 3786
CALIBRATOR: SERIAL #: 6645
CALIBRATION CHECK, BEFORE: 114.0 AFTER 113.91 WINDSCREEN X

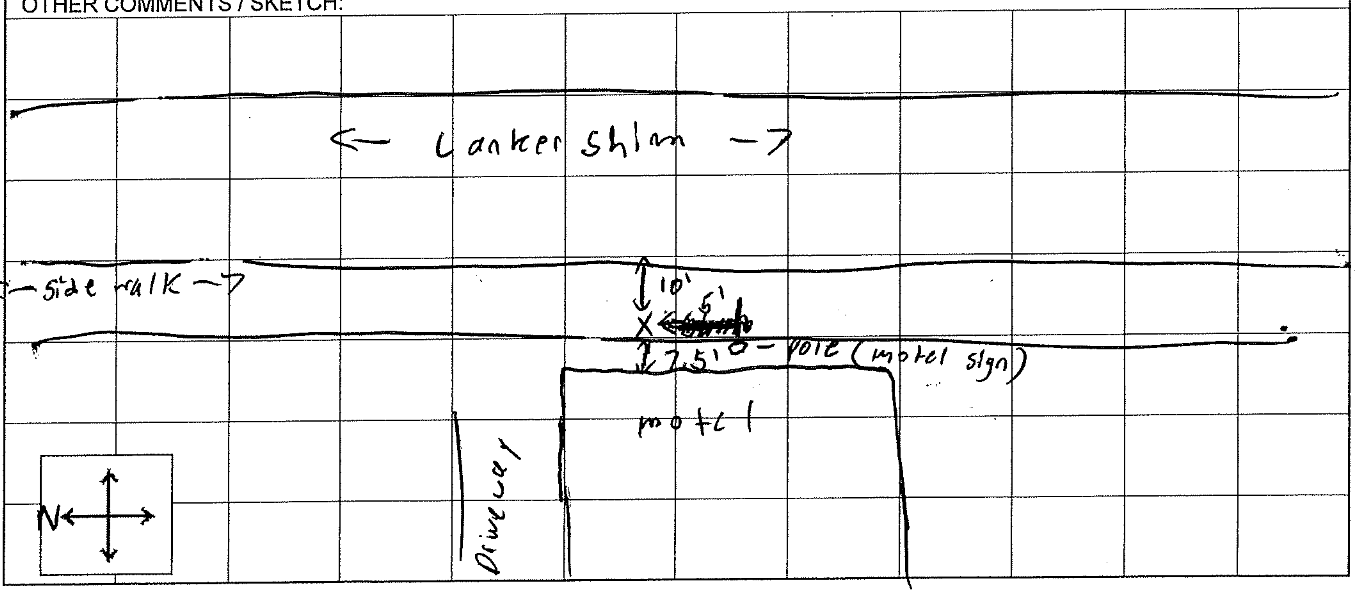
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER:

| FILE / MEAS # | START TIME | END TIME | $L_{eq}$ | max | L 1.67 | L 8.33 | L 25 | L 50 | L 90 | L 99 | min |
|---|---|---|---|---|---|---|---|---|---|---|---|
| .874 | 11:29 Am | 11:49 | 70.1 | 80.7 | 76.4 | 74.1 | 71.3 | 68.4 | 59.1 | 51.2 | 48.5 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

COMMENTS: paused out garbage truck. parked near SLM

**NOISE SOURCE INFO:**
PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER:
ROADWAY TYPE:
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

**DESCRIPTION / SKETCH:**
TERRAIN: HARD SOFT MIXED FLAT OTHER:
PHOTOS:
OTHER COMMENTS / SKETCH:



Appendix B
# Construction, On-Site Operational, and Traffic Noise Levels

## Construction Noise Levels

## Construction Noise Analysis - Demolition

| Equipment | | Typical Level @ 50', dBA[1] | Usage Factor[1,2] | Number of Units | Distance to Receiver, ft. | Hard or Soft Site? | Barrier Attenuation, dB | Leq(h), dBA | Lmax, dBA |
|---|---|---|---|---|---|---|---|---|---|
| Item No. | Description | | | | | | | | |
| 18 | Excavator | 80.7 | 0.4 | 2 | 50 | hard | 0 | 80 | 81 |
| 13 | Dozer | 81.7 | 0.4 | 2 | 50 | hard | 0 | 81 | 82 |
| 48 | Saw, Concrete | 89.6 | 0.2 | 1 | 50 | hard | 0 | 83 | 90 |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | ***Combined Equipment*** | | | | | | | ***86*** | ***90*** |

1. Obtained or estimated from:
   FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or
   "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
   "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN/EPA, December 31, 1971
2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use

**Construction Noise Analysis - Site Preparation**

| Equipment | | Typical Level @ 50', dBA[1] | Usage Factor[1,2] | Number of Units | Distance to Receiver, ft. | Hard or Soft Site? | Barrier Attenuation, dB | Leq(h), dBA | Lmax, dBA |
|---|---|---|---|---|---|---|---|---|---|
| Item No. | Description | | | | | | | | |
| 2 | Backhoe | 77.6 | 0.4 | 1 | 50 | hard | 0 | 74 | 78 |
| 29 | Loader (Front End Loader) | 79.1 | 0.4 | 1 | 50 | hard | 0 | 75 | 79 |
| 13 | Dozer | 81.7 | 0.4 | 1 | 50 | hard | 0 | 78 | 82 |
| 18 | Excavator | 80.7 | 0.4 | 1 | 50 | hard | 0 | 77 | 81 |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | ***Combined Equipment*** | | | | | | | ***82*** | ***82*** |

1. Obtained or estimated from:
   FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or
   "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
   "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN/EPA, December 31, 1971
2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use

## Construction Noise Analysis - Grading

| Equipment | | Typical Level @ 50', dBA[1] | Usage Factor[1,2] | Number of Units | Distance to Receiver, ft. | Hard or Soft Site? | Barrier Attenuation, dB | Leq(h), dBA | Lmax, dBA |
|---|---|---|---|---|---|---|---|---|---|
| Item No. | Description | | | | | | | | |
| 13 | Dozer | 81.7 | 0.4 | 1 | 50 | hard | 0 | 78 | 82 |
| 29 | Loader (Front End Loader) | 79.1 | 0.4 | 1 | 50 | hard | 0 | 75 | 79 |
| 2 | Backhoe | 77.6 | 0.4 | 1 | 50 | hard | 0 | 74 | 78 |
| 18 | Excavator | 80.7 | 0.4 | 1 | 50 | hard | 0 | 77 | 81 |
| 29 | Loader (Front End Loader) | 79.1 | 0.4 | 1 | 50 | hard | 0 | 75 | 79 |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | *Combined Equipment* | | | | | | | *83* | *82* |

1. Obtained or estimated from:
   FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or
   "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
   "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN/EPA, December 31, 1971
2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use

## Construction Noise Analysis - Building Construction

| Equipment | | Typical Level @ 50', dBA[1] | Usage Factor[1,2] | Number of Units | Distance to Receiver, ft. | Hard or Soft Site? | Barrier Attenuation, dB | Leq(h), dBA | Lmax, dBA |
|---|---|---|---|---|---|---|---|---|---|
| Item No. | Description | | | | | | | | |
| 12 | Crane | 80.6 | 0.16 | 1 | 50 | hard | 0 | 73 | 81 |
| 30 | Man Lift | 74.7 | 0.2 | 1 | 50 | hard | 0 | 68 | 75 |
| 29 | Loader (Front End Loader) | 79.1 | 0.4 | 1 | 50 | hard | 0 | 75 | 79 |
| 69 | Welder/Torch | 74 | 0.4 | 1 | 50 | hard | 0 | 70 | 74 |
| 20 | Generator | 80.6 | 0.5 | 1 | 50 | hard | 0 | 78 | 81 |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | *Combined Equipment* | | | | | | | *81* | *81* |

1. Obtained or estimated from:
   FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or
   "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
   "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN/EPA, December 31, 1971
2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use

**Construction Noise Analysis - Architectural Coating**

| Equipment | | Typical Level @ 50', dBA[1] | Usage Factor[1,2] | Number of Units | Distance to Receiver, ft. | Hard or Soft Site? | Barrier Attenuation, dB | Leq(h), dBA | Lmax, dBA |
|---|---|---|---|---|---|---|---|---|---|
| Item No. | Description | | | | | | | | |
| 10 | Compressor, Air | 77.7 | 0.4 | 1 | 50 | hard | 0 | 74 | 78 |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | ***Combined Equipment*** | | | | | | | ***74*** | ***78*** |

1. Obtained or estimated from:
   FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or
   "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
   "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN/EPA, December 31, 1971
2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use

**Construction Noise Analysis - Paving**

| Equipment | | Typical Level @ 50', dBA[1] | Usage Factor[1,2] | Number of Units | Distance to Receiver, ft. | Hard or Soft Site? | Barrier Attenuation, dB | Leq(h), dBA | Lmax, dBA |
|---|---|---|---|---|---|---|---|---|---|
| Item No. | Description | | | | | | | | |
| 34 | Paver | 77.2 | 0.5 | 1 | 50 | hard | 0 | 74 | 77 |
| 31 | Mixer, Concrete (or concrete m | 78.8 | 0.4 | 1 | 50 | hard | 0 | 75 | 79 |
| 44 | Roller | 80 | 0.2 | 1 | 50 | hard | 0 | 73 | 80 |
| 2 | Backhoe | 77.6 | 0.4 | 1 | 50 | hard | 0 | 74 | 78 |
| 34 | Paver | 77.2 | 0.5 | 1 | 50 | hard | 0 | 74 | 77 |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | | | | 1 | 50 | hard | 0 | | |
| | *Combined Equipment* | | | | | | | *81* | *80* |

1. Obtained or estimated from:
   FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or
   "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
   "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN/EPA, December 31, 1971
2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use

| | | | | Ref. Noise Level @ 50ft. | | | nstruction Noise Le | Highest Construction Noise Level (Leq, dBA) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Receptor | Receiver Type/Location | Construction Phase | Acoustical Average Distance | Leq(h), dBA | Dist. Excess Attenuation, dB | Barrier Attenuation, dB | Leq, dBA | Without PDF-NOI-1 | With PDF-NOI-1[a] | Applicable Noise Standard (Leq, dBA)[b] | Exceed Applicable Noise Standard? |
| 1 | SFR - North of project site, across Strathern St. | Demolition | 348 | 86 | 0 | 0 | 69 | 70 | 70 | 75 | No |
| | | Site Prep & Grading | 217 | 82 | 0 | 0 | 69 | | | | |
| | | Grading | 217 | 83 | 0 | 0 | 70 | | | | |
| | | Building Construction | 217 | 81 | 0 | 0 | 68 | | | | |
| | | Architectural Coating | 217 | 74 | 0 | 0 | 61 | | | | |
| | | Paving | 217 | 81 | 0 | 0 | 68 | | | | |
| 2 | SFR - Directly east of, and adjacent to, project site (north of Blythe St.) | Demolition | 401 | 86 | 0 | 0 | 68 | 83 | 73 | 75 | No |
| | | Site Prep & Grading | 50 | 82 | 0 | 0 | 82 | | | | |
| | | Grading | 50 | 83 | 0 | 0 | 83 | | | | |
| | | Building Construction | 50 | 81 | 0 | 0 | 81 | | | | |
| | | Architectural Coating | 50 | 74 | 0 | 0 | 74 | | | | |
| | | Paving | 50 | 81 | 0 | 0 | 81 | | | | |
| 3 | SFR - Directly east of, and adjacent to, project site (south of Blythe St.) | Demolition | 530 | 86 | 0 | 0 | 65 | 82 | 72 | 75 | No |
| | | Site Prep & Grading | 54 | 82 | 0 | 0 | 81 | | | | |
| | | Grading | 54 | 83 | 0 | 0 | 82 | | | | |
| | | Building Construction | 54 | 81 | 0 | 0 | 80 | | | | |
| | | Architectural Coating | 54 | 74 | 0 | 0 | 73 | | | | |
| | | Paving | 54 | 81 | 0 | 0 | 80 | | | | |
| 4 | SFR - Directly south of, and adjacent to, project site | Demolition | 120 | 86 | 0 | 0 | 78 | 84 | 74 | 75 | No |
| | | Site Prep & Grading | 47 | 82 | 0 | 0 | 83 | | | | |
| | | Grading | 47 | 83 | 0 | 0 | 84 | | | | |
| | | Building Construction | 47 | 81 | 0 | 0 | 82 | | | | |
| | | Architectural Coating | 47 | 74 | 0 | 0 | 75 | | | | |
| | | Paving | 47 | 81 | 0 | 0 | 82 | | | | |
| 5 | SFR - South of project site, across Arminta | Demolition | 269 | 86 | 0 | 5 | 66 | 66 | 56 | 75 | No |
| | | Site Prep & Grading | 374 | 82 | 0 | 5 | 60 | | | | |
| | | Grading | 374 | 83 | 0 | 5 | 61 | | | | |
| | | Building Construction | 374 | 81 | 0 | 5 | 59 | | | | |
| | | Architectural Coating | 374 | 74 | 0 | 5 | 52 | | | | |
| | | Paving | 374 | 81 | 0 | 5 | 59 | | | | |
| 6 | SFR - West of project site, across Lankershim Blvd. | Demolition | 290 | 86 | 0 | 5 | 66 | 66 | 66 | 75 | No |
| | | Site Prep & Grading | 400 | 82 | 0 | 5 | 59 | | | | |
| | | Grading | 400 | 83 | 0 | 5 | 60 | | | | |
| | | Building Construction | 400 | 81 | 0 | 5 | 58 | | | | |
| | | Architectural Coating | 400 | 74 | 0 | 5 | 51 | | | | |
| | | Paving | 400 | 81 | 0 | 5 | 58 | | | | |
| 7 | Village Inn Motel | Demolition | 479 | 86 | 0 | 5 | 61 | 61 | 61 | 75 | No |
| | | Site Prep & Grading | 688 | 82 | 0 | 5 | 54 | | | | |
| | | Grading | 688 | 83 | 0 | 5 | 55 | | | | |
| | | Building Construction | 688 | 81 | 0 | 5 | 53 | | | | |
| | | Architectural Coating | 688 | 74 | 0 | 5 | 46 | | | | |
| | | Paving | 688 | 81 | 0 | 5 | 53 | | | | |
| 8 | Arminta Street Elementary School | Demolition | 1237 | 86 | 1 | 10 | 47 | 47 | 37 | 75 | No |
| | | Site Prep & Grading | 964 | 82 | 0 | 10 | 46 | | | | |
| | | Grading | 964 | 83 | 0 | 10 | 47 | | | | |
| | | Building Construction | 964 | 81 | 0 | 10 | 45 | | | | |
| | | Architectural Coating | 964 | 74 | 0 | 10 | 38 | | | | |
| | | Paving | 964 | 81 | 0 | 10 | 45 | | | | |

[a] Noise levels at off-site sensitive receptors with implementaiton of PDF-NOI-1 takes into consideration the noise attenuation provided by a 15-foot-high noise barrier along the eastern and southern Project Site boundary.

[b] Noise standard based on Sections 111.02 and 112.05 of the LAMC.

## On-Site Operational Noise Levels

**Residential Outdoor Amenity Areas**

| | **Male** | **Female** | **Children** |
|---|---|---|---|
| **Voice Level** | **(dBA Leq)[a]** | **(dBA Leq)[a]** | **(dBA Leq)[a]** |
| Casual | 53 | 50 | 53 |
| Normal | 58 | 55 | 58 |
| Raised | 65 | 62 | 65 |
| Loud | 75 | 71 | 74 |
| Shout | 88 | 82 | 82 |

[a] Noise level measured at 1 meter

Source: Cyril M. Harris. 1998. *Handbook of Acoustical Measurements and Noise Control* , Third Edition. McGraw-Hill, Inc.

U.S. EPA. 1977. Speech Levels in Various Noise Environments (EPA-6700/1-77-025). May.

**Project On-Site Noise Sources:**

GAME LOUNGE

Total number of people: 4

Number of people talking simultaneously: 2

| Receptor | Distance[a] | Source | Leq @ 1 meter (3.28 ft.), dBA | Number of Sources | Estimated Noise Level (dBA Leq) at 1 meter (3.23 ft.) |
|---|---|---|---|---|---|
| SFRs, south of site boundary | 22 | Male raised voice | 65 | 1 | 65.00 |
| | | Female raised voice | 62 | 1 | 62.00 |
| SFRs, along eastern Project Site boudary and north of Blythe St. | 151 | Male raised voice | 65 | 1 | 65.00 |
| | | Female raised voice | 62 | 1 | 62.00 |

[a] The distance is from the acoustical average distance between the noise source and receptor.

POOL DECK & SPA

Total number of people: 15

Number of people talking simultaneously: 7.5

| Receptor | Distance[a] | Source | Leq @ 1 meter (3.28 ft.), dBA | Number of Sources | Estimated Noise Level (dBA Leq) at 1 meter (3.23 ft.) |
|---|---|---|---|---|---|
| SFRs, south of site boundary | 35 | Male raised voice | 65 | 4 | 70.74 |
| | | Female raised voice | 62 | 4 | 67.74 |

| | | | | | |
|---|---|---|---|---|---|
| SFRs, along eastern Project Site boudary and north of Blythe St. | 132 | Male raised voice | 65 | 4 | 70.74 |
| | | Female raised voice | 62 | 4 | 67.74 |

[a] The distance is from the acoustical average distance between the noise source and receptor.

OUTDOOR KITCHEN (Outdoor BBQ, Bar Counter & Sitting, Family Style Table)

Total number of people: 10
Number of people talking simultaneously: 5

| Receptor | Distance[a] | Source | Leq @ 1 meter (3.28 ft.), dBA | Number of Sources | Estimated Noise Level (dBA Leq) at 1 meter (3.23 ft.) |
|---|---|---|---|---|---|
| SFRs, south of site boundary | 28 | Male normal voice | 58 | 3 | 61.98 |
| | | Female normal voice | 55 | 3 | 58.98 |
| SFRs, along eastern Project Site boudary and north of Blythe St. | 150 | Male normal voice | 58 | 3 | 61.98 |
| | | Female normal voice | 55 | 3 | 58.98 |

[a] The distance is from the acoustical average distance between the noise source and receptor.

TOT LOT

Total number of people: 8
Number of people talking simultaneously: 4

| Receptor | Distance[a] | Source | Leq @ 1 meter (3.28 ft.), dBA | Number of Sources | Estimated Noise Level (dBA Leq) at 1 meter (3.23 ft.) |
|---|---|---|---|---|---|
| SFRs, south of site boundary | 68 | Male raised voice | 65 | 2 | 68.01 |
| | | Child raised voice | 65 | 2 | 68.01 |
| SFRs, along eastern Project Site boudary and north of Blythe St. | 120 | Male raised voice | 65 | 2 | 68.01 |
| | | Child raised voice | 65 | 2 | 68.01 |

[a] The distance is from the acoustical average distance between the noise source and receptor.

BBQ AND SITTING AREA

Total number of people: 8
Number of people talking simultaneously: 4

| Receptor | Distance[a] | Source | Leq @ 1 meter (3.28 ft.), dBA | Number of Sources | Estimated Noise Level (dBA Leq) at 1 meter (3.23 ft.) |
|---|---|---|---|---|---|
| SFRs, south of site boundary | 214 | Male normal voice | 58 | 2 | 61.01 |
| | | Female normal voice | 55 | 2 | 58.01 |
| SFRs, along eastern Project Site boudary and north of Blythe St. | 23 | Male normal voice | 58 | 2 | 61.01 |
| | | Female normal voice | 55 | 2 | 58.01 |

[a] The distance is from the acoustical average distance between the noise source and receptor.

Community Garden

| | |
|---|---|
| Total number of people: | 6 |
| Number of people talking simultaneously: | 3 |

| Receptor | Distance[a] | Source | Leq @ 1 meter (3.28 ft.), dBA | Number of Sources | Estimated Noise Level (dBA Leq) at 1 meter (3.23 ft.) |
|---|---|---|---|---|---|
| SFRs, south of site boundary | 260 | Male normal voice | 58 | 2 | 59.76 |
| | | Female normal voice | 55 | 2 | 56.76 |
| SFRs, along eastern Project Site boudary and north of Blythe St. | 19 | Male normal voice | 58 | 2 | 59.76 |
| | | Female normal voice | 55 | 2 | 56.76 |

[a] The distance is from the acoustical average distance between the noise source and receptor.

**Combined Outdoor Noise Levels:**

| Receptor | Noise Level (dBA Leq) | Existing Daytime (7am - 9pm) Ambient Noise Level (dBA Leq) | Existing Ambient + Project (dBA Leq) | **Increase over Ambient (dBA Leq)** |
|---|---|---|---|---|
| SFRs, south of site boundary[a] | 55 | 50 | 56 | 6 |
| SFRs, along eastern Project Site boudary and north of Blythe St. | 50 | 56 | 57 | 1 |

[a] Minimum daytime and nighttime ambient noise levels of 50 and 40 dBA Leq, respectively, in residential zone used if measured noise levels levels, in accordance with LAMC Section 111.03.

**Pet Park:**

| | |
|---|---|
| Noise level (dBA Leq): | 49.5 |
| Reference distance (ft) | 145 |

| Receptor | Distance[a] | Estimated Noise Level (dBA Leq) |
|---|---|---|
| SFRs north of project site, across Strathern St. | 170 | 48.12 |

[a] The distance is from the acoustical average distance between the noise source and receptor.

**Parking Garage Noise Levels:**

*Leq(h) = SELref + 10log($N_A$/1000) - 35.6*

*Leq(h) = hourly Leq noise level at 50 feet*
*SELref = reference noise levcel for stationary noise source represented in sound expsoure level (SEL) at 50 feet*
*NA = number of automobiles per hour*

*Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018. (Tables 4-13 & 4-14)*

Strathern Street Driveway:

| *Main Driveway off Strathern St.* | | *Residential Entrance 1* | | *Residential Entrance 2* | |
|---|---|---|---|---|---|
| SELref (dBA): | 92 | SELref (dBA): | 92 | SELref (dBA): | 92 |
| $N_A$: | 128 | $N_A$: | 64 | $N_A$: | 64 |
| Leq(h) @ 50ft.: | **47.5** | Leq(h) @ 50ft.: | **44.5** | Leq(h) @ 50ft.: | **44.5** |

*Assumes that 75% of peak hour residential trips would access driveway off of Strathern Street, which would serve residential parking only.

North Lankershim Boulevard Driveway:

| *Commercial Entrance 1* | | *Commercial Entrance 2* | | *Residential Entrance 3* | |
|---|---|---|---|---|---|
| SELref (dBA): | 92 | SELref (dBA): | 92 | SELref (dBA): | 92 |
| $N_A$: | 55 | $N_A$: | 55 | $N_A$: | 43 |
| Leq(h) @ 50ft.: | **43.8** | Leq(h) @ 50ft.: | **43.8** | Leq(h) @ 50ft.: | **42.7** |

*Assumes all peak hour restaurant trips (54) and 75% of pharmacy trips (56) would be evenly distributed amongst the two commericial-only entrances into parking garage. Assumes 25% of residential trips would access entrance off of this driveway.

North Lankershim Boulevard Thru-Driveway:

| | |
|---|---|
| SELref (dBA): | 92 |
| $N_A$: | 18.5 |
| Leq(h) @ 50ft.: | **39.1** |

*Assumes that 25% of peak hour pharmacy trips would access drive thru off of Lankershim Blvd.

| | | Estimated Noise Levels (dBA Leq) | |
|---|---|---|---|
| Receptor | Distance[a] | Individual Sources | Composite |
| | 320 | 27.66 | |
| | 210 | 31.32 | |
| SFRs, south of site boundary | 130 | 34.41 | 36.7 |
| SFRs, along eastern Project Site boudary and north of Blythe St. | 70 | 44.56 | 44.6 |

[a] Distance is from receptor to parking garage entrance location

**Rooftop HVACs:**

Single 3-ton HVAC unit:

| | dBA |
|---|---|
| Sound Power: | 77 |
| Sound Pressure @ 50ft: | 45 |
| | |
| Project HVAC Unit Quanity: | 216 |
| | |
| Composite HVAC Noise: | 68.3 |

| | Distance (ft.) | Noise Attenuation[a] | Noise Level |
|---|---|---|---|
| SFR to the South | 209.65 | -10 | 45.89 |
| SFR to the EastSFRs, along eastern Project Site boudary and north of Blythe St. | 194.86 | -10 | 46.53 |

[a] Accounts for noise attentuation from enclosure and parapet

**Loading Area:**

| | dBA Leq | Distance (ft.) |
|---|---|---|
| Reference Noise Level: | 61.8 | 66 |

| SFR to the South | Distance (ft.) | Noise Attenuationa | Noise Level |
|---|---|---|---|
| SFRs, along eastern Project Site boudary and north of Blythe St. | 320 | -5 | 43.09 |
| | 220 | -5 | 46.34 |

**<u>Composite Operational Noise Levels:</u>**

| Noise Sources | Estimated Noise Level (dBA Leq) SFR to the east, north of Blythe St. | SFR to the south, adjacent to Project boundary |
|---|---|---|
| Game Lounge | 34 | 50 |
| Pool Deck | 40 | 52 |
| Outdoor Kitchen | 31 | 45 |
| Tot Lot | 40 | 45 |
| BBQ & Sitting Area | 46 | 26 |
| Coomunity Garden | 46 | 24 |
| Pet Park | | |
| Parking Structure | 44 | 37 |
| HVAC | 47 | 46 |
| Loading Area | 46 | 43 |
| Composite Operational Noise | 53 | 56 |
| Existing Daytime Ambient Noise[a] | 56 | 50 |
| **Composite Operational + Ambient Noise** | **58** | **57** |
| Increase over Ambient | 2 | 7 |

[a] Minimum daytime ambient noise level of 50 dBA Leq in residential zone used if measured noise levels are below 50 dBA Leq, in accordance with LAMC Section 111.03.

## Traffic Noise Levels

This spreadsheet calculates traffic noise levels based on TNM Version 2.5 Lookup Tables.

** Type in yellow cells only.

**Traffic Data:**

- (selected) Enter ADT Traffic
- Enter Loudest-hour Traffic

**Units:**

- Metric
- (selected) English

Calculate

| Link | Roadway | Segment Location | Hard or Soft Ground (H or S) | Total Daily Traffic Volumes (ADT) | Traffic Mix Number # | Traffic Mix Description | Vehicle Speed mph max. 80 | Sound Levels at Receiver Locations: Distance feet, min. 33 max. 1000 | Sound Levels at Receiver Locations: dB CNEL |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Strathern Street (Existing) | West of Laurel Canyon Blvd. | H | 10,610 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.5 |
| 2 | Strathern Street (Existing) | East of Laurel Canyon Blvd. | H | 10,070 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.2 |
| 3 | Strathern Street (Existing) | West of Lankershim Blvd. | H | 9,070 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 62.8 |
| 4 | Strathern Street (Existing) | East of Lankershim Blvd. | H | 14,790 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 64.9 |
| 5 | Strathern Street (Existing) | West of Tujunga Ave. | H | 14,390 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 64.8 |
| 6 | Strathern Street (Existing) | East of Tujunga Ave. | H | 11,210 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.7 |
| 7 | Strathern Street (Existing) | West of Vineland Ave. | H | 10,060 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.2 |
| 8 | Strathern Street (Existing) | East of Vineland Ave. | H | 5,860 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 60.9 |
| 9 | Stagg Street (Existing) | West of Lankershim Blvd. | H | 2,160 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 54.9 |
| 10 | Stagg Street (Existing) | East of Lankershim Blvd. | H | 1,670 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 53.9 |
| 11 | Saticoy Street (Existing) | West of Lankershim Blvd. | H | 12,820 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 64.3 |
| 12 | Saticoy Street (Existing) | East of Lankershim Blvd. | H | 11,520 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.8 |
| 13 | Saticoy Street (Existing) | West of Tujunga Ave. | H | 10,420 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.4 |
| 14 | Saticoy Street (Existing) | East of Tujunga Ave. | H | 7,970 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 62.2 |
| 15 | Roscoe Boulevard (Existing) | West of Webb Ave. | H | 24,980 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.4 |
| 16 | Roscoe Boulevard (Existing) | East of Webb Ave. | H | 23,120 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.1 |
| 17 | Laurel Canyon Boulevard (Existing) | North of Strathern St. | H | 18,150 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 67.3 |
| 18 | Laurel Canyon Boulevard (Existing) | South of Strathern St. | H | 17,490 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 67.2 |
| 19 | Webb Avenue (Existing) | North of Roscoe Blvd. | H | 7,530 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 60.1 |
| 20 | Webb Avenue (Existing) | South of Roscoe Blvd. | H | 10,510 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 61.6 |
| 21 | Webb Avenue (Existing) | North of Strathern St. | H | 9,150 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 61.0 |
| 22 | Lankershim Boulevard (Existing) | South of Tuxford St. | H | 20,830 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.6 |
| 23 | Lankershim Boulevard (Existing) | North of Strathern St. | H | 19,660 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.4 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 24 | Lankershim Boulevard (Existing) | South of Strathern St. | H | 21,010 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.6 |
| 25 | Lankershim Boulevard (Existing) | North of Stagg St. | H | 21,790 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.8 |
| 26 | Lankershim Boulevard (Existing) | South of Stagg St. | H | 21,780 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.8 |
| 27 | Lankershim Boulevard (Existing) | North of Saticoy St. | H | 21,770 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.8 |
| 28 | Lankershim Boulevard (Existing) | South of Saticoy St. | H | 21,870 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.8 |
| 29 | Tujunga Avenue (Existing) | South of Strathern St. | H | 12,670 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 65.8 |
| 30 | Tujunga Avenue (Existing) | North of Saticoy St. | H | 13,180 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 66.0 |
| 31 | Tujunga Avenue (Existing) | South of Saticoy St. | H | 13,970 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 66.2 |
| 32 | Vineland Avenue (Existing) | South of Strathern St. | H | 21,970 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 68.2 |
| 33 | Strathern Street (Existing with Project) | West of Laurel Canyon Blvd. | H | 11,000 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.6 |
| 34 | Strathern Street (Existing with Project) | East of Laurel Canyon Blvd. | H | 10,790 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.5 |
| 35 | Strathern Street (Existing with Project) | West of Lankershim Blvd. | H | 9,780 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.1 |
| 36 | Strathern Street (Existing with Project) | East of Lankershim Blvd. | H | 15,740 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 65.2 |
| 37 | Strathern Street (Existing with Project) | West of Tujunga Ave. | H | 15,040 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 65.0 |
| 38 | Strathern Street (Existing with Project) | East of Tujunga Ave. | H | 11,670 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.9 |
| 39 | Strathern Street (Existing with Project) | West of Vineland Ave. | H | 10,510 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.4 |
| 40 | Strathern Street (Existing with Project) | East of Vineland Ave. | H | 6,130 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 61.1 |
| 41 | Stagg Street (Existing with Project) | West of Lankershim Blvd. | H | 2,450 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 55.5 |
| 42 | Stagg Street (Existing with Project) | East of Lankershim Blvd. | H | 1,830 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 54.3 |
| 43 | Saticoy Street (Existing with Project) | West of Lankershim Blvd. | H | 12,940 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 64.3 |
| 44 | Saticoy Street (Existing with Project) | East of Lankershim Blvd. | H | 11,610 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.9 |
| 45 | Saticoy Street (Existing with Project) | West of Tujunga Ave. | H | 10,500 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.4 |
| 46 | Saticoy Street (Existing with Project) | East of Tujunga Ave. | H | 8,100 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 62.3 |
| 47 | Roscoe Boulevard (Existing with Project) | West of Webb Ave. | H | 25,170 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.4 |
| 48 | Roscoe Boulevard (Existing with Project) | East of Webb Ave. | H | 23,170 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.1 |
| 49 | Laurel Canyon Boulevard (Existing with Project) | North of Strathern St. | H | 18,560 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 67.4 |
| 50 | Laurel Canyon Boulevard (Existing with Project) | South of Strathern St. | H | 17,910 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 67.3 |
| 51 | Webb Avenue (Existing with Project) | North of Roscoe Blvd. | H | 7,530 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 60.1 |
| 52 | Webb Avenue (Existing with Project) | South of Roscoe Blvd. | H | 10,650 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 61.6 |
| 53 | Webb Avenue (Existing with Project) | North of Strathern St. | H | 9,290 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 61.0 |
| 54 | Lankershim Boulevard (Existing with Project) | South of Tuxford St. | H | 21,200 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.7 |
| 55 | Lankershim Boulevard (Existing with Project) | North of Strathern St. | H | 20,030 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.4 |
| 56 | Lankershim Boulevard (Existing with Project) | South of Strathern St. | H | 21,840 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.8 |
| 57 | Lankershim Boulevard (Existing with Project) | North of Stagg St. | H | 22,870 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.0 |
| 58 | Lankershim Boulevard (Existing with Project) | South of Stagg St. | H | 22,410 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.9 |
| 59 | Lankershim Boulevard (Existing with Project) | North of Saticoy St. | H | 22,400 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.9 |
| 60 | Lankershim Boulevard (Existing with Project) | South of Saticoy St. | H | 22,290 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.9 |
| 61 | Tujunga Avenue (Existing with Project) | South of Strathern St. | H | 12,860 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 65.9 |
| 62 | Tujunga Avenue (Existing with Project) | North of Saticoy St. | H | 13,370 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 66.0 |
| 63 | Tujunga Avenue (Existing with Project) | South of Saticoy St. | H | 14,110 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 66.3 |
| 64 | Vineland Avenue (Existing with Project) | South of Strathern St. | H | 22,190 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 68.2 |
| 65 | Strathern Street (Future without Project) | West of Laurel Canyon Blvd. | H | 11,330 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.8 |
| 66 | Strathern Street (Future without Project) | East of Laurel Canyon Blvd. | H | 10,700 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.5 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 67 | Strathern Street (Future without Project) | West of Lankershim Blvd. | H | 9,670 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.1 |
| 68 | Strathern Street (Future without Project) | East of Lankershim Blvd. | H | 15,660 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 65.1 |
| 69 | Strathern Street (Future without Project) | West of Tujunga Ave. | H | 15,190 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 65.0 |
| 70 | Strathern Street (Future without Project) | East of Tujunga Ave. | H | 11,860 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 64.0 |
| 71 | Strathern Street (Future without Project) | West of Vineland Ave. | H | 10,630 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.5 |
| 72 | Strathern Street (Future without Project) | East of Vineland Ave. | H | 6,220 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 61.2 |
| 73 | Stagg Street (Future without Project) | West of Lankershim Blvd. | H | 2,340 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 55.3 |
| 74 | Stagg Street (Future without Project) | East of Lankershim Blvd. | H | 1,800 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 54.2 |
| 75 | Saticoy Street (Future without Project) | West of Lankershim Blvd. | H | 13,660 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 64.6 |
| 76 | Saticoy Street (Future without Project) | East of Lankershim Blvd. | H | 12,280 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 64.1 |
| 77 | Saticoy Street (Future without Project) | West of Tujunga Ave. | H | 11,120 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.7 |
| 78 | Saticoy Street (Future without Project) | East of Tujunga Ave. | H | 8,510 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 62.5 |
| 79 | Roscoe Boulevard (Future without Project) | West of Webb Ave. | H | 26,260 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.6 |
| 80 | Roscoe Boulevard (Future without Project) | East of Webb Ave. | H | 24,310 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.3 |
| 81 | Laurel Canyon Boulevard (Future without Project) | North of Strathern St. | H | 19,220 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 67.6 |
| 82 | Laurel Canyon Boulevard (Future without Project) | South of Strathern St. | H | 18,490 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 67.4 |
| 83 | Webb Avenue (Future without Project) | North of Roscoe Blvd. | H | 7,950 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 60.4 |
| 84 | Webb Avenue (Future without Project) | South of Roscoe Blvd. | H | 11,080 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 61.8 |
| 85 | Webb Avenue (Future without Project) | North of Strathern St. | H | 9,650 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 61.2 |
| 86 | Lankershim Boulevard (Future without Project) | South of Tuxford St. | H | 22,250 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.9 |
| 87 | Lankershim Boulevard (Future without Project) | North of Strathern St. | H | 21,050 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.7 |
| 88 | Lankershim Boulevard (Future without Project) | South of Strathern St. | H | 22,510 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.9 |
| 89 | Lankershim Boulevard (Future without Project) | North of Stagg St. | H | 23,320 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.1 |
| 90 | Lankershim Boulevard (Future without Project) | South of Stagg St. | H | 23,420 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.1 |
| 91 | Lankershim Boulevard (Future without Project) | North of Saticoy St. | H | 23,370 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.1 |
| 92 | Lankershim Boulevard (Future without Project) | South of Saticoy St. | H | 23,430 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.1 |
| 93 | Tujunga Avenue (Future without Project) | South of Strathern St. | H | 13,320 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 66.0 |
| 94 | Tujunga Avenue (Future without Project) | North of Saticoy St. | H | 13,840 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 66.2 |
| 95 | Tujunga Avenue (Future without Project) | South of Saticoy St. | H | 14,710 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 66.4 |
| 96 | Vineland Avenue (Future without Project) | South of Strathern St. | H | 23,370 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 68.4 |
| 97 | Strathern Street (Future with Project) | West of Laurel Canyon Blvd. | H | 11,720 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.9 |
| 98 | Strathern Street (Future with Project) | East of Laurel Canyon Blvd. | H | 11,420 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.8 |
| 99 | Strathern Street (Future with Project) | West of Lankershim Blvd. | H | 10,380 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.4 |
| 100 | Strathern Street (Future with Project) | East of Lankershim Blvd. | H | 16,610 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 65.4 |
| 101 | Strathern Street (Future with Project) | West of Tujunga Ave. | H | 15,840 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 65.2 |
| 102 | Strathern Street (Future with Project) | East of Tujunga Ave. | H | 12,320 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 64.1 |
| 103 | Strathern Street (Future with Project) | West of Vineland Ave. | H | 11,080 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.7 |
| 104 | Strathern Street (Future with Project) | East of Vineland Ave. | H | 6,490 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 61.4 |
| 105 | Stagg Street (Future with Project) | West of Lankershim Blvd. | H | 2,630 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 55.7 |
| 106 | Stagg Street (Future with Project) | East of Lankershim Blvd. | H | 1,960 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 54.6 |
| 107 | Saticoy Street (Future with Project) | West of Lankershim Blvd. | H | 13,780 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 64.6 |
| 108 | Saticoy Street (Future with Project) | East of Lankershim Blvd. | H | 12,370 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 64.1 |
| 109 | Saticoy Street (Future with Project) | West of Tujunga Ave. | H | 11,200 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 63.7 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 110 | Saticoy Street (Future with Project) | East of Tujunga Ave. | H | 8,640 | 5 | Generic - Average Roadway ("Vari | 30 | 50 | 62.6 |
| 111 | Roscoe Boulevard (Future with Project) | West of Webb Ave. | H | 26,450 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.6 |
| 112 | Roscoe Boulevard (Future with Project) | East of Webb Ave. | H | 24,360 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.3 |
| 113 | Laurel Canyon Boulevard (Future with Project) | North of Strathern St. | H | 19,630 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 67.7 |
| 114 | Laurel Canyon Boulevard (Future with Project) | South of Strathern St. | H | 18,910 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 67.5 |
| 115 | Webb Avenue (Future with Project) | North of Roscoe Blvd. | H | 7,950 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 60.4 |
| 116 | Webb Avenue (Future with Project) | South of Roscoe Blvd. | H | 11,220 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 61.8 |
| 117 | Webb Avenue (Future with Project) | North of Strathern St. | H | 9,790 | 4 | Generic - Local (From Local/Lodi) | 25 | 50 | 61.2 |
| 118 | Lankershim Boulevard (Future with Project) | South of Tuxford St. | H | 22,620 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.0 |
| 119 | Lankershim Boulevard (Future with Project) | North of Strathern St. | H | 21,420 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 67.7 |
| 120 | Lankershim Boulevard (Future with Project) | South of Strathern St. | H | 23,340 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.1 |
| 121 | Lankershim Boulevard (Future with Project) | North of Stagg St. | H | 24,400 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.3 |
| 122 | Lankershim Boulevard (Future with Project) | South of Stagg St. | H | 24,050 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.2 |
| 123 | Lankershim Boulevard (Future with Project) | North of Saticoy St. | H | 24,000 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.2 |
| 124 | Lankershim Boulevard (Future with Project) | South of Saticoy St. | H | 23,850 | 1 | Generic - Arterial Roadways (From | 35 | 50 | 68.2 |
| 125 | Tujunga Avenue (Future with Project) | South of Strathern St. | H | 13,510 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 66.1 |
| 126 | Tujunga Avenue (Future with Project) | North of Saticoy St. | H | 14,030 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 66.2 |
| 127 | Tujunga Avenue (Future with Project) | South of Saticoy St. | H | 14,850 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 66.5 |
| 128 | Vineland Avenue (Future with Project) | South of Strathern St. | H | 23,590 | 5 | Generic - Average Roadway ("Vari | 35 | 50 | 68.5 |
| 129 | Construction - Grading | All segments | H | 347 | 13 | Construction Traffic - Grading | 30 | 50 | 59.0 |
| 130 | Construction - Building | All segments | H | 100 | 14 | Construction Traffic - Building | 35 | 50 | 49.1 |

Appendix C
# Construction Vibration Levels

### Construction Vibration Analysis - Potential Building Damage

| Vibration attenuation constant (n): | | 1.1 | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Equipment Item | Reference PPV at 25 feet, in/s [a] | Building Category: | Extremely fragile historic buildings, ruins, ancient monuments | Fragile buildings | Historic and some old buildings | Older residential structures | New residential structures | Modern industrial/ commercial buildings |
| | | Vibration Damage Impact Criteria, PPV, in/s: | 0.08 | 0.1 | 0.25 | 0.3 | 0.5 | 0.5 |
| Large bulldozer[b] | 0.089 | Distance to Impact Criteria, feet: | 28 | 23 | 10 | 9 | 6 | 6 |
| Small bulldozer[c] | 0.003 | | 2 | 2 | 1 | 1 | 1 | 1 |

[a] Obtained from "Transportation and Construction Vibration Guidance Manual", Caltrans 2013

[b] Considered representative of other heavy earthmoving equipment such as excavators, graders, backhoes, etc.

[c] Considered representative of smaller equipment such as mini excavators.

### Construction Vibration Analysis - Human Response, Distance to Criteria

| Vibration attenuation constant (n): | | 1.1 | | | | |
|---|---|---|---|---|---|---|
| Equipment Item | Reference PPV at 25 feet, in/s [a] | Perceptibility: | Barely perceptible | Distinctly perceptible | Strongly perceptible | Severe |
| | | Vibration Damage Impact Criteria, PPV, in/s: | 0.01 | 0.04 | 0.1 | 0.4 |
| Large bulldozer[b] | 0.089 | Distance to Impact Criteria, feet: | 183 | 52 | 23 | 7 |
| Small bulldozer[c] | 0.003 | | 9 | 3 | 2 | 1 |

[a] Obtained from "Transportation and Construction Vibration Guidance Manual", Caltrans 2013

[b] Considered representative of any full size/large excavator, dozer, backhoe, etc.

[c] Considered representative of any small excavator, dozer, backhoe, etc.

**Construction Vibration Analysis**

| Receiver | Distance | Large Mobile [1] | | | Small Mobile [2] | | |
|---|---|---|---|---|---|---|---|
| | | Predicted PPV, in/sec | Building Damage? | Human Response | Predicted PPV, in/sec | Building Damage? | Human Response |
| *Reference Location* | *25* | *0.089* | *N/A (for reference only)* | *N/A (for reference only)* | *0.003* | *N/A (for reference only)* | *N/A (for reference only)* |
| Fast food restaurant (Burger King) | 50 | 0.042 | No | Distinctly perceptible | 0.001 | No | Below barely perceptible |
| SFR - Directly east of, and adjacent to, project site (north of Blythe St.) | 10 | 0.244 | No | Strongly perceptible | 0.008 | No | Below barely perceptible |
| SFR - Directly east of, and adjacent to, project site (south of Blythe St.) | 10 | 0.244 | No | Strongly perceptible | 0.008 | No | Below barely perceptible |
| SFR - Directly south of, and adjacent to, project site | 10 | 0.244 | No | Strongly perceptible | 0.008 | No | Below barely perceptible |
| Automotive repair shop (Schiro's Collision Repairs) | 10 | 0.244 | No | Strongly perceptible | 0.008 | No | Below barely perceptible |

[1] Considered representative of any full size/large excavator, dozer, backhoe, etc.
[2] Considered representative of any small excavator, dozer, backhoe, etc.