Appendix I:
Noise Supporting Information

THIS PAGE INTENTIONALLY LEFT BLANK

FIRSTCARBONSOLUTIONS™

Noise Impact Analysis Report
Baker Travel Stop and Mobile Home Park
Community of Baker, San Bernardino County, California

Prepared for:
Love's Travel Stops and Country Stores
10601 N. Pennsylvania Avenue
Oklahoma City, Oklahoma 73120
801.330.3886

Contact: Kym Van Dyke, Project Manager

Prepared by:
FirstCarbon Solutions
967 Kendall Drive
#A-537
San Bernardino, CA 92407
714.508.4100

Contact: Yael Marcus, Project Manager
Philip Ault, Director of Noise and Air Quality

Date: May 19, 2023

THIS PAGE INTENTIONALLY LEFT BLANK

Table of Contents

List of Tables

List of Exhibits

ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
CBC	California Building Standards Code
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dB	decibel
dBA	A-weighted decibel
DNL	Day-Night Level
EPA	United States Environmental Protection Agency
FCS	FirstCarbon Solutions
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
L_{dn}	day/night average sound level
L_{eq}	equivalent sound level
L_{max}	maximum noise level
L_{min}	minimum noise level
MM	Mitigation Measure
PPV	peak particle velocity
rms	root mean square
RV	Recreational Vehicle
VdB	vibration in decibels

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 1: INTRODUCTION

1.1 - Purpose of Analysis and Study Objectives

This Noise Impact Analysis has been prepared by FirstCarbon Solutions (FCS) to determine the off-site and on-site noise impacts associated with the proposed Love's Travel Stops and Country Stores Project (proposed project). The following is provided in this report:

- A description of the study area, project site, and proposed project.
- Information regarding the fundamentals of noise and vibration.
- A description of the local noise and vibration guidelines and standards.
- A description of the existing noise environment.
- An analysis of the potential short-term, construction-related noise and vibration impacts from the proposed project.
- An analysis of long-term, operations-related noise and vibration impacts from the proposed project.

1.2 - Project Summary

1.2.1 - Site Location

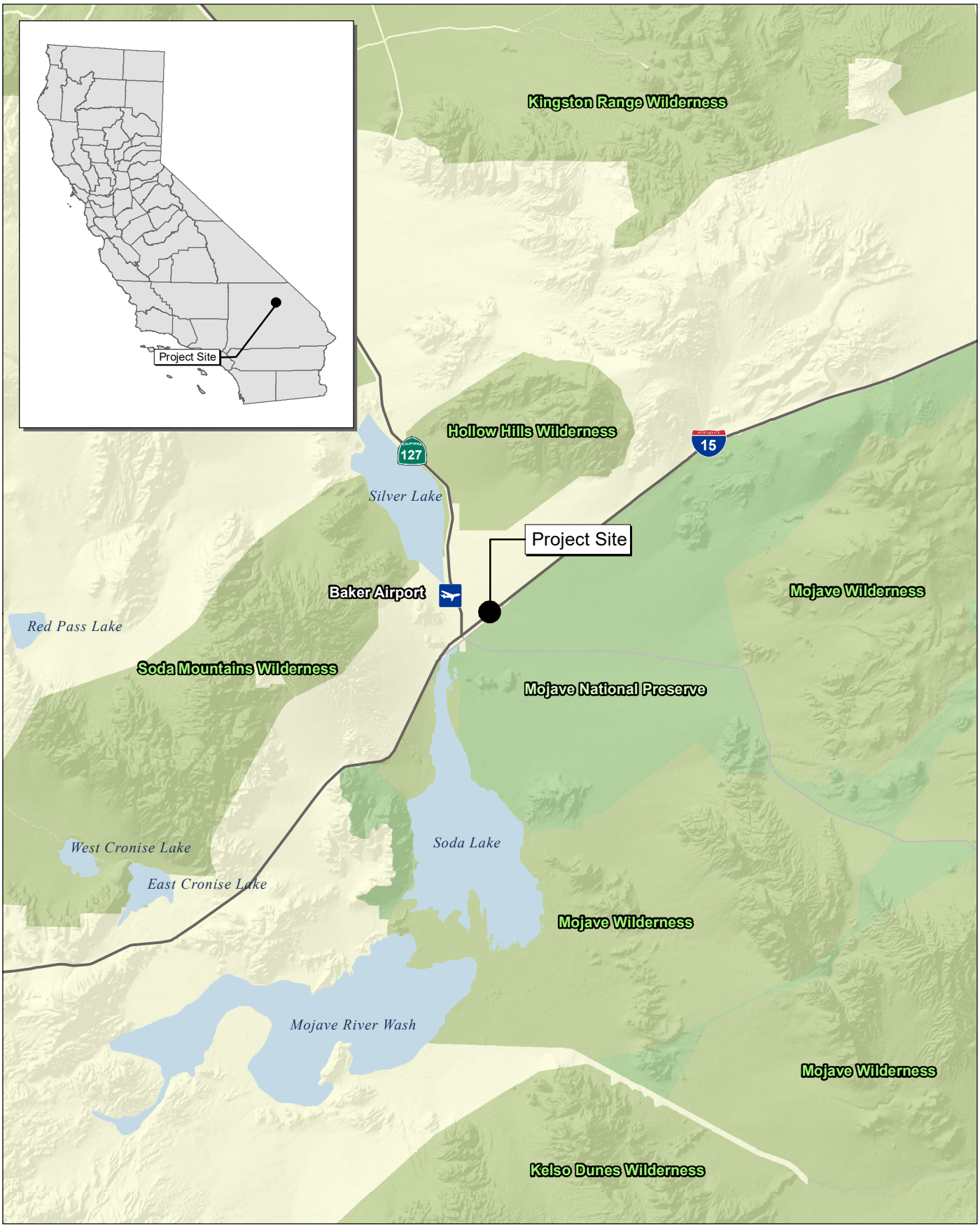
The proposed project is located in the unincorporated community of Baker, which is located just north of the center of San Bernardino County, California (County) (Exhibit 1). The project site is located south and northeast of the intersection of Baker Boulevard and Caltrans Avenue. The project site is located on two vacant parcels. Surrounding the project site are mobile homes and a U.S. Post Office to the north, vacant land to the east, a gas station, fast-food restaurants and a convenience store to the west, and the Interstate 15 (I-15) and Mojave National Preserve to the south.

1.2.2 - Project Description

The proposed project includes two components: a travel stop on a 17.47-acre parcel and a mobile home park on a 2.18-acre parcel (Exhibit 2).

The proposed travel stop would consist of a 12,200-square-foot building, which would include a 9,600-square-foot convenience store, as well as a 2,600-square-foot branded fast-food restaurant (Exhibit 3a). The travel stop would also include an auto fueling island, truck fueling island, truck scale, recreational vehicle (RV) dump station, 5,000-square-foot dog park, and five bioretention areas. Parking features would include 100 overnight truck parking spots, 48 car parking spots (including four Americans with Disabilities Act [ADA] parking spots), three RV parking spots, and 11 overnight RV parking spots. The travel stop would employ approximately 55 people across three shifts and would operate 24 hours a day, 7 days a week, 365 days per year.

The mobile home park would include eight mobile homes. Each mobile home would be approximately 60 feet by 14 feet (Exhibit 3b). Two parking spots would be provided for each mobile home, and four additional visitor parking spots would also be provided. The proposed mobile home park would be surrounded by a 6-foot-tall fence, and access would be provided via two driveways from Silver Lane. An automatic entry gate would be installed at each driveway entrance. The proposed project would also include landscaping throughout the project site and a central landscaped area with two shaded canopies, as well as two bioretention areas.



Source: Census 2000 Data, The California Spatial Information Library (CaSIL). Wilderness Connect.

FIRSTCARBON SOLUTIONS™

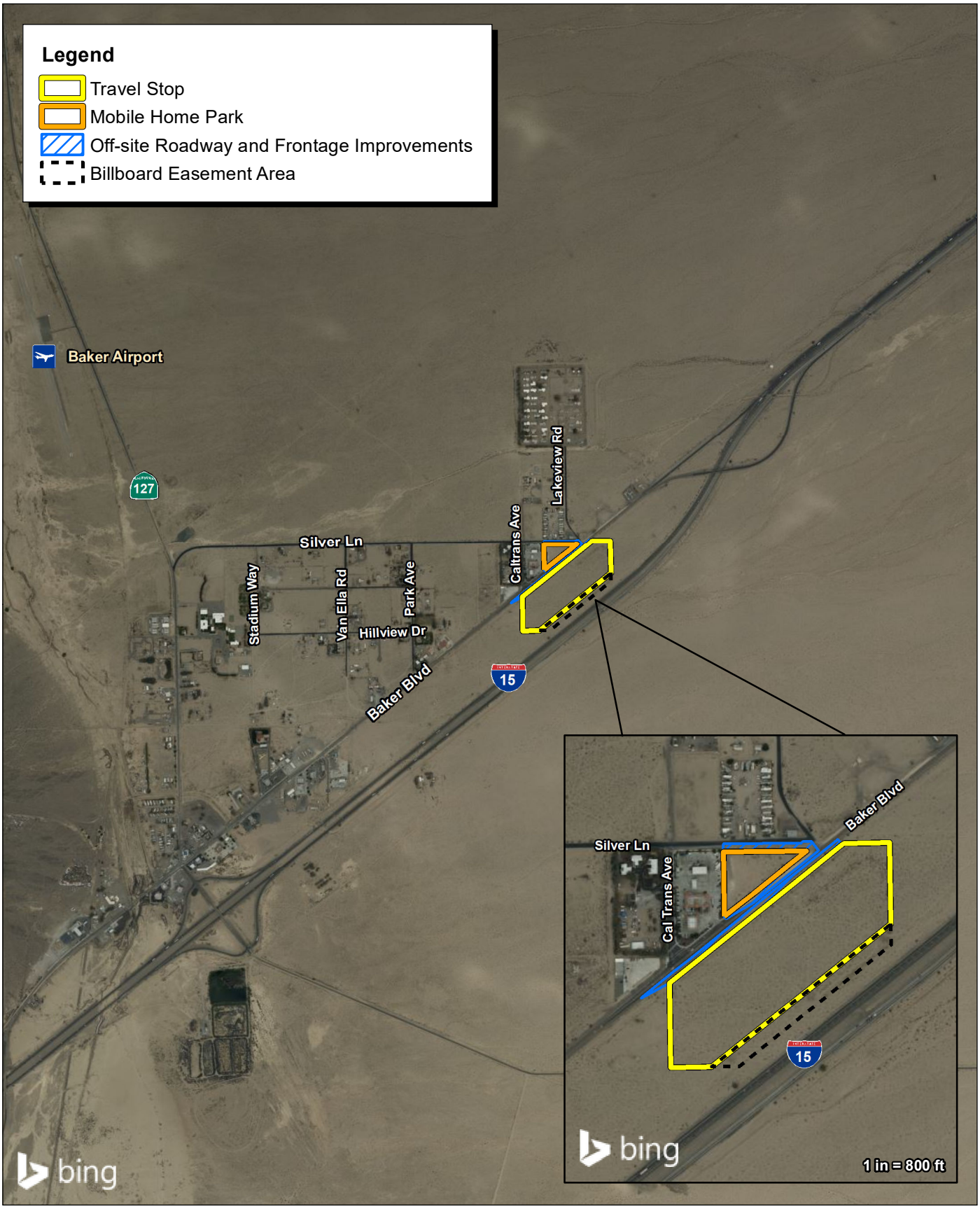
5 2.5 0 5 Miles

Figure 1
Regional Location Map

47670005 • 02/2023 | 1_regional.mxd

SAN BERNARDINO COUNTY
BAKER TRAVEL STOP AND MOBILE HOME PARK
INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

THIS PAGE INTENTIONALLY LEFT BLANK



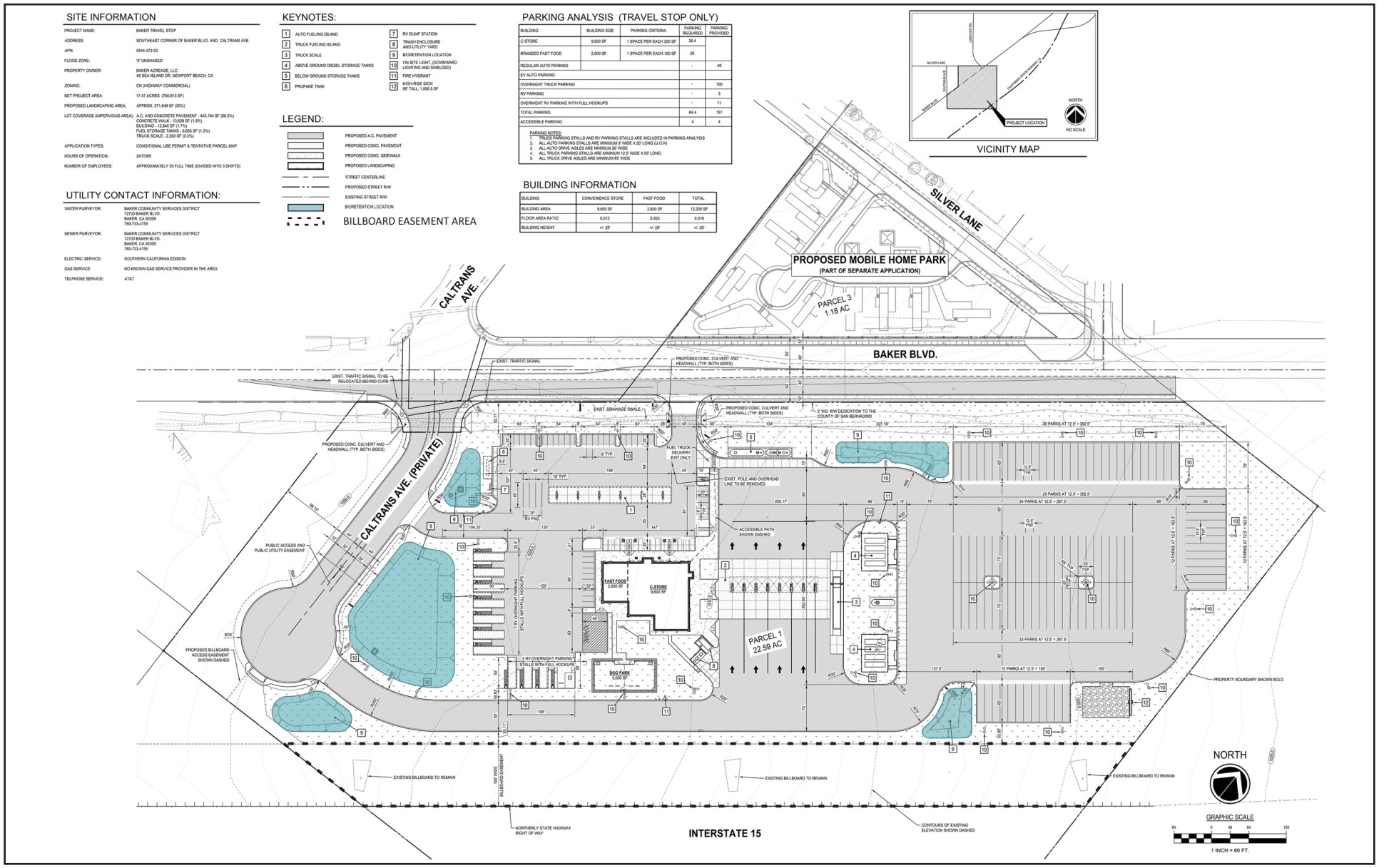
Source: Bing Aerial Imagery. Lane Engineers, Inc., 2023

FIRSTCARBON SOLUTIONS™

2,000 1,000 0 2,000 Feet

Figure 2
Local Vicinity Map

THIS PAGE INTENTIONALLY LEFT BLANK

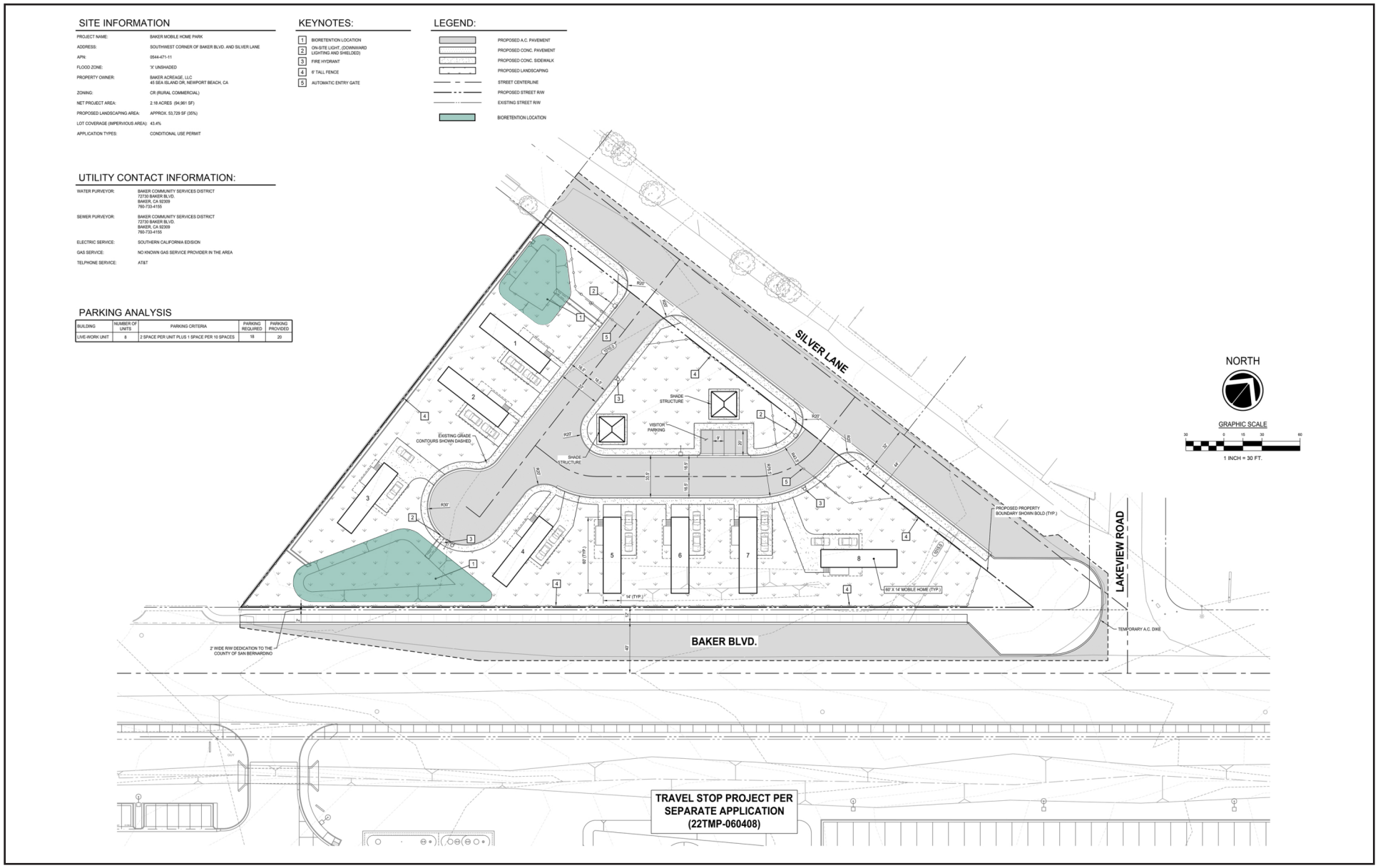


Source: Lane Engineers Inc., 2023.

FIRSTCARBON SOLUTIONS™

Figure 3a
Site Plan: Travel Stop

THIS PAGE INTENTIONALLY LEFT BLANK



Source: Lane Engineers Inc., 10/14/2022.

FIRSTCARBON SOLUTIONS™

Figure 3b
Site Plan: Mobile Home Park

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 2: NOISE AND VIBRATION FUNDAMENTALS

2.1 - Characteristics of Noise

Noise is generally defined as unwanted or objectionable sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm, or when it has adverse effects on health. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and in the extreme, hearing impairment. Noise effects can be caused by pitch or loudness. *Pitch* is the number of complete vibrations or cycles per second of a wave that result in the range of tone from high to low; higher-pitched sounds are louder to humans than lower-pitched sounds. *Loudness* is the intensity or amplitude of sound.

Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit, which expresses the ratio of the sound pressure level being measured to a standard reference level. The 0 point on the dB scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Changes of 3 dB or less are only perceptible in laboratory environments. Audible increases in noise levels generally refer to a change of 3 dB or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. Only audible changes in existing ambient or background noise levels are considered potentially significant.

The human ear is not equally sensitive to all frequencies within the audible sound spectrum, so sound pressure level measurements can be weighted to better represent frequency-based sensitivity of average healthy human hearing. One such specific "filtering" of sound is called "A-weighting." A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies that are audible to the human ear. Because decibels are logarithmic units, they cannot be added or subtracted by ordinary arithmetic means. For example, if one noise source produces a noise level of 70 dB, the addition of another noise source with the same noise level would not produce 140 dB; rather, they would combine to produce a noise level of 73 dB.

As noise spreads from a source, it loses energy so that the farther away the noise receiver is from the noise source, the lower the perceived noise level. Noise levels diminish or attenuate as distance from the source increases based on an inverse square rule, depending on how the noise source is physically configured. Noise levels from a single-point source, such as a single piece of construction equipment at ground level, attenuate at a rate of 6 dB for each doubling of distance (between the single-point source of noise and the noise-sensitive receptor of concern). Heavily traveled roads with few gaps in traffic behave as continuous line sources and attenuate roughly at a rate of 3 dB per doubling of distance.

2.1.1 - Noise Descriptors

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq} and community noise equivalent level (CNEL) or the day/night average sound level (L_{dn}) based on dBA. CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally exchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours.

Other noise rating scales of importance when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis are specified in terms of maximum levels denoted by L_{max} for short-term noise impacts. L_{max} reflects peak operating conditions and addresses the annoying aspects of intermittent noise.

2.1.2 - Noise Propagation

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source, as well as ground absorption, atmospheric conditions (wind, temperature gradients, and humidity) and refraction, and shielding by natural and manmade features. Sound from point sources, such as an air conditioning condenser, a piece of construction equipment, or an idling truck, radiates uniformly outward as it travels away from the source in a spherical pattern.

The attenuation or sound drop-off rate is dependent on the conditions of the land between the noise source and receiver. To account for this ground-effect attenuation (absorption), two types of site conditions are commonly used in noise models: soft-site and hard-site conditions. Soft-site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. For point sources, a drop-off rate of 7.5 dBA per each doubling of the distance (dBA/DD) is typically observed over soft ground with landscaping, as compared with a 6 dBA/DD drop-off rate over hard ground such as asphalt, concrete, stone, and very hard packed earth. For line sources, such as traffic noise on a roadway, a 4.5 dBA/DD is typically observed for soft-site conditions compared to the 3 dBA/DD drop-off rate for hard-site conditions. Table 1 briefly defines these measurement descriptors and other sound terminology used in this section.

Table 1: Sound Terminology

Term	Definition
Sound	A vibratory disturbance created by a vibrating object which, when transmitted by pressure waves through a medium such as air, can be detected by a receiving mechanism such as the human ear or a microphone.
Noise	Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
Ambient Noise	The composite of noise from all sources near and far in a given environment.
Decibel (dB)	A unitless measure of sound on a logarithmic scale, which represents the squared ratio of sound pressure amplitude to a reference sound pressure. The reference pressure is 20 micropascals, representing the threshold of human hearing (0 dB).
A-Weighted Decibel (dBA)	An overall frequency-weighted sound level that approximates the frequency response of the human ear.
Equivalent Noise Level (L_{eq})	The average sound energy occurring over a specified time period. In effect, L_{eq} is the steady-state sound level that in a stated period would contain the same acoustical energy as the time-varying sound that actually occurs during the same period.
Maximum and Minimum Noise Levels (L_{max} and L_{min})	The maximum or minimum instantaneous sound level measured during a measurement period.
Day-Night Level (DNL or L_{dn})	The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring between 10:00 p.m. and 7:00 a.m. (nighttime).
Community Noise Equivalent Level (CNEL)	The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added to the A-weighted sound levels occurring between 7:00 p.m. and 10:00 p.m. and 10 dB added to the A-weighted sound levels occurring between 10:00 p.m. and 7:00 a.m.
Source: Data compiled by FirstCarbon Solutions (FCS) 2023.	

2.1.3 - Traffic Noise

The level of traffic noise depends on the three primary factors: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater number of trucks. Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires. Because of the logarithmic nature of noise levels, a doubling of the traffic volume (assuming that the speed and truck mix do not

change) results in a noise level increase of 3 dBA. Based on the Federal Highway Administration (FHWA) community noise assessment criteria, this change is "barely perceptible." For reference, a doubling of perceived noise levels would require an increase of approximately 10 dBA. The truck mix on a given roadway also has an effect on community noise levels. As the number of heavy trucks increases and becomes a larger percentage of the vehicle mix, adjacent noise levels increase.

2.1.4 - Stationary Noise

A stationary noise producer is any entity in a fixed location that emits noise. Examples of stationary noise sources include machinery, engines, energy production, and other mechanical or powered equipment and activities such as loading and unloading or public assembly that may occur at commercial, industrial, manufacturing, or institutional facilities. Furthermore, while noise generated by the use of motor vehicles over public roads is preempted from local regulation, the use of these vehicles is considered a stationary noise source when operated on private property such as at a construction site, a truck terminal, or warehousing facility.

The effects of stationary noise depend on factors such as characteristics of the equipment and operations, distance and pathway between the generator and receptor, and weather. Stationary noise sources may be regulated at the point of manufacture (e.g., equipment or engines), with limitations on the hours of operation, or with provision of intervening structures, barriers, or topography.

Construction activities are a common source of stationary noise. Construction-period noise levels are higher than background ambient noise levels but eventually cease once construction is complete. Construction is performed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on each construction site and, therefore, would change the noise levels as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 2 shows typical noise levels of construction equipment as measured at a distance of 50 feet from the operating equipment.

Table 2: Typical Construction Equipment Maximum Noise Levels, L_{max}

Type of Equipment	Impact Device? (Yes/No)	Specification Maximum Sound Levels for Analysis (dBA at 50 feet)
Impact Pile Driver	Yes	95
Auger Drill Rig	No	85
Vibratory Pile Driver	No	95
Jackhammers	Yes	85
Pneumatic Tools	No	85
Pumps	No	77
Scrapers	No	85
Cranes	No	85
Portable Generators	No	82

Type of Equipment	Impact Device? (Yes/No)	Specification Maximum Sound Levels for Analysis (dBA at 50 feet)
Rollers	No	85
Bulldozers	No	85
Tractors	No	84
Front-end Loaders	No	80
Backhoe	No	80
Excavators	No	85
Graders	No	85
Air Compressors	No	80
Dump Truck	No	84
Concrete Mixer Truck	No	85
Pickup Truck	No	55

Notes:
dBA = A-weighted decibel
Source: Federal Highway Administration (FHWA). 2006. Highway Construction Noise Handbook. Accessed May 2023.

2.1.5 - Noise from Multiple Sources

Because sound pressure levels in decibels are based on a logarithmic scale, they cannot be added or subtracted in the usual arithmetical way. Therefore, sound pressure levels in decibels are logarithmically added on an energy summation basis. In other words, adding a new noise source to an existing noise source, both producing noise at the same level, will not double the noise level. Instead, if the difference between two noise sources is 10 dBA or more, the louder noise source will dominate, and the resultant noise level will be equal to the noise level of the louder source. In general, if the difference between two noise sources is 0–1 dBA, the resultant noise level will be 3 dBA higher than the louder noise source, or both sources if they are equal. If the difference between two noise sources is 2–3 dBA, the resultant noise level will be 2 dBA above the louder noise source. If the difference between two noise sources is 4–10 dBA, the resultant noise level will be 1 dBA higher than the louder noise source.

2.2 - Characteristics of Groundborne Vibration and Noise

Groundborne vibration consists of rapidly fluctuating motion through a solid medium, specifically the ground, which has an average motion of zero and in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. The effects of groundborne vibration typically only cause a nuisance to people, but in extreme cases, excessive groundborne vibration has the potential to cause structural damage to buildings. Although groundborne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Groundborne noise is an effect of groundborne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude such as the maximum instantaneous peak in the vibrations velocity, which is known as the peak particle velocity (PPV) or the root mean square (rms) amplitude of the vibration velocity. Because of the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels—denoted as LV—and is based on the reference quantity of 1 microinch per second. To distinguish these vibration levels referenced in decibels from noise levels referenced in decibels, the unit is written as "VdB."

Although groundborne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. When assessing annoyance from groundborne vibration, vibration is typically expressed as rms velocity in units of decibels of 1 microinch per second, with the unit written in VdB. Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. Human perception of vibration starts at levels as low as 67 VdB. Annoyance due to vibration in residential settings starts at approximately 70 VdB.

Off-site sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible groundborne noise or vibration. Construction activities, such as blasting, pile driving and operating heavy earthmoving equipment, are common sources of groundborne vibration. Construction vibration impacts on building structures are generally assessed in terms of PPV. Typical vibration source levels from construction equipment are shown in Table 3.

Table 3: Vibration Levels of Construction Equipment

Construction Equipment	PPV at 25 feet (inches/second)	rms Velocity in Decibels (VdB) at 25 feet
Water Trucks	0.001	57
Scraper	0.002	58
Bulldozer—small	0.003	58
Jackhammer	0.035	79
Concrete Mixer	0.046	81
Concrete Pump	0.046	81
Paver	0.046	81
Pickup Truck	0.046	81
Auger Drill Rig	0.051	82
Backhoe	0.051	82
Crane (Mobile)	0.051	82
Excavator	0.051	82
Grader	0.051	82
Loader	0.051	82
Loaded Trucks	0.076	86

Construction Equipment	PPV at 25 feet (inches/second)	rms Velocity in Decibels (VdB) at 25 feet
Bulldozer—large	0.089	87
Caisson drilling	0.089	87
Vibratory Roller–small	0.101	88
Compactor	0.138	90
Clam shovel drop	0.202	94
Vibratory Roller–large	0.210	94
Pile Driver (impact-typical)	0.644	104
Pile Driver (impact-upper range)	1.518	112

Notes:
PPV = peak particle velocity
Source: Compilation of scientific and academic literature, generated by the Federal Transit Administration (FTA) and Federal Highway Administration (FHWA).

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. Factors that influence groundborne vibration include:

- **Vibration source:** Type of activity or equipment, such as impact or mobile, and depth of vibration source.
- **Vibration path:** Soil type, rock layers, soil layering, depth to water table, and frost depth.
- **Vibration receiver:** Foundation type, building construction, and acoustical absorption.

Among these factors that influence groundborne vibration, there are significant differences in the vibration characteristics when the source is underground compared to at the ground surface. In addition, soil conditions are 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 and the depth of bedrock. Vibration propagation is more efficient in stiff clay soils than in loose sandy soils, and shallow rock seems to concentrate the vibration energy close to the surface and can result in groundborne vibration problems at large distance from the source. Factors such as layering of the soil and depth to the water table can have significant effects on the propagation of groundborne vibration. Soft, loose, sandy soils tend to attenuate more vibration energy than hard, rocky materials. Vibration propagation through groundwater is more efficient than through sandy soils. There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry

energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil type, but it has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests. The vibration level (calculated below as "PPV") at a distance from a point source can generally be calculated using the vibration reference equation:

$$PPV = PPV_{ref} * (25/D)^n \text{ (in/sec)}$$

Where:

PPV_{ref} = reference measurement at 25 feet from vibration source
D = distance from equipment to property line
n = vibration attenuation rate through ground

According to Section 7 of the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual, an "n" value of 1.5 is recommended to calculate vibration propagation through typical soil conditions.[1]

[1] Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. Website: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed May 16, 2023.

SECTION 3: REGULATORY SETTING

3.1 - Federal Regulations

3.1.1 - United States Environmental Protection Agency

In 1972, Congress enacted the Noise Control Act. This act authorized the United States Environmental Protection Agency (EPA) to publish descriptive data on the effects of noise and establish levels of sound "requisite to protect the public welfare with an adequate margin of safety." These levels are separated into health (hearing loss levels) and welfare (annoyance levels) categories, as shown in Table 4. The EPA cautions that these identified levels are not standards because they do not take into account the cost or feasibility of the levels.

For protection against hearing loss, 96 percent of the population would be protected if sound levels are less than or equal to an $L_{eq(24)}$ of 70 dBA. The EPA activity and interference guidelines are designed to ensure reliable speech communication at about 5 feet in the outdoor environment. For outdoor and indoor environments, interference with activity and annoyance should not occur if levels are below 55 dBA and 45 dBA, respectively.

Table 4: Summary of EPA Recommended Noise Levels to Protect Public Welfare

Effect	Level	Area
Hearing loss	$L_{eq}(24) \leq 70$ dB	All areas
Outdoor activity interference and annoyance	$L_{dn} \leq 55$ dB	Outdoors in residential areas, farms, and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	$L_{eq}(24) \leq 55$ dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{eq} \leq 45$ dB	Indoor residential areas.
	$L_{eq}(24) \leq 45$ dB	Other indoor areas with human activities such as schools, etc.

Notes:
dB = decibel
L_{eq} = equivalent sound level
L_{dn} = day/night average sound level
(24) signifies an L_{eq} duration of 24 hours.
Source: United States Environmental Protection Agency (EPA). 1978. Protective Noise Levels, EPA 550/9-79-100.

3.1.2 - Federal Transit Administration

The FTA has established industry accepted standards for vibration impact criteria and impact assessment. These guidelines are published in its Transit Noise and Vibration Impact Assessment

Manual.[2] The FTA guidelines include thresholds for construction vibration impacts for various structural categories as shown in Table 5.

Table 5: Federal Transit Administration Construction Vibration Impact Criteria

Building Category	PPV (in/sec)	Approximate VdB
I. Reinforced—Concrete, Steel, or Timber (no plaster)	0.5	102
II. Engineered Concrete and Masonry (no plaster)	0.3	98
III. Non-engineered Timber and Masonry Buildings	0.2	94
IV. Buildings Extremely Susceptible to Vibration Damage	0.12	90

Notes:
PPV = peak particle velocity
rms = root mean square
VdB = vibration measured as rms velocity in decibels of 1 microinch per second
Source: Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. September.

3.2 - State Regulations

The State of California has established regulations that help prevent adverse impacts to occupants of buildings located near noise sources. Referred to as the "State Noise Insulation Standard," it requires buildings to meet performance standards through design and/or building materials that would offset any noise source in the vicinity of the receptor. State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are found in the California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Standards Code [CBC]), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor-ceiling assemblies must block or absorb sound. For limiting noise from exterior noise sources, the noise insulation standards set an interior standard of 45 dBA CNEL in any habitable room with all doors and windows closed. In addition, the standards require preparation of an acoustical analysis demonstrating the manner in which dwelling units have been designed to meet this interior standard, where such units are proposed in an area with exterior noise levels greater than 60 dBA CNEL.

The proposed project does not include any type of hotel or multi-family residential development. Therefore, these standards are not applicable to the proposed project. However, the State has established land use compatibility guidelines for determining acceptable noise levels for specified land uses, including mobile home and commercial type land uses such as the proposed project, which the County has adopted as described below.

[2] Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. Website: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed May 16, 2023.

3.3 - Local Regulations

The project site is located within the census-designated place of Baker, in San Bernardino County, California. The County addresses noise in the San Bernardino County Policy Plan. The San Bernardino County Development Code establishes the County's noise performance standards for stationary sources.

3.3.1 - San Bernardino County Policy Plan Hazards Element

The County addresses noise and the management of community noise exposure in the Hazards Element of its Policy Plan. To address these noise sources found in the County, the following noise policies have been identified in the General Plan Hazards Element:[3]

Policy HZ-2.7 Truck delivery areas

We encourage truck delivery areas to be located away from residential properties and require associated noise impacts to be mitigated.

Policy HZ-2.8 Proximity to noise generating uses

We limit or restrict new noise-sensitive land uses in proximity to existing conforming noise generating uses and planned industrial areas.

Policy HZ-2.9 Control sound at the source

We prioritize noise mitigation measures that control sound at the source before buffers, soundwalls, and other perimeter measures.

3.3.2 - San Bernardino County Development Code

The County establishes noise standards for adjacent stationary noise sources in Chapter 83 of the San Bernardino County Development Code. These standards are reproduced in Table 6. The noise standards for stationary noise sources that most closely apply to the proposed project are residential and commercial. Under these designations, 55 dBA L_{eq} is the maximum stationary noise level as it affects adjacent residential properties between the hours of 7:00 a.m. to 10:00 p.m.

Table 6: Noise Standards for Stationary Noise Sources

Noise Level (dBA L_{eq})		
Receiving Land Use Category	**7:00 a.m. to 10:00 p.m.**	**10:00 p.m. to 7:00 a.m.**
Residential	55	45
Professional Services	55	55
Other Commercial	60	60

[3] County of San Bernardino. 2019. San Bernardino Countywide Plan, Hazards Element, Noise Section. Website: https://countywideplan.com/policy-plan/hazards/?expand_all=true#5d7486fc11676. Accessed May 16, 2023.

Noise Level (dBA L_{eq})		
Receiving Land Use Category	**7:00 a.m. to 10:00 p.m.**	**10:00 p.m. to 7:00 a.m.**
Industrial	70	70

Notes:
dBA = A-weighted decibel
L_{eq} = equivalent sound level
Source: County of San Bernardino. 2007. San Bernardino County Development Code, Chapter 83. Website: https://codelibrary.amlegal.com/codes/sanbernardino/latest/sanberncty_ca/0-0-0-169172#JD_83.01.080. Accessed May 16, 2023.

Additionally, the San Bernardino County Development Code also establishes interior and exterior noise level performance standards for adjacent mobile noise sources. There is no exterior operational noise level standard for commercial retail, bank, or restaurants, but the interior noise level standard is 50 dBA L_{dn}. For mobile homes, the interior operational noise level standard is 45 dBA L_{dn} and the exterior operational noise level standard is 60 dBA L_{dn}.

For construction activity, except for emergency work, the County prohibits any person from operating, or causing to be operated, construction equipment between 7:00 p.m. and 7:00 a.m.

Vibration is limited to that which cannot be felt without the aid of instruments at or beyond the lot line, and that which does not produce a particle velocity greater than or equal to 0.2 inch per second at the lot line. Construction vibration is exempt from this limit between the hours of 7:00 a.m. and 7:00 p.m. except on Sundays and federal holidays.[4]

[4] County of San Bernardino. 2007. San Bernardino County Development Code, Chapter 83. Website: https://codelibrary.amlegal.com/codes/sanbernardino/latest/sanberncty_ca/0-0-0-169172#JD_83.01.080. Accessed May 16, 2023.

SECTION 4: EXISTING NOISE CONDITIONS

The following section describes the existing ambient noise environment of the project vicinity.

4.1 - Existing Ambient Noise Levels

The project site is located within Baker, in San Bernardino County, California. Surrounding the project site are mobile homes and a U.S. Post Office to the north, vacant land to the east, a gas station, fast-food restaurants and a convenience store to the west, and the I-15 and Mojave National Preserve to the south. The dominant noise source in the project vicinity is traffic noise from I-15, which runs along the southern boundary of the project site.

The existing noise environment in the project vicinity was documented through ambient noise monitoring. Noise monitoring was conducted at four locations, and the noise measurement data sheets are included in Appendix A. Four short-term noise measurements (15 minutes each) were taken on Wednesday, April 19, 2023. The short-term noise measurements were taken between approximately 12:30 p.m. and 2:00 p.m. The noise measurement data sheets are provided in Appendix A of this report.

4.1.1 - Short-term Noise Measurements

The short-term noise measurements taken at the project site are summarized in Table 7. The noise measurements indicate that daytime ambient noise levels range from 52.0 dBA to 62.2 dBA L_{eq} at nearby residential land uses in the project vicinity. The noise technician observed that the dominant noise sources in the project vicinity are traffic noise on local roadways, though noises from animals and landscaping maintenance were also observed.

Table 7: Existing Ambient Noise Levels in the Project Vicinity

Site Location	Location Description	dBA	Primary Noise Sources
ST-1	Near Silver Lane, south of the mobile home park	52.0 L_{eq}	Traffic from Baker Boulevard and I-15, animal noises, landscaping maintenance.
ST-2	Near intersection of Lakeview Road and Silver Lane, south of the mobile home park	62.2 L_{eq}	Traffic from Baker Boulevard, Silver Lane, and I-15. Some landscaping maintenance noises.
ST-3	South of intersection of Lakeview Road and Baker Boulevard	54.6 L_{eq}	Traffic from Baker Boulevard and I-15.
ST-4	South of intersection of Caltrans Avenue and Baker Boulevard	56.8 L_{eq}	Traffic from Baker Boulevard and I-15.

Notes:
dBA = A-weighted decibel
L_{eq} = equivalent sound level
Source: FirstCarbon Solutions (FCS) 2023.

4.2 - Existing Traffic Noise Levels

Existing traffic noise levels along selected roadway segments in the project vicinity were modeled using the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). Site-specific information is entered, such as roadway traffic volumes, roadway active width, source-to-receiver distances, travel speed, noise source and receiver heights, and the percentages of automobiles, medium trucks, and heavy trucks that the traffic is made up of throughout the day, among other variables. The average daily traffic volumes were calculated by multiplying the PM peak-hour volumes by a factor of 10. The PM peak-hour volumes were obtained from the level of service assessment prepared for the project by CR Associates.[5] The traffic volumes described here correspond to the existing without project conditions traffic scenario as described in the transportation level of service assessment. The model inputs and outputs—including the 60 dBA, 65 dBA, and 70 dBA L_{dn} noise contour distances—are provided in Appendix B of this report. A summary of the modeling results is shown in Table 8.

Table 8: Existing Traffic Noise Levels

Roadway Segment	Approximate ADT	Centerline to 70 L_{dn} (feet)	Centerline to 65 L_{dn} (feet)	Centerline to 60 L_{dn} (feet)	L_{dn} (dBA) 50 feet from Centerline of Outermost Lane
Baker Boulevard–Death Valley Road to Mojave Pointe Road	2,700	< 50	< 50	63	60.7
Baker Boulevard–Mojave Pointe Road to Park Avenue	2,700	< 50	< 50	63	60.1
Baker Boulevard–Park Avenue to Caltrans Avenue	3,000	< 50	< 50	69	60.1
Baker Boulevard–Caltrans Avenue to Lakeview Road	2,600	< 50	< 50	65	59.1

Notes:
ADT = Average Daily Traffic
dBA = A-weighted decibel
L_{dn} = day/night average sound level
[1] Modeling results do not take into account mitigating features such as topography, vegetative screening, fencing, building design, or structure screening. Rather, it assumes a worst-case of having a direct line of sight on flat terrain.
Source: FirstCarbon Solutions (FCS) 2023.

Note that the Table 8 noise levels are indicative of traffic along Baker Boulevard only – they do not consider the effect of noise from nearby I-15. According to Figure HZ-7 of the San Bernardino County Policy Plan, noise levels may be as high as 70 dBA CNEL within a few hundred feet of I-15 and 65 dBA CNEL within roughly 700 feet of I-15. These contours include a significant portion of the project site and suggest that noise levels along Baker Boulevard may be a couple decibels higher than the noise levels shown in Table 8.

[5] CR Associates. 2022. Love's Travel Center in Baker Draft Level of Service Assessment.

SECTION 5: THRESHOLDS OF SIGNIFICANCE AND IMPACT ANALYSIS

5.1 - Thresholds of Significance

According to California Environmental Quality Act (CEQA) Guidelines Appendix G, to determine whether impacts related to noise and vibration are significant environmental effects, the following questions are analyzed and evaluated.

Would the proposed plan:

a) Generate 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) Generate 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 two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

5.2 - Substantial Noise Increase in Excess of Standards

5.2.1 - Construction Noise Impacts

For the purposes of this analysis, a significant impact would occur if construction activities would result in a substantial temporary increase in ambient noise levels in excess of the County's applicable noise standards. Construction noise is exempt from the County's noise performance thresholds, shown in Table 6 above, for construction activities that occur between the hours of 7:00 a.m. and 7:00 p.m., Monday through Saturday. No construction exemption is permitted on Sundays and federal holidays. Any construction activity outside of these hours would be required to meet the noise performance thresholds shown in Table 6 above for each identified receiving land use. For example, for receiving residential land uses, the noise level must not exceed 55 dBA L_{eq} between the hours of 7:00 a.m. and 10:00 p.m., and the noise level must not exceed 45 dBA L_{eq} between the hours of 10:00 p.m. and 7:00 a.m.

Construction-related Traffic Noise

Noise impacts from construction activities associated with the project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. One type of short-term noise impact that could occur during project construction would result from the increase in traffic flow on local streets, associated with the transport of workers, equipment, and materials to and from the project site. The transport of workers and construction equipment and materials to the project site would incrementally increase noise levels on access roads leading to the site. Because workers and construction equipment would use existing routes, noise from passing trucks would be similar to

existing vehicle-generated noise on these local roadways. Typically, a doubling of the Average Daily Traffic (ADT) hourly volumes on a roadway segment is required in order to result in an increase of 3 dBA in traffic noise levels; which, as discussed in the characteristics of nose discussion above, is the lowest change that can be perceptible to the human ear in outdoor environments. Project-related construction trips would not be expected to double the hourly or daily traffic volumes along any roadway segment in the project vicinity. For this reason, short-term intermittent noise from construction trips would not be expected to result in a perceptible increase in hourly- or daily-average traffic noise levels in the project vicinity. Therefore, short-term construction-related noise impacts associated with the transportation of workers and equipment to the project site would be less than significant.

Construction Equipment Operational Noise

Construction of the proposed project would generate noise during the approximately 2-month schedule of site clearing, grading, building construction, and other construction activities. Noise from grading activities is typically the foremost concern when evaluating a project's construction noise impact, as grading activities often require extensive use of heavy-duty, diesel-powered earthmoving equipment. For the proposed project, grading would have the greatest (and noisiest)construction equipment requirements, as a fleet of grading vehicles would be required to rough grade the project site parcels. Other construction phases would have reduced equipment requirements and/or would involve less daily usage of equipment. Given these considerations, the following analysis assesses noise impacts that may result from the proposed project's grading activities.

Grading for the proposed project is estimated to last approximately 12 months. The bulk of grading activities would be characterized by extensive use of a grader and bulldozer, which would be utilized across the project site to remove vegetation and level the site. Other grading vehicles, such as excavators, would not be as loud as these vehicles and/or would be utilized on a more intermittent basis. Given these considerations, noise impacts associated with the proposed project's grading activities have been evaluated by modeling the construction noise level that would be associated with a grader and a bulldozer grading a half-acre parcel of land (which is roughly equivalent to the area of grading that may occur on a single workday), then estimating construction noise levels at the nearby mobile home park based on its approximately 70-foot distance from this parcel. Put simply, the modeling estimates noise levels that would occur at the mobile home park based on a grader and a bulldozer operating for an entire workday at the project site that is directly south of the mobile home park. Noise levels are estimated to be 72.5 dBA L_{eq} at the southernmost residences located within the mobile home park. However, as noted, this noise level is reflective of a grader and bulldozer operating directly south of the mobile home park at minimum distances. The project site consists of over 19 acres, meaning that most construction activities would occur at greater distances than this modeling scenario. Further, most construction activities would utilize less noisy construction equipment. Therefore, on most days, the noise impact would be considerably less than this 72.5 dBA L_{eq} "worst-case" impact.

Although there could be a relatively high single event noise exposure potential causing an intermittent noise nuisance, the effect of construction activities on longer-term (hourly or daily)

ambient noise levels would be small but could result in a temporary increase in ambient noise levels in the project vicinity that could result in annoyance or sleep disturbance of nearby sensitive receptors, if construction were to occur during nighttime hours.

Chapter 83 of the San Bernardino County Development Code exempts construction noise from noise level standards between the hours of 7:00 a.m. and 7:00 p.m., except on Sundays and federal holidays. However, if construction activity were to occur outside of these hours, construction noise levels would need to be reduced to not exceed 55 dBA L_{eq} between the hours of 7:00 a.m. and 10:00 p.m. and 45 dBA L_{eq} between the hours of 10:00 p.m. and 7:00 a.m. Therefore, restricting construction activity to daytime hours, as well as implementing the best management noise reduction techniques and practices outlined in Mitigation Measure (MM) NOI-1, would ensure that construction noise would not result in a substantial temporary increase in ambient noise levels that would result in annoyance or sleep disturbance of nearby sensitive receptors, and would ensure construction activity noise levels would not exceed the County's nighttime noise level standard. Therefore, with implementation of MM NOI-1, temporary construction noise impacts would be reduced to less than significant.

5.2.2 - Mobile Source Operational Noise Impacts

A significant impact would occur if project-generated traffic would result in a substantial increase in ambient noise levels compared with those that would exist without the project. A characteristic of noise is that the lowest audible increase in noise levels generally refers to a change of 3 dBA, as this level has been found to be barely perceptible to the human ear in outdoor environments; while a change of 5 dBA is considered a readily perceptible change to the human ear in outdoor environments. Therefore, for the purposes of this analysis, a significant impact would occur if the proposed project would cause the L_{dn} to increase by 5 dBA or greater.

Table 9 shows a summary of the traffic noise levels for Existing, Near-Term Year 2024, Near-Term Year 2024 with Project, Horizon Year 2040, and Horizon Year 2040 with Project traffic noise conditions as measured at 50 feet from the centerline of the outermost travel lane.

Table 9: Traffic Noise Increase Summary

Roadway Segment	Near-Term Year 2024 (dBA) L_{dn}	Near-Term Year 2024 + Project (dBA) L_{dn}	Increase over Near-Term Year 2024 (dBA)	Horizon Year 2040 (dBA) L_{dn}	Horizon Year 2040 + Project (dBA) L_{dn}	Increase over Horizon Year 2040 (dBA)
Baker Boulevard–Death Valley Road to Mojave Pointe Road	61.2	64.5	3.3	62.9	65.4	2.5
Baker Boulevard–Mojave Pointe Road to Park Avenue	60.5	63.8	3.3	62.2	64.7	2.5
Baker Boulevard–Park Avenue to Caltrans Avenue	60.4	63.5	3.1	62.0	64.4	2.4
Baker Boulevard–Caltrans Avenue to Lakeview Road	59.4	61.5	2.1	61.4	62.9	1.5

Roadway Segment	Near-Term Year 2024 (dBA) L_{dn}	Near-Term Year 2024 + Project (dBA) L_{dn}	Increase over Near-Term Year 2024 (dBA)	Horizon Year 2040 (dBA) L_{dn}	Horizon Year 2040 + Project (dBA) L_{dn}	Increase over Horizon Year 2040 (dBA)
Notes: dBA = A-weighted decibel L_{dn} = day/night average sound level Source: FirstCarbon Solutions (FCS) 2023.						

As shown in Table 9, the highest traffic noise level increase along Baker Boulevard with implementation of the proposed project would occur from Death Valley Road (State Route 27) to Park Avenue, under Near-Term with Project traffic conditions. Along this roadway segment, the proposed project would result in an increase in traffic noise levels of 3.3 dBA over conditions without the project for this roadway segment. This increase is below the 5 dBA increase that would be considered a substantial permanent increase in noise levels compared with noise levels that would exist without the project. Therefore, project-related traffic noise levels would not result in a substantial permanent increase in traffic noise levels in excess of applicable standards and would represent a less than significant impact.

5.2.3 - Stationary Source Operational Noise Impacts

A significant impact would occur if operational noise levels generated by stationary noise sources at the project site would result in a substantial permanent increase in ambient noise levels in excess of any of the noise performance thresholds established in the County's Development Code. The County's Development Code establishes exterior noise level standards, measured as a cumulative of 30 minutes in any 1-hour time period, of 55 dBA during daytime hours between 7:00 a.m. and 10:00 p.m., and 45 dBA during nighttime hours between 10:00 p.m. and 7:00 a.m.

In addition to the hourly average standards shown in Table 6, above, the County has also established interior and exterior operational noise level standards for each land use. For commercial land uses, the interior operational noise levels must not exceed 50 dBA L_{dn}. For mobile homes, the interior operational noise levels must not exceed 45 dBA L_{dn} and the exterior operational noise levels must not exceed 60 dBA L_{dn}.

As noted in the characteristics of noise discussion, audible increases in noise levels generally refer to a change of 3 dBA or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. A change of 5 dBA is considered the minimum readily perceptible change to the human ear in outdoor environments. Therefore, for purposes of this analysis, an increase of more than 5 dBA above the applicable noise performance thresholds would be considered a substantial permanent increase in ambient noise levels.

The proposed project would include new stationary noise sources, including mechanical ventilation equipment and parking lot activities.

Mechanical Ventilation Equipment

Implementation of the project would include operation of new rooftop mechanical ventilation equipment. At the time of preparation of this analysis, specific details of rooftop mechanical ventilation systems were not available; therefore, a reference noise level for typical rooftop mechanical ventilation systems was used. Noise levels from typical commercial-grade mechanical ventilation equipment systems range up to approximately 60 dBA L_{eq} at a distance of 25 feet.

The proposed mobile home park would have residential-grade mechanical ventilation equipment on the ground adjacent to each mobile home. The travel stop would have commercial-grade mechanical ventilation equipment on the roof of the convenience store facility. The combined reasonable worst-case operational noise level of these mechanical ventilation systems would be 35 dBA L_{eq}, as measured at the nearest off-site residential property line (for the mobile homes north of Silver Lane). These noise levels would not exceed the County's most restrictive noise performance threshold, the nighttime interior noise level standard of 45 dBA, as measured at the nearest residential receptor. The noise calculation sheet is provided in Appendix B of this report.

Furthermore, the combined reasonable worst-case operational noise level of the commercial mechanical ventilation systems as measured at the nearest proposed mobile homes would be 30 dBA L_{eq}. These noise levels would not exceed the County's most restrictive noise performance threshold, the nighttime interior noise level standard, of 45 dBA, as measured at the nearest residential receptor.

Parking Lot Activities

Typical parking lot activities include people conversing, doors shutting, and vehicles idling which generate noise levels ranging from approximately 60 dBA to 70 dBA L_{max} at 50 feet. The proposed mobile home park would only contain parking for residents and guests and would not contain any substantial parking lot area. However, the proposed travel stop would include parking areas that would experience parking activities sporadically throughout the day and night, as cars, RVs, and trucks arrive and leave parking lot areas on the project site.

The nearest noise-sensitive receptor to the proposed parking areas of the proposed travel stop would be the proposed mobile homes located across Baker Boulevard. The nearest residence would be located approximately 210 feet from the nearest parking areas on the project site. This closest parking area is one of the parking areas designated for large truck parking. Assuming a minimum of one parking movement per stall per hour, reasonable worst-case hourly average noise levels associated with daily parking lot activities would be approximately 45 dBA L_{eq} at the exterior of the nearest residential receptor. The noise calculation sheet is provided in Appendix B of this report.

These noise levels would not exceed the County's most restrictive noise performance threshold, the nighttime interior noise level standard, of 45 dBA, as measured at the closest receiving residential land use. Therefore, operational parking lot activity noise levels would not result in a substantial permanent increase in ambient noise levels in excess of any of the County' noise performance thresholds and would represent a less than significant impact.

Mitigation Measures

Project construction activity noise impacts, which could result in a temporary increase in ambient noise levels in the project vicinity that could result in annoyance or sleep disturbance of nearby sensitive receptors and exceed the established nighttime noise standard, would be reduced to less than significant with implementation of the following multi-part mitigation measure.

MM NOI-1 Implementation of the following multi-part mitigation measure is required to reduce potential construction-period noise impacts:

Prior to issuance of construction permits, the following language shall be included, verbatim, in the general notes section of all the civil plan construction documents.

- The construction contractor shall ensure that all equipment driven by internal combustion engines shall be equipped with mufflers, which are in good condition and appropriate for the equipment.
- The construction contractor shall ensure that unnecessary idling of internal combustion engines (i.e., idling in excess of 5 minutes) is prohibited.
- The construction contractor shall utilize "quiet" models of air compressors and other stationary noise sources where technology exists.
- At all times during project grading and construction, the construction contractor shall ensure that stationary noise-generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from adjacent residences.
- The construction contractor shall ensure that the construction staging areas shall be located to create the greatest feasible distance between the staging area and noise-sensitive receptors nearest the project site.
- The construction contractor shall ensure that all on-site construction activities, including the operation of any tools or equipment used in construction, drilling, repair, alteration, grading, or demolition work, are limited to between the hours of 7:00 a.m. and 7:00 p.m., except on Sundays and federal holidays.

5.3 - Groundborne Vibration/Noise Levels

This section analyzes both construction and operational groundborne vibration and noise impacts. Groundborne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. Vibrating objects in contact with the ground radiate vibration waves through various soil and rock strata to the foundations of nearby buildings. Groundborne noise is generated when vibrating building components radiate sound, or noise generated by groundborne vibration. In general, if groundborne vibration levels do not exceed levels considered to be perceptible, then groundborne noise levels would not be perceptible in most interior environments. Therefore, this analysis focuses on determining exceedances of groundborne vibration levels.

The County has adopted criteria for groundborne vibration impacts. The County states that no ground vibration shall be allowed that can be felt without the aid of instruments at or beyond the lot

line, nor shall any vibration be allowed which produces a particle velocity greater than or equal to 0.2 inches per second (in/sec) PPV measured at or beyond the lot line. However, temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except on Sundays and federal holidays, are exempt from these regulations. Therefore, for purposes of this analysis, the FTA's guidelines for construction vibration impacts are used to determine potential significant construction-related impacts.

5.3.1 - Short-term Construction Vibration Impacts

A significant impact would occur if existing structures at the project site or in the project vicinity would be exposed to groundborne vibration levels in excess of the above levels established by the County.

Of the variety of equipment used during construction, the small vibratory rollers that are anticipated to be used in the site preparation phase of construction would produce the greatest groundborne vibration levels. Small vibratory rollers produce groundborne vibration levels ranging up to 0.101 in/sec PPV at 25 feet from the operating equipment.

The nearest off-site receptor to the mobile home park project site is the post office building located north of the project site, across Silver Lane. The façade of this building would be located approximately 40 feet from the nearest construction footprint where the heaviest construction equipment would potentially operate. At this distance, groundborne vibration levels would range up to 0.05 PPV from operation of the types of equipment that would produce the highest vibration levels. This is well below the FTA's construction vibration damage criteria of 0.3 PPV for this type of structure, a building of engineered concrete and masonry (no plaster) construction.

The nearest off-site receptor to the construction footprint associated with the travel stop is the commercial travel center building located north of the project site, across Silver Lane. The façade of this building would be located approximately 140 feet from the nearest construction footprint where the heaviest construction equipment would potentially operate. At this distance, groundborne vibration levels would range up to 0.007 PPV from operation of the types of equipment that would produce the highest vibration levels. This is well below the FTA's construction vibration damage criteria of 0.3 PPV for this type of structure, a building of engineered concrete and masonry (no plaster) construction. Therefore, the impact to off-site receptors of short-term groundborne vibration associated with construction would be less than significant.

5.3.2 - Operational Vibration Impacts

Implementation of the project would not include any permanent sources that would expose persons in the project vicinity to groundborne vibration levels that could be perceptible without instruments at any existing sensitive land use in the project vicinity. In addition, there are no existing significant permanent sources of groundborne vibration in the project vicinity to which the proposed project would be exposed. Therefore, project operational groundborne vibration level impacts would be considered less than significant.

5.4 - Noise Levels from Airport Activity

A significant impact would occur if the project would expose people residing or working in the project area to excessive noise levels 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.

The project site is not located within the vicinity of a private airstrip. The nearest public airport to the project site is Baker Airport, located approximately 1.4 miles northwest of the project site. However, according to the County, the airport is primarily used as an emergency airfield with recorded 135 operations per week. Although aircraft noise is occasionally audible on the project site, nearby airport activity would not expose people residing or working near the project site to excessive noise levels. Therefore, implementation of the project would not expose persons residing or working in the project vicinity to noise levels from airport activity that would be in excess of normally acceptable standards for the proposed land use development, and no impact would occur.

Appendix A:
Noise Measurement Data

THIS PAGE INTENTIONALLY LEFT BLANK

Project Number: 4767.0005 Sheet 1 of 4
Project Name: Love's Travel Stop Baker
Test Personnel: Spencer Churchill

NOISE MEASUREMENT SURVEY

Site Number: ST-1 Date: 19 April 2023 Time: From 12:30:58 To 12:46:00

Site Location: Northwest corner of the lot north of Baker Blvd. Across from mobile home community along Silver Ln, adjacent to existing travel plaza.

Primary Noise Sources: Traffic from Baker Blvd

Measurement Results

	dBA
L_{eq}	52.0
L_{max}	62.5
L_{min}	40.7
L_{peak}	82.7
L_5	57.8
L_{10}	55.4
L_{50}	48.9
L_{90}	43.8
SEL	

Observed Noise Sources/Events

Time	Noise Source/Event	dBA
	Chicken crowing	
	Dog barking	
	Intermittent law mower and weed whacking	

Comments: Unit positioned facing north towards the mobile home park. Measurement LxT_Data.493

Equipment: Larson LxT Measured Difference: 0.15 dBA
Settings: A-Weighted ☐ Other☐_____ Slow☐ Fast☐ Windscreen■

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature (F)	Relative Humidity (%)	
10 SSE	2.5 SSE	63	17	
Comments:				

General Information

Serial Number	04228
Model	SoundTrack LxT®
Firmware Version	2.206
Filename	LxT_Data.493
User	
Job Description	
Location	

Measurement Description

Start Time	Wednesday, 19 April 2023 00:30:58
Stop Time	Wednesday, 19 April 2023 00:46:00
Duration	00:15:01.7
Run Time	00:15:01.7
Pause	00:00:00.0
Pre Calibration	Wednesday, 19 April 2023 00:30:13
Post Calibration	None
Calibration Deviation	---

Note

Overall Data

LASeq		52.0	dB
LASmax	19 Apr 2023 00:44:58	62.5	dB
LApeak (max)	19 Apr 2023 00:33:46	82.7	dB
LASmin	19 Apr 2023 00:37:18	40.7	dB
LCSeq		68.7	dB
LASeq		52.0	dB
LCSeq - LASeq		16.7	dB
LAIeq		54.3	dB
LAeq		52.0	dB
LAIeq - LAeq		2.3	dB
Ldn		62.0	dB
LDay 07:00-22:00		---	dB
LNight 22:00-07:00		52.0	dB
Lden		62.0	dB
LDay 07:00-19:00		---	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		52.0	dB
LASE		81.6	dB
EAS		16.00	µPa²h
EAS8		511.1	µPa²h
EAS40		2.555	mPa²h
# Overloads		0	
Overload Duration		0.0	s

Statistics

LAS5.00		57.8	dBA
LAS10.00		55.4	dBA
LAS33.30		50.9	dBA
LAS50.00		48.9	dBA
LAS66.60		46.8	dBA
LAS90.00		43.8	dBA
LAS > 85.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LAS > 115.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)		0 / 0.0	s

Dose

Name	OSHA-1	
Dose	---	%
Projected Dose	---	%
TWA (Projected)	---	dBA
TWA (t)	---	dBA
Lep (t)	37.0	dBA

Settings

Exchange Rate	5	dB
Threshold	90.0	dBA
Criterion Level	90.0	dBA
Criterion Duration	8.0	h
RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRMLxT2L	
Microphone Correction	Off	
Integration Method	Exponential	

Project Number: 4767.0005 Sheet 2 of 4
Project Name: Love's Travel Stop Baker
Test Personnel: Spencer Churchill

NOISE MEASUREMENT SURVEY

Site Number: ST-2 Date: 19 April 2023 Time: From 12:49:18 To 13:04:19

Site Location: Northeast corner of the lot north of Baker Blvd. Across from post office along Silver Ln at the corner of Silver Ln and Baker Blvd

Primary Noise Sources: Traffic from Baker Blvd and Silver Ln

Measurement Results

	dBA
L_{eq}	62.2
L_{max}	74.4
L_{min}	41.5
L_{peak}	88.7
L_5	68.4
L_{10}	66.8
L_{50}	56.5
L_{90}	45.4
SEL	

Observed Noise Sources/Events

Time	Noise Source/Event	dBA
	Intermittent law mower and weed whacking	

Comments: Unit positioned facing north towards the post office. Measurement LxT_Data.494

Equipment: Larson LxT Measured Difference: 0.15 dBA
Settings: A-Weighted ☐ Other☐_____ Slow☐ Fast☐ Windscreen■

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature (F)	Relative Humidity (%)	
10 SSE	2.5 SSE	63	17	
Comments:				

General Information

Serial Number	04228
Model	SoundTrack LxT®
Firmware Version	2.206
Filename	LxT_Data.494
User	
Job Description	
Location	

Measurement Description

Start Time	Wednesday, 19 April 2023 00:49:18
Stop Time	Wednesday, 19 April 2023 01:04:19
Duration	00:15:00.9
Run Time	00:15:00.9
Pause	00:00:00.0
Pre Calibration	Wednesday, 19 April 2023 00:30:07
Post Calibration	None
Calibration Deviation	---

Note

Overall Data

LASeq		62.2	dB
LASmax	19 Apr 2023 00:55:54	74.4	dB
LApeak (max)	19 Apr 2023 00:55:54	88.7	dB
LASmin	19 Apr 2023 01:00:40	41.5	dB
LCSeq		74.1	dB
LASeq		62.2	dB
LCSeq - LASeq		11.9	dB
LAIeq		63.5	dB
LAeq		62.2	dB
LAIeq - LAeq		1.4	dB
Ldn		72.2	dB
LDay 07:00-22:00		---	dB
LNight 22:00-07:00		62.2	dB
Lden		72.2	dB
LDay 07:00-19:00		---	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		62.2	dB
LASE		91.7	dB
EAS		165.2	µPa²h
EAS8		5.280	mPa²h
EAS40		26.40	mPa²h
# Overloads		0	
Overload Duration		0.0	s

Statistics

LAS5.00		68.4	dBA
LAS10.00		66.8	dBA
LAS33.30		61.4	dBA
LAS50.00		56.5	dBA
LAS66.60		51.7	dBA
LAS90.00		45.4	dBA
LAS > 85.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LAS > 115.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)		0 / 0.0	s

Dose

Name	OSHA-1	
Dose	---	%
Projected Dose	---	%
TWA (Projected)	---	dBA
TWA (t)	---	dBA
Lep (t)	47.1	dBA

Settings

Exchange Rate	5	dB
Threshold	90.0	dBA
Criterion Level	90.0	dBA
Criterion Duration	8.0	h
RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRMLxT2L	
Microphone Correction	Off	
Integration Method	Exponential	

FIRSTCARBON SOLUTIONS
FCS INTERNATIONAL, INC.

Project Number: 4767.0005 Sheet 3 of 4
Project Name: Love's Travel Stop Baker
Test Personnel: Spencer Churchill

NOISE MEASUREMENT SURVEY

Site Number: ST-3 Date: 19 April 2023 Time: From 13:12:47 To 13:27:48

Site Location: Northeastern portion of the lot south of Baker Blvd. approximately 100 feet south of Baker Bvld, 200 yds north of the I-15 Freeway

Primary Noise Sources: Traffic from Baker Blvd, I-15

Measurement Results

	dBA
L_{eq}	54.6
L_{max}	73.2
L_{min}	41.4
L_{peak}	107.1
L_5	59.8
L_{10}	58.5
L_{50}	51.6
L_{90}	46.1
SEL	

Observed Noise Sources/Events

Time	Noise Source/Event	dBA

Comments: Unit positioned facing north towards Baker Blvd. Measurement LxT_Data.495

Equipment: Larson LxT Measured Difference: -0.09 dBA
Settings: A-Weighted ☐ Other☐_____ Slow☐ Fast☐ Windscreen■

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature (F)	Relative Humidity (%)	
10 SSE	2.5 SSE	63	17	
Comments:				

General Information

Serial Number	04228
Model	SoundTrack LxT®
Firmware Version	2.206
Filename	LxT_Data.495
User	
Job Description	
Location	

Measurement Description

Start Time	Wednesday, 19 April 2023 01:12:47
Stop Time	Wednesday, 19 April 2023 01:27:48
Duration	00:15:00.7
Run Time	00:15:00.7
Pause	00:00:00.0
Pre Calibration	Wednesday, 19 April 2023 01:12:29
Post Calibration	None
Calibration Deviation	---

Note

Overall Data

LASeq		54.6	dB
LASmax	19 Apr 2023 01:12:57	73.2	dB
LApeak (max)	19 Apr 2023 01:12:57	107.1	dB
LASmin	19 Apr 2023 01:17:01	41.4	dB
LCSeq		70.2	dB
LASeq		54.6	dB
LCSeq - LASeq		15.6	dB
LAIeq		61.0	dB
LAeq		54.6	dB
LAIeq - LAeq		6.4	dB
Ldn		64.6	dB
LDay 07:00-22:00		---	dB
LNight 22:00-07:00		54.6	dB
Lden		64.6	dB
LDay 07:00-19:00		---	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		54.6	dB
LASE		84.1	dB
EAS		28.82	µPa²h
EAS8		921.5	µPa²h
EAS40		4.608	mPa²h
# Overloads		0	
Overload Duration		0.0	s

Statistics

LAS5.00		59.8	dBA
LAS10.00		58.5	dBA
LAS33.30		53.8	dBA
LAS50.00		51.6	dBA
LAS66.60		49.6	dBA
LAS90.00		46.1	dBA
LAS > 85.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LAS > 115.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)		0 / 0.0	s

Dose

Name		OSHA-1	
Dose		---	%
Projected Dose		---	%
TWA (Projected)		---	dBA
TWA (t)		---	dBA
Lep (t)		39.5	dBA

Settings

Exchange Rate		5	dB
Threshold		90.0	dBA
Criterion Level		90.0	dBA
Criterion Duration		8.0	h
RMS Weight		A Weighting	
Peak Weight		A Weighting	
Detector		Slow	
Preamp		PRMLxT2L	
Microphone Correction		Off	
Integration Method		Exponential	

Project Number: 4767.0005 Sheet 4 of 4
Project Name: Love's Travel Stop Baker
Test Personnel: Spencer Churchill

NOISE MEASUREMENT SURVEY

Site Number: ST-4 Date: 19 April 2023 Time: From 13:36:44 To 13:52:04

Site Location: Southwest portion of the lot south of Baker Blvd. 100 feet south of Baker Blvd, 200 yds north of the I-15 Freeway. Directly south of Caltrans Ave.

Primary Noise Sources: Traffic from Baker Blvd/Caltrans Ave intersection, I-15

Measurement Results

	dBA
L_{eq}	56.8
L_{max}	79.0
L_{min}	43.4
L_{peak}	98.5
L_5	62.4
L_{10}	58.8
L_{50}	52.4
L_{90}	47.6
SEL	

Observed Noise Sources/Events

Time	Noise Source/Event	dBA

Comments: Unit positioned facing north towards the Baker Blvd/Caltrans Ave intersection. Measurement LxT_Data.496

Equipment: Larson LxT Measured Difference: 0.01 dBA
Settings: A-Weighted ☐ Other☐_____ Slow☐ Fast☐ Windscreen■

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature (F)	Relative Humidity (%)	
10 SSE	2.5 SSE	63	17	
Comments:				

General Information

Serial Number	04228
Model	SoundTrack LxT®
Firmware Version	2.206
Filename	LxT_Data.496
User	
Job Description	
Location	

Measurement Description

Start Time	Wednesday, 19 April 2023 01:36:44
Stop Time	Wednesday, 19 April 2023 01:52:04
Duration	00:15:20.9
Run Time	00:15:20.9
Pause	00:00:00.0
Pre Calibration	Wednesday, 19 April 2023 01:36:23
Post Calibration	None
Calibration Deviation	---

Note

Overall Data

LASeq		56.8	dB
LASmax	19 Apr 2023 01:36:44	79.0	dB
LApeak (max)	19 Apr 2023 01:37:23	98.5	dB
LASmin	19 Apr 2023 01:44:10	43.4	dB
LCSeq		71.0	dB
LASeq		56.8	dB
LCSeq - LASeq		14.2	dB
LAIeq		64.4	dB
LAeq		55.9	dB
LAIeq - LAeq		8.5	dB
Ldn		66.8	dB
LDay 07:00-22:00		---	dB
LNight 22:00-07:00		56.8	dB
Lden		66.8	dB
LDay 07:00-19:00		---	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		56.8	dB
LASE		86.4	dB
EAS		48.89	µPa²h
EAS8		1.529	mPa²h
EAS40		7.644	mPa²h
# Overloads		0	
Overload Duration		0.0	s

Statistics

LAS5.00		62.4	dBA
LAS10.00		58.8	dBA
LAS33.30		54.3	dBA
LAS50.00		52.4	dBA
LAS66.60		50.6	dBA
LAS90.00		47.6	dBA
LAS > 85.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LAS > 115.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)		0 / 0.0	s

Dose

Name	OSHA-1	
Dose	---	%
Projected Dose	---	%
TWA (Projected)	---	dBA
TWA (t)	---	dBA
Lep (t)	41.8	dBA

Settings

Exchange Rate	5	dB
Threshold	90.0	dBA
Criterion Level	90.0	dBA
Criterion Duration	8.0	h
RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRMLxT2L	
Microphone Correction	Off	
Integration Method	Exponential	

Appendix B:
Noise Modeling Data

THIS PAGE INTENTIONALLY LEFT BLANK

Parking Lot Activity Noise Calculation

Receptor:	Neaarest Receiving residential property line								
		Reference (dBA) 50 ft		Usage	Distance to	Ground	Shielding	Calculated (dBA)		
No.	Equipment Description	Lmax	Quantity	factor[1]	Receptor	Effect[2]	(dBA)[3]	Lmax	Leq	Energy
1	parking lot activity	70	10	1	210	1	0	57.5	41.3	13497.46248
2	parking lot activity	70	10	1	270	1	0	55.4	38.0	6350.657928
3	parking lot activity	70	10	1	330	1	0	53.6	35.4	3478.309263
4	parking lot activity	70	10	1	370	1	0	52.6	33.9	2467.770912
5	parking lot activity	70	10	1	400	1	0	51.9	32.9	1953.125
6	parking lot activity	70	10	1	425	1	0	51.4	32.1	1628.332994
7	parking lot activity	70	10	1	445	1	0	51.0	31.5	1418.50209
8	parking lot activity	70	10	1	465	1	0	50.6	30.9	1243.229064
9										
10										
							Lmax[4]	58	Leq	45

Notes:

[1] Percentage of time activity occurs each hour

[2] Soft ground terrain between project site and receptor.

[3] Shielding due to terrain or structures

[4] Calculated Lmax is the Loudest value.

Mechanical Equipment Noise Calculation for Travel Stop

Receptor:	Nearest Off-site Receiving residential property line	Noise Level Calculation Prior to Implementation of Noise Attenuation Requirements								
		Reference (dBA) 25 ft		Usage	Distance to	Ground	Shielding	Calculated (dBA)		
No.	Equipment Description	Lmax	Quantity	factor[1]	Receptor	Effect[2]	(dBA)[3]	Lmax	Leq	Energy
1	Residential grade mechanical ventilation equipment	53	3	100	170	1	0	36.3	32.8	1903.682496
2	Residential grade mechanical ventilation equipment	53	3	100	220	1	0	34.1	29.4	878.3613919
3	Residential grade mechanical ventilation equipment	53	2	100	315	1	0	31.0	23.0	199.4887276
4	Commercial grade mechanical ventilation equipment	60	1	100	770	1	0	30.2	15.3	34.22534625
5	Commercial grade mechanical ventilation equipment	60	1	100	790	1	0	30.0	15.0	31.69120496
6	Commercial grade mechanical ventilation equipment	60	1	100	810	1	0	29.8	14.7	29.40119411
7	Commercial grade mechanical ventilation equipment	60	1	100	825	1	0	29.6	14.4	27.82647411
8	Commercial grade mechanical ventilation equipment	60	1	100	845	1	0	29.4	14.1	25.89702638
9	Commercial grade mechanical ventilation equipment	60	1	100	865	1	0	29.2	13.8	24.14191428
10										
							Lmax[4]	36	Leq	35

Notes:
[1] Percentage of time activity occurs each hour
[2] Soft ground terrain between project site and receptor.
[3] Shielding due to rooftop parapet and soundwall shielding
[4] Calculated Lmax is the Loudest value.

Mechanical Equipment Noise Calculation for Travel Stop

Receptor:	Nearest On-site Proposed mobile home	Noise Level Calculation Prior to Implementation of Noise Attenuation Requirements								
		Reference (dBA) 25 ft		Usage	Distance to	Ground	Shielding	Calculated (dBA)		
No.	Equipment Description	Lmax	Quantity	factor[1]	Receptor	Effect[2]	(dBA)[3]	Lmax	Leq	Energy
1	Commercial grade mechanical ventilation equipment	60	1	100	435	1	0	35.2	22.8	189.8244959
2	Commercial grade mechanical ventilation equipment	60	1	100	445	1	0	35.0	22.5	177.3127613
3	Commercial grade mechanical ventilation equipment	60	1	100	455	1	0	34.8	22.2	165.8768716
4	Commercial grade mechanical ventilation equipment	60	1	100	480	1	0	34.3	21.5	141.2850839
5	Commercial grade mechanical ventilation equipment	60	1	100	485	1	0	34.2	21.4	136.9603352
6	Commercial grade mechanical ventilation equipment	60	1	100	490	1	0	34.2	21.2	132.8103086
7										
8										
9										
10										
							Lmax[4]	35	Leq	30

Notes:
[1] Percentage of time activity occurs each hour
[2] Soft ground terrain between project site and receptor.
[3] Shielding due to rooftop parapet and soundwall shielding
[4] Calculated Lmax is the Loudest value.

TABLE Existing-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Death Valley Road to Mojave Pointe Road
NOTES: Baker Travel Stop and Mobile Home Park - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2700 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 60.73

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	62.5	134.2

TABLE Existing-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Mojave Pointe Road to Park Avenue
NOTES: Baker Travel Stop and Mobile Home Park - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2700 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 12 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 60.15

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	63.3	134.5

TABLE Existing-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Park Avenue to Caltrans Avenue
NOTES: Baker Travel Stop and Mobile Home Park - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 60.11

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	69.1	144.7

TABLE Existing-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Caltrans Avenue to Lakeview Road
NOTES: Baker Travel Stop and Mobile Home Park - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2600 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 59.06

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	65.1	132.7

TABLE Near-Term Year 2024-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Death Valley Road to Mojave Pointe Road
NOTES: Baker Travel Stop and Mobile Home Park - Near-Term Year 2024

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 61.18

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	67.0	143.9

TABLE Near-Term Year 2024-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Mojave Pointe Road to Park Avenue
NOTES: Baker Travel Stop and Mobile Home Park - Near-Term Year 2024

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2900 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 12 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 60.46

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	66.3	141.0

TABLE Near-Term Year 2024-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Park Avenue to Caltrans Avenue
NOTES: Baker Travel Stop and Mobile Home Park - Near-Term Year 2024

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3200 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 60.39

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	71.9	151.0

TABLE Near-Term Year 2024-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Caltrans Avenue to Lakeview Road
NOTES: Baker Travel Stop and Mobile Home Park - Near-Term Year 2024

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2800 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 59.38

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	68.0	139.2

TABLE Near-Term Year 2024 + Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Death Valley Road to Mojave Pointe Road
NOTES: Baker Travel Stop and Mobile Home Park - Near-Term Year 2024 + Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 6400 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.47

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	51.7	110.8	238.3

TABLE Near-Term Year 2024 + Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Mojave Pointe Road to Park Avenue
NOTES: Baker Travel Stop and Mobile Home Park - Near-Term Year 2024 + Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 6300 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 12 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.83

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	52.2	110.0	235.9

TABLE Near-Term Year 2024 + Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Park Avenue to Caltrans Avenue
NOTES: Baker Travel Stop and Mobile Home Park - Near-Term Year 2024 + Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 6600 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.53

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	55.4	114.2	243.5

TABLE Near-Term Year 2024 + Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Caltrans Avenue to Lakeview Road
NOTES: Baker Travel Stop and Mobile Home Park - Near-Term Year 2024 + Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4600 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 61.54

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	91.8	192.3

TABLE Horizon Year 2040-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Death Valley Road to Mojave Pointe Road
NOTES: Baker Travel Stop and Mobile Home Park - Horizon Year 2040

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4500 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.94

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	87.7	188.5

TABLE Horizon Year 2040-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Mojave Pointe Road to Park Avenue
NOTES: Baker Travel Stop and Mobile Home Park - Horizon Year 2040

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4300 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 12 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.17

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	85.6	183.1

TABLE Horizon Year 2040-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Park Avenue to Caltrans Avenue
NOTES: Baker Travel Stop and Mobile Home Park - Horizon Year 2040

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4600 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 61.97

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	90.5	191.8

TABLE Horizon Year 2040-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Caltrans Avenue to Lakeview Road
NOTES: Baker Travel Stop and Mobile Home Park - Horizon Year 2040

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4500 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 61.44

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	0.0	90.5	189.6

TABLE Horizon Year 2040 + Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Death Valley Road to Mojave Pointe Road
NOTES: Baker Travel Stop and Mobile Home Park - Horizon Year 2040 + Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 7900 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.39

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	59.4	127.4	274.2

TABLE Horizon Year 2040 + Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Mojave Pointe Road to Park Avenue
NOTES: Baker Travel Stop and Mobile Home Park - Horizon Year 2040 + Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 7700 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 12 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.70

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	59.3	125.6	269.6

TABLE Horizon Year 2040 + Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Park Avenue to Caltrans Avenue
NOTES: Baker Travel Stop and Mobile Home Park - Horizon Year 2040 + Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.37

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	62.2	129.4	276.7

TABLE Horizon Year 2040 + Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/10/2023
ROADWAY SEGMENT: Baker Boulevard - Caltrans Avenue to Lakeview Road
NOTES: Baker Travel Stop and Mobile Home Park - Horizon Year 2040 + Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 6300 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	88.08	9.34
M-TRUCKS	1.65	0.19
H-TRUCKS	0.66	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.90

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	56.1	111.8	236.5
