Vineyard Avenue Warehouse

NOISE AND VIBRATION ANALYSIS

SAN BERNARDINO COUNTY

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LIST OF ABBREVIATED TERMS

(1)	Reference
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
MARB/IPA	March Air Reserve Base/Inland Port Airport
mph	Miles per hour
PPV	Peak Particle Velocity
Project	Vineyard Avenue Warehouse
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures for the proposed Vineyard Avenue Warehouse development ("Project"). The Project site is located at the easterly terminus of Vineyard Avenue, west of Maple Avenue, and south of Bohnert Avenue in unincorporated San Bernardino County. The Project consists of the development of 311,315 square feet (SF) of warehousing use. At the time this noise analysis was prepared, the future tenants of the proposed Project were unknown, and therefore, this noise study includes a conservative analysis of the proposed Project uses. This noise study has been prepared to satisfy applicable San Bernardino County noise standards and significance criteria based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

The results of this Noise and Vibration Analysis are summarized below based on the significance criteria in Section 4 of this report consistent with Appendix G of the CEQA Guidelines. (1) Table ES-1 shows the findings of significance for each potential noise and/or vibration impact under CEQA before and after any required mitigation measures.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise	7	*Less Than Significant*	-
Operational Noise	9	*Less Than Significant*	-
Construction Noise	10	*Less Than Significant*	-
Nighttime Concrete Pour Noise		*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-

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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Vineyard Avenue Warehouse ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, sets out the local regulatory setting, presents the study methods and procedures for transportation related CNEL traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term stationary-source operational noise and short-term construction noise and vibration impacts.

1.1 SITE LOCATION

The proposed Project is located at the easterly terminus of Vineyard Avenue, west of Maple Avenue, and south of Bohnert Avenue in unincorporated San Bernardino County near the City of Rialto, as shown on Exhibit 1-A.

1.2 PROJECT DESCRIPTION

A preliminary site plan for the proposed Project is shown on Exhibit 1-B. The Project consists of the development of 311,315 square feet (SF) of warehousing use. It is anticipated that the Project would be developed in a single phase with an anticipated Opening Year of 2025.

At the time this noise analysis was prepared, the future warehousing tenants of the proposed Project were unknown, and therefore, this noise study includes a conservative analysis of the proposed Project uses. The on-site Project-related noise sources are expected to include: loading dock activity, roof-top air conditioning units, parking lot vehicle activities, trash enclosure activity, and truck movements. This noise analysis is intended to describe the noise level impacts associated with the expected typical operational activities at the Project site.

EXHIBIT 1-A: LOCATION MAP

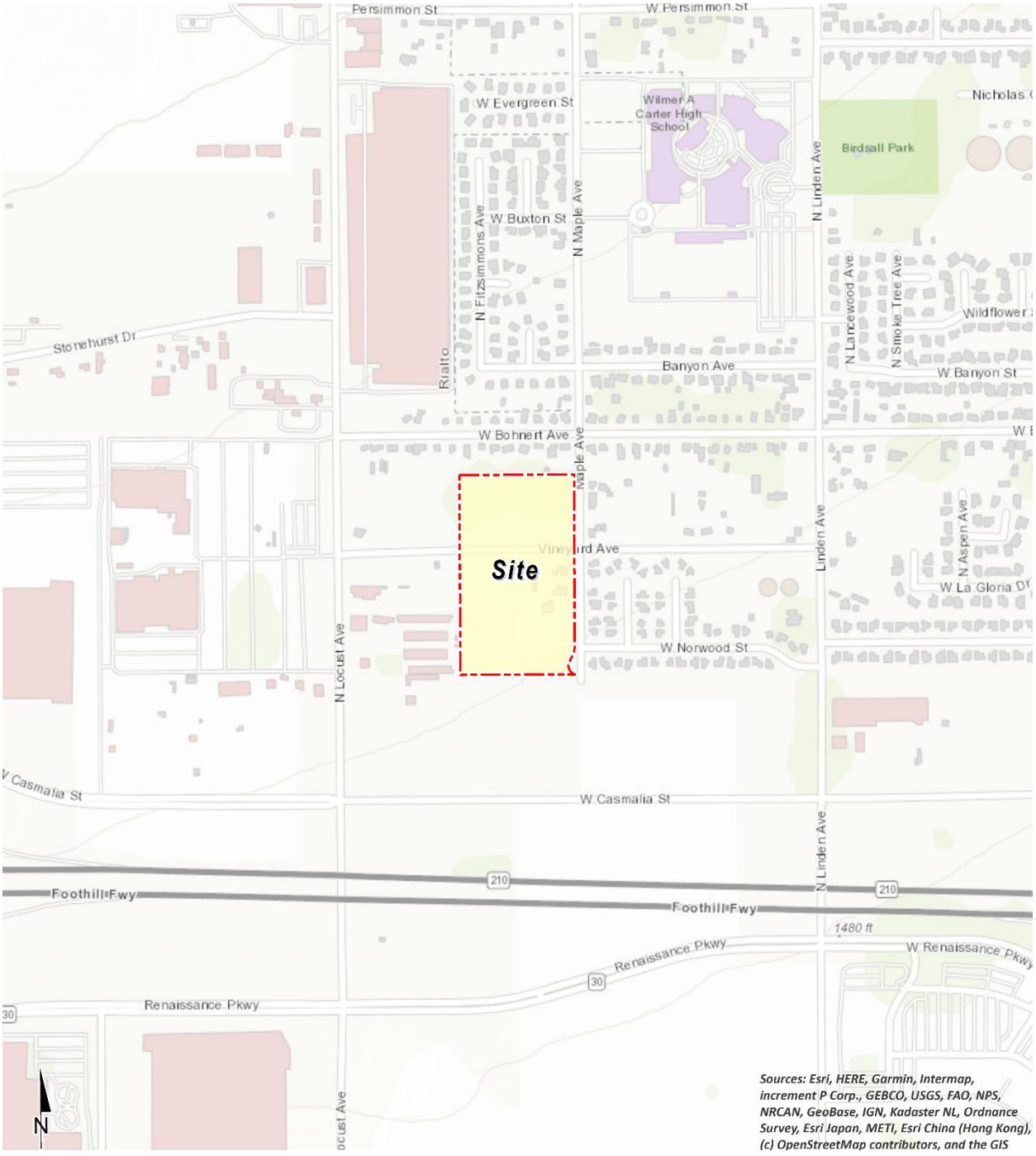
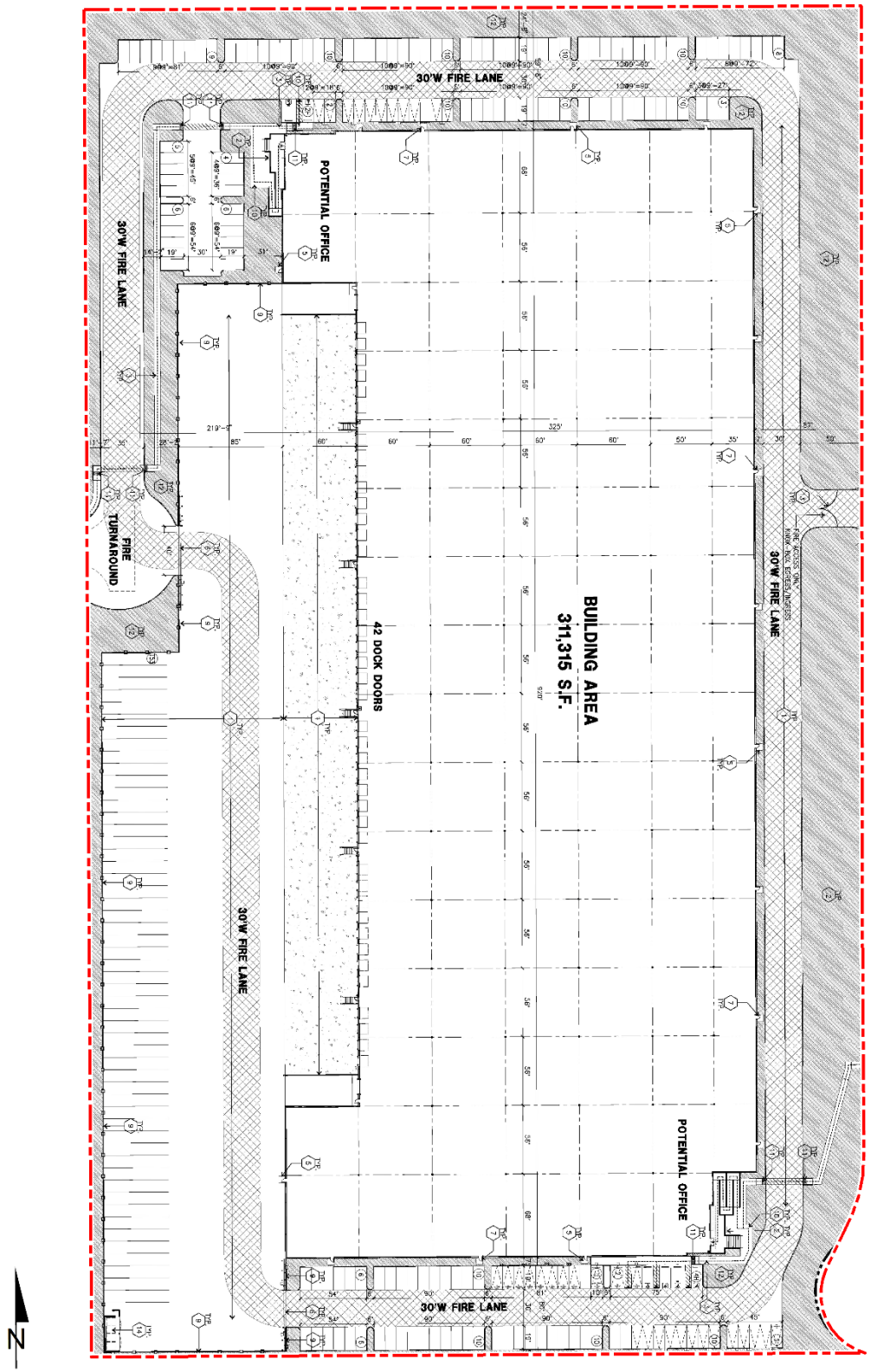


EXHIBIT 1-B: PRELIMINARY SITE PLAN



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2 FUNDAMENTALS

Noise is simply defined as *unwanted sound*. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to 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 which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

EXHIBIT 2-A: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	INTOLERABLE OR DEAFENING	HEARING LOSS
NEAR JET ENGINE		130		
		120		
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110		
LOUD AUTO HORN		100	VERY NOISY	
GAS LAWN MOWER AT 1m (3 ft)		90		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		SPEECH INTERFERENCE
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	SLEEP DISTURBANCE
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		
QUIET SUBURBAN NIGHTTIME	LIBRARY	30	FAINT	NO EFFECT
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20		
	BROADCAST/RECORDING STUDIO	10	VERY FAINT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0		

Source: Environmental Protection Agency Office of Noise Abatement and Control, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004) March 1974.

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (2) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal

conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA at approximately 1,000 feet, which can cause serious discomfort. (3) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most used metric is the equivalent level (L_{eq}). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in dBA. The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time-of-day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when noise can become more intrusive. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The San Bernardino County relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

2.3 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The way noise reduces with distance depends on the following factors.

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (2)

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation

associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (4)

2.3.3 ATMOSPHERIC EFFECTS

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (2)

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an "out of sight, out of mind" effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby residents. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of-sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The Federal Highway Administration (FHWA) does not consider the planting of vegetation to be a noise abatement measure. (5)

2.4 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receiver by controlling the noise source, transmission path, receiver, or all three. This concept is known as the source-path-receiver concept. In general, noise control measures can be applied to these three elements.

2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must block the line-of-sight path of sound from the noise source.

2.6 LAND USE COMPATIBILITY WITH NOISE

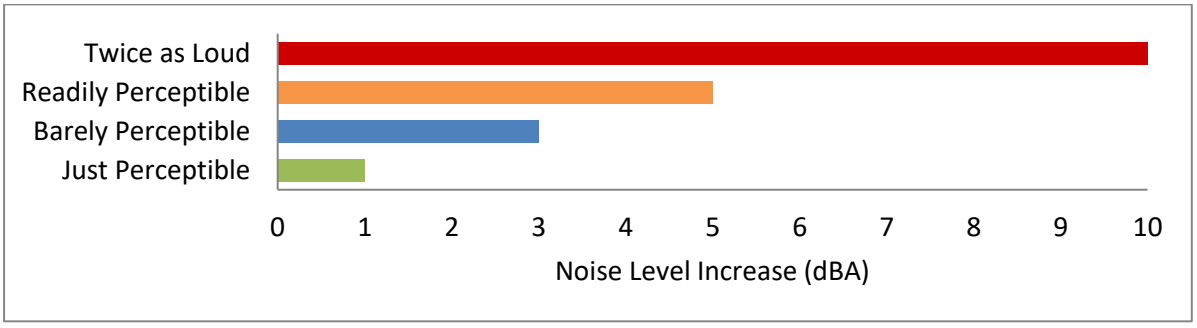
Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (6)

2.7 COMMUNITY RESPONSE TO NOISE

Approximately sixteen percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints may occur. Twenty to thirty percent of the population will not complain even in very severe noise environments. (7 pp. 8-6) Thus, a variety of reactions can be expected from people exposed to any given noise environment.

Surveys have shown that community response to noise varies from no reaction to vigorous action for newly introduced noises averaging from 10 dB below existing to 25 dB above existing. (8) According to research originally published in the Noise Effects Handbook (7), the percentage of high annoyance ranges from approximately 0 percent at 45 dB or less, 10 percent are highly annoyed around 60 dB, and increases rapidly to approximately 70 percent being highly annoyed at approximately 85 dB or greater. Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. A change of 3 dBA is considered barely perceptible, and changes of 5 dBA are considered readily perceptible. (4)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



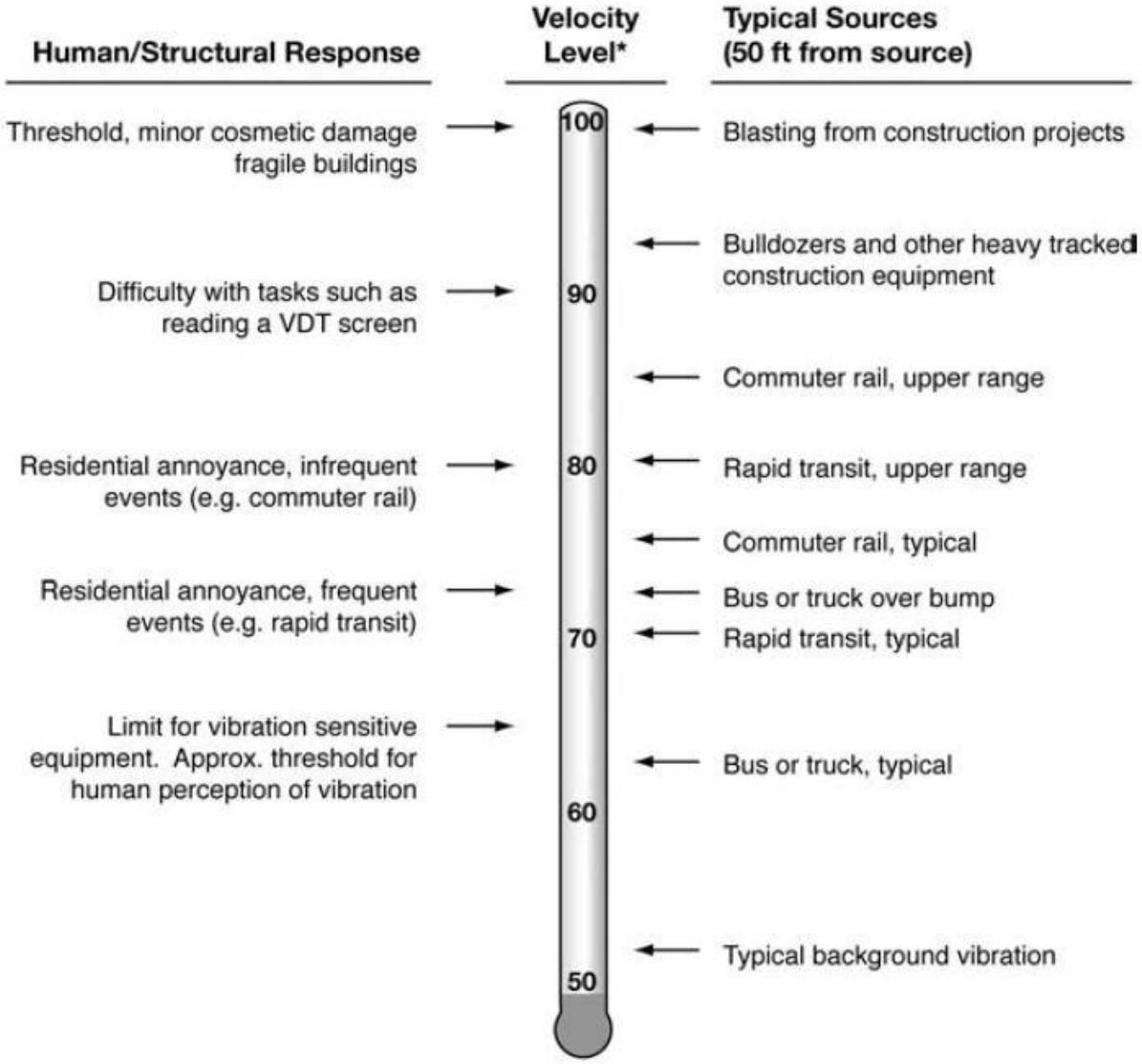
2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual*, vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

Additionally, in contrast to airborne noise, ground-borne vibration outdoors is not a common environmental problem and annoyance from ground-borne vibration is almost exclusively an indoor phenomenon (8). Therefore, the effects of vibrations should only be evaluated at a structure and the effects of the building structure on the vibration should be considered. Wood-frame buildings, such as typical residential structures, are more easily excited by ground vibration than heavier buildings. In contrast, large masonry buildings with spread footings have a low response to ground vibration (8). In general, the heavier a building is, the lower the response will be to the incident vibration energy. However, all structurers reduce vibration levels due to the coupling of the building to the soil. There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal (8). The PPV is most frequently used to describe vibration impacts to buildings but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body (8). However, the RMS amplitude and PPV are related mathematically, and the RMS amplitude of equipment is typically calculated from the PPV reference level. The RMS amplitude is approximately 70% of the PPV (9). Thus, either can be used in the description of vibration impacts.

While not universally accepted, vibration decibel notation (VdB) is another vibration notation developed and used by the FTA in their guidance manual to describe vibration levels and provide a background of common vibration levels and set vibration limits. (8) Decibel notation (VdB) serves to reduce the range of numbers used to describe vibration levels and is used in this report to describe vibration levels. As stated in the FTA guidance manual, the background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION



** RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second*

Source: Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual.

3 REGULATORY SETTING

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies.

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research (OPR). (10) OPR identifies suggested land use noise compatibility levels as part of its General Plan Guidelines. These suggested guidelines provide planners with a tool to gauge the compatibility of land uses relative to existing and future noise levels. The guidelines identify normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable noise levels for various land uses. The land use compatibility guidelines are intended to be an advisory resource when considering changes in land use and policies, such as zoning modifications. In addition, the State through the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

California Assembly Bill 98 (AB 98), signed in September 2024, controls noise impacts from logistics facilities by establishing buffer zones and setbacks from sensitive areas like homes and schools. It mandates that loading bays and entrances face away from these areas and requires noise-dampening measures such as walls and landscaping. The law also directs cities and counties to implement designated truck routes to keep heavy-duty vehicles away from residential neighborhoods. These regulations aim to reduce noise pollution and improve the quality of life for communities near warehouses. As the Project was applied for prior to adoption of AB 98, the Project would not be subject to AB 98.

3.2 SAN BERNARDINO COUNTY COUNTYWIDE PLAN HAZARDS ELEMENT

The San Bernardino County is committed to protecting life, property, and commerce from impacts associated with natural hazards, human-generated hazards, and increased risk due to climate change. The County also works to ensure that residents in unincorporated disadvantaged communities have a reduced risk of exposure to pollution and have equitable access to public facilities and services. Effectively reducing these risks requires the County and its partners to evaluate public safety threats, proactively plan and protect against potential hazards, and establish systems that will make the county and its people safer and more self- reliant. (11) To

address noise sources found in the San Bernardino County, the following policies have been identified in the Countywide Plan Hazards Element:

- **Policy HZ-2.6**: Coordination with transportation authorities. We collaborate with airport owners, FAA, Caltrans, SBCTA, SCAG, neighboring jurisdictions, and other transportation providers in the preparation and maintenance of, and updates to transportation-related plans and projects to minimize noise impacts and provide appropriate mitigation measures.
- **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, sound walls, and other perimeter measures.
- **Policy HZ-2.10:** Agricultural operations. We require new development adjacent to existing conforming agricultural operations to provide adequate buffers to reduce the exposure of new development to operational noise, odor, and the storage or application of pesticides or other hazardous materials.
- **Policy HZ-3.19**: Community education. We make educational materials available to the public in unincorporated environmental justice focus areas so that they clearly understand the potential for adverse pollution, noise, odor, vibration, and lighting and glare, and the effects of toxic materials to promote civil engagement. We require that such educational materials be developed in accordance with Plain Language Guidelines.

3.3 SAN BERNARDINO COUNTY DEVELOPMENT CODE

While the San Bernardino County Countywide Plan Hazards Element provides guidelines and criteria to assess transportation noise on sensitive land uses, the County Code, Title 8 Development Code contains the noise level limits for mobile, stationary, and construction-related noise sources. (12) All the nearest noise-sensitive receivers are located within San Bernardino County. Receivers within the City of Rialto are also evaluated using the same County criteria, as the City of Rialto Municipal Code does not identify specific exterior noise level standards.

3.3.1 TRANSPORTATION NOISE STANDARDS

Section 83.01.080(d), Table 83-3, contains the San Bernardino County's mobile noise source-related standards, shown on Exhibit 3-A. Exterior transportation (mobile) noise level standards for residential land uses in the Project study area are shown to be 60 dBA CNEL, while non-noise-sensitive land uses, such as office uses, require exterior noise levels of 65 dBA CNEL per the County's Table 83-3 mobile noise source standards.

EXHIBIT 3-A: COUNTY OF SAN BERNARDINO MOBILE NOISE LEVEL STANDARDS

Noise Standards for Adjacent Mobile Noise Sources			
Land Use		*Ldn (or CNEL) dB(A)*	
Categories	*Uses*	*Interior (1)*	*Exterior (2)*
Residential	Single and multi-family, duplex, mobile homes	45	60(3)
Commercial	Hotel, motel, transient housing	45	60(3)
	Commercial retail, bank, restaurant	50	N/A
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	N/A
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library	45	65
Open Space	Park	N/A	65

Notes:

(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.

(2) The outdoor environment shall be limited to:

- Hospital/office building patios
- Hotel and motel recreation areas
- Mobile home parks
- Multi-family private patios or balconies
- Park picnic areas
- Private yard of single-family dwellings
- School playgrounds

(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.

CNEL = (Community Noise Equivalent Level). The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m.

Source: County of San Bernardino County Code, Title 8 Development Code, Table 83-3.

3.3.2 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location such as the Vineyard Avenue Warehouse Project, stationary-source (operational) noise such as the expected loading dock activity, roof-top air conditioning units, parking lot vehicle activities, trash enclosure activity, and truck movements are typically evaluated against standards established under a jurisdiction's Municipal Code. The San Bernardino County Code, Title 8 Development Code, Section 83.01.080(c) Table 83-2, shown on Exhibit 3-B establishes the noise level standards for stationary noise sources. Since the Project's land use will potentially impact adjacent noise-sensitive uses in the Project study area, this noise study relies on the more conservative residential noise level standards to describe potential operational noise impacts.

EXHIBIT 3-B: COUNTY OF SAN BERNARDINO STATIONARY NOISE LEVEL STANDARDS

Table 83-2		
Noise Standards for Stationary Noise Sources		
Affected Land Uses (Receiving Noise)	***7:00 a.m. - 10:00 p.m. Leq***	***10:00 p.m. - 7:00 a.m. Leq***
Residential	55 dB(A)	45 dB(A)
Professional Services	55 dB(A)	55 dB(A)
Other Commercial	60 dB(A)	60 dB(A)
Industrial	70 dB(A)	70 dB(A)
Leq = (Equivalent Energy Level). The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period, typically one, eight or 24 hours.		
dB(A) = (A-weighted Sound Pressure Level). The sound pressure level, in decibels, as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, placing greater emphasis on those frequencies within the sensitivity range of the human ear.		
Ldn = (Day-Night Noise Level). The average equivalent A-weighted sound level during a 24-hour day obtained by adding 10 decibels to the hourly noise levels measured during the night (from 10:00 p.m. to 7:00 a.m.). In this way Ldn takes into account the lower tolerance of people for noise during nighttime periods.		

Source: County of San Bernardino County Code, Title 8 Development Code, Table 83-2.

For residential properties, the exterior noise level shall not exceed 55 dBA L_{50} during the daytime hours (7:00 a.m. to 10:00 p.m.) and 45 dBA L_{50} during the nighttime hours (10:00 p.m. to 7:00 a.m.) for both the whole hour, and for not more than 30 minutes in any hour. The exterior noise level (11)standards shall apply for a cumulative period of 30 minutes in any hour, as well as the standard plus 5 dBA cannot be exceeded for a cumulative period of more than 15 minutes in any hour, or the standard plus 10 dBA for a cumulative period of more than 5 minutes in any hour, or the standard plus 15 dBA for a cumulative period of more than 1 minute in any hour, or the standard plus 20 dBA for any period of time.

Further, Section 83.01.080(e) indicates that if the existing ambient noise level already exceeds any of the exterior noise level limit categories, then the standard shall be adjusted to reflect the ambient conditions. The San Bernardino County operational noise level standards are shown on Table 3-1 and included in Appendix 3.1.

TABLE 3-1: OPERATIONAL NOISE LEVEL STANDARDS

Time Period	Exterior Noise Level Standards (dBA)[1]				
	L_{50} (30 mins)	L_{25} (15 mins)	L_8 (5 mins)	L_2 (1 min)	L_{max} (Anytime)
Daytime (7:00 a.m. to 10:00 p.m.)	55	60	65	70	75
Nighttime (10:00 p.m. to 7:00 a.m.)	45	50	55	60	65

[1] County of San Bernardino Development Code, Title 8, Section 83.01.080 (Appendix 3.1). The percent noise level is the level exceeded "n" percent of the time during the measurement period. L_{50} is the noise level exceeded 50% of the time.

The percentile noise descriptors are provided to ensure that the duration of the noise source is fully considered. However, due to the relatively constant intensity of the Project operational activities, the L_{50} or average L_{eq} noise level metrics best describe the loading dock activity, roof-top air conditioning units, parking lot vehicle activities, trash enclosure activity, and truck movements. In addition, the L_{eq} noise level metric accounts for noise fluctuations over time by averaging the louder and quieter events and giving more weight to the louder events. In addition, due to the mathematical relationship between the median (L_{50}) and the mean (L_{eq}), the L_{eq} will always be larger than or equal to the L_{50}. The more variable the noise becomes, the larger the L_{eq} becomes in comparison to the L_{50}. Therefore, this noise study conservatively relies on the average L_{eq} sound level limits to describe the Project operational noise levels.

3.4 CONSTRUCTION NOISE STANDARDS

Section 83.01.080(g)(3) of the San Bernardino County Development Code, provided in Appendix 3.1, indicates that construction activity is considered exempt from the noise level standards between the hours of 7:00 a.m. to 7:00 p.m. except on Sundays and Federal holidays. (12) However, neither the San Bernardino County Countywide Plan or Development Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a *substantial temporary or periodic noise increase*. Therefore, a numerical construction threshold based on Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* is used for analysis of daytime construction impacts, as discussed below. According to the FTA, local noise ordinances are typically not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity, and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. Project construction noise criteria should account for the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that can be considered reasonable criteria for construction noise assessment. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive residential land use (8 p. 179).

3.5 CONSTRUCTION VIBRATION STANDARDS

The San Bernardino County Development Code, Section 83.01.090(a) states that vibration shall be no *greater than or equal to two-tenths inches per second measured at or beyond the lot line*. (12) (b) *Vibration velocity shall be measured with a seismograph or other instrument capable of measuring and recording displacement and frequency, particle velocity, or acceleration. Readings shall be made at points of maximum vibration along any lot line next to a parcel within a residential, commercial and industrial land use zoning district.* Subsection (c) indicates that the following sources vibration shall be exempt from the vibration regulations (1) *motor vehicles not under the control of the subject use*; (2) *temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.* Therefore, to determine if the vibration levels are due to the operation and construction of the Project, the peak particle velocity (PPV) vibration level standard of 0.2 inches per second is used.

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4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

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 ground-borne vibration or ground-borne 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?

4.1 NOISE LEVEL INCREASES (THRESHOLD A)

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines. Under CEQA, consideration must be given to the magnitude of the increase, the existing baseline ambient noise levels, and the location of receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant* (13). This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged.

The Federal Interagency Committee on Noise (FICON) (14) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level (L_{eq}).

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders the noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera (13). For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the without project noise levels are below 60 dBA. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be

appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. The FICON guidance provides an established source of criteria to assess the impacts of substantial temporary or permanent increase in baseline ambient noise levels. Based on the FICON criteria, the amount to which a given noise level increase is considered acceptable is reduced when the without Project (baseline) noise levels are already shown to exceed certain land-use specific exterior noise level criteria. The specific levels are based on typical responses to noise level increases of 5 dBA or *readily perceptible*, 3 dBA or *barely perceptible*, and 1.5 dBA depending on the underlying without Project noise levels for noise-sensitive uses. These levels of increases and their perceived acceptance are consistent with the guidance provided by both the Federal Highway Administration (4 p. 9) and Caltrans (15 p. 2_48).

4.2 VIBRATION (THRESHOLD B)

As described in Section 3.5, the vibration impacts originating from the construction of the Vineyard Avenue Warehouse, vibration-generating activities are appropriately evaluated using the San Bernardino County threshold to assess potential temporary construction-related impacts at nearby receiver locations. The San Bernardino County Municipal Code identifies an operational vibration level threshold of 0.2 in/sec PPV.

4.3 CEQA GUIDELINES NOT FURTHER ANALYZED (THRESHOLD C)

CEQA Noise Threshold C applies when there are nearby public and private airports and/or air strips and focuses on land use compatibility of the Project to nearby airports and airstrips. The Project site is not located within two miles of an airport or airstrip. The closest airport is the San Bernardino International Airport located over 9 miles southeast of the Project site. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to Appendix G to the CEQA Guidelines, Noise Threshold C.

4.4 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed Project. Table 4-1 shows the significance criteria summary matrix that includes the allowable criteria used to identify potentially significant incremental noise level increases.

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site	Noise-Sensitive[1]	if ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase	
		if ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL Project increase	
		if ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project increase	
Operational	Residential	Exterior Noise Level Limit[2]	55 dBA L_{eq}	45 dBA L_{eq}
	Noise-Sensitive[1]	if ambient is < 60 dBA L_{eq}	≥ 5 dBA L_{eq} Project increase	
		if ambient is 60 - 65 dBA L_{eq}	≥ 3 dBA L_{eq} Project increase	
		if ambient is > 65 dBA L_{eq}	≥ 1.5 dBA L_{eq} Project increase	
Construction	Noise-Sensitive	Permitted between 7:00 a.m. to 7:00 p.m.; except Sundays and Federal holidays.[3]		
		Noise Level Threshold[4]	80 dBA L_{eq}	n/a
		Vibration Level Threshold[5]	0.2 PPV in/sec	n/a

[1] FICON, 1992.
[2] County of San Bernardino Development Code, Title 8, Section 83.01.080 (Appendix 3.1)
[3] Section 83.01.080(g)(3) of the County of San Bernardino County Code.
[4] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[5] Section 83.01.090(a) of the County of San Bernardino County Code.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m. "n/a" = construction activities are not planned during the nighttime hours; "PPV" = peak particle velocity.

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at four locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, long-term noise level measurements were collected by Urban Crossroads, Inc. on Tuesday, June 6, 2023. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the equivalent daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (16)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing equivalent hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (2) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (8)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (8) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the

future noise level impacts. Collecting noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels and is necessary to assess potential noise increase due to the Project's contribution to the ambient noise levels. This approach is necessary to calculate the temporary or permanent increase in *ambient* noise levels as required by the CEQA Guidelines Environmental Checklist.

5.3 NOISE MEASUREMENT RESULTS

The noise measurements presented below focus on the equivalent or the energy average hourly sound levels (L_{eq}) to describe the existing *ambient* conditions. The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise levels at each noise level measurement location.

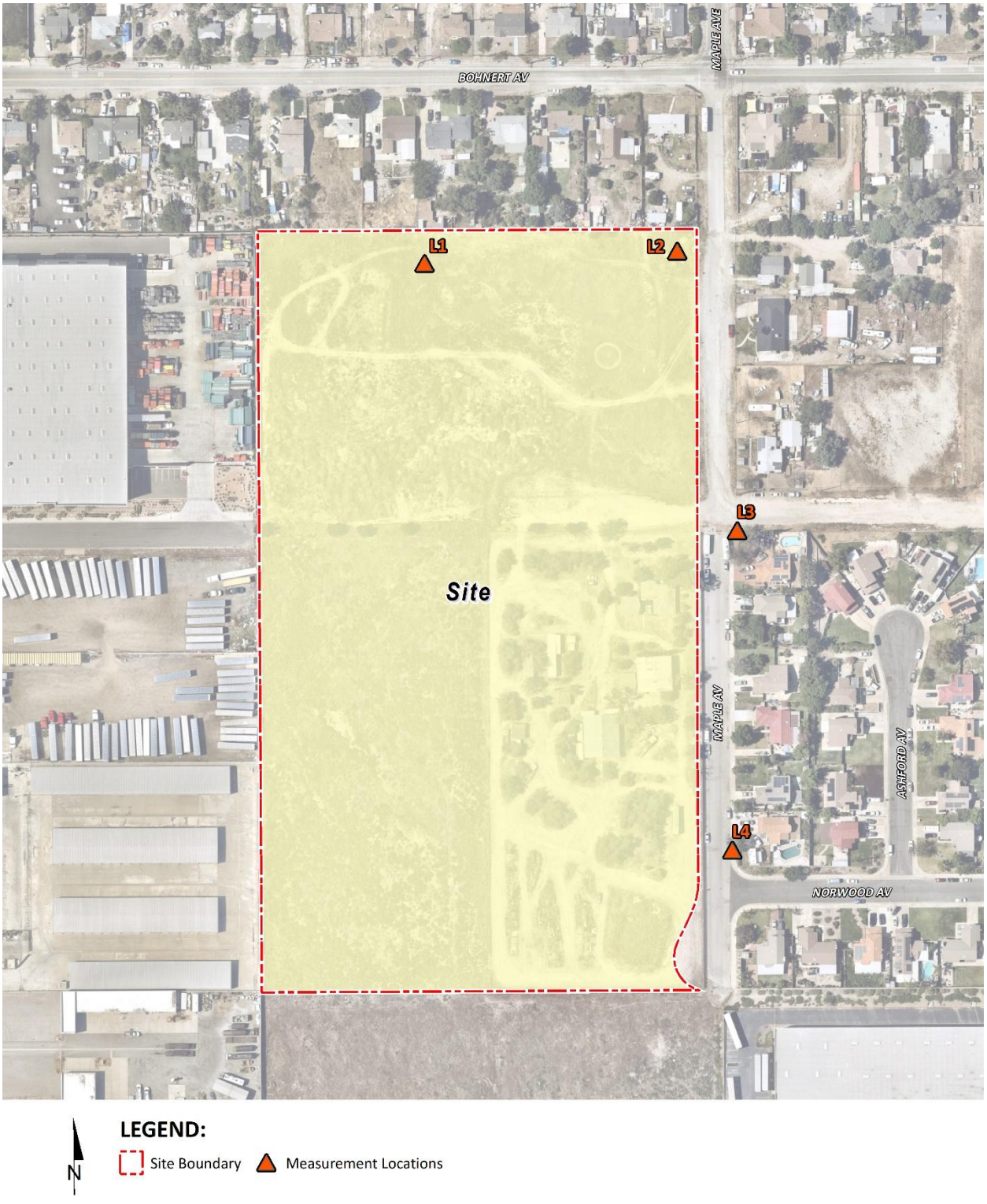
TABLE 5-1: AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]	
		Daytime	Nighttime
L1	Located north of the site near the residence at 18205 Bohnert Ave.	49.3	48.8
L2	Located north of the site near the residence at 18279 Bohnert Ave.	50.7	49.2
L3	Located east of the site near the residence at 18312 Vineyard Ave.	55.2	52.0
L4	Located east of the site near the residence at 2231 N Maple Ave.	58.0	56.2

[1] See Exhibit 5-A for the noise level measurement locations.
[2] Energy (logarithmic) average levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

Table 5-1 provides the equivalent noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L_1, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} percentile noise levels observed during the daytime and nighttime periods.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS



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6 TRAFFIC NOISE METHODS AND PROCEDURES

The following section outlines the methods and procedures used to estimate and analyze the future transportation related noise environment. Consistent with San Bernardino County Noise Guidelines for Land Use Planning (see Exhibit 3-A), all transportation related noise levels are presented in terms of the 24-hour CNEL's.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (17) The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (18) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period. Research conducted by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (19)

6.1.1 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the 9 off-site study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the San Bernardino County General Plan Circulation Element, and the vehicle speeds. The ADT volumes used in this study area presented on Table 6-2 are based on the *Vineyard Avenue Warehouse Traffic Analysis*, prepared by Urban Crossroads, Inc. for the following traffic scenarios (20).

- Existing
- Existing plus Project
- Opening Year Cumulative (OYC) (2025) without Project Conditions
- Opening Year Cumulative (OYC) (2025) with Project Conditions
- Horizon Year (2040) without Project Conditions
- Horizon Year (2040) with Project Conditions

The ADT volumes vary for each roadway segment based on the existing traffic volumes and the combination of project traffic distributions. This analysis relies on a comparative evaluation of the off-site traffic noise impacts at the boundary of the right-of-way of the receiving adjacent land use, without and with project ADT traffic volumes from the Project traffic analysis. The

Project is anticipated to generate a net total of 536 two-way trips per day (actual vehicles) that includes 216 truck trips.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Classification[1]	Receiving Land Use[2]	Distance from Centerline to Receiving Land Use (Feet)[3]	Vehicle Speed (mph)
1	Alder Av.	s/o Casmalia Av.	Major	Non-Sensitive	60'	50
2	Alder Av.	n/o Renaissance Pkwy.	Major	Non-Sensitive	60'	50
3	Locust Av.	s/o Vineyard Av.	Secondary	Non-Sensitive	44'	45
4	Locust Av.	n/o Casmalia Av.	Secondary	Non-Sensitive	44'	45
5	Locust Av.	s/o Casmalia Av.	Secondary	Non-Sensitive	44'	45
6	Casmalia Av.	e/o Alder Av.	Secondary	Non-Sensitive	44'	55
7	Casmalia Av.	w/o Laurel Av.	Secondary	Non-Sensitive	44'	55
8	Casmalia Av.	w/o Locust Av.	Secondary	Non-Sensitive	44'	55
9	Casmalia Av.	e/o Locust Av.	Secondary	Non-Sensitive	44'	55

[1] Vineyard Avenue Warehouse, Urban Crossroads, Inc.
[2] Based on a review of existing aerial imagery.
[3] Distance to receiving land use is based upon the right-of-way distances.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]					
			Existing		OYC (2025)		HY (2040)	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Alder Av.	s/o Casmalia Av.	14,192	14,600	23,818	24,226	26,322	26,730
2	Alder Av.	n/o Renaissance Pkwy.	22,348	22,364	35,599	35,615	39,542	39,558
3	Locust Av.	s/o Vineyard Av.	12,169	12,185	12,661	12,677	14,808	14,824
4	Locust Av.	n/o Casmalia Av.	13,936	14,456	14,499	15,019	27,224	27,744
5	Locust Av.	s/o Casmalia Av.	8,071	8,087	8,930	8,946	19,871	19,887
6	Casmalia Av.	e/o Alder Av.	13,594	14,018	24,761	25,185	27,159	27,583
7	Casmalia Av.	w/o Laurel Av.	10,369	10,793	13,883	14,307	20,570	20,994
8	Casmalia Av.	w/o Locust Av.	11,402	11,826	14,958	15,382	19,797	20,221
9	Casmalia Av.	e/o Locust Av.	7,843	7,939	10,722	10,818	12,106	12,202

[1] Vineyard Avenue Warehouse Traffic Analysis, Urban Crossroads, Inc.

To quantify the off-site noise levels, the Project related truck trips were added to the heavy truck category in the FHWA noise prediction model. The addition of the Project related truck trips increases the percentage of heavy trucks in the vehicle mix. This approach recognizes that the FHWA noise prediction model is significantly influenced by the number of heavy trucks in the vehicle mix. Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits. The daily Project truck trip-ends were assigned to the individual off-site study area roadway

segments based on the Project truck trip distribution percentages documented in the *Vineyard Avenue Warehouse Traffic Analysis*. Using the Project truck trips in combination with the Project trip distribution, Urban Crossroads, Inc. calculated the number of additional Project truck trips and vehicle mix percentages for each of the study area roadway segments. Table 6-4 shows the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios, and Tables 6-5 to 6-7 show the vehicle mixes used for the with Project traffic scenarios.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	69.27%	10.61%	20.12%	100.00%
Medium Trucks	73.75%	4.15%	22.09%	100.00%
Heavy Trucks	79.07%	4.65%	16.28%	100.00%

[1] Based on the August 30, 2023, directional vehicle classification count collected on Locust Avenue south of Vineyard Avenue (Vineyard Avenue Warehouse Traffic Analysis, Urban Crossroads, Inc.)
"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

TABLE 6-4: WITHOUT PROJECT VEHICLE MIX

Classification	Total % Traffic Flow[1]			Total
	Autos	Medium Trucks	Heavy Trucks	
All Segments	88.81%	10.83%	0.36%	100.00%

[1] Based on the August 30, 2023, directional vehicle classification count collected on Locust Avenue south of Vineyard Avenue (Vineyard Avenue Warehouse Traffic Analysis, Urban Crossroads, Inc.)

Due to the added Project truck trips, the increase in Project traffic volumes and the distributions of trucks on the study area road segments, the percentage of autos, medium trucks and heavy trucks will vary for each of the traffic scenarios. This explains why the existing and future traffic volumes and vehicle mixes vary between seemingly identical study area roadway segments.

TABLE 6-5: EXISTING WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total
1	Alder Av.	s/o Casmalia Av.	87.64%	10.58%	1.79%	100.00%
2	Alder Av.	n/o Renaissance Pkwy.	88.81%	10.83%	0.36%	100.00%
3	Locust Av.	s/o Vineyard Av.	88.82%	10.82%	0.36%	100.00%
4	Locust Av.	n/o Casmalia Av.	87.71%	10.49%	1.80%	100.00%
5	Locust Av.	s/o Casmalia Av.	88.83%	10.81%	0.36%	100.00%
6	Casmalia Av.	e/o Alder Av.	87.60%	10.55%	1.84%	100.00%
7	Casmalia Av.	w/o Laurel Av.	87.24%	10.47%	2.29%	100.00%
8	Casmalia Av.	w/o Locust Av.	87.38%	10.50%	2.12%	100.00%
9	Casmalia Av.	e/o Locust Av.	88.94%	10.70%	0.36%	100.00%

[1] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-6: OYC 2025 WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total
1	Alder Av.	s/o Casmalia Av.	88.10%	10.68%	1.22%	100.00%
2	Alder Av.	n/o Renaissance Pkwy.	88.81%	10.83%	0.36%	100.00%
3	Locust Av.	s/o Vineyard Av.	88.82%	10.82%	0.36%	100.00%
4	Locust Av.	n/o Casmalia Av.	87.76%	10.50%	1.74%	100.00%
5	Locust Av.	s/o Casmalia Av.	88.83%	10.81%	0.36%	100.00%
6	Casmalia Av.	e/o Alder Av.	88.14%	10.68%	1.19%	100.00%
7	Casmalia Av.	w/o Laurel Av.	87.63%	10.56%	1.81%	100.00%
8	Casmalia Av.	w/o Locust Av.	87.71%	10.58%	1.71%	100.00%
9	Casmalia Av.	e/o Locust Av.	88.91%	10.74%	0.36%	100.00%

[1] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-7: HY 2040 WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total
1	Alder Av.	s/o Casmalia Av.	88.17%	10.69%	1.14%	100.00%
2	Alder Av.	n/o Renaissance Pkwy.	88.81%	10.83%	0.36%	100.00%
3	Locust Av.	s/o Vineyard Av.	88.82%	10.82%	0.36%	100.00%
4	Locust Av.	n/o Casmalia Av.	88.24%	10.65%	1.11%	100.00%
5	Locust Av.	s/o Casmalia Av.	88.82%	10.83%	0.36%	100.00%
6	Casmalia Av.	e/o Alder Av.	88.19%	10.69%	1.11%	100.00%
7	Casmalia Av.	w/o Laurel Av.	88.00%	10.65%	1.35%	100.00%
8	Casmalia Av.	w/o Locust Av.	87.97%	10.64%	1.39%	100.00%
9	Casmalia Av.	e/o Locust Av.	88.89%	10.75%	0.36%	100.00%

[1] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

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7 OFF-SITE TRAFFIC NOISE ANALYSIS

To assess the off-site transportation CNEL noise level impacts associated with development of the proposed Project, noise contours were developed based on *the Vineyard Avenue Warehouse Traffic Analysis* prepared by Urban Crossroads, Inc. (20) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway.

7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental 24-hour dBA CNEL traffic-related noise impacts at receiving land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA CNEL noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 through 7-6 present a summary of the exterior traffic noise levels without barrier attenuation for each traffic condition. Appendix 7.1 includes the traffic noise level contours worksheets for each traffic condition.

TABLE 7-1: EXISTING WITHOUT PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Alder Av.	s/o Casmalia Av.	Non-Sensitive	73.0	56	122	262
2	Alder Av.	n/o Renaissance Pkwy.	Non-Sensitive	75.0	RW	111	240
3	Locust Av.	s/o Vineyard Av.	Non-Sensitive	72.4	RW	75	161
4	Locust Av.	n/o Casmalia Av.	Non-Sensitive	73.0	75	162	350
5	Locust Av.	s/o Casmalia Av.	Non-Sensitive	70.6	75	161	347
6	Casmalia Av.	e/o Alder Av.	Non-Sensitive	75.0	170	367	790
7	Casmalia Av.	w/o Laurel Av.	Non-Sensitive	73.9	166	358	770
8	Casmalia Av.	w/o Locust Av.	Non-Sensitive	74.3	166	358	771
9	Casmalia Av.	e/o Locust Av.	Non-Sensitive	72.6	314	677	1459

[1] Based on a review of existing aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-2: EXISTING WITH PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Alder Av.	s/o Casmalia Av.	Non-Sensitive	73.8	107	231	497
2	Alder Av.	n/o Renaissance Pkwy.	Non-Sensitive	75.0	129	279	600
3	Locust Av.	s/o Vineyard Av.	Non-Sensitive	72.4	63	136	294
4	Locust Av.	n/o Casmalia Av.	Non-Sensitive	73.8	79	170	366
5	Locust Av.	s/o Casmalia Av.	Non-Sensitive	70.6	48	104	224
6	Casmalia Av.	e/o Alder Av.	Non-Sensitive	75.7	106	229	493
7	Casmalia Av.	w/o Laurel Av.	Non-Sensitive	74.8	91	197	425
8	Casmalia Av.	w/o Locust Av.	Non-Sensitive	75.1	96	208	447
9	Casmalia Av.	e/o Locust Av.	Non-Sensitive	72.7	66	143	308

[1] Based on a review of existing aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-3: OYC 2025 WITHOUT PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Alder Av.	s/o Casmalia Av.	Non-Sensitive	75.3	135	291	626
2	Alder Av.	n/o Renaissance Pkwy.	Non-Sensitive	77.0	176	380	818
3	Locust Av.	s/o Vineyard Av.	Non-Sensitive	72.5	65	140	302
4	Locust Av.	n/o Casmalia Av.	Non-Sensitive	73.1	71	153	330
5	Locust Av.	s/o Casmalia Av.	Non-Sensitive	71.0	51	111	239
6	Casmalia Av.	e/o Alder Av.	Non-Sensitive	77.6	142	306	660
7	Casmalia Av.	w/o Laurel Av.	Non-Sensitive	75.1	97	208	449
8	Casmalia Av.	w/o Locust Av.	Non-Sensitive	75.5	102	219	472
9	Casmalia Av.	e/o Locust Av.	Non-Sensitive	74.0	81	175	378

[1] Based on a review of existing aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-4: OYC 2025 WITH PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Alder Av.	s/o Casmalia Av.	Non-Sensitive	75.7	145	312	671
2	Alder Av.	n/o Renaissance Pkwy.	Non-Sensitive	77.0	176	380	818
3	Locust Av.	s/o Vineyard Av.	Non-Sensitive	72.5	65	140	302
4	Locust Av.	n/o Casmalia Av.	Non-Sensitive	73.9	81	174	374
5	Locust Av.	s/o Casmalia Av.	Non-Sensitive	71.0	52	111	239
6	Casmalia Av.	e/o Alder Av.	Non-Sensitive	78.0	151	326	702
7	Casmalia Av.	w/o Laurel Av.	Non-Sensitive	75.8	108	232	499
8	Casmalia Av.	w/o Locust Av.	Non-Sensitive	76.1	112	242	521
9	Casmalia Av.	e/o Locust Av.	Non-Sensitive	74.0	82	176	379

[1] Based on a review of existing aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-5: HY 2040 WITHOUT PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Alder Av.	s/o Casmalia Av.	Non-Sensitive	75.7	144	311	669
2	Alder Av.	n/o Renaissance Pkwy.	Non-Sensitive	77.5	189	407	878
3	Locust Av.	s/o Vineyard Av.	Non-Sensitive	73.2	72	155	335
4	Locust Av.	n/o Casmalia Av.	Non-Sensitive	75.9	108	233	502
5	Locust Av.	s/o Casmalia Av.	Non-Sensitive	74.5	88	189	407
6	Casmalia Av.	e/o Alder Av.	Non-Sensitive	78.0	151	326	702
7	Casmalia Av.	w/o Laurel Av.	Non-Sensitive	76.8	126	271	583
8	Casmalia Av.	w/o Locust Av.	Non-Sensitive	76.7	122	264	568
9	Casmalia Av.	e/o Locust Av.	Non-Sensitive	74.5	88	190	410

[1] Based on a review of existing aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-6: HY 2040 WITH PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Alder Av.	s/o Casmalia Av.	Non-Sensitive	76.1	154	331	713
2	Alder Av.	n/o Renaissance Pkwy.	Non-Sensitive	77.5	189	407	878
3	Locust Av.	s/o Vineyard Av.	Non-Sensitive	73.2	72	155	335
4	Locust Av.	n/o Casmalia Av.	Non-Sensitive	76.3	116	250	539
5	Locust Av.	s/o Casmalia Av.	Non-Sensitive	74.5	88	189	407
6	Casmalia Av.	e/o Alder Av.	Non-Sensitive	78.4	160	345	743
7	Casmalia Av.	w/o Laurel Av.	Non-Sensitive	77.3	135	291	628
8	Casmalia Av.	w/o Locust Av.	Non-Sensitive	77.2	132	285	614
9	Casmalia Av.	e/o Locust Av.	Non-Sensitive	74.5	88	191	410

[1] Based on a review of existing aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

7.2 EXISTING PROJECT TRAFFIC NOISE LEVEL INCREASES

An analysis of existing traffic noise levels plus traffic noise generated by the proposed Project has been included in this report for informational purposes and to fully analyze all the existing traffic scenarios identified in the Traffic Analysis prepared by Urban Crossroads, Inc. However, the analysis of existing off-site traffic noise levels plus traffic noise generated by the proposed Project scenario will not actually occur since the Project would not be fully constructed and operational until Year 2025 conditions. Table 7-1 shows the Existing without Project conditions CNEL noise levels. The Existing without Project exterior noise levels range from 70.6 to 75.0 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions ranging from 70.6 to 75.7 dBA CNEL. Table 7-7 shows that the Project off-site traffic noise level increases range from 0.0 to 0.9 dBA CNEL on the study area roadway segments. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to unmitigated Project-related traffic noise levels.

7.3 OYC 2025 TRAFFIC NOISE LEVEL INCREASES

Table 7-3 presents the Opening Year Cumulative (OYC) without Project conditions CNEL noise levels. The OYC without Project exterior noise levels range from 71.0 to 77.6 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows that the OYC with Project conditions will range from 71.0 to 78.0 dBA CNEL. Table 7-8 shows that the Project off-site traffic noise level increases range from 0.0 to 0.8 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to

the study area roadway segments would experience *less than significant* noise level impacts due to unmitigated Project-related traffic noise levels.

7.4 HORIZON YEAR 2040 TRAFFIC NOISE LEVEL INCREASES

Table 7-5 presents the HY 2040 without Project conditions CNEL noise levels. The HY 2040 without Project exterior noise levels range from 73.2 to 78.0 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-6 shows that the HY 2040 with Project conditions will range from 73.2 to 78.4 dBA CNEL. Table 7-9 shows that the Project off-site traffic noise level increases range from 0.0 to 0.5 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to unmitigated Project-related traffic noise levels.

TABLE 7-7: EXISTING WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]			Incremental Noise Level Increase Threshold[3]	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Alder Av.	s/o Casmalia Av.	Non-Sensitive	73.0	73.8	0.8	1.5	No
2	Alder Av.	n/o Renaissance Pkwy.	Non-Sensitive	75.0	75.0	0.0	1.5	No
3	Locust Av.	s/o Vineyard Av.	Non-Sensitive	72.4	72.4	0.0	1.5	No
4	Locust Av.	n/o Casmalia Av.	Non-Sensitive	73.0	73.8	0.8	1.5	No
5	Locust Av.	s/o Casmalia Av.	Non-Sensitive	70.6	70.6	0.0	1.5	No
6	Casmalia Av.	e/o Alder Av.	Non-Sensitive	75.0	75.7	0.7	1.5	No
7	Casmalia Av.	w/o Laurel Av.	Non-Sensitive	73.9	74.8	0.9	1.5	No
8	Casmalia Av.	w/o Locust Av.	Non-Sensitive	74.3	75.1	0.8	1.5	No
9	Casmalia Av.	e/o Locust Av.	Non-Sensitive	72.6	72.7	0.1	1.5	No

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.
[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

TABLE 7-8: OYC 2025 WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]			Incremental Noise Level Increase Threshold[3]	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Alder Av.	s/o Casmalia Av.	Non-Sensitive	75.3	75.7	0.4	1.5	No
2	Alder Av.	n/o Renaissance Pkwy.	Non-Sensitive	77.0	77.0	0.0	1.5	No
3	Locust Av.	s/o Vineyard Av.	Non-Sensitive	72.5	72.5	0.0	1.5	No
4	Locust Av.	n/o Casmalia Av.	Non-Sensitive	73.1	73.9	0.8	1.5	No
5	Locust Av.	s/o Casmalia Av.	Non-Sensitive	71.0	71.0	0.0	1.5	No
6	Casmalia Av.	e/o Alder Av.	Non-Sensitive	77.6	78.0	0.4	1.5	No
7	Casmalia Av.	w/o Laurel Av.	Non-Sensitive	75.1	75.8	0.7	1.5	No
8	Casmalia Av.	w/o Locust Av.	Non-Sensitive	75.5	76.1	0.6	1.5	No
9	Casmalia Av.	e/o Locust Av.	Non-Sensitive	74.0	74.0	0.0	1.5	No

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.
[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

TABLE 7-9: HY 2040 WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]			Incremental Noise Level Increase Threshold[3]	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Alder Av.	s/o Casmalia Av.	Non-Sensitive	75.7	76.1	0.4	1.5	No
2	Alder Av.	n/o Renaissance Pkwy.	Non-Sensitive	77.5	77.5	0.0	1.5	No
3	Locust Av.	s/o Vineyard Av.	Non-Sensitive	73.2	73.2	0.0	1.5	No
4	Locust Av.	n/o Casmalia Av.	Non-Sensitive	75.9	76.3	0.4	1.5	No
5	Locust Av.	s/o Casmalia Av.	Non-Sensitive	74.5	74.5	0.0	1.5	No
6	Casmalia Av.	e/o Alder Av.	Non-Sensitive	78.0	78.4	0.4	1.5	No
7	Casmalia Av.	w/o Laurel Av.	Non-Sensitive	76.8	77.3	0.5	1.5	No
8	Casmalia Av.	w/o Locust Av.	Non-Sensitive	76.7	77.2	0.5	1.5	No
9	Casmalia Av.	e/o Locust Av.	Non-Sensitive	74.5	74.5	0.0	1.5	No

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.
[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

8 RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following sensitive receiver locations, as shown on Exhibit 8-A, were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

To describe the potential off-site Project noise levels, seven receiver locations in the vicinity of the Project site were identified. The selection of receiver locations is based on FHWA guidelines and is consistent with additional guidance provided by Caltrans and the FTA, as previously described in Section 5.2. Due to the additional attenuation from distance and the shielding of intervening structures, other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures. Distance is measured in a straight line from the project boundary to each receiver location.

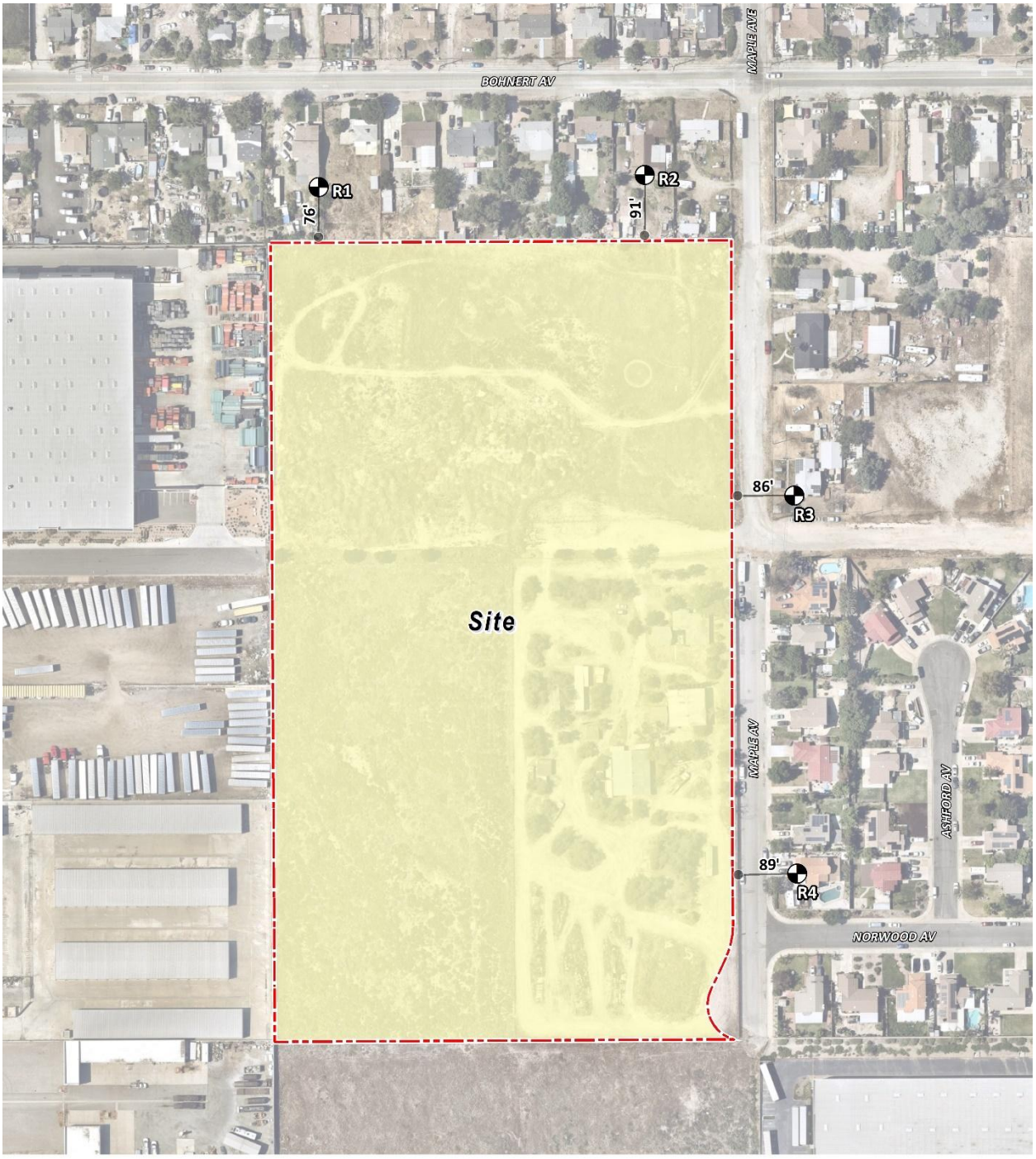
R1: Location R1 represents the existing noise sensitive residence at 18205 Bohnert Avenue, approximately 76 feet north of the Project site. It appears that there are no distinct private outdoor living areas (patio, pool, porch, etc.). Therefore, R1 is placed in the backyard near the building façade. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents the existing noise sensitive residence at 18279 Bohnert Avenue, approximately 91 feet north of the Project site. It appears that there are no distinct private outdoor living areas (patio, pool, porch, etc.). Therefore, R2 is placed in the backyard near the building façade. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R3: Location R3 represents the existing noise sensitive residence at 18312 Vineyard Avenue approximately 86 feet east of the Project site. A 24-hour noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

R4: Location R4 represents the existing noise sensitive residence at 2231 N Maple Avenue, approximately 89 feet east of the Project site. A 24-hour noise measurement was taken near this location, L4, to describe the existing ambient noise environment. ambient noise environment.

EXHIBIT 8-A: RECEIVER LOCATIONS



9 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearest receiver locations, identified in Section 8, resulting from the operation of the proposed Vineyard Avenue Warehouse Project. Exhibit 9-A presents the 23 individual noise sources used to assess the operational noise levels with the planned 8-foot-high noise barrier at the northwest corner of the Project site. To reduce the noise exposure to the existing noise sensitive residential areas near the Project site, several design features were considered as part of the site planning process. These design features include positioning the loading dock areas in a north-south orientation and placing the warehouse buildings between the loading docks and the residential areas to the north on Bohnert Avenue and to the east on Maple Avenue.

9.1 OPERATIONAL NOISE SOURCES

This operational noise analysis is intended to describe noise level impacts associated with the expected typical of daytime and nighttime activities at the Project site. Consistent with similar warehouse uses, the Project business operations would primarily be conducted within the enclosed building, except for traffic movement, parking, as well as loading and unloading of trucks at designated loading bays. The on-site Project-related noise sources are expected to include: loading dock activity, roof-top air conditioning units, parking lot vehicle activities, trash enclosure activity, and truck movements. Additional noise activity may be attributed to emergency generators. However, emergency generators are designed for use only during power outages or emergencies, meaning their operation is infrequent and temporary. Additionally, they require periodic testing and maintenance, but this occurs on a scheduled basis for short durations rather than continuous operation. Because they are not a constant source of noise, their impact does not contribute to ongoing operational noise levels in a way that would typically require regulatory restrictions. In addition, Section 83.01.080(e)(2) of the San Bernardino County Development Code recognizes this distinction and exempts emergency generators from standard noise limitations.

9.2 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 9-1 used to estimate the Project operational noise impacts. It is important to note that the following projected noise levels assume the reasonable worst-case noise environment with the typical noise sources operating at the same time. These sources of noise activity will likely vary throughout the day.

9.2.1 MEASUREMENT PROCEDURES

The reference noise level measurements presented in this section were collected using a Larson Davis LxT Type 1 precision sound level meter (serial number 01146) or Piccolo Type 2 integrating sound level meter and dataloggers. All sound level meter was calibrated using a Larson-Davis calibrator, Model CAL 150 or 200, programmed in "slow" mode to record noise levels in "A"

weighted form and was located at approximately five feet above the ground elevation for each measurement. The sound level meters and microphones were equipped with a windscreen during all measurements. Detailed reference noise measurement worksheets with photos for each noise source activity are included in Appendix 9.1.

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS

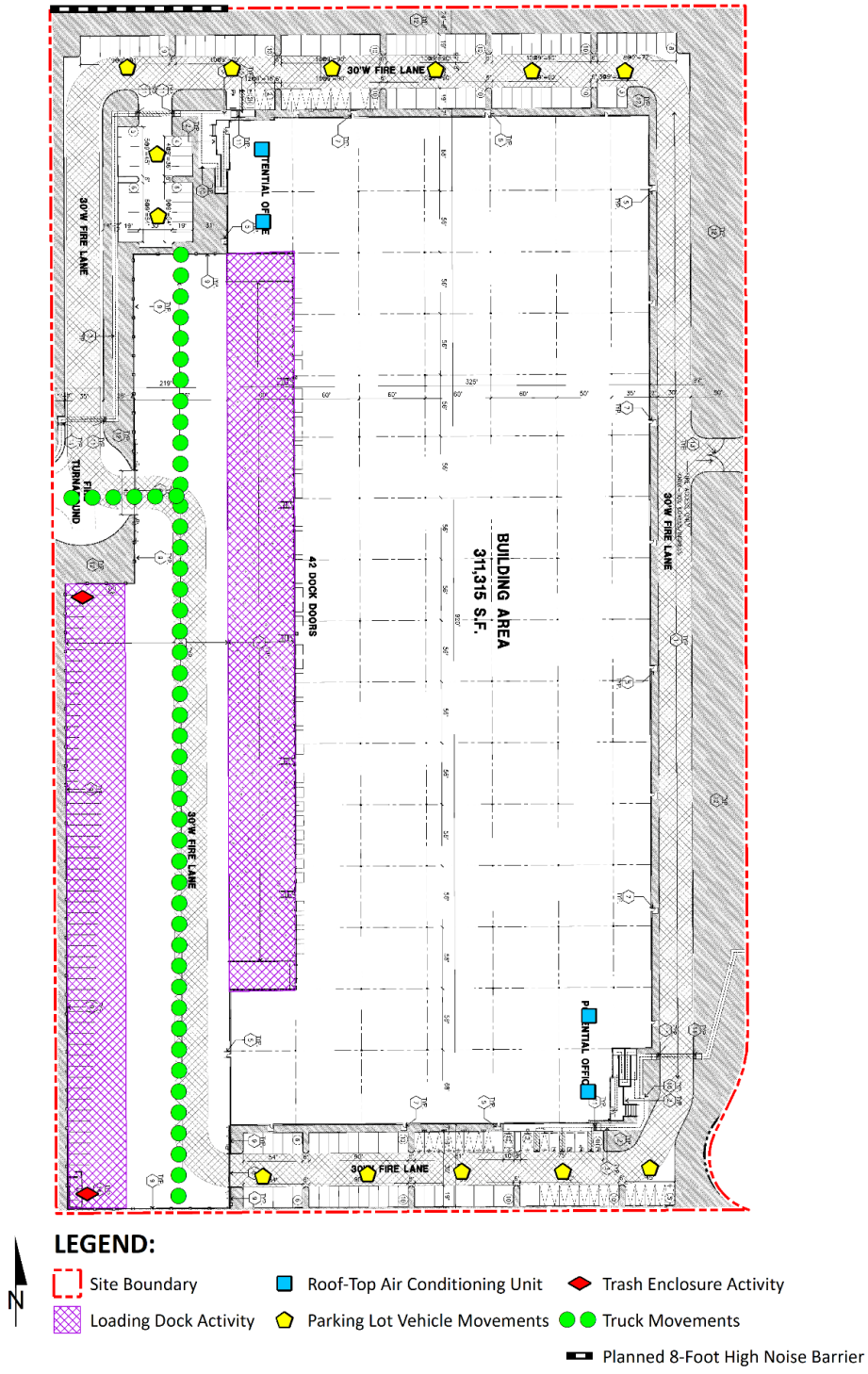


TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Reference Noise Source	Noise Source Height (Feet)	Min./ Hour[1]		Reference Noise Level (dBA L_{eq}) @ 50 Feet	Sound Power Level (dBA)[2]
		Day	Night		
Loading Dock Activity	8'	60	60	62.8	103.4
Roof-Top Air Conditioning Units	5'	39	28	57.2	88.9
Parking Lot Vehicle Movements	5'	60	60	52.6	81.1
Trash Enclosure Activity	5'	60	30	57.3	89.0
Truck Movements	8'	60	60	59.9	93.2

[1] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site. "Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

[2] Sound power level represents the total amount of acoustical energy (noise level) produced by a sound source independent of distance or surroundings. Sound power levels calculated using the CadnaA noise model at the reference distance to the noise source. Numbers may vary due to size differences between point and area noise sources.

9.2.2 LOADING DOCK ACTIVITY

The reference loading dock activities are intended to describe the typical operational noise source levels associated with the Project. This includes truck idling, deliveries, backup alarms, unloading/loading, docking including a combination of tractor trailer semi-trucks, two-axle delivery trucks, and background forklift operations. At a uniform reference distance of 50 feet, Urban Crossroads collected a reference noise level of 62.8 dBA L_{eq}. The loading dock activity noise level measurement was taken over a fifteen-minute period and represents multiple noise sources taken from the center of activity. The reference noise level measurement includes employees unloading a docked truck container included the squeaking of the truck's shocks when weight was removed from the truck, employees playing music over a radio, as well as a forklift horn and backup alarm. In addition, during the noise level measurement a truck entered the loading dock area and proceeded to reverse and dock in a nearby loading bay, adding truck engine, idling, air brakes noise, in addition to on-going idling of an already docked truck.

9.2.3 ROOF-TOP AIR CONDITIONING UNITS

The noise level measurements describe a single mechanical roof-top air conditioning unit. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. At the uniform reference distance of 50 feet, the reference noise level is 57.2 dBA L_{eq}. Based on the typical operating conditions observed over a four-day measurement period, the roof-top air conditioning units are estimated to operate for and average 39 minutes per hour during the daytime hours, and 28 minutes per hour during the nighttime hours. These operating conditions reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. For this noise analysis, the air conditioning units are expected to be located on the roof of the Project buildings.

9.2.4 PARKING LOT VEHICLE MOVEMENTS

To describe the on-site parking lot activity, a long-term 29-hour reference noise level measurement was collected in the center of activity within the staff parking lot of a warehouse distribution center. At 50 feet from the center of activity, the parking lot produced a reference noise level of 52.6 dBA L_{eq}. Parking activities are expected to take place during the full hour (60 minutes) throughout the daytime and evening hours. The parking lot noise levels are mainly due to cars pulling in and out of parking spaces in combination with car doors opening and closing.

9.2.5 TRASH ENCLOSURE ACTIVITY

To describe the noise levels associated with a trash enclosure activity, Urban Crossroads collected a reference noise level measurement at an existing trash enclosure containing two dumpster bins. The trash enclosure noise levels describe metal gates opening and closing, metal scraping against concrete floor sounds, dumpster movement on metal wheels, and trash dropping into the metal dumpster. The reference noise levels describe trash enclosure noise activities when trash is dropped into an empty metal dumpster, as would occur at the Project Site. The measured reference noise level at the uniform 50-foot reference distance is 57.3 dBA L_{eq} for the trash enclosure activity. The reference noise level describes the expected noise source activities associated with the trash enclosures for the Project's proposed building.

9.2.6 TRUCK MOVEMENTS

The truck movements reference noise level measurement was collected over a period of 1 hour and 28 minutes and represent multiple heavy trucks entering and exiting the outdoor loading dock area producing a reference noise level of 59.98 dBA L_{eq} at 50 feet. It is expected that the trucks will access the site to the west on Vineyard Avenue with truck activities occurring on the western building façade away from the noise sensitive residential uses to the north and east. The noise sources included at this measurement location account for trucks entering and existing the Project driveways and maneuvering in and out of the outdoor loading dock activity area.

9.3 CADNAA NOISE PREDICTION MODEL

To fully describe the exterior operational noise levels from the Project, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze multiple types of noise sources using the spatially accurate Project site plan, georeferenced Nearmap aerial imagery, topography, buildings, and barriers in its calculations to predict outdoor noise levels. Using the ISO 9613-2 protocol, CadnaA will calculate the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613-2 protocol, the CadnaA noise prediction model relies on the reference sound power level (L_w) to describe individual noise sources.

While sound pressure levels (e.g., L_{eq}) quantify in decibels the intensity of given sound sources at a reference distance, sound power levels (L_w) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source

and diminish because of intervening obstacles and barriers, air absorption, wind, and other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment. The operational noise level calculations provided in this noise study account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. A default ground attenuation factor of 0.5 was used in the CadnaA noise analysis to account for mixed ground representing a combination of hard and soft surfaces. Appendix 9.1 includes the detailed noise model inputs including the planned screenwall used to estimate the Project operational noise levels presented in this section.

9.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include loading dock activity, roof-top air conditioning units, parking lot vehicle activities, trash enclosure activity, and truck movements, Urban Crossroads, Inc. calculated the unmitigated operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. Table 9-2 shows the Project operational noise levels during the daytime hours of 7:00 a.m. to 10:00 p.m. The daytime hourly noise levels at the off-site receiver locations are expected to range from 32.7 to 48.9 dBA L_{eq}.

TABLE 9-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)			
	R1	R2	R3	R4
Loading Dock Activity	47.1	25.5	25.6	25.7
Roof-Top Air Conditioning Units	35.8	32.7	29.2	36.1
Parking Lot Vehicle Movements	41.0	39.6	27.8	31.8
Trash Enclosure Activity	31.8	10.8	9.6	12.3
Truck Movements	39.4	17.3	15.5	15.5
Total (All Noise Sources)	**48.9**	**40.6**	**32.7**	**37.8**

[1] See Exhibit 9-A for the noise source locations. CadnaA noise model calculations are included in Appendix 9.2.

Table 9-3 shows the Project operational noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. The nighttime hourly noise levels at the off-site receiver locations are expected to range from 31.7 to 48.8 dBA L_{eq}. The differences between the daytime and nighttime noise levels are largely related to the estimated duration of noise activity as outlined in Table 9-1. While it is expected that the noise source activities will be reduced during the nighttime hours, the analysis assumes no difference between the operating duration for loading dock activity, parking lot vehicle and truck movements. However, the analysis assumes that roof-top air conditioning units and trash enclosure activities operating durations will be lower during the nighttime hours. This explains the minor variation in the Project operational noise levels between the daytime and nighttime hours. Appendix 9.2 includes detailed noise model calculations including the planned 8-foot-high-wall at the northwest corner of the Project site.

TABLE 9-3: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)			
	R1	R2	R3	R4
Loading Dock Activity	47.1	25.5	25.6	25.7
Roof-Top Air Conditioning Units	33.4	30.3	26.8	33.7
Parking Lot Vehicle Movements	41.0	39.6	27.8	31.8
Trash Enclosure Activity	27.8	6.9	5.6	8.3
Truck Movements	39.4	17.3	15.5	15.5
Total (All Noise Sources)	**48.8**	**40.3**	**31.7**	**36.3**

[1] See Exhibit 9-A for the noise source locations. CadnaA noise model calculations are included in Appendix 9.2.

9.5 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level thresholds based on the San Bernardino County exterior noise level standards at nearby noise-sensitive receiver locations. Table 9-4 shows the operational noise levels associated with Vineyard Avenue Warehouse will satisfy the Section 83.01.080 of the County of San Bernardino Development Code at the nearest receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearest noise-sensitive receiver locations.

TABLE 9-4: OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Project Operational Noise Levels (dBA Leq)[2]		Noise Level Standards (dBA Leq)[3]		Noise Level Standards Exceeded?[4]	
	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
R1	48.9	48.8	55.0	48.8	No	No
R2	40.6	40.3	55.0	49.2	No	No
R3	32.7	31.7	55.2	52.0	No	No
R4	37.8	36.3	58.0	56.2	No	No

[1] See Exhibit 8-A for the receiver locations.
[2] Proposed Project unmitigated operational noise levels as shown on Tables 9-2 and 9-3.
[3] Exterior noise level standards, adjusted to reflect the ambient noise levels (see Table 5-1) per the County of San Bernardino Development Code Section 83.01.080(e).
[4] Do the estimated Project operational noise source activities exceed the noise level standards?
[5] Project operational noise levels provided for informational purposes
"Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

9.6 PROJECT OPERATIONAL NOISE LEVEL INCREASES

To describe the Project operational noise level increases, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearby receiver locations that may be potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (2) Instead, they must be logarithmically added using the following base equation:

$$SPL_{Total} = 10\log_{10}[10^{SPL1/10} + 10^{SPL2/10} + \ldots 10^{SPLn/10}]$$

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describes the Project noise level increases to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the daytime and nighttime ambient conditions are presented on Tables 9-5 and 9-6, respectively. As indicated on Table 9-5, the Project will generate a daytime operational noise level increase ranging from 0.0 to 2.8 dBA L_{eq} at the nearest receiver locations. Table 9-6 shows that the Project will generate a nighttime operational noise level increase ranging from 0.0 to 3.0 dBA L_{eq} at the nearest receiver locations. Project-related operational noise level increases will not exceed the operational noise level increase significance criteria presented in Table 4-1. Therefore, Project related operational noise level increases at the sensitive receiver locations will be *less than significant.*

TABLE 9-5: DAYTIME PROJECT OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	48.8	L1	49.3	52.1	2.8	5.0	No
R2	40.3	L2	50.7	51.1	0.4	5.0	No
R3	31.7	L3	55.2	55.2	0.0	5.0	No
R4	36.3	L4	58.0	58.0	0.0	5.0	No

[1] See Exhibit 8-A for the receiver locations.
[2] Total Project daytime operational noise levels as shown on Table 9-2.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance increase criteria as shown on Table 4-1.

TABLE 9-6: NIGHTTIME OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	48.8	L1	48.8	51.8	3.0	5.0	No
R2	40.3	L2	49.2	49.7	0.5	5.0	No
R3	31.7	L3	52.0	52.0	0.0	5.0	No
R4	36.3	L4	56.2	56.2	0.0	5.0	No

[1] See Exhibit 8-A for the receiver locations.
[2] Total Project nighttime operational noise levels as shown on Table 9-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed nighttime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance increase criteria as shown on Table 4-1.

10 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 10-A shows the construction noise source locations in relation to the nearest sensitive receiver locations previously described in Section 8. To prevent high levels of construction noise from impacting noise-sensitive land uses, San Bernardino County Development Code Section 83.01.080(g)(3), states that construction activities are limited to the hours of 7:00 a.m. to 7:00 p.m. on any day and limited at any time on Sundays and federal holidays.

10.1 CONSTRUCTION NOISE LEVELS

The FTA *Transit Noise and Vibration Impact Assessment Manual* recognizes that construction projects are accomplished in several different stages and outlines the procedures for assessing noise impacts during construction. Each stage has a specific equipment mix, depending on the work to be completed during that stage. As a result of the equipment mix, each stage has its own noise characteristics; some stages have higher continuous noise levels than others, and some have higher impact noise levels than others. The Project construction activities are expected to occur in the following stages that may overlap:

- Demolition
- Site Preparation
- Grading
- Building Construction
- Paving
- Architectural Coating

10.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe construction noise activities, this construction noise analysis was prepared using reference construction equipment noise levels from the Federal Highway Administration (FHWA) published the Roadway Construction Noise Model (RCNM), which includes a national database of construction equipment reference noise emission levels. (21) The RCNM equipment database, provides a comprehensive list of the noise generating characteristics for specific types of construction equipment. In addition, the database provides an acoustical usage factor to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation.

EXHIBIT 10-A: CONSTRUCTION NOISE SOURCE LOCATIONS

10.3 ON-SITE CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts at the nearby sensitive receiver locations were completed. Consistent with FTA guidance for detailed construction noise assessment, Table 10-1 presents the combined noise levels for the loudest construction equipment, assuming all equipment operates at the same time. Therefore, while stages of construction activities may overlap, only the loudest construction activity is evaluated.

To account for the dynamic nature of construction activities, the CadnaA construction noise analysis evaluates the equipment as multiple moving point sources within the construction area (Project site boundary). Construction impacts are based on the highest noise level calculated at each receiver location. As shown on Table 10-2, the construction noise levels are expected to range from 58.1 to 69.8 dBA L_{eq} at the nearby receiver locations. Appendix 10.1 includes the detailed CadnaA construction noise model inputs.

TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Equipmnet[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})	Composite Reference Noise Level (dBA L_{eq})[2]	Reference Power Level (dBA L_w)[3]
Demolition	Concrete Saw	83	86.8	118.4
	Grapple (on backhoe)	83		
	Gradall	79		
Site Preparation	Tractor	80	84.0	115.6
	Backhoe	74		
	Grader	81		
Grading	Scraper	80	83.3	114.9
	Excavator	77		
	Dozer	78		
Building Construction	Crane	73	80.6	112.2
	Generator	78		
	Front End Loader	75		
Paving	Paver	74	77.8	109.5
	Dump Truck	72		
	Roller	73		
Architectural Coating	Man Lift	68	76.2	107.8
	Compressor (air)	74		
	Generator (<25kVA)	70		

[1] FHWA Road Construction Noise Model.
[2] Represents the combined noise level for all equipment assuming they operate at the same time consistent with FTA Transit Noise and Vibration Impact Assessment guidance.
[3] Sound power level represents the total amount of acoustical energy (noise level) produced by a sound source independent of distance or surroundings.

TABLE 10-2: ON-SITE CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})						
	Demolition	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	68.9	65.4	65.4	62.7	60.0	58.3	68.9
R2	68.7	65.2	65.2	62.5	59.8	58.1	68.7
R3	69.8	66.3	66.3	63.6	60.9	59.2	69.8
R4	69.3	65.8	65.8	63.1	60.4	58.7	69.3

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.
[2] Construction noise level calculations based on distance from the construction activity, which is measured from the Project site boundary to the nearest receiver locations. CadnaA construction noise model inputs are included in Appendix 10.1.

10.4 CONSTRUCTION NOISE LEVEL COMPLIANCE

To evaluate whether the Project will generate potentially significant short-term noise levels at nearest receiver locations, a construction-related daytime noise level threshold of 80 dBA L_{eq} is used as a reasonable threshold to assess the daytime construction noise level impacts. The construction noise analysis shows that the nearest receiver locations will satisfy the reasonable daytime 80 dBA L_{eq} significance threshold during Project construction activities as shown on Table 10-3. Therefore, the noise impacts due to Project construction noise are considered *less than significant* at all receiver locations.

TABLE 10-3: PROJECT SITE CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	68.9	80	No
R2	68.7	80	No
R3	69.8	80	No
R4	69.3	80	No

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.
[2] Highest construction noise level calculations based on distance from the construction noise source activity to the nearest receiver locations as shown on Table 10-2.
[3] Construction noise level thresholds as shown on Table 4-1.
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?
[5] Project operational noise levels provided for informational purposes

10.6 NIGHTTIME CONCRETE POUR NOISE ANALYSIS

It is our understanding that nighttime concrete pouring activities will occur as a part of Project building construction activities. Nighttime concrete pouring activities are often used to support reduced concrete mixer truck transit times and lower air temperatures than during the daytime hours and are generally limited to the actual building pad area as shown on Exhibit 10-B. Since the nighttime concrete pours will take place outside the permitted San Bernardino County

Municipal Code, Section 16.20.125.E.3 hours of *7:00 a.m. to 7:00 p.m. on any day and at any time on Sundays and federal holidays*. The Project Applicant will be required to obtain authorization for nighttime work from the San Bernardino County. Any nighttime construction noise activities shall satisfy the noise limits outlined in Table 3-1.

EXHIBIT 10-B: CONCRETE POUR NOISE SOURCE LOCATIONS

10.6.1 NIGHTTIME CONCRETE POUR REFERENCE NOISE LEVEL MEASUREMENTS

To estimate the noise levels due to nighttime concrete pouring activities, sample reference noise level measurements were taken during a nighttime concrete pouring at a construction site. Urban Crossroads, Inc. collected short-term nighttime concrete pour reference noise level measurements during the noise-sensitive nighttime hours between 1:00 a.m. to 2:00 a.m. at 27334 San Bernardino Avenue in the City of Redlands. The reference noise levels describe the expected concrete pour noise sources that may include concrete mixer truck movements and pouring activities, concrete paving equipment, rear mounted concrete mixer truck backup alarms, engine idling, air brakes, generators, and workers communicating/whistling. To describe the nighttime concrete pour noise levels associated with the construction of the Vineyard Avenue Warehouse, this analysis relies on reference sound pressure level of 67.7 dBA L_{eq} at 50 feet representing a sound power level of 100.3 dBA L_w. While the Project noise levels will depend on the actual duration of activities and specific equipment fleet in use at the time of construction, the reference sound power level of 100.3 dBA L_w is used to describe the expected Project nighttime concrete pour noise activities.

10.6.2 NIGHTTIME CONCRETE POUR NOISE LEVEL COMPLIANCE

As shown on Table 10-4, the noise levels associated with the nighttime concrete pour activities are estimated to range from 48.0 to 51.1 dBA L_{eq} and will satisfy the San Bernardino County nighttime stationary-source exterior hourly average L_{eq} residential noise level threshold at all the receiver locations. Based on the results of this analysis, all nearest noise receiver locations will experience *less than significant* impacts due to the Project related nighttime concrete pour activities. Appendix 10.2 includes the CadnaA nighttime concrete pour noise model inputs.

TABLE 10-4: NIGHTTIME CONCRETE POUR NOISE LEVEL COMPLIANCE

Receiver Location[1]	Concrete Pour Construction Noise Levels (dBA L_{eq})		
	Exterior Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	48.0	48.8	No
R2	49.0	49.2	No
R3	51.1	52.0	No
R4	50.4	56.2	No

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.
[2] Nighttime Concrete Pour noise model inputs are included in Appendix 10.2.
[3] Exterior nighttime noise level standards, adjusted to reflect the ambient noise levels (see Table 5-1) per the County of San Bernardino Development Code Section 83.01.080(e).
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?
[5] Project operational noise levels provided for informational purposes

10.7 CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. The operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Ground vibration levels associated with various types of construction equipment are summarized on Table 10-5. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential Project construction vibration levels using the following vibration assessment methods defined by the FTA. To calculate the vibration levles, the FTA provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 10-5: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV (in/sec) at 25 feet
Small bulldozer	0.003
Jackhammer	0.035
Loaded Trucks	0.076
Large bulldozer	0.089
Vibratory Roller	0.210

Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

Table 10-6 presents the expected Project related vibration levels at the nearby receiver locations. At distances ranging from 76 to 91 feet from Project construction activities, construction vibration velocity levels are estimated to range from 0.030 to 0.040 in/sec PPV. Based on maximum acceptable continuous vibration threshold of 0.2 PPV (in/sec), the typical Project construction vibration levels will fall below the building damage thresholds at all the noise sensitive receiver locations. Therefore, the Project-related vibration impacts are considered *less than significant* during typical construction activities at the Project site.

TABLE 10-6: PROJECT CONSTRUCTION VIBRATION LEVELS

Location[1]	Distance to Const. Activity (Feet)[2]	Typical Construction Vibration Levels PPV (in/sec)[3]						Thresholds PPV (in/sec)[4]	Thresholds Exceeded?[5]
		Small bulldozer	Jack-hammer	Loaded Trucks	Large bulldozer	Vibratory Roller	Highest Vibration Level		
R1	76'	0.001	0.007	0.014	0.017	0.040	0.040	0.2	No
R2	91'	0.000	0.005	0.011	0.013	0.030	0.030	0.2	No
R3	86'	0.000	0.005	0.012	0.014	0.033	0.033	0.2	No
R4	89'	0.000	0.005	0.011	0.013	0.031	0.031	0.2	No

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.
[2] Distance from receiver to limits of construction activity.
[3] Based on the Vibration Source Levels of Construction Equipment (Table 10-5).
[4] Section 83.01.090(a) of the County of San Bernardino County Code.
[5] Does the peak vibration exceed the acceptable vibration thresholds?
"PPV" = Peak Particle Velocity

11 REFERENCES

1. **State of California.** *California Environmental Quality Act, Appendix G.* 2018.
2. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
3. **Environmental Protection Agency Office of Noise Abatement and Control.** *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March 1974. EPA/ONAC 550/9/74-004.
4. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* December 2011.
5. **U.S. Department of Transportation Federal Highway Administration.** *Highway Noise Barrier Design Handbook.* 2001.
6. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
7. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
8. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual, FTA Report No. 0123.* September 2018.
9. **California Department of Transportation.** *Transportation and Construction Vibration Guidance Manual.* April 2020.
10. **Office of Planning and Research.** *State of California General Plan Guidelines.* 2019.
11. **County of San Bernardino.** *Countywide Plan.* October 2020.
12. —. *Code of Ordinances, Title 8 Development Code, Chapter 83.01 General Performance Standards.*
13. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
14. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
15. **California Department of Transportation.** *Technical Noise Supplement.* November 2009.
16. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
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18. **California Department of Transportation Environmental Program, Office of Environmental Engineering.** *Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction.* September 1995. TAN 95-03.
19. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
20. **Urban Crossroads, Inc.** *Vineyard Avenue Traffic Analysis.* September 2023.

21. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning.** *FHWA Roadway Construction Noise Model.* January, 2006.

12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Vineyard Avenue Warehouse Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 584-3148.

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EDUCATION

Master of Science in Civil and Environmental Engineering
California Polytechnic State University, San Luis Obispo • December, 1993

Bachelor of Science in City and Regional Planning
California Polytechnic State University, San Luis Obispo • June, 1992

PROFESSIONAL REGISTRATIONS

PE – Registered Professional Traffic Engineer – TR 2537 • January, 2009
AICP – American Institute of Certified Planners – 013011 • June, 1997–January 1, 2012
PTP – Professional Transportation Planner • May, 2007 – May, 2013
INCE – Institute of Noise Control Engineering • March, 2004

PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
ITE – Institute of Transportation Engineers

PROFESSIONAL CERTIFICATIONS

Certified Acoustical Consultant – County of San Diego • March, 2018
Certified Acoustical Consultant – County of Orange • February, 2011
FHWA-NHI-142051 Highway Traffic Noise Certificate of Training • February, 2013

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APPENDIX 3.1:

SAN BERNARDINO COUNTY MUNICIPAL CODE

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§ 83.01.080 Noise.

This Section establishes standards concerning acceptable noise levels for both noise-sensitive land uses and for noise-generating land uses.

(a) *Noise Measurement.* Noise shall be measured:

(1) At the property line of the nearest site that is occupied by, and/or zoned or designated to allow the development of noise-sensitive land uses;

(2) With a sound level meter that meets the standards of the American National Standards Institute (ANSI § SI4 1979, Type 1 or Type 2);

(3) Using the "A" weighted sound pressure level scale in decibels (ref. pressure = 20 micronewtons per meter squared). The unit of measure shall be designated as dB(A).

(b) *Noise Impacted Areas.* Areas within the County shall be designated as "noise-impacted" if exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards listed in Subdivision (d) (Noise Standards for Stationary Noise Sources) and Subdivision (e) (Noise Standards for Adjacent Mobile Noise Sources), below. New development of residential or other noise-sensitive land uses shall not be allowed in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to these standards. Noise-sensitive land uses shall include residential uses, schools, hospitals, nursing homes, religious institutions, libraries, and similar uses.

(c) *Noise Standards for Stationary Noise Sources.*

(1) *Noise Standards.* Table 83-2 (Noise Standards for Stationary Noise Sources) describes the noise standard for emanations from a stationary noise source, as it affects adjacent properties:

Table 83-2

Noise Standards for Stationary Noise Sources

Affected Land Uses (Receiving Noise)	***7:00 a.m. - 10:00 p.m. Leq***	***10:00 p.m. - 7:00 a.m. Leq***
Residential	55 dB(A)	45 dB(A)
Professional Services	55 dB(A)	55 dB(A)
Other Commercial	60 dB(A)	60 dB(A)
Industrial	70 dB(A)	70 dB(A)
Leq = (Equivalent Energy Level). The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period, typically one, eight or 24 hours.		
dB(A) = (A-weighted Sound Pressure Level). The sound pressure level, in decibels, as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, placing greater emphasis on those frequencies within the sensitivity range of the human ear.		
Ldn = (Day-Night Noise Level). The average equivalent A-weighted sound level during a 24-hour day obtained by adding 10 decibels to the hourly noise levels measured during the night (from 10:00 p.m. to 7:00 a.m.). In this way Ldn takes into account the lower tolerance of people for noise during nighttime periods.		

(2) *Noise Limit Categories.* No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporated or unincorporated, to exceed any one of the following:

(A) The noise standard for the receiving land use as specified in Subdivision (b) (Noise-Impacted Areas), above, for a cumulative period of more than 30 minutes in any hour.

(B) The noise standard plus five dB(A) for a cumulative period of more than 15 minutes in any hour.

(C) The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour.

(D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.

(E) The noise standard plus 20 dB(A) for any period of time.

(d) *Noise Standards for Adjacent Mobile Noise Sources.* Noise from mobile sources may affect adjacent properties adversely. When it does, the noise shall be mitigated for any new development to a level that shall not exceed the standards described in the following Table 83-3 (Noise Standards for Adjacent Mobile Noise Sources).

Table 83-3			
Noise Standards for Adjacent Mobile Noise Sources			
Land Use		***Ldn (or CNEL) dB(A)***	
Categories	***Uses***	***Interior*** (1)	***Exterior*** (2)
Residential	Single and multi-family, duplex, mobile homes	45	60(3)
Commercial	Hotel, motel, transient housing	45	60(3)
	Commercial retail, bank, restaurant	50	N/A
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	N/A
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library	45	65
Open Space	Park	N/A	65

Notes:

(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.

(2) The outdoor environment shall be limited to:
- Hospital/office building patios
- Hotel and motel recreation areas
- Mobile home parks
- Multi-family private patios or balconies
- Park picnic areas
- Private yard of single-family dwellings
- School playgrounds

(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.

CNEL = (Community Noise Equivalent Level). The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m.

(e) *Increases in Allowable Noise Levels.* If the measured ambient level exceeds any of the first four noise limit categories in Subdivision (d)(2), above, the allowable noise exposure standard shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category in Subdivision (d)(2), above, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

(f) *Reductions in Allowable Noise Levels.* If the alleged offense consists entirely of impact noise or simple tone noise, each of the noise levels in Table 83-2 (Noise Standards for Stationary Noise Sources) shall be reduced by five dB(A).

(g) *Exempt Noise.* The following sources of noise shall be exempt from the regulations of this Section:

(1) Motor vehicles not under the control of the commercial or industrial use.

(2) Emergency equipment, vehicles, and devices.

(3) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

(h) *Noise Standards for Other Structures.* All other structures shall be sound attenuated against the combined input of all present and projected exterior noise to not exceed the criteria.

Table 83-4
Noise Standards for Other Structures

Typical Uses	*12-Hour Equivalent Sound Level (Interior) in dBA Ldn*
Educational, institutions, libraries, meeting facilities, etc.	45
General office, reception, etc.	50
Retail stores, restaurants, etc.	55
Other areas for manufacturing, assembly, testing, warehousing, etc.	65

In addition, the average of the maximum levels on the loudest of intrusive sounds occurring during a 24-hour period shall not exceed 65 dBA interior.

(Ord. 4011, passed - -2007; Am. Ord. 4245, passed - -2014)

§ 83.01.090 Vibration.

(a) *Vibration Standard.* 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 two-tenths inches per second measured at or beyond the lot line.

(b) *Vibration Measurement.* Vibration velocity shall be measured with a seismograph or other instrument capable of measuring and recording displacement and frequency, particle velocity, or acceleration. Readings shall be made at points of maximum vibration along any lot line next to a parcel within a residential, commercial and industrial land use zoning district.

(c) *Exempt Vibrations.* The following sources of vibration shall be exempt from the regulations of this Section.

(1) Motor vehicles not under the control of the subject use.

(2) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

(Ord. 4011, passed - -2007)

APPENDIX 5.1:

STUDY AREA PHOTOS

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JN:15533

15533_L1_A 1.North
34, 8' 32.540000"117, 24' 20.660000"

15533_L1_A 2.South
34, 8' 32.580000"117, 24' 20.660000"

15533_L1_A 3.East
34, 8' 32.610000"117, 24' 20.600000"

15533_L1_A 4.West
34, 8' 32.580000"117, 24' 20.660000"

15533_L2_C 1.North
34, 8' 32.770000"117, 24' 20.030000"

15533_L2_C 2.South
34, 8' 32.700000"117, 24' 20.000000"

15533_L2_C 3.East
34, 8' 32.690000"117, 24' 19.970000"

15533_L2_C 4.West
34, 8' 32.760000"117, 24' 20.060000"

JN:15533

15533_L3_J 1.North
34, 8' 27.210000"117, 24' 19.310000"

15533_L3_J 2.South
34, 8' 27.120000"117, 24' 19.340000"

15533_L3_J 3.East
34, 8' 27.350000"117, 24' 19.400000"

15533_L3_J 4.West
34, 8' 27.350000"117, 24' 19.310000"

JN:15533

15533_L4_O 1.North
34, 8' 22.690000"117, 24' 19.230000"

15533_L4_O 2.South
34, 8' 22.530000"117, 24' 19.290000"

15533_L4_O 3.East
34, 8' 22.720000"117, 24' 19.340000"

15533_L4_O 4.West
34, 8' 22.650000"117, 24' 19.370000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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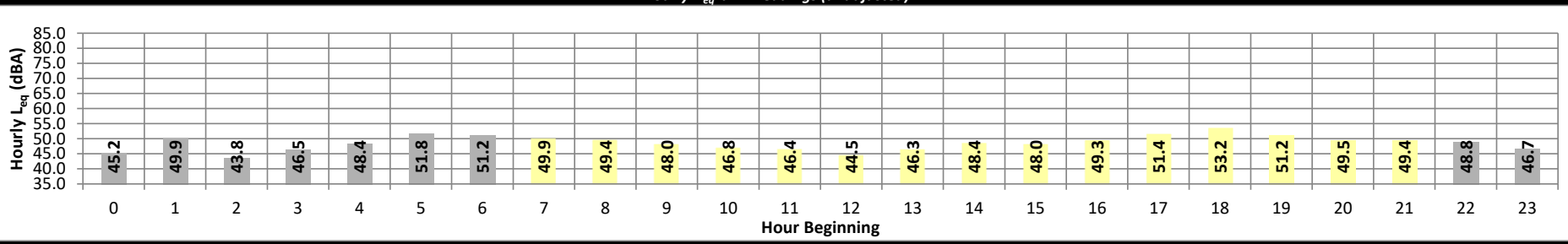
24-Hour Noise Level Measurement Summary

Date: Tuesday, June 6, 2023 *Location:* L1 - Located north of the site near the residence at 18205 *Meter:* Piccolo II *JN:* 15533

Project: Blackmon & Berry *Source:* Bohnert Ave. *Analyst:* Z. Ibrahim

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	45.2	50.5	41.5	49.9	49.4	48.6	48.2	46.2	44.1	42.2	41.9	41.6	45.2	10.0	55.2
	1	49.9	57.9	41.4	57.8	57.5	56.9	55.9	49.9	44.8	42.0	41.8	41.5	49.9	10.0	59.9
	2	43.8	47.3	41.7	46.8	46.3	45.6	45.3	44.3	43.5	42.3	42.0	41.8	43.8	10.0	53.8
	3	46.5	50.1	44.3	49.7	49.3	48.6	48.2	47.1	46.2	45.0	44.7	44.4	46.5	10.0	56.5
	4	48.4	53.7	45.4	53.1	52.7	51.9	51.3	48.7	47.5	46.1	45.8	45.5	48.4	10.0	58.4
	5	51.8	58.8	47.4	58.0	57.2	55.7	54.8	52.4	50.7	48.5	48.1	47.6	51.8	10.0	61.8
	6	51.2	57.4	47.7	56.8	56.1	54.7	53.8	51.6	50.4	48.6	48.3	47.8	51.2	10.0	61.2
Day	7	49.9	54.1	47.4	53.6	53.2	52.3	51.8	50.4	49.4	48.1	47.9	47.5	49.9	0.0	49.9
	8	49.4	54.5	46.8	53.7	53.2	51.9	51.3	49.9	48.9	47.6	47.3	47.0	49.4	0.0	49.4
	9	48.0	53.5	44.1	53.0	52.7	52.1	51.7	48.5	46.7	45.0	44.7	44.3	48.0	0.0	48.0
	10	46.8	51.5	43.8	51.0	50.5	49.5	49.0	47.5	46.3	44.6	44.4	44.0	46.8	0.0	46.8
	11	46.4	52.7	42.4	51.7	50.8	49.6	49.1	47.3	45.4	43.3	43.0	42.6	46.4	0.0	46.4
	12	44.5	49.8	41.2	49.2	48.9	48.1	47.2	45.3	43.4	41.9	41.6	41.3	44.5	0.0	44.5
	13	46.3	51.8	43.0	51.2	50.7	49.5	49.0	47.0	45.6	43.7	43.5	43.1	46.3	0.0	46.3
	14	48.4	54.1	44.9	53.5	53.2	52.5	51.7	48.8	47.2	45.6	45.3	45.0	48.4	0.0	48.4
	15	48.0	52.7	45.2	52.2	51.5	50.8	50.2	48.8	47.3	45.9	45.7	45.4	48.0	0.0	48.0
	16	49.3	53.7	46.7	53.1	52.6	51.6	51.1	49.9	48.9	47.4	47.1	46.8	49.3	0.0	49.3
	17	51.4	56.5	48.9	55.9	55.3	54.1	53.5	51.7	50.7	49.6	49.4	49.0	51.4	0.0	51.4
	18	53.2	58.0	50.7	57.4	56.7	55.7	55.2	53.7	52.7	51.4	51.2	50.8	53.2	0.0	53.2
	19	51.2	55.2	49.2	54.7	54.2	53.1	52.7	51.6	50.8	49.7	49.5	49.3	51.2	5.0	56.2
	20	49.5	52.0	47.8	51.7	51.4	51.0	50.7	49.9	49.3	48.4	48.2	47.9	49.5	5.0	54.5
	21	49.4	52.9	47.3	52.5	52.3	51.7	51.1	49.9	49.0	47.9	47.7	47.4	49.4	5.0	54.4
Night	22	48.8	52.9	45.9	52.3	52.0	51.4	51.0	49.5	48.4	46.7	46.4	46.0	48.8	10.0	58.8
	23	46.7	51.6	43.2	51.2	50.8	50.0	49.2	47.7	45.9	44.0	43.7	43.4	46.7	10.0	56.7

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	44.5	49.8	41.2	49.2	48.9	48.1	47.2	45.3	43.4	41.9	41.6	41.3
	Max	53.2	58.0	50.7	57.4	56.7	55.7	55.2	53.7	52.7	51.4	51.2	50.8
Energy Average		49.3	Average:		53.0	52.5	51.6	51.0	49.4	48.1	46.7	46.4	46.1
Night	Min	43.8	47.3	41.4	46.8	46.3	45.6	45.3	44.3	43.5	42.0	41.8	41.5
	Max	51.8	58.8	47.7	58.0	57.5	56.9	55.9	52.4	50.7	48.6	48.3	47.8
Energy Average		48.8	Average:		52.8	52.4	51.5	50.8	48.6	46.8	45.0	44.7	44.4

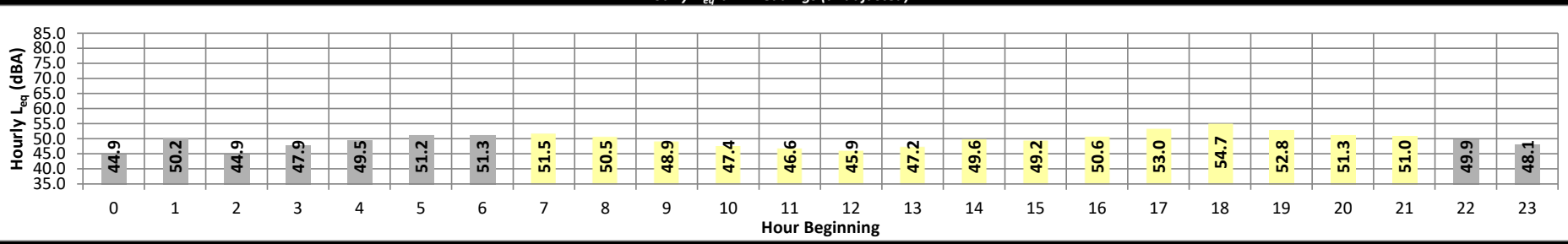
24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
55.6	**49.3**	**48.8**

24-Hour Noise Level Measurement Summary

Date: Tuesday, June 6, 2023 *Location:* L2 - Located north of the site near the residence at 18279 *Meter:* Piccolo II *JN:* 15533

Project: Blackmon & Berry *Source:* Bohnert Ave. *Analyst:* Z. Ibrahim

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	44.9	48.7	42.6	48.3	47.8	46.9	46.5	45.4	44.5	43.2	43.0	42.7	44.9	10.0	54.9
	1	50.2	56.9	42.5	56.6	56.5	56.1	55.8	51.0	45.0	43.2	43.0	42.6	50.2	10.0	60.2
	2	44.9	48.1	42.6	47.7	47.3	46.7	46.4	45.4	44.6	43.3	43.0	42.7	44.9	10.0	54.9
	3	47.9	53.0	45.3	52.4	51.9	50.8	50.0	48.2	47.4	46.1	45.8	45.4	47.9	10.0	57.9
	4	49.5	54.4	46.4	54.0	53.7	53.0	52.4	49.7	48.5	47.1	46.9	46.5	49.5	10.0	59.5
	5	51.2	55.8	48.5	55.2	54.6	53.5	53.0	51.7	50.8	49.3	49.0	48.6	51.2	10.0	61.2
	6	51.3	55.5	48.8	55.0	54.5	53.6	53.1	51.8	50.8	49.6	49.3	49.0	51.3	10.0	61.3
Day	7	51.5	55.7	48.9	55.1	54.8	54.0	53.4	52.0	51.0	49.7	49.4	49.1	51.5	0.0	51.5
	8	50.5	54.4	48.2	53.8	53.4	52.5	52.1	51.0	50.1	48.9	48.6	48.3	50.5	0.0	50.5
	9	48.9	55.0	45.5	54.3	53.8	53.0	52.3	49.2	47.6	46.2	46.0	45.7	48.9	0.0	48.9
	10	47.4	50.8	45.4	50.4	50.0	49.3	48.9	47.9	47.1	46.1	45.9	45.6	47.4	0.0	47.4
	11	46.6	51.1	43.7	50.5	50.2	49.5	49.0	47.5	45.9	44.3	44.1	43.8	46.6	0.0	46.6
	12	45.9	53.0	41.8	52.4	51.8	50.4	49.5	46.3	44.2	42.3	42.1	41.9	45.9	0.0	45.9
	13	47.2	53.2	44.0	52.6	51.9	50.5	49.7	47.7	46.3	44.7	44.4	44.1	47.2	0.0	47.2
	14	49.6	55.3	46.4	54.9	54.4	53.4	52.7	49.8	48.6	47.1	46.9	46.5	49.6	0.0	49.6
	15	49.2	54.1	46.6	53.6	53.0	52.1	51.5	49.9	48.4	47.2	47.0	46.7	49.2	0.0	49.2
	16	50.6	54.6	48.2	54.2	53.8	53.0	52.4	51.0	50.1	48.8	48.6	48.3	50.6	0.0	50.6
	17	53.0	58.3	50.5	57.7	56.9	55.8	55.2	53.4	52.3	51.1	50.9	50.6	53.0	0.0	53.0
	18	54.7	60.3	51.9	59.5	58.7	57.5	56.7	55.1	54.0	52.7	52.4	52.0	54.7	0.0	54.7
	19	52.8	57.3	50.6	56.7	56.1	54.9	54.3	53.2	52.4	51.2	51.0	50.7	52.8	5.0	57.8
	20	51.3	54.6	49.2	54.2	53.8	53.2	52.8	51.7	51.0	49.9	49.7	49.3	51.3	5.0	56.3
	21	51.0	55.3	48.7	54.8	54.3	53.4	52.8	51.4	50.5	49.4	49.1	48.8	51.0	5.0	56.0
Night	22	49.9	53.8	47.2	53.3	53.0	52.3	51.8	50.3	49.4	48.0	47.8	47.4	49.9	10.0	59.9
	23	48.1	53.8	44.6	53.5	53.0	51.7	50.5	48.8	47.1	45.4	45.1	44.7	48.1	10.0	58.1

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	45.9	50.8	41.8	50.4	50.0	49.3	48.9	46.3	44.2	42.3	42.1	41.9
	Max	54.7	60.3	51.9	59.5	58.7	57.5	56.7	55.1	54.0	52.7	52.4	52.0
Energy Average		50.7	Average:		54.3	53.8	52.8	52.2	50.5	49.3	48.0	47.7	47.4
Night	Min	44.9	48.1	42.5	47.7	47.3	46.7	46.4	45.4	44.5	43.2	43.0	42.6
	Max	51.3	56.9	48.8	56.6	56.5	56.1	55.8	51.8	50.8	49.6	49.3	49.0
Energy Average		49.2	Average:		52.9	52.5	51.6	51.1	49.2	47.6	46.1	45.9	45.5

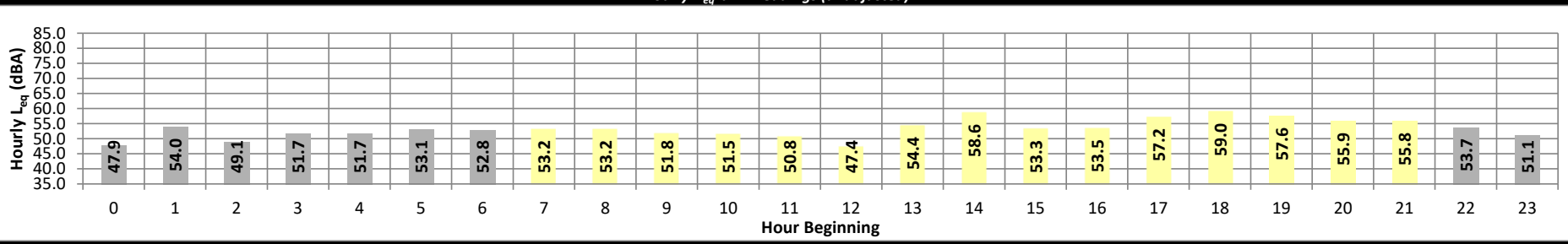
24-Hour CNEL	*Leq (dBA)* *Daytime (7am-10pm)*	*Nighttime (10pm-7am)*
56.3	**50.7**	**49.2**

24-Hour Noise Level Measurement Summary

Date: Tuesday, June 6, 2023 *Location:* L3 - Located east of the site near the residence at 18312 *Meter:* Piccolo II *JN:* 15533

Project: Blackmon & Berry *Source:* Vineyard Ave. *Analyst:* Z. Ibrahim

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	47.9	51.6	45.5	51.2	50.8	50.1	49.6	48.5	47.6	46.2	45.9	45.6	47.9	10.0	57.9
	1	54.0	60.5	50.1	60.0	59.6	58.8	58.1	53.5	51.8	50.6	50.4	50.1	54.0	10.0	64.0
	2	49.1	52.5	46.4	52.2	51.9	51.3	50.8	49.7	48.7	47.2	46.9	46.6	49.1	10.0	59.1
	3	51.7	54.9	49.3	54.6	54.3	53.7	53.4	52.3	51.4	50.0	49.7	49.4	51.7	10.0	61.7
	4	51.7	56.1	49.6	55.9	55.4	54.2	53.7	52.0	51.2	50.2	50.0	49.7	51.7	10.0	61.7
	5	53.1	58.5	50.6	57.9	57.3	56.0	55.1	53.4	52.4	51.2	51.0	50.7	53.1	10.0	63.1
	6	52.8	55.1	51.2	54.8	54.6	54.2	54.0	53.2	52.6	51.6	51.5	51.3	52.8	10.0	62.8
Day	7	53.2	56.8	51.3	56.5	56.2	55.6	55.0	53.5	52.8	51.8	51.6	51.4	53.2	0.0	53.2
	8	53.2	58.0	50.9	57.6	57.1	55.8	54.9	53.4	52.7	51.6	51.3	51.0	53.2	0.0	53.2
	9	51.8	58.7	48.3	57.9	57.4	56.3	55.6	51.5	50.1	49.0	48.7	48.4	51.8	0.0	51.8
	10	51.5	58.6	48.3	57.8	57.0	54.9	53.8	51.9	50.6	49.1	48.8	48.4	51.5	0.0	51.5
	11	50.8	57.7	46.6	57.2	56.6	55.1	53.9	51.3	49.6	47.4	47.1	46.7	50.8	0.0	50.8
	12	47.4	53.0	45.0	52.5	52.0	50.6	49.7	47.7	46.6	45.4	45.3	45.0	47.4	0.0	47.4
	13	54.4	65.1	48.1	64.5	63.9	62.3	58.5	52.0	50.5	48.8	48.5	48.2	54.4	0.0	54.4
	14	58.6	69.5	50.3	68.6	67.9	66.1	64.1	56.5	53.8	51.2	50.8	50.5	58.6	0.0	58.6
	15	53.3	62.5	50.0	61.4	60.5	56.8	55.5	53.1	51.9	50.6	50.4	50.1	53.3	0.0	53.3
	16	53.5	57.5	51.3	57.1	56.6	55.6	55.1	54.0	53.1	51.9	51.6	51.4	53.5	0.0	53.5
	17	57.2	60.5	55.1	60.2	59.8	59.2	58.8	57.7	56.8	55.7	55.5	55.2	57.2	0.0	57.2
	18	59.0	61.9	57.0	61.6	61.3	60.7	60.4	59.4	58.7	57.6	57.4	57.1	59.0	0.0	59.0
	19	57.6	60.5	55.4	60.3	60.0	59.4	59.0	58.1	57.4	56.0	55.8	55.5	57.6	5.0	62.6
	20	55.9	59.2	53.5	58.9	58.5	57.9	57.5	56.4	55.6	54.2	53.9	53.6	55.9	5.0	60.9
	21	55.8	60.5	53.0	60.0	59.4	58.2	57.6	56.4	55.4	53.9	53.6	53.2	55.8	5.0	60.8
Night	22	53.7	58.7	50.9	58.2	57.7	56.7	56.2	54.0	53.1	51.7	51.4	51.0	53.7	10.0	63.7
	23	51.1	56.6	47.6	56.2	55.7	54.5	53.7	51.5	50.1	48.5	48.2	47.8	51.1	10.0	61.1

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	47.4	53.0	45.0	52.5	52.0	50.6	49.7	47.7	46.6	45.4	45.3	45.0
	Max	59.0	69.5	57.0	68.6	67.9	66.1	64.1	59.4	58.7	57.6	57.4	57.1
Energy Average		55.2	Average:		59.5	59.0	57.6	56.6	54.2	53.0	51.6	51.3	51.0
Night	Min	47.9	51.6	45.5	51.2	50.8	50.1	49.6	48.5	47.6	46.2	45.9	45.6
	Max	54.0	60.5	51.2	60.0	59.6	58.8	58.1	54.0	53.1	51.7	51.5	51.3
Energy Average		52.0	Average:		55.7	55.2	54.4	53.8	52.0	51.0	49.7	49.4	49.1

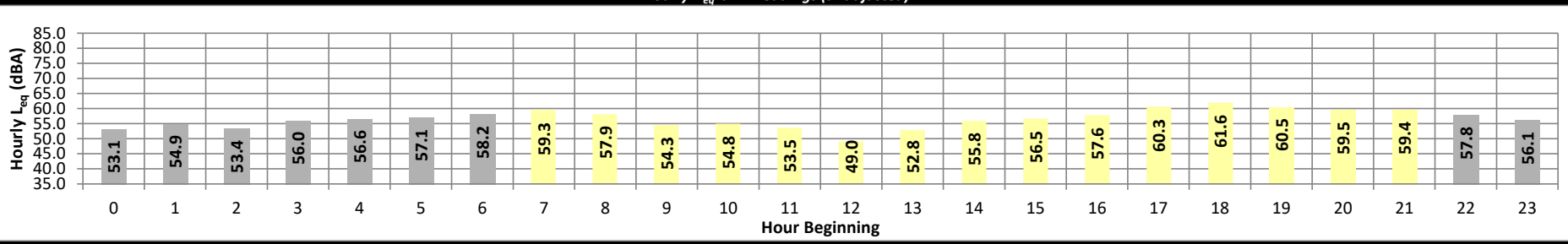
24-Hour CNEL	*Leq (dBA) Daytime (7am-10pm)*	*Leq (dBA) Nighttime (10pm-7am)*
59.7	**55.2**	**52.0**

24-Hour Noise Level Measurement Summary

Date: Tuesday, June 6, 2023 *Location:* L4 - Located east of the site near the residence at 2231 N *Meter:* Piccolo II *JN:* 15533

Project: Blackmon & Berry *Source:* Maple Ave *Analyst:* Z. Ibrahim

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	53.1	57.4	49.6	57.1	56.7	55.8	55.3	54.0	52.7	50.6	50.2	49.8	53.1	10.0	63.1
	1	54.9	62.5	49.3	61.9	61.3	59.7	59.0	55.3	52.8	50.5	50.0	49.5	54.9	10.0	64.9
	2	53.4	57.9	49.3	57.5	57.2	56.5	55.9	54.2	52.9	50.4	50.0	49.4	53.4	10.0	63.4
	3	56.0	60.1	52.2	59.7	59.4	58.7	58.3	56.9	55.5	53.3	52.8	52.4	56.0	10.0	66.0
	4	56.6	60.6	53.8	60.2	59.9	59.0	58.5	57.2	56.2	54.6	54.3	54.0	56.6	10.0	66.6
	5	57.1	59.7	55.0	59.4	59.2	58.8	58.5	57.5	56.8	55.7	55.4	55.1	57.1	10.0	67.1
	6	58.2	60.7	56.1	60.4	60.2	59.8	59.5	58.7	58.0	56.8	56.6	56.3	58.2	10.0	68.2
Day	7	59.3	63.8	56.7	63.3	62.9	62.0	61.5	59.9	58.5	57.3	57.1	56.8	59.3	0.0	59.3
	8	57.9	60.6	55.8	60.3	60.0	59.5	59.2	58.4	57.7	56.5	56.3	56.0	57.9	0.0	57.9
	9	54.3	58.0	52.2	57.6	57.4	56.7	56.0	54.8	54.0	52.8	52.6	52.3	54.3	0.0	54.3
	10	54.8	58.0	52.3	57.6	57.3	56.8	56.5	55.4	54.5	53.0	52.7	52.4	54.8	0.0	54.8
	11	53.5	61.3	48.7	60.8	60.5	59.8	58.9	52.7	50.8	49.3	49.1	48.8	53.5	0.0	53.5
	12	49.0	53.3	46.9	52.6	52.0	51.1	50.6	49.5	48.6	47.4	47.2	47.0	49.0	0.0	49.0
	13	52.8	56.9	50.4	56.4	55.9	54.8	54.4	53.4	52.4	51.0	50.7	50.5	52.8	0.0	52.8
	14	55.8	59.7	53.1	59.3	59.0	58.2	57.7	56.4	55.4	53.8	53.5	53.2	55.8	0.0	55.8
	15	56.5	63.5	53.9	62.4	61.2	59.3	58.1	56.7	55.9	54.5	54.3	54.0	56.5	0.0	56.5
	16	57.6	61.1	55.4	60.7	60.5	59.6	59.1	58.1	57.3	56.1	55.8	55.5	57.6	0.0	57.6
	17	60.3	63.3	58.2	63.0	62.7	62.1	61.8	60.8	60.1	58.8	58.6	58.3	60.3	0.0	60.3
	18	61.6	64.8	59.5	64.5	64.2	63.6	63.2	62.2	61.4	60.2	59.9	59.6	61.6	0.0	61.6
	19	60.5	63.6	58.0	63.3	63.0	62.4	62.1	61.1	60.3	58.9	58.5	58.1	60.5	5.0	65.5
	20	59.5	62.5	57.0	62.3	62.0	61.5	61.2	60.1	59.2	57.8	57.5	57.1	59.5	5.0	64.5
	21	59.4	63.4	56.5	63.1	62.8	62.1	61.6	59.9	59.0	57.4	57.0	56.7	59.4	5.0	64.4
Night	22	57.8	62.0	54.6	61.7	61.3	60.7	60.3	58.3	57.3	55.6	55.2	54.8	57.8	10.0	67.8
	23	56.1	61.3	52.0	60.9	60.6	59.6	58.9	57.1	54.9	53.0	52.7	52.2	56.1	10.0	66.1

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	49.0	53.3	46.9	52.6	52.0	51.1	50.6	49.5	48.6	47.4	47.2	47.0
	Max	61.6	64.8	59.5	64.5	64.2	63.6	63.2	62.2	61.4	60.2	59.9	59.6
Energy Average		58.0	Average:		60.5	60.1	59.3	58.8	57.3	56.3	55.0	54.7	54.4
Night	Min	53.1	57.4	49.3	57.1	56.7	55.8	55.3	54.0	52.7	50.4	50.0	49.4
	Max	58.2	62.5	56.1	61.9	61.3	60.7	60.3	58.7	58.0	56.8	56.6	56.3
Energy Average		56.2	Average:		59.9	59.5	58.7	58.2	56.6	55.2	53.4	53.0	52.6

24-Hour CNEL	*Leq (dBA) Daytime (7am-10pm)*	*Leq (dBA) Nighttime (10pm-7am)*
63.5	**58.0**	**56.2**

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE LEVEL CALCULATIONS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E | Project Name: Vineyard Av. Warehouse
Road Name: Alder Av. | Job Number: 15533
Road Segment: s/o Casmalia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,192 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,018 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	72 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.260
Medium Trucks:	48.076
Heavy Trucks:	48.094

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.74	0.13	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-11.87	0.15	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-26.66	0.15	-1.20	-5.34	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.4	65.5	63.3	61.3	68.5	68.9
Medium Trucks:	68.1	67.4	60.9	63.4	70.5	70.6
Heavy Trucks:	57.7	57.3	51.0	51.7	59.2	59.4
Vehicle Noise:	70.6	69.8	65.5	65.7	72.8	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	92	199	429	925
CNEL:	95	206	443	955

Monday, October 2, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P | Project Name: Vineyard Av. Warehouse
Road Name: Alder Av. | Job Number: 15533
Road Segment: s/o Casmalia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,600 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,047 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	72 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	87.64%
Medium Trucks:	73.8%	4.2%	22.1%	10.58%
Heavy Trucks:	79.1%	4.7%	16.3%	1.79%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.260
Medium Trucks:	48.076
Heavy Trucks:	48.094

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.67	0.13	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-11.85	0.15	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-19.58	0.15	-1.20	-5.34	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.5	65.5	63.4	61.4	68.6	68.9
Medium Trucks:	68.1	67.4	61.0	63.4	70.5	70.6
Heavy Trucks:	64.7	64.4	58.1	58.8	66.3	66.5
Vehicle Noise:	71.4	70.7	66.1	66.4	73.6	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	104	223	481	1,037
CNEL:	107	231	497	1,070

Monday, October 2, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC | Project Name: Vineyard Av. Warehouse
Road Name: Alder Av. | Job Number: 15533
Road Segment: s/o Casmalia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,818 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,708 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	72 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.260
Medium Trucks:	48.076
Heavy Trucks:	48.094

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.49	0.13	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-9.62	0.15	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-24.41	0.15	-1.20	-5.34	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.6	67.7	65.6	63.6	70.8	71.1
Medium Trucks:	70.3	69.7	63.2	65.7	72.7	72.9
Heavy Trucks:	59.9	59.6	53.3	53.9	61.5	61.7
Vehicle Noise:	72.8	72.1	67.7	67.9	75.1	75.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	131	281	606	1,306
CNEL:	135	291	626	1,349

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC+P | Project Name: Vineyard Av. Warehouse
Road Name: Alder Av. | Job Number: 15533
Road Segment: s/o Casmalia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,226 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,737 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	72 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.10%
Medium Trucks:	73.8%	4.2%	22.1%	10.68%
Heavy Trucks:	79.1%	4.7%	16.3%	1.22%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.260
Medium Trucks:	48.076
Heavy Trucks:	48.094

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.45	0.13	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-9.61	0.15	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-19.04	0.15	-1.20	-5.34	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.7	67.7	65.6	63.6	70.8	71.2
Medium Trucks:	70.3	69.7	63.2	65.7	72.7	72.9
Heavy Trucks:	65.3	64.9	58.6	59.3	66.9	67.0
Vehicle Noise:	73.3	72.6	68.1	68.4	75.5	75.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	140	302	650	1,401
CNEL:	145	312	671	1,447

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY
Road Name: Alder Av.
Road Segment: s/o Casmalia Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,322 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,887 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	72 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.260
Medium Trucks:	48.076
Heavy Trucks:	48.094

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.05	0.13	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-9.19	0.15	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-23.97	0.15	-1.20	-5.34	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.1	68.1	66.0	64.0	71.2	71.6
Medium Trucks:	70.8	70.1	63.6	66.1	73.2	73.3
Heavy Trucks:	60.4	60.0	53.7	54.4	61.9	62.1
Vehicle Noise:	73.2	72.5	68.1	68.4	75.5	75.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	140	301	648	1,396
CNEL:	144	311	669	1,442

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P
Road Name: Alder Av.
Road Segment: s/o Casmalia Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,730 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,917 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	72 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.17%
Medium Trucks:	73.8%	4.2%	22.1%	10.69%
Heavy Trucks:	79.1%	4.7%	16.3%	1.14%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.260
Medium Trucks:	48.076
Heavy Trucks:	48.094

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.02	0.13	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-9.18	0.15	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-18.91	0.15	-1.20	-5.34	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.1	68.2	66.0	64.1	71.2	71.6
Medium Trucks:	70.8	70.1	63.6	66.1	73.2	73.3
Heavy Trucks:	65.4	65.1	58.8	59.4	67.0	67.2
Vehicle Noise:	73.7	73.0	68.5	68.8	75.9	76.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	149	321	691	1,488
CNEL:	154	331	713	1,537

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Alder Av.
Road Segment: n/o Renaissance Pkwy.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,348 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,602 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	72 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.260
Medium Trucks:	48.076
Heavy Trucks:	48.094

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.76	0.13	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-9.90	0.15	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-24.68	0.15	-1.20	-5.34	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	67.4	65.3	63.3	70.5	70.8
Medium Trucks:	70.1	69.4	62.9	65.4	72.5	72.6
Heavy Trucks:	59.6	59.3	53.0	53.7	61.2	61.4
Vehicle Noise:	72.5	71.8	67.4	67.7	74.8	75.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	125	270	581	1,251
CNEL:	129	278	600	1,293

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
Road Name: Alder Av.
Road Segment: n/o Renaissance Pkwy.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,364 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,604 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	72 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.260
Medium Trucks:	48.076
Heavy Trucks:	48.094

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.76	0.13	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-9.90	0.15	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-24.68	0.15	-1.20	-5.34	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	67.4	65.3	63.3	70.5	70.8
Medium Trucks:	70.1	69.4	62.9	65.4	72.5	72.6
Heavy Trucks:	59.6	59.3	53.0	53.7	61.2	61.4
Vehicle Noise:	72.5	71.8	67.4	67.7	74.8	75.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	125	270	581	1,252
CNEL:	129	279	600	1,293

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC | Project Name: Vineyard Av. Warehouse
Road Name: Alder Av. | Job Number: 15533
Road Segment: n/o Renaissance Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	35,599 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	2,552 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	72 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.260
Medium Trucks:	48.076
Heavy Trucks:	48.094

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.26	0.13	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-7.88	0.15	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-22.66	0.15	-1.20	-5.34	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.4	69.4	67.3	65.3	72.5	72.9
Medium Trucks:	72.1	71.4	64.9	67.4	74.5	74.6
Heavy Trucks:	61.7	61.3	55.0	55.7	63.2	63.4
Vehicle Noise:	74.6	73.8	69.5	69.7	76.8	77.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	171	368	792	1,707
CNEL:	176	380	818	1,763

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC+P | Project Name: Vineyard Av. Warehouse
Road Name: Alder Av. | Job Number: 15533
Road Segment: n/o Renaissance Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	35,615 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	2,554 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	72 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.260
Medium Trucks:	48.076
Heavy Trucks:	48.094

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.26	0.13	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-7.88	0.15	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-22.66	0.15	-1.20	-5.34	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.4	69.5	67.3	65.3	72.5	72.9
Medium Trucks:	72.1	71.4	64.9	67.4	74.5	74.6
Heavy Trucks:	61.7	61.3	55.0	55.7	63.2	63.4
Vehicle Noise:	74.6	73.8	69.5	69.7	76.8	77.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	171	368	792	1,707
CNEL:	176	380	818	1,763

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY | Project Name: Vineyard Av. Warehouse
Road Name: Alder Av. | Job Number: 15533
Road Segment: n/o Renaissance Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	39,542 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	2,835 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	72 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.260
Medium Trucks:	48.076
Heavy Trucks:	48.094

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.72	0.13	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-7.42	0.15	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-22.21	0.15	-1.20	-5.34	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.8	69.9	67.8	65.8	73.0	73.3
Medium Trucks:	72.5	71.9	65.4	67.9	74.9	75.1
Heavy Trucks:	62.1	61.8	55.5	56.1	63.7	63.9
Vehicle Noise:	75.0	74.3	69.9	70.1	77.3	77.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	183	394	850	1,831
CNEL:	189	407	878	1,891

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P | Project Name: Vineyard Av. Warehouse
Road Name: Alder Av. | Job Number: 15533
Road Segment: n/o Renaissance Pkwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	39,558 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	2,836 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	72 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.260
Medium Trucks:	48.076
Heavy Trucks:	48.094

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.72	0.13	-1.20	-4.69	0.000	0.000
Medium Trucks:	81.00	-7.42	0.15	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-22.21	0.15	-1.20	-5.34	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.8	69.9	67.8	65.8	73.0	73.3
Medium Trucks:	72.5	71.9	65.4	67.9	74.9	75.1
Heavy Trucks:	62.1	61.8	55.5	56.1	63.7	63.9
Vehicle Noise:	75.0	74.3	69.9	70.1	77.3	77.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	183	394	850	1,831
CNEL:	189	407	878	1,891

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E | Project Name: Vineyard Av. Warehouse
Road Name: Locust Av. | Job Number: 15533
Road Segment: s/o Vineyard Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,169 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	873 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.95	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-12.08	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.87	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.6	64.6	62.5	60.5	67.7	68.1
Medium Trucks:	67.5	66.8	60.3	62.8	69.9	70.0
Heavy Trucks:	57.5	57.1	50.8	51.5	59.1	59.2
Vehicle Noise:	69.9	69.2	64.8	65.0	72.2	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	61	132	285	613
CNEL:	63	136	294	633

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P | Project Name: Vineyard Av. Warehouse
Road Name: Locust Av. | Job Number: 15533
Road Segment: s/o Vineyard Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,185 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	874 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.82%
Medium Trucks:	73.8%	4.2%	22.1%	10.82%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.94	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-12.08	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.87	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.6	64.7	62.5	60.5	67.7	68.1
Medium Trucks:	67.5	66.8	60.3	62.8	69.9	70.0
Heavy Trucks:	57.5	57.1	50.8	51.5	59.1	59.2
Vehicle Noise:	69.9	69.2	64.8	65.0	72.2	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	61	132	285	613
CNEL:	63	136	294	633

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC | Project Name: Vineyard Av. Warehouse
Road Name: Locust Av. | Job Number: 15533
Road Segment: s/o Vineyard Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,661 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	908 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.77	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-11.91	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.69	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.8	64.8	62.7	60.7	67.9	68.2
Medium Trucks:	67.7	67.0	60.5	63.0	70.0	70.2
Heavy Trucks:	57.7	57.3	51.0	51.7	59.2	59.4
Vehicle Noise:	70.1	69.3	64.9	65.2	72.3	72.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	63	136	292	629
CNEL:	65	140	302	650

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC+P | Project Name: Vineyard Av. Warehouse
Road Name: Locust Av. | Job Number: 15533
Road Segment: s/o Vineyard Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,677 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	909 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.82%
Medium Trucks:	73.8%	4.2%	22.1%	10.82%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.77	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-11.91	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.69	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.8	64.8	62.7	60.7	67.9	68.2
Medium Trucks:	67.7	67.0	60.5	63.0	70.0	70.2
Heavy Trucks:	57.7	57.3	51.0	51.7	59.2	59.4
Vehicle Noise:	70.1	69.3	64.9	65.2	72.3	72.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	63	136	292	630
CNEL:	65	140	302	650

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY
Road Name: Locust Av.
Road Segment: s/o Vineyard Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,808 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,062 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.09	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-11.23	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.01	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.4	65.5	63.4	61.4	68.6	68.9
Medium Trucks:	68.3	67.7	61.2	63.7	70.7	70.9
Heavy Trucks:	58.3	58.0	51.7	52.4	59.9	60.1
Vehicle Noise:	70.8	70.0	65.6	65.9	73.0	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	70	151	324	699
CNEL:	72	155	335	721

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P
Road Name: Locust Av.
Road Segment: s/o Vineyard Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,824 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,063 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.82%
Medium Trucks:	73.8%	4.2%	22.1%	10.82%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.09	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-11.23	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.01	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.4	65.5	63.4	61.4	68.6	68.9
Medium Trucks:	68.3	67.7	61.2	63.7	70.7	70.9
Heavy Trucks:	58.3	58.0	51.7	52.4	59.9	60.1
Vehicle Noise:	70.8	70.0	65.6	65.9	73.0	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	70	151	324	699
CNEL:	72	155	335	722

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Locust Av.
Road Segment: n/o Casmalia Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,936 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	999 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.36	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-11.49	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.28	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.2	65.2	63.1	61.1	68.3	68.7
Medium Trucks:	68.1	67.4	60.9	63.4	70.5	70.6
Heavy Trucks:	58.1	57.7	51.4	52.1	59.6	59.8
Vehicle Noise:	70.5	69.7	65.3	65.6	72.7	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	67	145	311	671
CNEL:	69	149	322	693

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
Road Name: Locust Av.
Road Segment: n/o Casmalia Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,456 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,036 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	87.71%
Medium Trucks:	73.8%	4.2%	22.1%	10.49%
Heavy Trucks:	79.1%	4.7%	16.3%	1.80%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.25	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-11.47	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.14	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.3	65.3	63.2	61.2	68.4	68.8
Medium Trucks:	68.1	67.4	60.9	63.4	70.5	70.6
Heavy Trucks:	65.2	64.9	58.6	59.2	66.8	67.0
Vehicle Noise:	71.5	70.8	66.1	66.4	73.6	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	76	165	355	764
CNEL:	79	170	366	788

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC | Project Name: Vineyard Av. Warehouse
Road Name: Locust Av. | Job Number: 15533
Road Segment: n/o Casmalia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,499 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,040 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.18	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-11.32	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-26.11	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.4	65.4	63.3	61.3	68.5	68.8
Medium Trucks:	68.2	67.6	61.1	63.6	70.6	70.8
Heavy Trucks:	58.3	57.9	51.6	52.3	59.8	60.0
Vehicle Noise:	70.7	69.9	65.5	65.8	72.9	73.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	69	148	320	689
CNEL:	71	153	330	711

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC+P | Project Name: Vineyard Av. Warehouse
Road Name: Locust Av. | Job Number: 15533
Road Segment: n/o Casmalia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,019 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,077 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	87.76%
Medium Trucks:	73.8%	4.2%	22.1%	10.50%
Heavy Trucks:	79.1%	4.7%	16.3%	1.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.08	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-11.30	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.10	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.5	65.5	63.4	61.4	68.6	68.9
Medium Trucks:	68.3	67.6	61.1	63.6	70.7	70.8
Heavy Trucks:	65.3	64.9	58.6	59.3	66.8	67.0
Vehicle Noise:	71.6	70.9	66.2	66.5	73.7	73.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	78	168	363	781
CNEL:	81	174	374	806

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY | Project Name: Vineyard Av. Warehouse
Road Name: Locust Av. | Job Number: 15533
Road Segment: n/o Casmalia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,224 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,952 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.55	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-8.58	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.37	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.1	68.1	66.0	64.0	71.2	71.6
Medium Trucks:	71.0	70.3	63.8	66.3	73.4	73.5
Heavy Trucks:	61.0	60.6	54.3	55.0	62.6	62.7
Vehicle Noise:	73.4	72.7	68.3	68.5	75.7	75.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	105	226	487	1,048
CNEL:	108	233	502	1,083

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P | Project Name: Vineyard Av. Warehouse
Road Name: Locust Av. | Job Number: 15533
Road Segment: n/o Casmalia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,744 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,989 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.24%
Medium Trucks:	73.8%	4.2%	22.1%	10.65%
Heavy Trucks:	79.1%	4.7%	16.3%	1.11%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.61	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-8.58	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.40	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.1	68.2	66.1	64.1	71.3	71.6
Medium Trucks:	71.0	70.3	63.8	66.3	73.4	73.5
Heavy Trucks:	66.0	65.6	59.3	60.0	67.5	67.7
Vehicle Noise:	73.9	73.2	68.6	68.9	76.1	76.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	112	242	522	1,124
CNEL:	116	250	539	1,160

Monday, October 2, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E | Project Name: Vineyard Av. Warehouse
Road Name: Locust Av. | Job Number: 15533
Road Segment: s/o Casmalia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,071 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	579 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.73	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-13.87	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-28.65	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.8	62.9	60.7	58.7	65.9	66.3
Medium Trucks:	65.7	65.0	58.6	61.0	68.1	68.2
Heavy Trucks:	55.7	55.3	49.1	49.7	57.3	57.4
Vehicle Noise:	68.1	67.4	63.0	63.3	70.4	70.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	47	100	216	466
CNEL:	48	104	223	481

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P | Project Name: Vineyard Av. Warehouse
Road Name: Locust Av. | Job Number: 15533
Road Segment: s/o Casmalia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,087 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	580 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.83%
Medium Trucks:	73.8%	4.2%	22.1%	10.81%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.72	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-13.87	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-28.65	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.8	62.9	60.7	58.8	65.9	66.3
Medium Trucks:	65.7	65.0	58.6	61.0	68.1	68.2
Heavy Trucks:	55.7	55.3	49.1	49.7	57.3	57.4
Vehicle Noise:	68.1	67.4	63.0	63.3	70.4	70.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	47	100	216	466
CNEL:	48	104	224	482

Monday, October 2, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC | Project Name: Vineyard Av. Warehouse
Road Name: Locust Av. | Job Number: 15533
Road Segment: s/o Casmalia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,930 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	640 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.29	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-13.43	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-28.21	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.2	63.3	61.2	59.2	66.4	66.7
Medium Trucks:	66.1	65.5	59.0	61.5	68.5	68.7
Heavy Trucks:	56.1	55.8	49.5	50.2	57.7	57.9
Vehicle Noise:	68.6	67.8	63.4	63.7	70.8	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	107	231	499
CNEL:	51	111	239	515

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC+P | Project Name: Vineyard Av. Warehouse
Road Name: Locust Av. | Job Number: 15533
Road Segment: s/o Casmalia Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,946 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	641 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.83%
Medium Trucks:	73.8%	4.2%	22.1%	10.81%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.28	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-13.43	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-28.21	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.3	63.3	61.2	59.2	66.4	66.7
Medium Trucks:	66.1	65.5	59.0	61.5	68.5	68.7
Heavy Trucks:	56.1	55.8	49.5	50.2	57.7	57.9
Vehicle Noise:	68.6	67.8	63.4	63.7	70.8	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	107	232	499
CNEL:	52	111	239	515

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY
Road Name: Locust Av.
Road Segment: s/o Casmalia Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,871 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,425 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.82	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-9.95	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-24.74	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.7	66.8	64.7	62.7	69.9	70.2
Medium Trucks:	69.6	68.9	62.5	65.0	72.0	72.1
Heavy Trucks:	59.6	59.3	53.0	53.6	61.2	61.4
Vehicle Noise:	72.0	71.3	66.9	67.2	74.3	74.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	85	183	395	850
CNEL:	88	189	407	878

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P
Road Name: Locust Av.
Road Segment: s/o Casmalia Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,887 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,426 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	69.3%	10.6%	20.1%	88.82%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.81	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	79.45	-9.95	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-24.74	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.7	66.8	64.7	62.7	69.9	70.2
Medium Trucks:	69.6	68.9	62.5	65.0	72.0	72.1
Heavy Trucks:	59.6	59.3	53.0	53.6	61.2	61.4
Vehicle Noise:	72.0	71.3	66.9	67.2	74.3	74.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	85	183	395	850
CNEL:	88	189	407	878

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Casmalia Av.
Road Segment: e/o Alder Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,594 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	975 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-3.34	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-12.47	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-27.26	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.5	67.6	65.5	63.5	70.7	71.0
Medium Trucks:	70.0	69.4	62.9	65.4	72.4	72.6
Heavy Trucks:	59.2	58.9	52.6	53.3	60.8	61.0
Vehicle Noise:	72.6	71.8	67.5	67.7	74.8	75.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	92	199	428	923
CNEL:	95	205	442	953

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
Road Name: Casmalia Av.
Road Segment: e/o Alder Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,018 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,005 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	69.3%	10.6%	20.1%	87.60%
Medium Trucks:	73.8%	4.2%	22.1%	10.55%
Heavy Trucks:	79.1%	4.7%	16.3%	1.84%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-3.26	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-12.45	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-20.03	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.6	67.7	65.5	63.5	70.7	71.1
Medium Trucks:	70.1	69.4	62.9	65.4	72.5	72.6
Heavy Trucks:	66.5	66.1	59.8	60.5	68.0	68.2
Vehicle Noise:	73.4	72.7	68.1	68.4	75.5	75.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	103	222	478	1,030
CNEL:	106	229	493	1,063

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC | Project Name: Vineyard Av. Warehouse
Road Name: Casmalia Av. | Job Number: 15533
Road Segment: e/o Alder Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,761 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,775 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-0.73	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-9.87	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-24.65	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.1	70.2	68.1	66.1	73.3	73.6
Medium Trucks:	72.6	72.0	65.5	68.0	75.0	75.2
Heavy Trucks:	61.9	61.5	55.2	55.9	63.4	63.6
Vehicle Noise:	75.2	74.4	70.1	70.3	77.4	77.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	138	296	639	1,376
CNEL:	142	306	660	1,422

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC+P | Project Name: Vineyard Av. Warehouse
Road Name: Casmalia Av. | Job Number: 15533
Road Segment: e/o Alder Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,185 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,806 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.14%
Medium Trucks:	73.8%	4.2%	22.1%	10.68%
Heavy Trucks:	79.1%	4.7%	16.3%	1.19%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-0.69	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-9.86	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-19.40	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.2	70.2	68.1	66.1	73.3	73.6
Medium Trucks:	72.7	72.0	65.5	68.0	75.1	75.2
Heavy Trucks:	67.1	66.7	60.5	61.1	68.7	68.8
Vehicle Noise:	75.6	74.9	70.5	70.7	77.8	78.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	146	316	680	1,465
CNEL:	151	326	702	1,513

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY | Project Name: Vineyard Av. Warehouse
Road Name: Casmalia Av. | Job Number: 15533
Road Segment: e/o Alder Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,159 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,947 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-0.33	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-9.47	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-24.25	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.5	70.6	68.5	66.5	73.7	74.0
Medium Trucks:	73.0	72.4	65.9	68.4	75.4	75.6
Heavy Trucks:	62.3	61.9	55.6	56.3	63.8	64.0
Vehicle Noise:	75.6	74.8	70.5	70.7	77.8	78.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	146	315	679	1,463
CNEL:	151	326	702	1,512

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P | Project Name: Vineyard Av. Warehouse
Road Name: Casmalia Av. | Job Number: 15533
Road Segment: e/o Alder Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,583 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,978 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.19%
Medium Trucks:	73.8%	4.2%	22.1%	10.69%
Heavy Trucks:	79.1%	4.7%	16.3%	1.11%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-0.29	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-9.46	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-19.28	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.6	70.6	68.5	66.5	73.7	74.0
Medium Trucks:	73.1	72.4	65.9	68.4	75.5	75.6
Heavy Trucks:	67.2	66.9	60.6	61.2	68.8	69.0
Vehicle Noise:	76.0	75.3	70.8	71.0	78.2	78.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	155	334	719	1,550
CNEL:	160	345	743	1,600

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Casmalia Av.
Road Segment: w/o Laurel Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,369 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	743 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-4.51	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-13.65	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-28.43	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.3	66.4	64.3	62.3	69.5	69.8
Medium Trucks:	68.9	68.2	61.7	64.2	71.3	71.4
Heavy Trucks:	58.1	57.7	51.4	52.1	59.6	59.8
Vehicle Noise:	71.4	70.6	66.3	66.5	73.6	73.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	77	166	357	770
CNEL:	80	171	369	796

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
Road Name: Casmalia Av.
Road Segment: w/o Laurel Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,793 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	774 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	69.3%	10.6%	20.1%	87.24%
Medium Trucks:	73.8%	4.2%	22.1%	10.47%
Heavy Trucks:	79.1%	4.7%	16.3%	2.29%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-4.42	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-13.62	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-20.23	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.4	66.5	64.4	62.4	69.6	69.9
Medium Trucks:	68.9	68.2	61.7	64.2	71.3	71.4
Heavy Trucks:	66.3	65.9	59.6	60.3	67.8	68.0
Vehicle Noise:	72.4	71.8	67.1	67.4	74.6	74.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	89	191	411	886
CNEL:	91	197	425	915

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC
Road Name: Casmalia Av.
Road Segment: w/o Laurel Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,883 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	995 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-3.24	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-12.38	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-27.17	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.6	67.7	65.5	63.6	70.7	71.1
Medium Trucks:	70.1	69.5	63.0	65.5	72.5	72.7
Heavy Trucks:	59.3	59.0	52.7	53.4	60.9	61.1
Vehicle Noise:	72.7	71.9	67.6	67.8	74.9	75.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	94	202	434	936
CNEL:	97	208	449	967

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC+P
Road Name: Casmalia Av.
Road Segment: w/o Laurel Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,307 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,026 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	69.3%	10.6%	20.1%	87.63%
Medium Trucks:	73.8%	4.2%	22.1%	10.56%
Heavy Trucks:	79.1%	4.7%	16.3%	1.81%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-3.17	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-12.36	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-20.01	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.7	67.7	65.6	63.6	70.8	71.2
Medium Trucks:	70.2	69.5	63.0	65.5	72.5	72.7
Heavy Trucks:	66.5	66.1	59.8	60.5	68.1	68.2
Vehicle Noise:	73.5	72.8	68.2	68.4	75.6	75.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	104	224	484	1,042
CNEL:	108	232	499	1,076

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY
Road Name: Casmalia Av.
Road Segment: w/o Laurel Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,570 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,475 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-1.54	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-10.67	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-25.46	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.3	69.4	67.3	65.3	72.5	72.8
Medium Trucks:	71.8	71.2	64.7	67.2	74.2	74.4
Heavy Trucks:	61.0	60.7	54.4	55.1	62.6	62.8
Vehicle Noise:	74.4	73.6	69.3	69.5	76.6	76.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	122	262	564	1,216
CNEL:	126	271	583	1,256

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P
Road Name: Casmalia Av.
Road Segment: w/o Laurel Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,994 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,505 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	69.3%	10.6%	20.1%	88.00%
Medium Trucks:	73.8%	4.2%	22.1%	10.65%
Heavy Trucks:	79.1%	4.7%	16.3%	1.35%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-1.49	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-10.66	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-19.63	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.4	69.4	67.3	65.3	72.5	72.8
Medium Trucks:	71.9	71.2	64.7	67.2	74.3	74.4
Heavy Trucks:	66.9	66.5	60.2	60.9	68.4	68.6
Vehicle Noise:	74.9	74.2	69.7	69.9	77.1	77.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	131	282	608	1,310
CNEL:	135	291	628	1,353

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Casmalia Av.
Road Segment: w/o Locust Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,402 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	818 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-4.10	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-13.24	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-28.02	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.8	66.8	64.7	62.7	69.9	70.2
Medium Trucks:	69.3	68.6	62.1	64.6	71.7	71.8
Heavy Trucks:	58.5	58.1	51.8	52.5	60.0	60.2
Vehicle Noise:	71.8	71.0	66.7	66.9	74.1	74.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	82	177	381	821
CNEL:	85	183	394	848

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
Road Name: Casmalia Av.
Road Segment: w/o Locust Av.
Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,826 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	848 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	69.3%	10.6%	20.1%	87.38%
Medium Trucks:	73.8%	4.2%	22.1%	10.50%
Heavy Trucks:	79.1%	4.7%	16.3%	2.12%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-4.01	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-13.21	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-20.16	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.8	66.9	64.8	62.8	70.0	70.3
Medium Trucks:	69.3	68.6	62.2	64.6	71.7	71.8
Heavy Trucks:	66.3	66.0	59.7	60.4	67.9	68.1
Vehicle Noise:	72.8	72.1	67.5	67.7	74.9	75.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	93	201	433	933
CNEL:	96	208	447	964

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC | Project Name: Vineyard Av. Warehouse
Road Name: Casmalia Av. | Job Number: 15533
Road Segment: w/o Locust Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,958 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,072 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.92	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-12.06	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-26.84	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	68.0	65.9	63.9	71.1	71.4
Medium Trucks:	70.5	69.8	63.3	65.8	72.9	73.0
Heavy Trucks:	59.7	59.3	53.0	53.7	61.2	61.4
Vehicle Noise:	73.0	72.2	67.9	68.1	75.2	75.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	98	212	456	983
CNEL:	102	219	472	1,016

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC+P | Project Name: Vineyard Av. Warehouse
Road Name: Casmalia Av. | Job Number: 15533
Road Segment: w/o Locust Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,382 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,103 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	87.71%
Medium Trucks:	73.8%	4.2%	22.1%	10.58%
Heavy Trucks:	79.1%	4.7%	16.3%	1.71%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.85	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-12.04	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-19.95	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.0	68.1	65.9	63.9	71.1	71.5
Medium Trucks:	70.5	69.8	63.3	65.8	72.9	73.0
Heavy Trucks:	66.6	66.2	59.9	60.6	68.1	68.3
Vehicle Noise:	73.7	73.0	68.5	68.7	75.9	76.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	109	234	505	1,087
CNEL:	112	242	521	1,123

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY | Project Name: Vineyard Av. Warehouse
Road Name: Casmalia Av. | Job Number: 15533
Road Segment: w/o Locust Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,797 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,419 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.70	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-10.84	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-25.62	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.2	69.2	67.1	65.1	72.3	72.6
Medium Trucks:	71.7	71.0	64.5	67.0	74.1	74.2
Heavy Trucks:	60.9	60.5	54.2	54.9	62.4	62.6
Vehicle Noise:	74.2	73.4	69.1	69.3	76.5	76.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	119	255	550	1,185
CNEL:	122	264	568	1,225

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P | Project Name: Vineyard Av. Warehouse
Road Name: Casmalia Av. | Job Number: 15533
Road Segment: w/o Locust Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,221 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	1,450 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	87.97%
Medium Trucks:	73.8%	4.2%	22.1%	10.64%
Heavy Trucks:	79.1%	4.7%	16.3%	1.39%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.65	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-10.83	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-19.67	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.2	69.3	67.1	65.1	72.3	72.7
Medium Trucks:	71.7	71.0	64.5	67.0	74.1	74.2
Heavy Trucks:	66.8	66.5	60.2	60.9	68.4	68.6
Vehicle Noise:	74.8	74.1	69.6	69.8	77.0	77.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	128	276	594	1,281
CNEL:	132	285	614	1,322

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E | Project Name: Vineyard Av. Warehouse
Road Name: Casmalia Av. | Job Number: 15533
Road Segment: e/o Locust Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,843 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	562 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-5.72	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-14.86	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-29.65	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	65.2	63.1	61.1	68.3	68.6
Medium Trucks:	67.7	67.0	60.5	63.0	70.1	70.2
Heavy Trucks:	56.9	56.5	50.2	50.9	58.4	58.6
Vehicle Noise:	70.2	69.4	65.1	65.3	72.4	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	64	138	297	639
CNEL:	66	142	307	661

Monday, October 2, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P | Project Name: Vineyard Av. Warehouse
Road Name: Casmalia Av. | Job Number: 15533
Road Segment: e/o Locust Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,939 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	569 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.94%
Medium Trucks:	73.8%	4.2%	22.1%	10.70%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-5.66	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-14.86	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-29.65	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.2	65.3	63.1	61.1	68.3	68.7
Medium Trucks:	67.7	67.0	60.5	63.0	70.1	70.2
Heavy Trucks:	56.9	56.5	50.2	50.9	58.4	58.6
Vehicle Noise:	70.2	69.4	65.2	65.3	72.5	72.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	64	138	298	642
CNEL:	66	143	308	663

Monday, October 2, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC | Project Name: Vineyard Av. Warehouse
Road Name: Casmalia Av. | Job Number: 15533
Road Segment: e/o Locust Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,722 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	769 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-4.37	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-13.50	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-28.29	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.5	66.5	64.4	62.4	69.6	70.0
Medium Trucks:	69.0	68.3	61.9	64.4	71.4	71.5
Heavy Trucks:	58.2	57.8	51.6	52.2	59.8	60.0
Vehicle Noise:	71.5	70.8	66.5	66.7	73.8	74.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	79	170	366	788
CNEL:	81	175	378	814

Monday, October 2, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC+P | Project Name: Vineyard Av. Warehouse
Road Name: Casmalia Av. | Job Number: 15533
Road Segment: e/o Locust Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,818 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	776 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	69.3%	10.6%	20.1%	88.91%
Medium Trucks:	73.8%	4.2%	22.1%	10.74%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-4.32	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:	82.40	-13.50	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-28.29	1.31	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.5	66.6	64.5	62.5	69.7	70.0
Medium Trucks:	69.0	68.3	61.9	64.4	71.4	71.5
Heavy Trucks:	58.2	57.8	51.6	52.2	59.8	60.0
Vehicle Noise:	71.6	70.8	66.5	66.7	73.8	74.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	79	170	366	790
CNEL:	82	176	379	816

Monday, October 2, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY
Road Name: Casmalia Av.
Road Segment: e/o Locust Av.

Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,106 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	868 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	69.3%	10.6%	20.1%	88.81%
Medium Trucks:	73.8%	4.2%	22.1%	10.83%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-3.84	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-12.98	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-27.76	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.0	67.1	64.9	63.0	70.1	70.5
Medium Trucks:	69.5	68.9	62.4	64.9	71.9	72.1
Heavy Trucks:	58.7	58.4	52.1	52.8	60.3	60.5
Vehicle Noise:	72.1	71.3	67.0	67.2	74.3	74.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	85	184	396	854
CNEL:	88	190	410	882

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P
Road Name: Casmalia Av.
Road Segment: e/o Locust Av.

Project Name: Vineyard Av. Warehouse
Job Number: 15533

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,202 vehicles
Peak Hour Percentage:	7.17%
Peak Hour Volume:	875 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	69.3%	10.6%	20.1%	88.89%
Medium Trucks:	73.8%	4.2%	22.1%	10.75%
Heavy Trucks:	79.1%	4.7%	16.3%	0.36%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	40.460
Medium Trucks:	40.241
Heavy Trucks:	40.262

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-3.80	1.28	-1.20	*-4.61*	0.000	0.000
Medium Trucks:	82.40	-12.98	1.31	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	86.40	-27.76	1.31	-1.20	*-5.50*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.1	67.1	65.0	63.0	70.2	70.5
Medium Trucks:	69.5	68.9	62.4	64.9	71.9	72.1
Heavy Trucks:	58.7	58.4	52.1	52.8	60.3	60.5
Vehicle Noise:	72.1	71.3	67.0	67.2	74.3	74.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	86	184	397	856
CNEL:	88	191	410	884

APPENDIX 9.1:

REFERENCE NOISE MEASUREMENT WORKSHEETS

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Short-Term Noise Level Measurement Summary

Reference Source: Loading Dock Activity (Dry Goods)

Measurement Location: Motivational Fullfillment and Logistics Services, 6810 Bickmore Avenue, Chino

JN: 15533

Analyst: B. Lawson

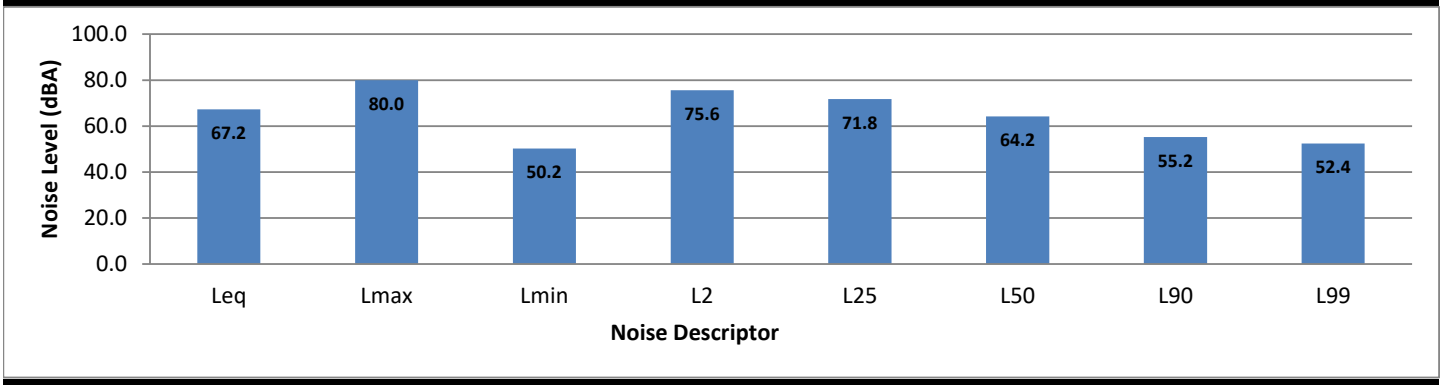
Date: 1/7/2015

Measurement Time (hh:mm:ss)		
Start	*Stop*	*Duration*
10:45:46 AM	11:00:46 AM	0:15:00

Sound Level Meter: Larson Davis LxT

Noise Source: The noise level measurements represent the typical weekday dry goods logistics warehouse operation in a single building with a loading dock area along the western side of the building façade. Up to ten active trucks were observed in the loading dock area including a combination of track trailer semi-trucks, two-axle delivery trucks, and background forklift operations.

Noise Levels (dBA)



Measurement Results (dBA) at Reference Distance of 30 Feet

L_{eq}	L_{max}	L_{min}	L_2	L_{25}	L_{50}	L_{90}	L_{99}
67.2	80.0	50.2	75.6	71.8	64.2	55.2	52.4

Measurement Results (dBA) at Uniform Reference Distance of 50 Feet

L_{eq}	L_{max}	L_{min}	L_2	L_{25}	L_{50}	L_{90}	L_{99}
62.8	75.6	45.8	71.2	67.4	59.8	50.8	48.0

Short-Term Noise Level Measurement Summary

Reference Source: Loading Dock Activity (Dry Goods)

Measurement Location: Walmart at 170 Town Center Parkway in the City of Santee

Sound Level Meter: Piccolo 1 SLM

JN: 15533

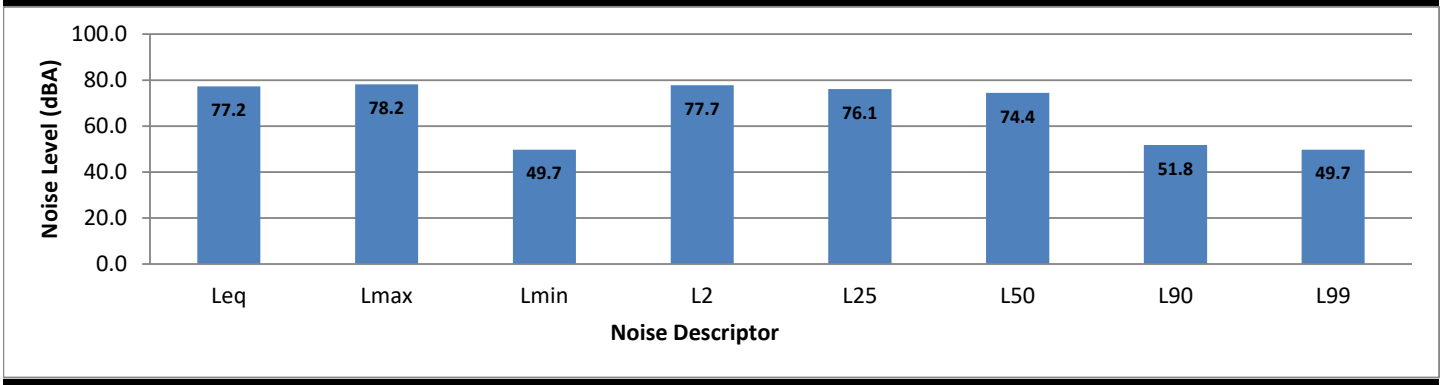
Analyst: B. Lawson

Date: 7/27/2015

Measurement Time (hh:mm:ss)		
Start	*Stop*	*Duration*
		96 Hours

Noise Source: the noise level measurements describe a single mechanical roof-top air conditioning unit on the roof of the existing Walmart store. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. At a distance of 5 feet from the roof-top air conditioning unit, the exterior noise levels were measured at 77.2 dBA Leq with a peak maximum noise level of 78.2 dBA Lmax. Based on the typical operating conditions observed over a four-day measurement period, the roof-top air conditioning units are estimated to operate for 39 minutes during the daytime, 35 minutes during the evening, and 28 minutes during the nighttime hours.

Noise Levels (dBA)



Measurement Results (dBA) at Reference Distance of 5 Feet

L_{eq}	L_{max}	L_{min}	L_2	L_{25}	L_{50}	L_{90}	L_{99}
77.2	78.2	49.7	77.7	76.1	74.4	51.8	49.7

Measurement Results (dBA) at Uniform Reference Distance of 50 Feet

L_{eq}	L_{max}	L_{min}	L_2	L_{25}	L_{50}	L_{90}	L_{99}
57.2	58.2	29.7	57.7	56.1	54.4	31.8	29.7

URBAN CROSSROADS

Short-Term Noise Level Measurement Summary

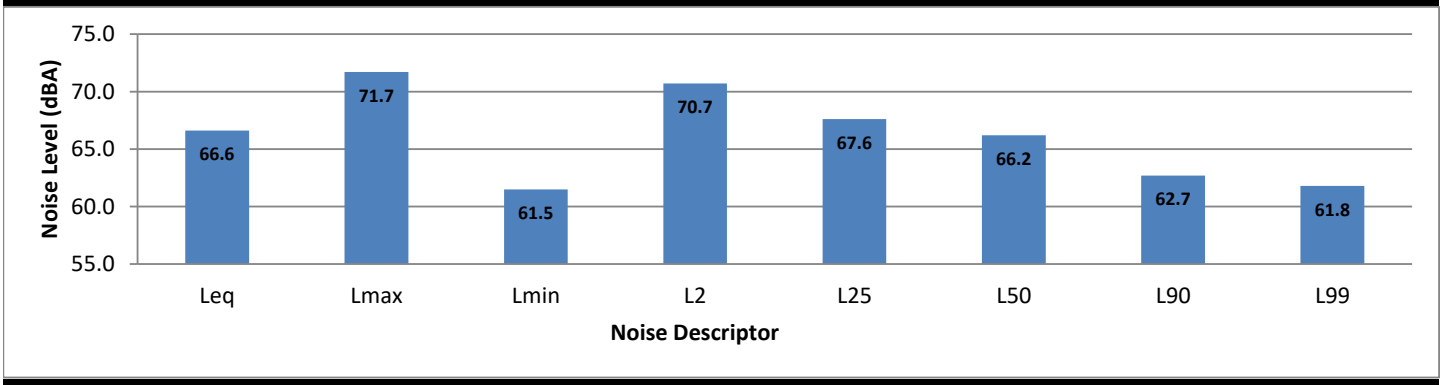
Reference Source:	Parking Lot Vehicle Movement	*JN:* 15533	
Measurement Location:	Amazon Employee Parking Lot at 3611 S Northpointe Drive, Fresno	*Analyst:* B. Lawson	
		Date: 1/6/2021	

Measurement Time (hh:mm:ss)		
Start	*Stop*	*Duration*
		29 Hours

Sound Level Meter: Piccolo 2 SLM

Noise Source: To describe the on-site parking lot activity, a long-term 29-hour reference noise level measurement was collected in the center of activity within the staff parking lot of a warehouse distribution center. At 50 feet from the center of activity, the parking lot produced a reference noise level of 52.6 dBA Leq. The parking lot noise levels are mainly due to cars pulling in and out of parking spaces in combination with car doors opening and closing

Noise Levels (dBA)



Measurement Results (dBA) at Reference Distance of 5 Feet

L_{eq}	L_{max}	L_{min}	L_2	L_{25}	L_{50}	L_{90}	L_{99}
66.6	71.7	61.5	70.7	67.6	66.2	62.7	61.8

Measurement Results (dBA) at Uniform Reference Distance of 50 Feet

L_{eq}	L_{max}	L_{min}	L_2	L_{25}	L_{50}	L_{90}	L_{99}
52.6	57.7	47.5	56.7	53.6	52.2	48.7	47.8

Short-Term Noise Level Measurement Summary

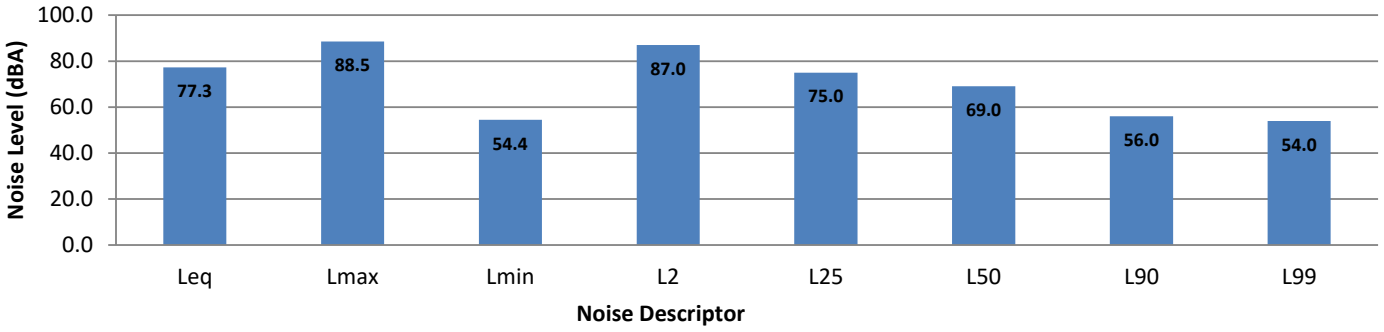
Reference Source:	Trash Enclosure Activity	*JN:* 15533	
Measurement Location:	250 Baker Street Business Park, Costa Mesa	*Analyst:* B. Lawson	
		Date: 5/3/2018	

Measurement Time (hh:mm:ss)		
Start	*Stop*	*Duration*
5:26:00 PM		32 Seconds

Sound Level Meter: Larson Davis LxT

Noise Source: The trash enclosure noise levels describe metal gates opening and closing, metal scraping against concrete floor sounds, dumpster movement on metal wheels, and trash dropping into the metal dumpster. The reference noise levels describe trash enclosure noise activities when trash is dropped into an empty metal dumpster. The measured reference noise level at the uniform 50-foot reference distance is 57.3 dBA Leq for the trash enclosure activity.

Noise Levels (dBA)

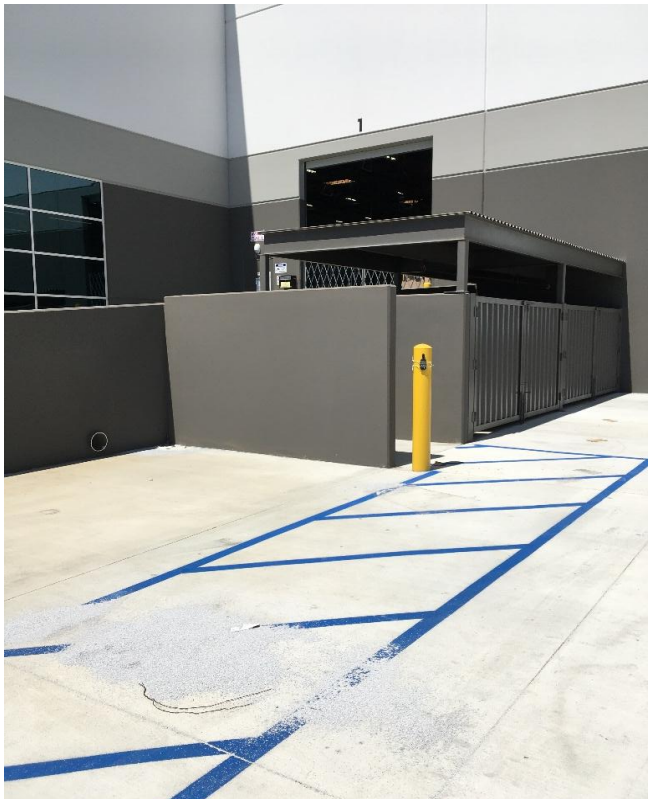


Measurement Results (dBA) at Reference Distance of 5 Feet

L_{eq}	L_{max}	L_{min}	L_2	L_{25}	L_{50}	L_{90}	L_{99}
77.3	88.5	54.4	87.0	75.0	69.0	56.0	54.0

Measurement Results (dBA) at Uniform Reference Distance of 50 Feet

L_{eq}	L_{max}	L_{min}	L_2	L_{25}	L_{50}	L_{90}	L_{99}
57.3	68.5	34.4	67.0	55.0	49.0	36.0	34.0



Short-Term Noise Level Measurement Summary

Reference Source: Truck Movements

Measurement Location: Tejon Industrial Drive at Industrial Parkway Drive, Arvin.

Sound Level Meter: Piccolo 2

JN: 15533

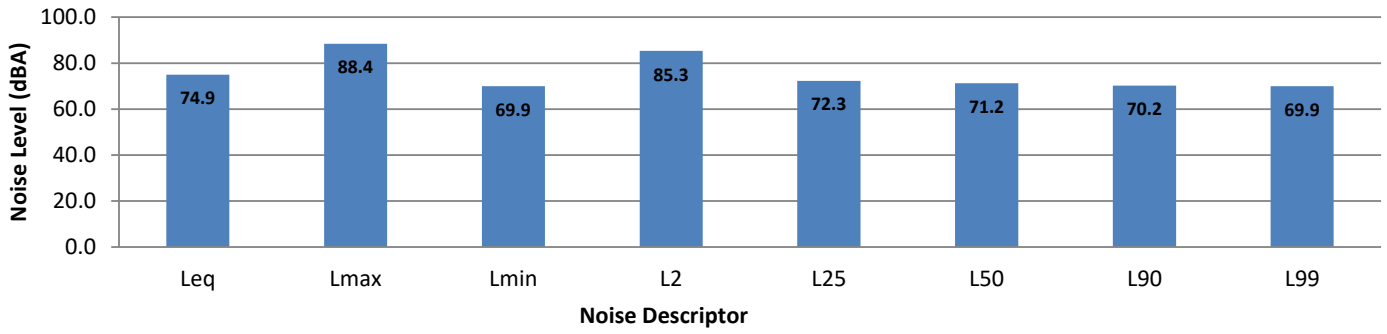
Analyst: B. Lawson

Date: 7/28/2021

Measurement Time (hh:mm:ss)		
Start	*Stop*	*Duration*
11:45:00 AM		24 Hours

Noise Source: The truck movements reference noise level measurement was collected on Tejon Industrial Drive at the intersection of Industrial Parkway Drive. The truck movements at this location include the heavy tractor trailers truck movements associated with the Dollar General, Vision Media, and the IKEA distribution centers. Using the sixty highest one-minute measurements collected over a 24-hour period, the heavy trucks entering and exiting the outdoor loading dock area produced a reference noise level of 59.9 dBA Leq at 50 feet

Noise Levels (dBA)



Measurement Results (dBA) at Reference Distance of 5 Feet

L_{eq}	L_{max}	L_{min}	L_2	L_{25}	L_{50}	L_{90}	L_{99}
74.9	88.4	69.9	85.3	72.3	71.2	70.2	69.9

Measurement Results (dBA) at Uniform Reference Distance of 50 Feet

L_{eq}	L_{max}	L_{min}	L_2	L_{25}	L_{50}	L_{90}	L_{99}
59.9	73.4	54.9	70.3	57.3	56.2	55.2	54.9

URBAN CROSSROADS

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APPENDIX 9.2:

OPERATIONAL NOISE CALCULATIONS

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15533 - Vineyard Avenue Warehouse

CadnaA Noise Prediction Model: 15533-03.cna
Date: 26.03.25
Analyst: B. Lawson

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (ft)	**10000.00**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (ft)	**3280.80**
Min. Length of Section (ft)	**3.30**
Min. Length of Section (%)	**0.00**
Proj. Line Sources	**On**
Proj. Area Sources	**On**
Ref. Time	
Daytime Penalty (dB)	**0.00**
Recr. Time Penalty (dB)	**5.00**
Night-time Penalty (dB)	**10.00**
DTM	
Standard Height (m)	**0.00**
Model of Terrain	**Triangulation**
Reflection	
max. Order of Reflection	**1**
Search Radius Src	**328.08**
Search Radius Rcvr	**328.08**
Max. Distance Source - Rcvr	**3280.84 3280.84**
Min. Distance Rvcr - Reflector	**3.28 3.28**
Min. Distance Source - Reflector	**0.33**
Industrial (ISO 9613 (1996))	
Lateral Diffraction	**some Obj**
Obst. within Area Src do not shield	**On**
Screening	**Incl. Ground Att. over Barrier**
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	**3.0 20.0 0.0**
Temperature (°F)	**50**
rel. Humidity (%)	**70**
Ground Absorption G	**0.50**
Wind Speed for Dir. (mph)	**6.7**
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1		R1	48.9	48.8	55.4	55.0	45.0	0.0				5.00	a	6211453.30	2361394.41	5.00
R2		R2	40.6	40.3	46.9	55.0	45.0	0.0				5.00	a	6211902.00	2361403.64	5.00
R3		R3	32.6	31.7	38.4	55.0	45.0	0.0				5.00	a	6212100.07	2360958.92	5.00
R4		R4	37.8	36.3	43.0	55.0	45.0	0.0				5.00	a	6212095.10	2360438.94	5.00

Partial Noise Levels

Name	Expression	Partial Sum Level											
		R1			R2			R3			R4		
		Day	Night	CNEL	Day	Night	CNEL	Day	Night	CNEL	Day	Night	CNEL
DOCK	DOCK*	47.1	47.1	53.8	25.5	25.5	32.2	25.6	25.6	32.3	25.7	25.7	32.3
AC	AC*	35.8	33.4	40.0	32.7	30.3	37.0	29.2	26.8	33.4	36.1	33.7	40.3
CAR	CAR*	41.0	41.0	47.7	39.6	39.6	46.3	27.8	27.8	34.5	31.8	31.8	38.5
TRASH	TRASH*	31.8	27.8	34.8	10.8	6.9	13.8	9.6	5.6	12.6	12.3	8.3	15.3
TRUCK	TRUCK*	39.4	39.4	46.1	17.3	17.3	24.0	15.5	15.5	22.1	15.5	15.5	22.2

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		AC01	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g	6211861.63	2360392.00	50.00
POINTSOURCE		AC02	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g	6211859.37	2360322.58	50.00
POINTSOURCE		AC03	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g	6211576.71	2361188.03	50.00
POINTSOURCE		AC04	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g	6211576.67	2361121.83	50.00
POINTSOURCE		CAR01	81.1	81.1	81.1	Lw	81.1					5.00	a	6211561.86	2360250.58	5.00

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		CAR02	81.1	81.1	81.1	Lw	81.1					5.00	a	6211657.37	2360251.13	5.00
POINTSOURCE		CAR03	81.1	81.1	81.1	Lw	81.1					5.00	a	6211743.12	2360251.84	5.00
POINTSOURCE		CAR04	81.1	81.1	81.1	Lw	81.1					5.00	a	6211835.35	2360250.27	5.00
POINTSOURCE		CAR05	81.1	81.1	81.1	Lw	81.1					5.00	a	6211914.61	2360252.18	5.00
POINTSOURCE		CAR06	81.1	81.1	81.1	Lw	81.1					5.00	a	6211908.85	2361254.02	5.00
POINTSOURCE		CAR07	81.1	81.1	81.1	Lw	81.1					5.00	a	6211824.22	2361255.46	5.00
POINTSOURCE		CAR08	81.1	81.1	81.1	Lw	81.1					5.00	a	6211736.35	2361258.03	5.00
POINTSOURCE		CAR09	81.1	81.1	81.1	Lw	81.1					5.00	a	6211641.97	2361260.72	5.00
POINTSOURCE		CAR10	81.1	81.1	81.1	Lw	81.1					5.00	a	6211550.83	2361262.27	5.00
POINTSOURCE		CAR11	81.1	81.1	81.1	Lw	81.1					5.00	a	6211481.28	2361128.88	5.00
POINTSOURCE		CAR12	81.1	81.1	81.1	Lw	81.1					5.00	a	6211481.15	2361185.32	5.00
POINTSOURCE		CAR13	81.1	81.1	81.1	Lw	81.1					5.00	a	6211455.37	2361264.98	5.00
POINTSOURCE		TRASH01	89.0	89.0	89.0	Lw	89		900.00	0.00	270.00	5.00	a	6211405.92	2360781.77	5.00
POINTSOURCE		TRASH02	89.0	89.0	89.0	Lw	89		900.00	0.00	270.00	5.00	a	6211401.00	2360237.03	5.00

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src				Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number			Speed		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)	
LINESOURCE		TRUCK01	93.2	93.2	93.2	68.9	68.9	68.9	Lw	93.2									8	a
LINESOURCE		TRUCK02	93.2	93.2	93.2	77.7	77.7	77.7	Lw	93.2									8	a

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
LINESOURCE	TRUCK01	8.00	a			6211501.30	2361093.81	8.00	0.00
						6211484.29	2360218.32	8.00	0.00
LINESOURCE	TRUCK02	8.00	a			6211497.00	2360872.47	8.00	0.00
						6211380.25	2360872.25	8.00	0.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
AREASOURCE		DOCK01	103.4	103.4	103.4	67.6	67.6	67.6	Lw	103.4					8	a
AREASOURCE		DOCK02	103.4	103.4	103.4	68.9	68.9	68.9	Lw	103.4					8	a

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
AREASOURCE	DOCK01	8.00	a			6211542.87	2361092.93	8.00	0.00
						6211604.37	2361094.32	8.00	0.00
						6211594.04	2360419.45	8.00	0.00
						6211533.71	2360419.53	8.00	0.00
AREASOURCE	DOCK02	8.00	a			6211390.93	2360793.97	8.00	0.00
						6211445.18	2360793.05	8.00	0.00
						6211436.48	2360223.59	8.00	0.00
						6211384.05	2360224.13	8.00	0.00

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height			Coordinates			
				left	right		horz.	vert.	Begin		End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
BARRIERPLANNED			0						0.00	a		6211385.40	2361318.90	0.00	0.00
												6211548.26	2361317.00	0.00	0.00

Building(s)

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING			BUILDING00001	x	0		45.00	a	6211545.39	2361217.77	45.00	0.00
									6211930.85	2361212.16	45.00	0.00
									6211917.32	2360361.16	45.00	0.00
									6211881.51	2360361.77	45.00	0.00
									6211881.33	2360295.79	45.00	0.00
									6211532.58	2360297.94	45.00	0.00
									6211533.71	2360419.53	45.00	0.00
									6211594.04	2360419.45	45.00	0.00
									6211604.37	2361094.32	45.00	0.00
									6211542.87	2361092.93	45.00	0.00

APPENDIX 10.1:

PROJECT CONSTRUCTION NOISE CALCULATIONS

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15533 - Vineyard Avenue Warehouse

CadnaA Noise Prediction Model: 15533-03_Construction.cna
Date: 25.03.25
Analyst: B. Lawson

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (ft)	**10000.00**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (ft)	**3280.80**
Min. Length of Section (ft)	**3.30**
Min. Length of Section (%)	**0.00**
Proj. Line Sources	**On**
Proj. Area Sources	**On**
Ref. Time	
Daytime Penalty (dB)	**0.00**
Recr. Time Penalty (dB)	**5.00**
Night-time Penalty (dB)	**10.00**
DTM	
Standard Height (m)	**0.00**
Model of Terrain	**Triangulation**
Reflection	
max. Order of Reflection	**1**
Search Radius Src	**328.08**
Search Radius Rcvr	**328.08**
Max. Distance Source - Rcvr	**3280.84 3280.84**
Min. Distance Rvcr - Reflector	**3.28 3.28**
Min. Distance Source - Reflector	**0.33**
Industrial (ISO 9613 (1996))	
Lateral Diffraction	**some Obj**
Obst. within Area Src do not shield	**On**
Screening	**Incl. Ground Att. over Barrier**
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	**3.0 20.0 0.0**
Temperature (°F)	**50**
rel. Humidity (%)	**70**
Ground Absorption G	**0.50**
Wind Speed for Dir. (mph)	**6.7**
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	68.9	-35.9	65.8	55.0	45.0	0.0				5.00	a	6211453.30	2361394.41	5.00
RECEIVERS		R2	68.7	-36.1	65.7	55.0	45.0	0.0				5.00	a	6211902.00	2361403.64	5.00
RECEIVERS		R3	69.8	-35.0	66.8	55.0	45.0	0.0				5.00	a	6212100.07	2360958.92	5.00
RECEIVERS		R4	69.3	-35.4	66.3	55.0	45.0	0.0				5.00	a	6212095.10	2360438.94	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
SITEBOUNDARY		CONSTRUCTION	123.2	18.4	18.4	75.1	-29.7	-29.7	PWL-Pt	118.4					8	a

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
SITEBOUNDARY	CONSTRUCTION	8.00	a			6211385.40	2361318.90	8.00	0.00
						6212019.41	2361311.50	8.00	0.00
						6212007.47	2360542.22	8.00	0.00
						6212005.71	2360373.13	8.00	0.00
						6212004.51	2360356.52	8.00	0.00
						6212000.91	2360340.26	8.00	0.00
						6211994.99	2360324.70	8.00	0.00
						6211973.41	2360281.22	8.00	0.00
						6211970.43	2360273.20	8.00	0.00
						6211968.87	2360264.79	8.00	0.00
						6211968.77	2360256.23	8.00	0.00

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
				6211970.13	2360247.79	8.00	0.00
				6211972.92	2360239.70	8.00	0.00
				6211977.05	2360232.21	8.00	0.00
				6211982.40	2360225.53	8.00	0.00
				6211988.81	2360219.87	8.00	0.00
				6211996.10	2360215.38	8.00	0.00
				6212004.04	2360212.21	8.00	0.00
				6211372.74	2360219.63	8.00	0.00

APPENDIX 10.2:

NIGHTTIME CONCRETE POUR NOISE CALCULATIONS

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15533 - Vineyard Avenue Warehouse

CadnaA Noise Prediction Model: 15533-03_Pour.cna
Date: 25.03.25
Analyst: B. Lawson

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (ft)	**10000.00**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (ft)	**3280.80**
Min. Length of Section (ft)	**3.30**
Min. Length of Section (%)	**0.00**
Proj. Line Sources	**On**
Proj. Area Sources	**On**
Ref. Time	
Daytime Penalty (dB)	**0.00**
Recr. Time Penalty (dB)	**5.00**
Night-time Penalty (dB)	**10.00**
DTM	
Standard Height (m)	**0.00**
Model of Terrain	**Triangulation**
Reflection	
max. Order of Reflection	**1**
Search Radius Src	**328.08**
Search Radius Rcvr	**328.08**
Max. Distance Source - Rcvr	**3280.84 3280.84**
Min. Distance Rvcr - Reflector	**3.28 3.28**
Min. Distance Source - Reflector	**0.33**
Industrial (ISO 9613 (1996))	
Lateral Diffraction	**some Obj**
Obst. within Area Src do not shield	**On**
Screening	**Incl. Ground Att. over Barrier**
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	**3.0 20.0 0.0**
Temperature (°F)	**50**
rel. Humidity (%)	**70**
Ground Absorption G	**0.50**
Wind Speed for Dir. (mph)	**6.7**
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	48.0	-56.7	45.0	55.0	45.0	0.0				5.00	a	6211453.30	2361394.41	5.00
RECEIVERS		R2	49.0	-55.8	46.0	55.0	45.0	0.0				5.00	a	6211902.00	2361403.64	5.00
RECEIVERS		R3	51.1	-53.7	48.1	55.0	45.0	0.0				5.00	a	6212100.07	2360958.92	5.00
RECEIVERS		R4	50.4	-54.3	47.4	55.0	45.0	0.0				5.00	a	6212095.10	2360438.94	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
BUILDING		POUR	105.1	0.3	0.3	59.9	-44.8	-44.8	PWL-Pt	100.3					8	a

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING	POUR	8.00	a			6211545.39	2361217.77	8.00	0.00
						6211930.85	2361212.16	8.00	0.00
						6211917.32	2360361.16	8.00	0.00
						6211881.51	2360361.77	8.00	0.00
						6211881.33	2360295.79	8.00	0.00
						6211532.58	2360297.94	8.00	0.00
						6211533.71	2360419.53	8.00	0.00
						6211542.87	2361092.93	8.00	0.00

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