

# Amargosa and Palmetto High-Cube Warehouse

NOISE IMPACT AND VIBRATION ANALYSIS
CITY OF HESPERIA

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# **TABLE OF CONTENTS**

		OF CONTENTS	
		DICES	
		EXHIBITS	
		TABLES	
		F ABBREVIATED TERMS	
1		TIVE SUMMARY NTRODUCTION	
_			
	1.1	Site LocationProject Description	
_	1.2	·	
2	F	UNDAMENTALS	
	2.1	Range of Noise	
	2.2	Noise Descriptors	
	2.3	Sound Propagation	
	2.4 2.5	Noise Control  Noise Barrier Attenuation	
	2.5	Land Use Compatibility With Noise	
	2.7	Community Response to Noise	
	2.8	Vibration	
3	R	EGULATORY SETTING	1:
	3.1	State of California Noise Requirements	
	3.2	City of Hesperia General Plan Noise Element	
	3.3	Operational Noise Standards	
	3.4	Construction Noise Standards	
	3.5	Vibration Standards	
4	SI	IGNIFICANCE CRITERIA	19
	4.1	Noise Level Increases (Threshold A)	19
	4.2	Vibration (Threshold B)	
	4.3	CEQA Guidelines Not Further Analyzed (Threshold C)	<b>2</b> 1
	4.4	Significance Criteria Summary	<b>2</b> 1
5	E	XISTING NOISE LEVEL MEASUREMENTS	23
	5.1	Measurement Procedure and Criteria	23
	5.2	Noise Measurement Locations	
	5.3	Noise Measurement Results	24
6	T	RAFFIC NOISE METHODS AND PROCEDURES	27
	6.1	FHWA Traffic Noise Prediction Model	27
7	0	DFF-SITE TRAFFIC NOISE ANALYSIS	31
	7.1	Traffic Noise Contours	32
	7.3	Opening Year (2024) Traffic Noise Level Increases	
	7.4	General Plan Buildout (2040) Traffic Noise Level Increases	34
8	R	ECEIVER LOCATIONS	37
9	0	PERATIONAL NOISE ANALYSIS	39



9	9.1	Operational Noise Sources	39
9	9.2	Reference Noise Levels	39
9	9.3	CadnaA Noise Prediction Model	43
9	9.4	Project Operational Noise Levels	43
9	9.5	Project Operational Noise Level Compliance	
9	9.6	Project Operational Noise Level Increases	45
10	CO	NSTRUCTION ANALYSIS	47
1	l0.1	Construction Noise Levels	47
1	L0.2	Construction Reference Noise Levels	47
1	L0.3	Construction Noise Analysis	49
1	L0.4	Construction Noise Level Compliance	50
1	L0.5	Nighttime Concrete Pour Noise Analysis	51
1		Construction Vibration Analysis	
11	REF	ERENCES	55
12	CEF	RTIFICATIONS	57

## **APPENDICES**

**APPENDIX 3.1: CITY OF HESPERIA MUNICIPAL CODE** 

**APPENDIX 5.1: STUDY AREA PHOTOS** 

**APPENDIX 5.2: NOISE LEVEL MEASUREMENT WORKSHEETS** 

**APPENDIX 7.1: OFF-SITE TRAFFIC NOISE CONTOURS** 

APPENDIX 9.1: CADNAA OPERATIONAL NOISE MODEL INPUTS APPENDIX 10.1: CADNAA CONSTRUCTION NOISE MODEL INPUTS APPENDIX 10.2: CADNAA CONCRETE POUR NOISE MODEL INPUTS

## **LIST OF EXHIBITS**

EXHIBIT 1-A: LOCATION MAP	4
EXHIBIT 1-B: SITE PLAN	
EXHIBIT 2-A: TYPICAL NOISE LEVELS	
EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION	
EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION	
EXHIBIT 3-A: LAND USE NOISE COMPATIBILITY CRITERIA	
EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS	
EXHIBIT 8-A: RECEIVER LOCATIONS	
EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS	
EXHIBIT 10-A: CONSTRUCTION NOISE SOURCE LOCATIONS	
EXHIBIT 10-B: NIGHTTIME CONCRETE POUR NOISE SOURCE AND RECEIVER LOCATIONS	



# **LIST OF TABLES**

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS	1
TABLE 3-1: OPERATIONAL NOISE STANDARDS	
TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY	21
TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS	24
TABLE 6-1: OFF-SITE ROADWAY PARAMETERS	
TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES	29
TABLE 6-3: TIME OF DAY VEHICLE SPLITS	
TABLE 6-4: WITHOUT PROJECT VEHICLE MIX	
TABLE 6-5: OPENING YEAR (2024) WITH PROJECT VEHICLE MIX	
TABLE 6-6: GENERAL PLAN BUILDOUT (2040) WITH PROJECT VEHICLE MIX	
TABLE 7-1: EXISTING WITHOUT PROJECT CONTOURS	
TABLE 7-2: OPENING YEAR (2024) WITHOUT PROJECT CONTOURS	
TABLE 7-3: OPENING YEAR (2024) WITH PROJECT CONTOURS	
TABLE 7-4: GENERAL PLAN BUILDOUT (2040) WITHOUT PROJECT CONTOURS	
TABLE 7-5: GENERAL PLAN BUILDOUT (2040) WITH PROJECT CONTOURS	
TABLE 7-6: OPENING YEAR (2024) WITH PROJECT TRAFFIC NOISE LEVEL INCREASES	35
TABLE 7-7: GENERAL PLAN BUILDOUT (2040) WITH PROJECT TRAFFIC NOISE LEVEL INCREASES	36
TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS	
TABLE 9-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS	
TABLE 9-3: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS	
TABLE 9-4: OPERATIONAL NOISE LEVEL COMPLIANCE	
TABLE 9-5: DAYTIME PROJECT OPERATIONAL NOISE LEVEL INCREASES	46
TABLE 9-6: NIGHTTIME OPERATIONAL NOISE LEVEL INCREASES	
TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS	
TABLE 10-2: CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY	
TABLE 10-3: CONSTRUCTION NOISE LEVEL COMPLIANCE	
TABLE 10-4: NIGHTTIME CONCRETE POUR NOISE LEVEL COMPLIANCE	
TABLE 10-5: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT	
TABLE 10-6: PROJECT CONSTRUCTION VIBRATION LEVELS	54



## **LIST OF ABBREVIATED TERMS**

(1) Reference

ADT Average Daily Traffic

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

 $\begin{array}{lll} L_{eq} & & \text{Equivalent continuous (average) sound level} \\ L_{max} & & \text{Maximum level measured over the time interval} \\ L_{min} & & \text{Minimum level measured over the time interval} \end{array}$ 

mph Miles per hour

OPR Office of Planning and Research

PPV Peak particle velocity

Project Amargosa and Palmetto High-Cube 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 potential noise impacts and the necessary noise mitigation measures, if any, for the proposed Amargosa and Palmetto High-Cube Warehouse development ("Project"). The proposed Project is to consist of 499,850 square high-cube fulfillment center warehouse building in a single building. This study has been prepared to satisfy applicable City of Hesperia standards and thresholds of significance based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines (1).

The results of this Amargosa and Palmetto High-Cube Warehouse Noise Impact and Vibration Analysis are summarized below based on the significance criteria in Section 4 of this report. 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** 

Analusia	Report	Significance Findings		
Analysis	Section	Unmitigated	Mitigated	
Off-Site Traffic Noise	7	Less Than Significant	-	
Operational Noise	9	Less Than Significant	-	
Construction Noise		Less Than Significant	-	
Nighttime Concrete Pour Noise	10	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 Amargosa and Palmetto High-Cube 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 on the northwest corner of Amargosa Road and Palmetto Way in the City of Hesperia as shown on Exhibit 1-A.

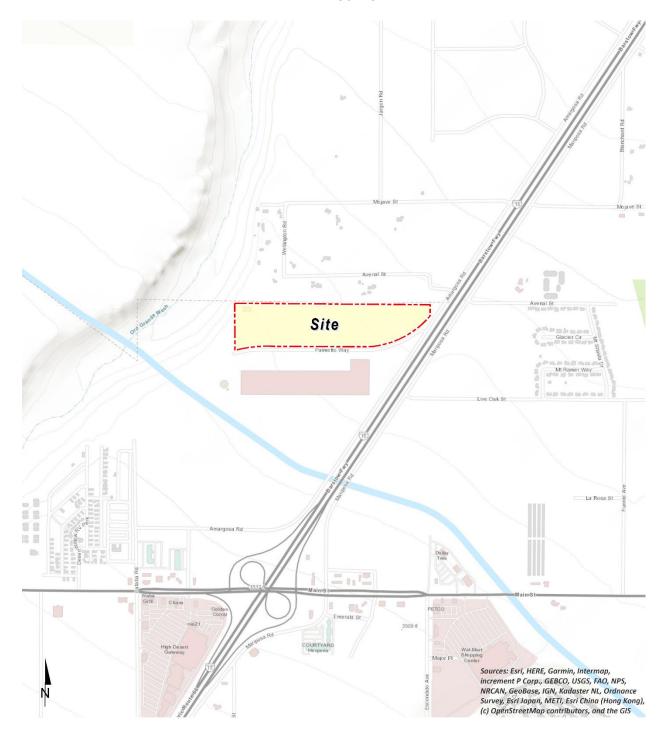
## 1.2 PROJECT DESCRIPTION

The proposed Project is to consist of 499,850 square high-cube fulfillment center warehouse building as shown on Exhibit 1-B. the proposed project is anticipated to be constructed and fully operational by year 2024.

The on-site Project-related noise sources are expected to include: loading dock activity, trailer parking activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements. This noise analysis is intended to describe noise level impacts associated with the expected typical operational activities at the Project site.

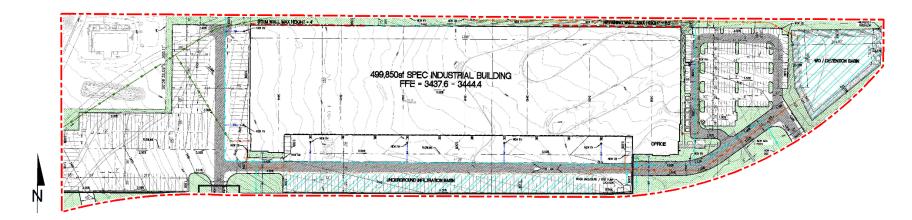


**EXHIBIT 1-A: LOCATION MAP** 





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

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 Aweighted decibels (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<sub>eq</sub> sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L<sub>eq</sub> 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 City of Hesperia 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 ft. 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.



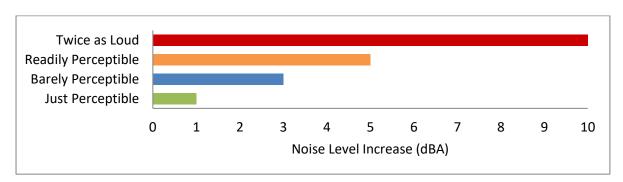
## 2.6 LAND USE COMPATIBILITY WITH NOISE

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 Impact and Vibration Impact Assessment Manual* (8), 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.

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. 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. Decibel notation (VdB) is commonly used to measure RMS. Decibel notation (VdB) serves to reduce the range of numbers used to describe human response to vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receivers for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment and/or activities.

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.



Velocity Typical Sources Level\* (50 ft from source) Human/Structural Response 100 Threshold, minor cosmetic damage Blasting from construction projects fragile buildings Bulldozers and other heavy tracked construction equipment Difficulty with tasks such as 90 reading a VDT screen Commuter rail, upper range 80 Residential annoyance, infrequent Rapid transit, upper range events (e.g. commuter rail) Commuter rail, typical Residential annoyance, frequent Bus or truck over bump events (e.g. rapid transit) Rapid transit, typical Limit for vibration sensitive equipment. Approx. threshold for Bus or truck, typical human perception of vibration 60 Typical background vibration 50

**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

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). (9) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

## 3.2 CITY OF HESPERIA GENERAL PLAN NOISE ELEMENT

The City of Hesperia has adopted a Noise Element of the General Plan (10) to control and abate environmental noise, and to protect the citizens of the City of Hesperia from excessive exposure to noise. The General Plan Noise Element specifies the maximum allowable unmitigated exterior noise levels for new developments impacted by transportation noise sources such as arterial roads, freeways, airports, and railroads. In addition, the City of Hesperia General Plan Noise Element identifies several goals and policies to minimize the impacts of excessive noise levels throughout the community and establishes noise level requirements for all land uses. To limit the exposure of City residents to excessive noise, the City of Hesperia General Plan Noise Element contains the following two goals:

- NS-1 To achieve and maintain an environment which is free from excessive or harmful noise through identification, control, and abatement.
- NS-2 To achieve and maintain an environment which is free from excessive vibration.

To satisfy these two overarching goals, the General Plan Noise Element identifies the following implementation policies to reduce noise levels associated with the development of the Project.

NS-1.2 Control and abate undesirable sounds through the use of the land use compatibility criteria shown in Exhibit NS-1, Table NS-3, and the Municipal Code Section 16.20.125(B).

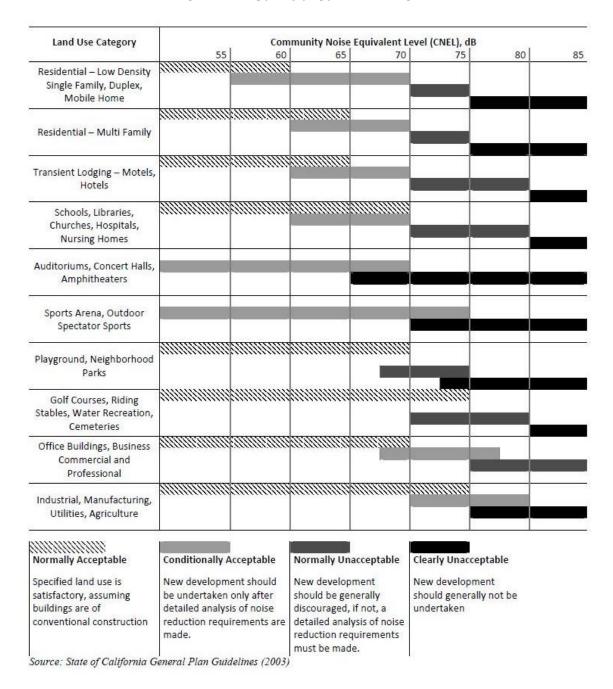


- NS-1.5 Require the design and construction of commercial, industrial, office and mixed-use structures developments with noise attenuation methods to minimize excessive noise upon noise-sensitive land uses.
- NS-1.9 Encourage commercial, industrial, office and mixed-use developments to locate loading areas, parking lots, driveways, trash enclosures, mechanical equipment, and other noisier components away from noise-sensitive land uses.
- NS-1.10 Limit the hours of construction activity in, and around, residential areas in order to reduce the intrusion of noise in the early morning and late evening hours and on weekends and holidays.
- NS-1.11 Limit delivery hours for businesses with loading areas or docks fronting, siding, or bordering or gaining access on driveways adjacent to noise-sensitive areas.
- NS-1.12 Implement nighttime and daytime on-site noise level limits to address noise generated by commercial and industrial uses where it affects abutting residential and other noise-sensitive land uses.

The State of California Land Use Compatibility Plan (Exhibit NS-1) in the City of Hesperia General Plan Noise Element lists land use categories and the acceptable and unacceptable levels of community noise exposure. The compatibility criteria shown on Table NS-1 (and Exhibit 3-A of this report) provides the City with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels.

The State of California Land Use Compatibility Plan describes categories of compatibility, but not specific noise standards. According to these categories of transportation-related noise compatibility, the Amargosa and Palmetto High-Cube Warehouse industrial land uses are considered *normally acceptable* with unmitigated exterior noise levels below 75 dBA CNEL and *conditionally acceptable* with noise levels between 70 and 80 dBA CNEL. For *conditionally acceptable* land use, "new construction or development should be undertaken only after a detailed analysis of noise reduction requirements are made (10).





**EXHIBIT 3-A: LAND USE NOISE COMPATIBILITY CRITERIA** 

## 3.3 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Amargosa and Palmetto High-Cube Warehouse, stationary-source (operational) noise such as the expected loading dock activity, trailer parking activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements are typically evaluated against standards established under a jurisdiction's Municipal Code.



Section 16.20.125 of the City of Hesperia Municipal Code included in Appendix 3.1, establishes the noise level standards for stationary noise sources and establishes noise level limits for affected land uses. Since the Project land use will potentially impact a combination of non-noise-sensitive and noise sensitive uses in the Project study area, this noise study relies on the exterior noise level standards for all land uses identified by the City of Hesperia Municipal Code.

For non-noise sensitive industrial uses, the maximum exterior noise level shall not exceed 70 dBA  $L_{eq}$  at any time, while the maximum exterior noise level exterior noise levels at non-noise sensitive commercial uses shall not exceed 65 dBA  $L_{eq}$  at any time. For noise sensitive residential properties, the maximum exterior noise level shall not exceed 60 dBA  $L_{eq}$  during the daytime hours (7:00 a.m. to 10:00 p.m.) and 50 dBA  $L_{eq}$  during the nighttime hours (10:00 p.m. to 7:00 a.m.). (11) In addition, except for the nighttime hours from 10:00 p.m. to 7:00 a.m.) the maximum permissible noise levels due to wind noise may be adjusted so that it is no greater than five dB(A) above the ambient noise level. The Municipal Code operational noise level standards are summarized on Table 3-1.

Jurisdiction	Receiving Land Use	Time Period	Exterior Noise Level Standard (dBA L <sub>eq</sub> ) <sup>2</sup>
	A-1, A-2, R-1, R-3, and RR Zone Districts	Daytime (7:00 a.m 10:00 p.m.)	60
o:.		Nighttime (10:00 p.m 7:00 a.m.)	55
City of Hesperia <sup>1</sup>	C-1, C-2, C-3, C-4, C-R, AP, and P-I Zone Districts	Anytime	65
	I-1 and I-2 Zone	Anytime	70

**TABLE 3-1: OPERATIONAL NOISE STANDARDS** 

## 3.4 Construction Noise Standards

The City of Hesperia Municipal Code, Section 16.20.125.E.3 exempts construction noise from its stationary-source noise level limits between seven a.m. and seven p.m. and at any time on Sundays and federal holidays. (11) In addition, neither the City of Hesperia General Plan or Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers for CEQA analysis purposes. 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



<sup>&</sup>lt;sup>1</sup> City of Hesperia Municipal Code, Section 16.20.125 (Appendix 3.1).

<sup>&</sup>lt;sup>2</sup> L<sub>eq</sub> represents a steady state sound level containing the same total energy as a time varying signal over a given sample period.

construction noise assessment. The FTA considers a daytime exterior construction noise level of 80 dBA Leg as a reasonable threshold for noise sensitive residential land use (8 p. 179).

## 3.5 VIBRATION STANDARDS

The City of Hesperia Municipal Code, Section 16.20.130, identifies an operational vibration level threshold of 0.2 in/sec PPV which is used in this report to evaluate potential impacts due to onsite Project related operational vibration level activities at nearby receiver locations. (11) According to Section 16.20.130.C.2, temporary construction, maintenance, or demolition activities are considered exempt provided that construction vibration activity is limited the hours between seven a.m. and seven p.m. including Sundays and federal holidays.



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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. (12) 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.

## 4.1.1 Noise-Sensitive Receivers

The Federal Interagency Committee on Noise (FICON) (13) 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. (12) 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 guidance provided by both the Federal Highway Administration (4 p. 9) and Caltrans (14 p. 2 48).

#### 4.1.2 Non-Noise-Sensitive Receivers

The City of Hesperia General Plan Noise Element, Exhibit NS-1, Land Use Compatibility Criteria was used to establish the satisfactory noise levels of significance for non-noise-sensitive land uses in the Project study area. As previously shown on Exhibit 3-A, the normally acceptable exterior noise level for non-noise-sensitive land uses is 75 dBA CNEL. Noise levels greater than 70 dBA CNEL are considered conditionally acceptable per the Land Use Compatibility for Community Noise Exposure. (10) To determine if Project-related traffic noise level increases are significant at off-site non-noise-sensitive land uses, a barely perceptible 3 dBA criteria is used. When the without Project noise levels are greater than the normally acceptable 75 dBA CNEL land use compatibility criteria, a barely perceptible 3 dBA or greater noise level increase is considered a significant impact since the noise level criteria is already exceeded. The noise level increases used to determine significant impacts for non-noise-sensitive land uses is generally consistent with the FICON noise level increase thresholds for noise-sensitive land uses but instead rely on the City of Hesperia General Plan Noise Element, Table N-1, Land Use Compatibility for Community Noise Exposure normally acceptable 70 dBA CNEL exterior noise level criteria.

## 4.2 VIBRATION (THRESHOLD B)

As described in Section 3.5, the vibration impacts originating from the construction of the Amargosa and Palmetto High-Cube Warehouse, vibration-generating activities are appropriately evaluated using the City of Hesperia threshold to assess potential temporary construction-related impacts at nearby receiver locations. The City of Hesperia 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 Hesperia Airport located roughly 5.5 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** 

Amalysis	Receiving	Condition(s)	Significan	ce Criteria	
Analysis	Land Use	Condition(s)	Daytime	Nighttime	
		If ambient is < 60 dBA Leq	≥ 5 dBA L <sub>eq</sub> Pr	oject increase	
	Noise- Sensitive <sup>1</sup>	If ambient is 60 - 65 dBA Leq	≥ 3 dBA L <sub>eq</sub> Pr	oject increase	
e Tri	Schsitive	If ambient is > 65 dBA Leq	≥ 1.5 dBA L <sub>eq</sub> P	roject increase	
Off-Site Traffic	Non-Noise- Sensitive <sup>2</sup>	if ambient is > 75 dBA CNEL	≥ 3 dBA CNEL Project increase		
	Multiple	Exterior Noise Level Standards	See Table 3-1.		
Operational		If ambient is < 60 dBA Leq	≥ 5 dBA L <sub>eq</sub> Project increase		
rati	Noise-	If ambient is 60 - 65 dBA Leq	≥ 3 dBA L <sub>eq</sub> Project increase		
Ope	Sensitive <sup>1</sup>	If ambient is > 65 dBA Leq	≥ 1.5 dBA L <sub>eq</sub> P	roject increase	
		Vibration Level Threshold <sup>3</sup>	0.2 in/s	ec PPV	
Construction		Permitted hours of 7:00 Sunday or a fo	) a.m. to7:00 p.m. ex ederal holiday <sup>4</sup>	ccept	
nstrı	All	Noise Level Threshold <sup>5</sup>	80 dBA L <sub>eq</sub>	n/a	
Cor		Vibration Level Threshold <sup>3</sup>	0.2 in/sec PPV	n/a	

<sup>&</sup>lt;sup>1</sup> FICON, 1992.



<sup>&</sup>lt;sup>2</sup> City of Hesperia General Plan Noise Element Exhibit NS-1 Land Use Compatibility Criteria.

<sup>&</sup>lt;sup>3</sup> City of Hesperia Municipal Code, Section 16.20.130.A (Appendix 3.1).

<sup>&</sup>lt;sup>4</sup> City of Hesperia Municipal Code, Section 16.20.125.E.3 (Appendix 3.1).

<sup>&</sup>lt;sup>5</sup> Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.

<sup>&</sup>quot;Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.; "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 five 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, noise level measurements were collected by Urban Crossroads, Inc. on Tuesday, June 21<sup>th</sup>, 2022. 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. 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. (15)

## **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 ambient 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, that 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 reference ambient 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 impacts due to the Project's contribution to the ambient noise levels.

#### 5.3 Noise Measurement Results

The noise measurements presented below focus on the average or equivalent sound levels ( $L_{eq}$ ). 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: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS** 

Location <sup>1</sup>	Description	Energy Average Noise Level (dBA L <sub>eq</sub> ) <sup>2</sup>	
		Daytime	Nighttime
L1	Located north of the Project Site near the existing noise sensitive residence at 13030 Avenal Street.	61.0	58.2
L2	Located south of the existing noise sensitive residence at 13164 Avenal Road with the Project Site.	55.6	55.2
L3	Located east of the Project site near the existing noise sensitive residence at 10445 Avenal Street.	58.6	58.4
L4	Located southeast of the Project site near the existing noise sensitive residence at 10122 Mt. Whitney Way.	62.7	61.7
L5	Located south of the existing noise sensitive residence at 10376 Wellington Road.	52.3	51.5

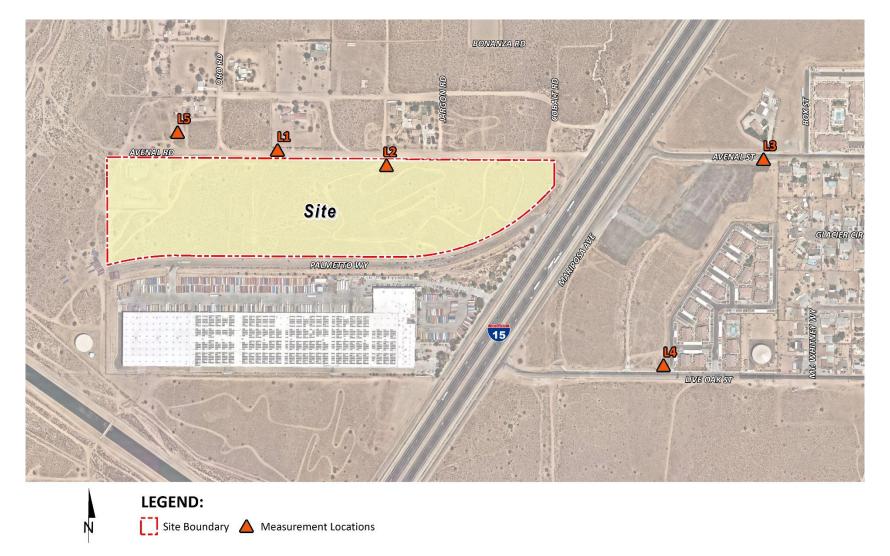
<sup>&</sup>lt;sup>1</sup> See Exhibit 5-A for the noise level measurement locations.

Table 5-1 provides the (energy average) 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<sub>1</sub>, L<sub>2</sub>, L<sub>5</sub>, L<sub>8</sub>, L<sub>25</sub>, L<sub>50</sub>, L<sub>90</sub>, L<sub>95</sub>, and L<sub>99</sub> percentile noise levels observed during the daytime and nighttime periods.



<sup>&</sup>lt;sup>2</sup> Energy (logarithmic) average levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2.

<sup>&</sup>quot;Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.



**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 traffic noise environment. Consistent with the State of California Land Use Compatibility Plan (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. (16) 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. (17) 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. (18)

#### 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 seven off-site study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of Hesperia General Plan Circulation Element, and the posted vehicle speeds. The ADT volumes used in this study area presented on Table 6-2 are based on *Amargosa and Palmetto High-Cube Warehouse Traffic Impact Analysis*, prepared by the Ganddini Group, Inc.. (19)

- Existing Conditions
- Opening Year (2024) Without Project Conditions (OYC).
- Opening Year (2024) With Project Conditions (OYCP).
- General Plan Buildout (2040) Without Project Conditions (HY).
- General Plan Buildout (2040) With Project Conditions (HYP).



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 study.

**TABLE 6-1: OFF-SITE ROADWAY PARAMETERS** 

ID	Roadway	Segment	Classification <sup>1</sup>	Receiving Land Use <sup>2</sup>	Distance from Centerline to Receiving Land Use (Feet) <sup>3</sup>	Vehicle Speed (mph)
1	Key Pointe Dr.	s/o Amargosa Rd.	Secondary	Non-Sensitive	40'	45
2	Amargosa Rd.	n/o Palmetto Wy.	Arterial	Sensitive	50'	50
3	Amargosa Rd.	w/o Key Pointe Dr.	Arterial	Sensitive	50'	50
4	Amargosa Rd.	e/o Key Pointe Dr.	Arterial	Non-Sensitive	50'	50
5	Main St.	w/o Key Pointe Dr.	Major Arterial	Sensitive	60'	55
6	Main St.	e/o Key Pointe Dr.	Major Arterial	Non-Sensitive	60'	55
7	Main St.	e/o I-15 NB Ramps	Major Arterial	Non-Sensitive	60'	55

<sup>&</sup>lt;sup>1</sup> City of Hesperia General Plan Circulation Element.

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 *Amargosa and Palmetto High-Cube 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 6-6 show the vehicle mixes used for the with Project traffic scenarios.



<sup>&</sup>lt;sup>2</sup> Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.

<sup>&</sup>lt;sup>3</sup> Distance to receiving land use is based upon the right-of-way distances.

**TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES** 

			Average Daily Traffic Volumes <sup>1</sup>					
ID	Roadway	Segment		OY 2	2024	GP 2040		
	,		Existing	Without Project	With Project	Without Project	With Project	
1	Key Pointe Dr.	s/o Amargosa Rd.	430	1,000	1,692	4,700	5,392	
2	Amargosa Rd.	n/o Palmetto Wy.	8,610	9,130	9,328	13,110	13,308	
3	Amargosa Rd.	w/o Key Pointe Dr.	6,530	7,380	7,396	11,280	11,296	
4	Amargosa Rd.	e/o Key Pointe Dr.	6,340	6,620	7,328	7,360	8,068	
5	Main St.	w/o Key Pointe Dr.	20,470	39,240	39,264	41,730	41,754	
6	Main St.	e/o Key Pointe Dr.	11,910	29,510	30,178	27,250	27,918	
7	Main St.	e/o I-15 NB Ramps	41,530	46,730	46,967	51,280	51,517	

<sup>&</sup>lt;sup>1</sup> Amargosa and Palmetto High-Cube Warehouse Traffic Impact Analysis, Ganddini Group, Inc.

**TABLE 6-3: TIME OF DAY VEHICLE SPLITS** 

Vahiala Tura		Total of Time of		
Vehicle Type	Daytime	Evening	Nighttime	Day Splits
Autos	77.50%	12.90%	9.60%	100.00%
Medium Trucks	84.80%	4.90%	10.30%	100.00%
Heavy Trucks	86.50%	2.70%	10.80%	100.00%

<sup>&</sup>lt;sup>1</sup> Typical Southern California vehicle mix. Values rounded to the nearest one-hundredth.

**TABLE 6-4: WITHOUT PROJECT VEHICLE MIX** 

Classification		Total		
	Autos	Medium Trucks	Heavy Trucks	Total
All Segments	93.94%	1.74%	4.32%	100.00%

Based on an existing vehicle count taken at US Highway 395 and Phelan Road/Main Street (Hesperia Industrial Center Traffic Analysis, Urban Crossroads, Inc.). Vehicle mix percentage values rounded to the nearest one-hundredth.



<sup>&</sup>quot;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.

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: OPENING YEAR (2024) WITH PROJECT VEHICLE MIX

	Roadway	Segment	With Project <sup>1</sup>			
ID			Autos	Medium Trucks	Heavy Trucks	Total <sup>2</sup>
1	Key Pointe Dr.	s/o Amargosa Rd.	89.62%	2.18%	8.20%	100.00%
2	Amargosa Rd.	n/o Palmetto Wy.	94.07%	1.70%	4.23%	100.00%
3	Amargosa Rd.	w/o Key Pointe Dr.	93.95%	1.73%	4.31%	100.00%
4	Amargosa Rd.	e/o Key Pointe Dr.	92.95%	1.84%	5.21%	100.00%
5	Main St.	w/o Key Pointe Dr.	93.94%	1.74%	4.32%	100.00%
6	Main St.	e/o Key Pointe Dr.	93.69%	1.76%	4.54%	100.00%
7	Main St.	e/o I-15 NB Ramps	93.97%	1.73%	4.30%	100.00%

<sup>&</sup>lt;sup>1</sup> Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-6: GENERAL PLAN BUILDOUT (2040) WITH PROJECT VEHICLE MIX

	Roadway	Segment	With Project <sup>1</sup>			
ID			Autos	Medium Trucks	Heavy Trucks	Total <sup>2</sup>
1	Key Pointe Dr.	s/o Amargosa Rd.	92.58%	1.88%	5.54%	100.00%
2	Amargosa Rd.	n/o Palmetto Wy.	94.03%	1.71%	4.26%	100.00%
3	Amargosa Rd.	w/o Key Pointe Dr.	93.95%	1.74%	4.32%	100.00%
4	Amargosa Rd.	e/o Key Pointe Dr.	93.04%	1.83%	5.13%	100.00%
5	Main St.	w/o Key Pointe Dr.	93.94%	1.74%	4.32%	100.00%
6	Main St.	e/o Key Pointe Dr.	93.67%	1.77%	4.56%	100.00%
7	Main St.	e/o I-15 NB Ramps	93.97%	1.73%	4.30%	100.00%

 $<sup>^{\</sup>rm 1}\,\text{Total}$  of vehicle mix percentage values rounded to the nearest one-hundredth.



# 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 *Amargosa and Palmetto High-Cube Warehouse Traffic Impact Analysis* prepared by the Ganddini Group, Inc. (19) 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 traffic-related noise impacts at 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 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 to 7-5 present a summary of the exterior traffic noise levels 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** 

	D d	Sagment	Receiving	CNEL at Receiving	Distance to Contour from Centerline (Feet)			
ID	коаа	Road Segment Land Use <sup>1</sup>		Land Use (dBA) <sup>2</sup>	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	
1	Key Pointe Dr.	s/o Amargosa Rd.	Non-Sensitive	57.2	RW	RW	RW	
2	Amargosa Rd.	n/o Palmetto Wy.	Sensitive	70.2	52	112	241	
3	Amargosa Rd.	w/o Key Pointe Dr.	Sensitive	69.0	RW	93	200	
4	Amargosa Rd.	e/o Key Pointe Dr.	Non-Sensitive	68.9	RW	91	197	
5	Main St.	w/o Key Pointe Dr.	Sensitive	74.6	122	262	565	
6	Main St.	e/o Key Pointe Dr.	Non-Sensitive	72.3	85	183	394	
7	Main St.	e/o I-15 NB Ramps	Non-Sensitive	77.7	195	420	906	

<sup>&</sup>lt;sup>1</sup> Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.



<sup>&</sup>lt;sup>2</sup> The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.

<sup>&</sup>quot;RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-2: OPENING YEAR (2024) WITHOUT PROJECT CONTOURS

	Dood	Segment	Receiving	CNEL at Receiving	Distance to Contour from Centerline (Feet)			
ID	Road		Land Use <sup>1</sup>	Land Use (dBA) <sup>2</sup>	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	
1	Key Pointe Dr.	s/o Amargosa Rd.	Non-Sensitive	60.9	RW	RW	46	
2	Amargosa Rd.	n/o Palmetto Wy.	Sensitive	70.5	54	116	251	
3	Amargosa Rd.	w/o Key Pointe Dr.	Sensitive	69.6	RW	101	217	
4	Amargosa Rd.	e/o Key Pointe Dr.	Non-Sensitive	69.1	RW	94	202	
5	Main St.	w/o Key Pointe Dr.	Sensitive	77.4	188	405	872	
6	Main St.	e/o Key Pointe Dr.	Non-Sensitive	76.2	155	335	721	
7	Main St.	e/o Key Pointe Dr.	Non-Sensitive	78.2	211	455	980	

<sup>&</sup>lt;sup>1</sup> Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.

TABLE 7-3: OPENING YEAR (2024) WITH PROJECT CONTOURS

15	D Road	Segment	Receiving	CNEL at Receiving	Distance to Contour from Centerline (Feet)			
טו			Land Use <sup>1</sup>	Land Use (dBA) <sup>2</sup>	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	
1	Key Pointe Dr.	s/o Amargosa Rd.	Non-Sensitive	65.0	RW	40	86	
2	Amargosa Rd.	n/o Palmetto Wy.	Sensitive	70.5	54	117	252	
3	Amargosa Rd.	w/o Key Pointe Dr.	Sensitive	69.6	RW	101	218	
4	Amargosa Rd.	e/o Key Pointe Dr.	Non-Sensitive	70.0	50	108	232	
5	Main St.	w/o Key Pointe Dr.	Sensitive	77.4	188	405	872	
6	Main St.	e/o Key Pointe Dr.	Non-Sensitive	76.4	160	346	745	
7	Main St.	e/o Key Pointe Dr.	Non-Sensitive	78.2	211	455	981	

<sup>&</sup>lt;sup>1</sup> Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.



<sup>&</sup>lt;sup>2</sup> The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.

<sup>&</sup>quot;RW" = Location of the respective noise contour falls within the right-of-way of the road.

<sup>&</sup>lt;sup>2</sup> The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.

<sup>&</sup>quot;RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-4: GENERAL PLAN BUILDOUT (2040) WITHOUT PROJECT CONTOURS

	D1	Sagment	Receiving	CNEL at Receiving	Distance to Contour from Centerline (Feet)		
ID	Road	Segment	Land Use <sup>1</sup>	Land Use (dBA) <sup>2</sup>	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Key Pointe Dr.	s/o Amargosa Rd.	Non-Sensitive	67.6	RW	60	129
2	Amargosa Rd.	n/o Palmetto Wy.	Sensitive	72.1	69	148	319
3	Amargosa Rd.	w/o Key Pointe Dr.	Sensitive	71.4	62	134	289
4	Amargosa Rd.	e/o Key Pointe Dr.	Non-Sensitive	69.6	RW	101	217
5	Main St.	w/o Key Pointe Dr.	Sensitive	77.7	196	422	909
6	Main St.	e/o Key Pointe Dr.	Non-Sensitive	75.9	147	317	684
7	Main St.	e/o Key Pointe Dr.	Non-Sensitive	78.6	225	484	1043

<sup>&</sup>lt;sup>1</sup> Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.

TABLE 7-5: GENERAL PLAN BUILDOUT (2040) WITH PROJECT CONTOURS

15	D Road	Segment	Receiving	CNEL at Receiving	Distance to Contour from Centerline (Feet)			
טו			Land Use <sup>1</sup>	Land Use (dBA) <sup>2</sup>	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	
1	Key Pointe Dr.	s/o Amargosa Rd.	Non-Sensitive	68.9	RW	72	156	
2	Amargosa Rd.	n/o Palmetto Wy.	Sensitive	72.1	69	149	320	
3	Amargosa Rd.	w/o Key Pointe Dr.	Sensitive	71.4	62	134	289	
4	Amargosa Rd.	e/o Key Pointe Dr.	Non-Sensitive	70.4	53	114	246	
5	Main St.	w/o Key Pointe Dr.	Sensitive	77.7	196	422	909	
6	Main St.	e/o Key Pointe Dr.	Non-Sensitive	76.1	153	329	708	
7	Main St.	e/o Key Pointe Dr.	Non-Sensitive	78.6	225	485	1044	

<sup>&</sup>lt;sup>1</sup> Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.

# 7.3 OPENING YEAR (2024) TRAFFIC NOISE LEVEL INCREASES

Table 7-2 presents the Opening Year (2024) without Project conditions CNEL noise levels. The Opening Year (2024) without Project exterior noise levels range from 60.9 to 78.2 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-3 shows that the Opening Year (2024) with Project conditions will range from 65.0 to 78.2 dBA CNEL. Table 7-6 shows that the Project off-site traffic noise level increases range from 0.0 to 4.1 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 increases on receiving land uses due to the Project-related traffic.



<sup>&</sup>lt;sup>2</sup> The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.

<sup>&</sup>quot;RW" = Location of the respective noise contour falls within the right-of-way of the road.

<sup>&</sup>lt;sup>2</sup> The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.

<sup>&</sup>quot;RW" = Location of the respective noise contour falls within the right-of-way of the road.

# 7.4 GENERAL PLAN BUILDOUT (2040) TRAFFIC NOISE LEVEL INCREASES

Table 7-4 presents the General Plan Buildout (2040) without Project conditions CNEL noise levels. The General Plan Buildout (2040) without Project exterior noise levels range from 67.6 to 78.6 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-5 shows that the General Plan Buildout (2040) with Project conditions will range from 77.1 to 80.5 dBA CNEL. Table 7-7 shows that the Project off-site traffic noise level increases range from 0.0 to 1.3 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 increases on receiving land uses due to the Project-related traffic.



TABLE 7-6: OPENING YEAR (2024) WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving	CNEL at Receiving Land Use (dBA) <sup>1</sup>			Incremental Noise Level Increase Threshold <sup>2</sup>	
			Land Use <sup>1</sup>	No Project	With Project	Project Addition	Limit	Exceeded?
1	Key Pointe Dr.	s/o Amargosa Rd.	Non-Sensitive	60.9	65.0	4.1	n/a	No
2	Amargosa Rd.	n/o Palmetto Wy.	Sensitive	70.5	70.5	0.0	1.5	No
3	Amargosa Rd.	w/o Key Pointe Dr.	Sensitive	69.6	69.6	0.0	1.5	No
4	Amargosa Rd.	e/o Key Pointe Dr.	Non-Sensitive	69.1	70.0	0.9	n/a	No
5	Main St.	w/o Key Pointe Dr.	Sensitive	77.4	77.4	0.0	1.5	No
6	Main St.	e/o Key Pointe Dr.	Non-Sensitive	76.2	76.4	0.2	3.0	No
7	Main St.	e/o I-15 NB Ramps	Non-Sensitive	78.2	78.2	0.0	3.0	No

<sup>&</sup>lt;sup>1</sup> Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.



<sup>&</sup>lt;sup>2</sup> The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.

<sup>&</sup>lt;sup>3</sup> Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

n/a" Per the City of Hesperia General Plan Noise Element Exhibit NS-1, a barely perceptible 3 dBA or greater noise level increase is considered a significant impact when the ambient non-noise sensitive noise level is greater than the normally acceptable 75 dBA CNEL land use compatibility criteria

TABLE 7-7: GENERAL PLAN BUILDOUT (2040) WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving	CNEL at Receiving Land Use (dBA) <sup>1</sup>			Incremental Noise Level Increase Threshold <sup>2</sup>	
	1.000		Land Use <sup>1</sup>	No Project	With Project	Project Addition	Limit	Exceeded?
1	Key Pointe Dr.	s/o Amargosa Rd.	Non-Sensitive	67.6	68.9	1.3	n/a	No
2	Amargosa Rd.	n/o Palmetto Wy.	Sensitive	72.1	72.1	0.0	1.5	No
3	Amargosa Rd.	w/o Key Pointe Dr.	Sensitive	71.4	71.4	0.0	1.5	No
4	Amargosa Rd.	e/o Key Pointe Dr.	Non-Sensitive	69.6	70.4	0.8	n/a	No
5	Main St.	w/o Key Pointe Dr.	Sensitive	77.7	77.7	0.0	1.5	No
6	Main St.	e/o Key Pointe Dr.	Non-Sensitive	75.9	76.1	0.2	3.0	No
7	Main St.	e/o I-15 NB Ramps	Non-Sensitive	78.6	78.6	0.0	3.0	No

<sup>&</sup>lt;sup>1</sup> Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.



<sup>&</sup>lt;sup>2</sup> The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.

<sup>&</sup>lt;sup>3</sup> Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

n/a" Per the City of Hesperia General Plan Noise Element Exhibit NS-1, a barely perceptible 3 dBA or greater noise level increase is considered a significant impact when the ambient non-noise sensitive noise level is greater than the normally acceptable 75 dBA CNEL land use compatibility criteria

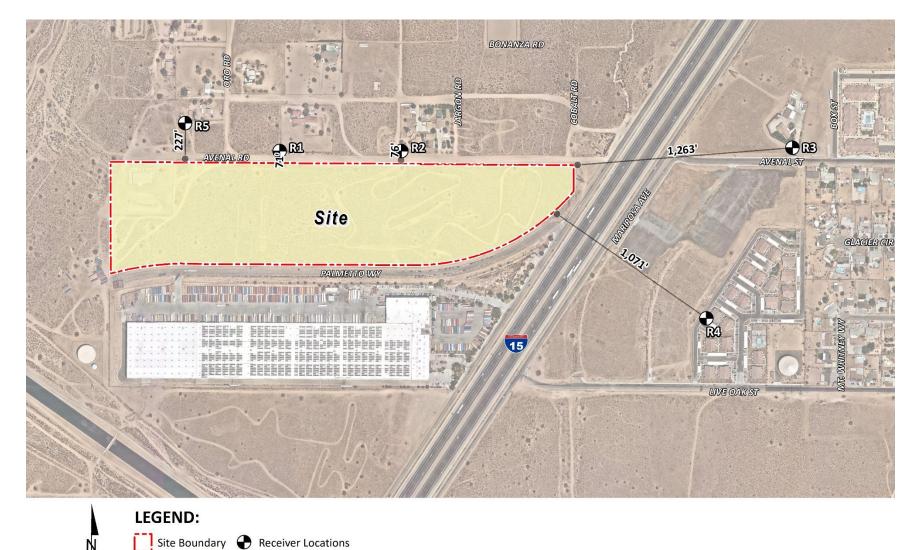
# 8 RECEIVER LOCATIONS

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, five 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. 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 13030 Avenal Street, approximately 71 feet north of the Project site. Receiver R1 is placed at the private outdoor living areas (backyards) facing the Project site. 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 13164 Avenal Road, approximately 76 feet north of the Project site. Receiver R2 is placed at the private outdoor living areas (backyards) facing the Project site. 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 10445 Avenal Street, approximately 1,263 feet east of the Project site. Receiver R3 is placed at the private outdoor living areas (backyards) facing 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 10122 Mt. Whitney Way, approximately 1,071 feet southeast of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R4 is placed at the residential building façade. A 24-hour noise measurement was taken near this location, L4, to describe the existing ambient noise environment.
- R5: Location R5 represents the existing noise sensitive residence at 10376 Wellington Road, approximately 227 feet north of the Project site Receiver R5 is placed at the private outdoor living areas (backyards) facing the Project site. A 24-hour noise measurement was taken near this location, L5, to describe the existing ambient noise environment.





**EXHIBIT 8-A: RECEIVER LOCATIONS** 



Distance from receiver to Project site boundary (in feet)

# 9 OPERATIONAL NOISE ANALYSIS

This section analyzes the potential stationary-source operational noise impacts at the nearby receiver locations, identified in Section 8, resulting from the operation of the proposed Amargosa and Palmetto High-Cube Warehouse Project. Exhibit 9-A identifies the noise source locations used to assess the operational noise levels.

# 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. To present the potential worst-case noise conditions, this analysis assumes the Project would be operational 24 hours per day, seven days per week. Consistent with similar warehouse and industrial uses, the Project business operations would primarily be conducted within the enclosed buildings, 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, trailer parking activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements.

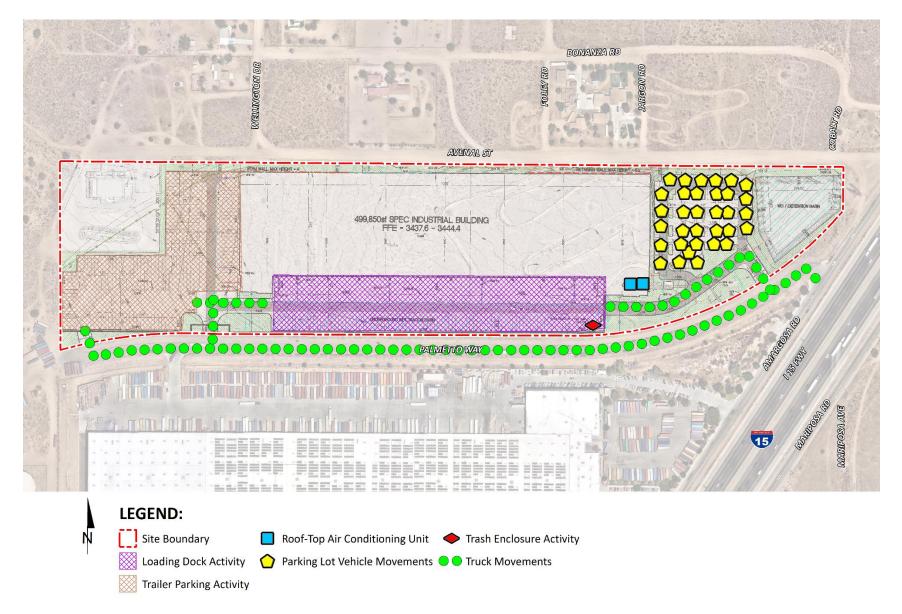
## 9.2 REFERENCE NOISE LEVELS

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 worst-case noise environment with the loading dock activity, trailer parking activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements all 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 precisions sound level meter (serial number 01146). The LxT sound level meter was calibrated using a Larson-Davis calibrator, Model CAL 200, was 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. 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. (15)





**EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS** 



**TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS** 

Noise Source <sup>1</sup>	Noise Source	Min./ Hour <sup>2</sup>		Reference Noise Level	Sound Power
Noise Source	Height (Feet)	Day	Night	(dBA L <sub>eq</sub> ) @ 50 Feet	Level (dBA)³
Loading Dock Activity	8'	60	60	65.7	111.5
Trailer Parking Activity	8'	60	60	62.8	103.4
Roof-Top Air Conditioning Units	5'	39	28	57.2	88.9
Trash Enclosure Activity	5'	10	10	57.3	89.0
Parking Lot Vehicle Movements	5'	60	60	52.6	81.1
Truck Movements	8'	60	60	59.8	93.2

<sup>&</sup>lt;sup>1</sup> As measured by Urban Crossroads, Inc.

#### 9.2.2 LOADING DOCK ACTIVITY

The reference loading dock activities are intended to describe the typical outdoor operational noise activities associated with the Project. This includes truck idling, reefer activity (refrigerator truck/cold storage), deliveries, backup alarms, trailer docking including a combination of tractor trailer semi-trucks, two-axle delivery trucks, and background operation activities. Since the noise levels generated by cold storage loading dock activity can be slightly higher due to the use of refrigerated trucks or reefers.

The reference noise level measurement was taken in the center of the loading dock activity area and represents multiple concurrent noise sources resulting in a combined noise level of 65.7 dBA  $L_{eq}$  at a uniform distance of 50 feet. Specifically, the reference noise level measurement represents one truck located approximately 30 feet from the noise level meter with another truck passing by to park roughly 20 feet away, both with their engines idling. Throughout the reference noise level measurement, a separate docked and running reefer truck was located approximately 50 feet east of the measurement location. Additional background noise sources included truck pass-by noise, truck drivers talking to each other next to docked trucks, and air brake release noise when trucks parked.

## 9.2.3 TRAILER PARKING ACTIVITY

To evaluate the noise levels associated with truck idling, backup alarms, trailer movements and storage activities, Urban Crossroads collected a reference noise level measurement at an existing parcel hub facility to describe the potential operational noise levels associated with Project operational activities. The measured reference noise level at 50 feet from activity was measured at  $62.8 \text{ dBA L}_{\text{eq}}$ .



<sup>&</sup>lt;sup>2</sup> Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site.

<sup>&</sup>quot;Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

<sup>&</sup>lt;sup>3</sup> 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.

The reference noise level measurement includes a semi-truck with trailer pass-by event, background switcher cab trailer towing, drop-off, idling, and backup alarm events. Noise associated with trailer storage activity is expected to operate for the entire hour (60 minutes).

### 9.2.4 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 levels are 57.2 dBA L<sub>eq</sub>. 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 building.

#### 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 Leq 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. Typical trash enclosure activities are estimated to occur for 10 minutes per hour.

### 9.2.6 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 an Amazon warehouse distribution center. At 50 feet from the center of activity, the parking lot produced a reference noise level of 52.6 dBA  $L_{\rm eq}$ . 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 cars pulling in and out of parking spaces in combination with car doors opening and closing.

# 9.2.7 TRUCK MOVEMENTS

The truck movements reference noise level measurement was collected over a period of 1 hour and 28 minutes and represents multiple heavy trucks entering and exiting the outdoor loading dock area producing a reference noise level of 59.8 dBA  $L_{eq}$  at 50 feet. 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 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, trailer parking activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements, Urban Crossroads, Inc. calculated the 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 37.6 to 47.7 dBA Leq.



**TABLE 9-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS** 

Noise Source <sup>1</sup>	Operation	Operational Noise Levels by Receiver Location (dBA Leq)							
Noise Source-	R1	R2	R3	R4	R5				
Loading Dock Activity	30.9	30.6	35.1	42.8	29.2				
Trailer Parking Activity	45.7	40.1	30.4	31.4	47.3				
Roof-Top Air Conditioning Units	17.9	19.9	21.1	23.3	19.7				
Trash Enclosure Activity	0.0	0.0	11.3	14.1	0.0				
Parking Lot Vehicle Movements	19.9	32.0	27.6	29.5	19.4				
Truck Movements	17.9	17.4	28.3	31.8	36.6				
Total (All Noise Sources)	45.9	41.2	37.6	43.6	47.7				

<sup>&</sup>lt;sup>1</sup> See Exhibit 9-A for the noise source locations. CadnaA noise model calculations are included in Appendix 9.1.

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 37.5 to 47.7 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 and Appendix 9.1.

**TABLE 9-3: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS** 

Noise Source <sup>1</sup>	Operation	nal Noise Lev	els by Receiv	er Location	(dBA Leq)
Noise Source	R1	R2	R3	R4	R5
Loading Dock Activity	30.9	30.6	35.1	42.8	29.2
Trailer Parking Activity	45.7	40.1	30.4	31.4	47.3
Roof-Top Air Conditioning Units	15.5	17.5	18.7	20.9	17.3
Trash Enclosure Activity	0.0	0.0	10.4	13.1	0.0
Parking Lot Vehicle Movements	19.9	32.0	27.6	29.5	19.4
Truck Movements	17.9	17.4	28.3	31.8	36.6
Total (All Noise Sources)	45.9	41.2	37.5	43.6	47.7

 $<sup>^{1}</sup>$  See Exhibit 9-A for the noise source locations. CadnaA noise model calculations are included in Appendix 9.1.

# 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 City of Hesperia exterior noise level standards at nearby noise-sensitive receiver locations. Table 9-4 shows the operational noise levels associated with Amargosa and Palmetto High-Cube Warehouse Project will satisfy the City of Hesperia exterior noise level standards adjusted to reflect the ambient noise conditions.



**TABLE 9-4: OPERATIONAL NOISE LEVEL COMPLIANCE** 

Receiver Location <sup>1</sup>		perational s (dBA Leq) <sup>2</sup>	Noise Leve	l Standards Leq) <sup>3</sup>	Noise Level Standards Exceeded? <sup>4</sup>		
Location	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime	
R1	45.9	45.9	60	55	No	No	
R2	41.2	41.2	60	55	No	No	
R3	37.6	37.5	60	55	No	No	
R4	43.6	43.6	60	55	No	No	
R5	47.7	47.7	60	55	No	No	

<sup>&</sup>lt;sup>1</sup> See Exhibit 8-A for the receiver locations.

## 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 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:

$$\mathsf{SPL}_\mathsf{Total} = \mathsf{10log}_{10}[\mathsf{10}^{\mathsf{SPL1/10}} + \mathsf{10}^{\mathsf{SPL2/10}} + ... \; \mathsf{10}^{\mathsf{SPLn/10}}]$$

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. As indicated on Tables 9-5, the Project will generate a daytime operational noise level increases ranging from 0.0 to 1.3 dBA L<sub>eq</sub> at the nearest receiver locations. Table 9-6 shows that the Project will generate a nighttime operational noise level increases ranging from 0.0 to 1.5 dBA L<sub>eq</sub> at the nearest receiver locations. Project-related operational noise level increases will satisfy the operational noise level increase significance criteria presented on Table 4-1. Therefore, the incremental Project operational noise level increase is considered *less than significant* at all receiver locations.



<sup>&</sup>lt;sup>2</sup> Proposed Project operational noise levels as shown on Tables 9-2 and 9-3.

<sup>&</sup>lt;sup>3</sup> Exterior noise level standards, for residential land use, as shown on Table 3-1.

<sup>&</sup>lt;sup>4</sup> Do the estimated Project operational noise source activities exceed the noise level standards?

<sup>&</sup>quot;Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

**TABLE 9-5: DAYTIME PROJECT OPERATIONAL NOISE LEVEL INCREASES** 

Receiver Location <sup>1</sup>	Total Project Operational Noise Level <sup>2</sup>	Measurement Location <sup>3</sup>	Reference Ambient Noise Levels <sup>4</sup>	Combined Project and Ambient <sup>5</sup>	Project Increase <sup>6</sup>	Increase Criteria <sup>7</sup>	Increase Criteria Exceeded?
R1	45.9	L1	61.0	61.1	0.1	5.0	No
R2	41.2	L2	55.6	55.8	0.2	5.0	No
R3	37.6	L3	58.6	58.6	0.0	5.0	No
R4	43.6	L4	62.7	62.8	0.1	5.0	No
R5	47.7	L5	52.3	53.6	1.3	5.0	No

<sup>&</sup>lt;sup>1</sup> See Exhibit 8-A for the receiver locations.

**TABLE 9-6: NIGHTTIME OPERATIONAL NOISE LEVEL INCREASES** 

Receiver Location <sup>1</sup>	Total Project Operational Noise Level <sup>2</sup>	Measurement Location <sup>3</sup>	Reference Ambient Noise Levels <sup>4</sup>	Combined Project and Ambient <sup>5</sup>	Project Increase <sup>6</sup>	Increase Criteria <sup>7</sup>	Increase Criteria Exceeded?
R1	37.9	L1	65.7	65.7	0.0	1.5	No
R2	36.1	L2	55.2	55.3	0.1	5.0	No
R3	39.9	L3	43.2	44.9	1.7	5.0	No
R4	45.5	L4	45.8	48.7	2.9	5.0	No
R5	42.4	L5	50.8	51.4	0.6	5.0	No

 $<sup>^{\</sup>rm 1}\,\mbox{See}$  Exhibit 8-A for the receiver locations.



<sup>&</sup>lt;sup>2</sup> Total Project daytime operational noise levels as shown on Table 9-2.

<sup>&</sup>lt;sup>3</sup> Reference noise level measurement locations as shown on Exhibit 5-A.

<sup>&</sup>lt;sup>4</sup> Observed daytime ambient noise levels as shown on Table 5-1.

<sup>&</sup>lt;sup>5</sup> Represents the combined ambient conditions plus the Project activities.

 $<sup>^{\</sup>rm 6}$  The noise level increase expected with the addition of the proposed Project activities.

<sup>&</sup>lt;sup>7</sup> Significance increase criteria as shown on Table 4-1.

<sup>&</sup>lt;sup>2</sup> Total Project nighttime operational noise levels as shown on Table 9-4.

<sup>&</sup>lt;sup>3</sup> Reference noise level measurement locations as shown on Exhibit 5-A.

<sup>&</sup>lt;sup>4</sup> Observed nighttime ambient noise levels as shown on Table 5-1.

<sup>&</sup>lt;sup>5</sup> Represents the combined ambient conditions plus the Project activities.

<sup>&</sup>lt;sup>6</sup> The noise level increase expected with the addition of the proposed Project activities.

<sup>&</sup>lt;sup>7</sup> Significance increase criteria as shown on Table 4-1.

# 10 CONSTRUCTION ANALYSIS

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 activity boundaries in relation to the nearest sensitive receiver locations previously described in Section 8. According to Section 16.20.125.E.3 of the Municipal Code states that construction activities are limited to the hours of 7:00 a.m. to 7:00 p.m. on any day and at any time on Sundays and federal holidays.

In addition, since neither the City of Hesperia General Plan or County Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers for CEQA analysis purposes. 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. The FTA considers a daytime exterior construction noise level of 80 dBA Leq as a reasonable threshold for noise sensitive residential land use. (8 p. 179).

#### **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:

- 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. (20) 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** 



Distance from receiver to Project site boundary (in feet)

## **10.3** 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 general construction noise assessment, Table 10-1 presents the combined noise levels for the loudest construction equipment, assuming they operate at the same time. As shown on Table 10-2, the construction noise levels are expected to range from 39.1 to 59.7 dBA Leq 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 Activity	Reference Noise Level @ 50 Feet (dBA L <sub>eq</sub> ) <sup>1</sup>	Combined Noise Level (dBA L <sub>eq</sub> ) <sup>2</sup>	Combined Sound Power Level (PWL) <sup>3</sup>	
	Crawler Tractors	78			
Site Preparation	Hauling Trucks	72	80	112	
rreparation	Rubber Tired Dozers	75			
	Graders	81			
Grading	Excavators	77	83	115	
	Compactors	76			
	Cranes	73			
Building Construction	Tractors	80	81	113	
Construction	Welders	70			
	Pavers	74		115	
Paving	Paving Equipment	82	83		
	Rollers	73			
	Cranes	73			
Architectural Coating	Air Compressors	74	77	109	
Coating	Generator Sets	70			

<sup>&</sup>lt;sup>1</sup> FHWA Roadway Construction Noise Model (RCNM).



<sup>&</sup>lt;sup>2</sup> 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.

<sup>&</sup>lt;sup>3</sup> 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 calibrated using the CadnaA noise model at the reference distance to the noise source.

TABLE 10-2: CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

	Construction Noise Levels (dBA Leq)							
Receiver Location <sup>1</sup>	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels <sup>2</sup>		
R1	56.7	59.7	57.7	59.7	53.7	59.7		
R2	56.5	59.5	57.5	59.5	53.5	59.5		
R3	42.1	45.1	43.1	45.1	39.1	45.1		
R4	44.1	47.1	45.1	47.1	41.1	47.1		
R5	52.9	55.9	53.9	55.9	49.9	55.9		

<sup>&</sup>lt;sup>1</sup> Noise receiver locations are shown on Exhibit 10-A.

## 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: CONSTRUCTION NOISE LEVEL COMPLIANCE** 

Barahaan.	Construction Noise Levels (dBA L <sub>eq</sub> )					
Receiver Location <sup>1</sup>	Highest Construction Noise Levels <sup>2</sup>	Threshold <sup>3</sup>	Threshold Exceeded? <sup>4</sup>			
R1	59.7	80	No			
R2	59.5	80	No			
R3	45.1	80	No			
R4	47.1	80	No			
R5	55.9	80	No			

<sup>&</sup>lt;sup>1</sup> Noise receiver locations are shown on Exhibit 10-A.



<sup>&</sup>lt;sup>2</sup> 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.

<sup>&</sup>lt;sup>2</sup> 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.

<sup>&</sup>lt;sup>3</sup> Construction noise level thresholds as shown on Table 4-1.

<sup>&</sup>lt;sup>4</sup> Do the estimated Project construction noise levels exceed the construction noise level threshold?

## 10.5 NIGHTTIME CONCRETE POUR NOISE ANALYSIS

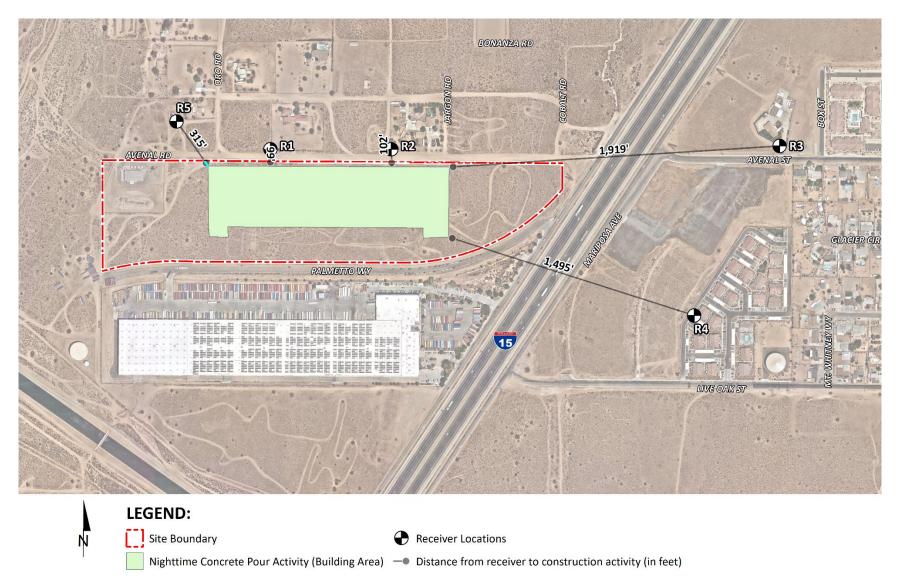
It is our understanding that nighttime concrete pouring activities will occur as a part of Project building construction activities. Nighttime concrete pouring activities are often used to support reduced concrete mixer truck transit times and lower air temperatures than during the daytime hours and 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 City of Hesperia 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 City of Hesperia. Any nighttime construction noise activities shall satisfy the noise limits outlined in Table 3-1.

#### 10.5.1 NIGHTTIME CONCRETE POUR REFERENCE NOISE LEVEL MEASUREMENTS

To estimate the noise levels due to nighttime concrete pour activities, sample reference noise level measurements were taken during a nighttime concrete pour 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 Amargosa and Palmetto High-Cube Warehouse, this analysis relies on reference sound power level of 100.3 dBA L<sub>w</sub>. 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<sub>w</sub> is used to describe the expected Project nighttime concrete pour noise activities.





**EXHIBIT 10-B: NIGHTTIME CONCRETE POUR NOISE SOURCE AND RECEIVER LOCATIONS** 



#### 10.5.2 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 29.9 to 47.3 dBA L<sub>eq</sub> and will satisfy the City of Hesperia nighttime stationary-source exterior hourly average L<sub>eq</sub> 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

		Construction Noise Levels (dBA L <sub>eq</sub> )				
Receiver Location <sup>1</sup>	Use	Paving Construction <sup>2</sup>	Nighttime Threshold <sup>3</sup>	Threshold Exceeded? <sup>4</sup>		
R1	Residence	47.3	55	No		
R2	Residence	47.2	55	No		
R3	Residence	29.9	55	No		
R4	Residence	31.7	55	No		
R5	Residence	40.3	55	No		

<sup>&</sup>lt;sup>1</sup> Noise receiver locations are shown on Exhibit 10-B.

## 10.6 CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. 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 for human response (annoyance) and building damage using the following vibration assessment methods defined by the FTA. To describe the vibration impacts the FTA provides the following equation:  $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$ 



 $<sup>^2</sup>$  Paving construction noise level calculations based on distance from the construction noise source activity to nearby receiver locations.

<sup>&</sup>lt;sup>3</sup> Exterior nighttime noise level standards as shown on Table 3-1.

<sup>&</sup>lt;sup>4</sup> Do the estimated Project construction noise levels exceed the nighttime construction noise level threshold?

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

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 71 to 1,263 feet from Project construction activities, construction vibration velocity levels range from 0.000 to 0.0.19 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.

Moreover, the vibration levels reported at the sensitive receiver locations are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site perimeter.

**TABLE 10-6: PROJECT CONSTRUCTION VIBRATION LEVELS** 

	Distance to	Typical Construction Vibration Levels PPV (in/sec) <sup>3</sup>					Thresholds	Thresholds
Receiver <sup>1</sup>	Const. Activity (Feet) <sup>2</sup>	Small bulldozer	Jackhammer	Loaded Trucks	Large bulldozer	Highest Vibration Level	PPV (in/sec) <sup>4</sup>	Exceeded? <sup>5</sup>
R1	71'	0.001	0.007	0.016	0.019	0.019	0.2	No
R2	76'	0.001	0.007	0.014	0.017	0.017	0.2	No
R3	1,263'	0.000	0.000	0.000	0.000	0.000	0.2	No
R4	1,071'	0.000	0.000	0.000	0.000	0.000	0.2	No
R5	227'	0.000	0.001	0.003	0.003	0.003	0.2	No

<sup>&</sup>lt;sup>1</sup> Receiver locations are shown on Exhibit 8-A.



<sup>&</sup>lt;sup>2</sup> Distance from receiver location to Project construction boundary (Project site boundary).

<sup>&</sup>lt;sup>3</sup> Based on the Vibration Source Levels of Construction Equipment (Table 8-4).

<sup>&</sup>lt;sup>4</sup> City of Hesperia Municipal Code, Section 16.20.130 (Appendix 3.1)

<sup>&</sup>lt;sup>5</sup> Does the peak vibration exceed the acceptable vibration thresholds?

<sup>&</sup>quot;PPV" = Peak Particle Velocity

# 11 REFERENCES

- 1. **State of California.** California Environmental Quality Act, Environmental Checklist Form Appendix G. 2021.
- 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.* September 2018.
- 9. Office of Planning and Research. State of California General Plan Guidlines. October 2019.
- 10. City of Hesperia. General Plan Noise Element. 2010.
- 11. . Municipal Code, Section 16.20.
- 12. California Court of Appeal. *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; Cal.Rptr.3d, October 2008.
- 13. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
- 14. California Department of Transportation. *Technical Noise Supplement*. November 2009.
- 15. American National Standards Institute (ANSI). Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.
- 16. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
- 17. 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.
- 18. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
- 19. **Ganddini Group, Inc.** *Amargosa and Palmetto High-Cube Warehouse Traffic Impact Analysis.* August 2022.
- 20. U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning. FHWA Roadway Construction Noise Model. January, 2006.



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# 12 CERTIFICATIONS

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Amargosa and Palmetto High-Cube 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.

Bill Lawson, P.E., INCE Principal URBAN CROSSROADS, INC. 1133 Camelback #8329 Newport Beach, CA 92658 (949) 581-3148 blawson@urbanxroads.com



#### **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:**

**CITY OF HESPERIA MUNICIPAL CODE** 



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16.20.125 - Noise.

- A. Noise Measurement. Noise will be measured with a sound level meter, which meets the standards of the American National Standards Institute (ANSI Section S1.4-1979, Type 1 or Type 2). Noise levels shall be measured using the "A" weighted sound pressure level scale in decibels (ref. pressure = 20 micro-newtons per meter squared). The unit of measure shall be designated as dB(A). The building official shall be the noise control officer.
- B. Noise Standards.
  - 1. The following table describes the noise standard for emanations from any source, as it affects adjacent properties:

#### **NOISE STANDARDS**

Affected Land Use (Receiving Noise)	Maximum Noise Level	Time Period
A-1, A-2, R-1, R-3 and RR Zone Districts	55 dB(A)	10:00 p.m 7:00 a.m.
A-1, A-2, R-1, R-3 and RR Zone Districts	60 dB(A)*	7:00 a.m 10:00 p.m.
C-1, C-2, C-3, C-4, C-R, AP, and P-I Zone Districts	65 dB(A)*	Anytime
I-1 and I-2 Zone Districts	70 dB(A)*	Anytime

- \* Due to wind noise, the maximum permissible noise level may be adjusted so that it is no greater than five dB(A) above the ambient noise level.
  - 2. No person shall operate or cause to be operated any source of sound at any location or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level, when measured on any other property, either incorporated or unincorporated, to exceed:
    - a. The noise standard for that receiving land use (as specified in subsection (B)(1) of this section) for a cumulative period of more than thirty (30) minutes in any hour; or
    - b. The noise standard plus five dB(A) for a cumulative period of more than fifteen (15) minutes in any hour; or
    - c. The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour; or
    - d. The noise standard plus fifteen (15) dB(A) for a cumulative period of more than one minute in any hour; or
    - e. The noise standard plus twenty (20) dB(A) for any period of time.
  - C. If the measured ambient level exceeds any of the first four noise limit categories 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, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.
- D. If the alleged offense consists entirely of impact noise or simple tone noise, each of the noise levels in subsection (B)(1) of this section shall be reduced by five dB(A).
- E. Exempt Noises. The following sources of noise are exempt:
  - 1. Motor vehicles not under the control of the industrial use:
  - 2. Emergency equipment, vehicles and devices;
  - 3. Temporary construction, repair, or demolition activities between seven a.m. and seven p.m. except Sundays and federal holidays.

(Ord. 2002-07 Exh. A, 2002; Amended during 1997 codification; Ord. 75 § 2 (part), 1990; SBCC § 87.1305)

#### 16.20.130 - Vibration.

- A. Vibration Standard. No ground vibration shall be allowed which can be felt without the aid of instruments at or beyond the lot line; nor will any vibration be permitted which produces a particle velocity greater than or equal to 0.2 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 are to be made at points of maximum vibration along any lot line next to a residential or commercial district or a community industrial lot.
- C. Exempt Vibrations. The following sources of vibration are not regulated by this code:
  - 1. Motor vehicles not under the control of the industrial use;
  - 2. Temporary construction, maintenance or demolition activities between seven a.m. and seven p.m. except Sundays and federal holidays.

(SBCC § 87.1310)

# **APPENDIX 5.1:**

**STUDY AREA PHOTOS** 



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# JN:14848



14848\_L1\_G\_1.North 34, 26' 15.580000"117, 22' 42.770000"



14848\_L1\_G\_3.East 34, 26' 15.160000"117, 22' 42.710000"



14848\_L1\_G\_2.South 34, 26' 15.160000"117, 22' 42.740000"



14848\_L1\_G\_4.West 34, 26' 15.190000"117, 22' 42.880000"

# JN:14848



14848\_L2\_S\_1.North 34, 26' 14.640000"117, 22' 34.720000"



14848\_L2\_S\_3.East 34, 26' 14.670000"117, 22' 34.780000"



14848\_L2\_S\_2.South 34, 26' 14.640000"117, 22' 34.780000"



14848\_L2\_S\_4.West 34, 26' 14.700000"117, 22' 34.780000"

## JN:14848



14848\_L3\_Z\_1.North 34, 26' 15.340000"117, 22' 7.860000"



14848\_L3\_Z\_3.East 34, 26' 15.330000"117, 22' 7.940000"



14848\_L3\_Z\_2.South 34, 26' 15.300000"117, 22' 7.970000"



14848\_L3\_Z\_4.West 34, 26' 15.330000"117, 22' 7.970000"

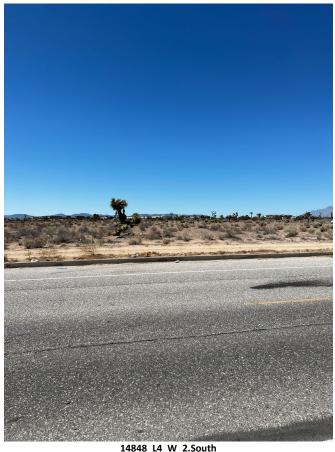
## JN:14848



14848\_L4\_W\_1.North 34, 26' 3.110000"117, 22' 14.920000"



14848\_L4\_W\_3.East 34, 26' 2.750000"117, 22' 14.890000"



14848\_L4\_W\_2.South 34, 26' 2.740000"117, 22' 15.010000"



14848\_L4\_W\_4.West 34, 26' 2.820000"117, 22' 14.890000"

### JN:14848



14848\_L5\_A\_1.North 34, 26' 16.520000"117, 22' 49.640000"



14848\_L5\_A\_3.East 34, 26' 16.520000"117, 22' 49.640000"



14848\_L5\_A\_2.South 34, 26' 16.520000"117, 22' 49.670000"



14848\_L5\_A\_4.West 34, 26' 16.520000"117, 22' 49.670000"



# APPENDIX 5.2:

**NOISE LEVEL MEASUREMENT WORKSHEETS** 





### 24-Hour Noise Level Measurement Summary Date: Tuesday, June 21, 2022 Location: L1 - Located north of the Project Site near the existing noise Meter: Piccolo II JN: 14848 Project: Amargosa and Palmetto High-Cube Warehouse Source: sensitive residence at 13030 Avenal Street. Analyst: B. Lawson Hourly L eq dBA Readings (unadjusted) (**qBy**) 80.0 75.0 70.0 65.0 60.0 Hourly 155.0 55.0 45.0 40.0 63. 58.3 62. 61. 0 e e 61 59. 8 49.0 56. 49 50. 51. 40.0 35.0 0 2 3 6 7 8 9 10 13 18 19 20 21 22 23 1 5 11 12 14 15 16 17 **Hour Beginning** Timeframe L1% L2% L5% L8% L25% L50% L90% L95% L99% Adj. L ea Hour L<sub>ea</sub> L max L min L eq Adj. 59.0 49.0 54.1 53.8 53.3 52.0 51.3 49.4 48.4 46.9 46.6 46.2 49.0 10.0 0 46.1 1 48.3 51.2 45.5 51.0 50.8 50.3 50.0 49.0 48.1 46.5 46.1 45.6 48.3 10.0 58.3 2 53.9 51.2 56.5 56.0 55.7 54.6 52.1 51.8 51.4 53.9 10.0 63.9 57.0 56.8 53.6 Night 3 58.2 58.0 55.1 54.8 56.7 10.0 66.7 56.7 59.1 54.7 58.9 58.7 57.3 56.6 55.4 4 61.0 64.3 58.7 64.0 63.7 63.1 62.8 61.6 60.8 59.4 59.2 58.8 61.0 10.0 71.0 5 62.0 59.1 58.9 60.7 10.0 70.7 60.7 63.4 58.8 63.1 62.8 62.3 61.1 60.5 59.3 10.0 6 60.3 66.6 58.0 65.4 64.7 63.2 62.2 60.4 59.6 58.5 58.3 58.1 60.3 70.3 49.8 55.0 47.0 54.4 54.0 52.8 52.1 50.3 49.1 47.6 47.4 47.1 49.8 49.8 0.0 8 50.8 58.6 58.1 57.5 55.4 49.3 47.2 46.9 46.6 50.8 50.8 46.4 53.8 51.1 0.0 9 51.0 58.7 46.4 58.4 58.0 56.8 55.7 50.6 48.6 47.0 46.8 46.5 51.0 0.0 51.0 10 62.2 60.4 59.6 51.5 51.0 56.0 0.0 56.0 56.0 50.8 61.8 61.5 56.8 54.6 51.9 11 60.6 67.2 53.5 66.7 66.3 65.1 64.4 61.5 59.1 55.3 54.6 53.8 60.6 0.0 60.6 12 59.2 63.5 62.8 60.2 57.8 53.7 53.1 59.2 0.0 59.2 65.3 52.8 64.9 64.5 54.3 13 58.3 64.9 51.9 64.5 64.0 62.9 62.1 59.3 56.4 53.3 52.8 52.2 58.3 0.0 58.3 Dav 14 61.5 68.5 54.0 68.0 67.6 66.5 65.7 62.4 59.7 55.8 55.0 54.3 61.5 0.0 61.5 15 68.3 67.5 56.5 55.7 63.3 70.2 55.5 69.9 69.5 64.3 61.2 57.2 63.3 0.0 63.3 16 64.8 71.6 56.7 71.1 70.7 69.5 68.7 65.9 63.2 58.8 57.9 57.0 64.8 0.0 64.8 17 70.3 69.9 69.6 68.5 57.0 63.7 63.7 56.7 67.5 64.5 62.1 58.5 57.7 0.0 63.7 18 61.6 67.3 55.5 66.9 66.5 65.6 64.8 62.6 60.6 57.2 56.6 55.7 61.6 0.0 61.6 19 62.5 68.7 55.7 68.2 67.8 66.8 66.1 63.6 61.3 57.5 56.8 56.0 62.5 5.0 67.5 20 61.7 68.0 55.2 67.6 67.1 66.0 65.1 62.6 60.4 57.0 56.3 55.5 61.7 5.0 66.7 21 62.5 67.5 62.5 69.1 55.8 68.7 68.2 67.0 66.0 63.6 61.2 57.4 56.8 56.1 5.0 22 10.0 58.4 63.9 53.6 63.5 63.2 62.2 61.5 59.3 57.4 54.8 54.3 53.7 58.4 68.4 Night 23 59.8 66.5 53.6 66.0 65.5 64.3 63.3 60.6 58.4 55.3 54.6 53.9 59.8 10.0 69.8 L<sub>eq</sub> (dBA) **Timeframe** Hour L<sub>eq</sub> L max $L_{min}$ L1% L2% L5% L8% L25% L50% L90% L95% L99% 54.4 52.1 Daytime Nighttime Min 49.8 55.0 46.4 54.0 52.8 50.3 48.6 47.0 46.8 46.5 24-Hour Dav Max 64.8 71.6 56.7 71.1 70.7 69.5 68.7 65.9 63.2 58.8 57.9 57.0 (7am-10pm) (10pm-7am) **Energy Average** 61.0 Average 65.3 64.8 63.7 62.8 60.0 57.6 54.4 53.8 53.2 58.2 60.1 61.0 48.3 51.2 51.0 50.8 50.3 50.0 49.0 48.1 46.5 46.1 45.6 Min 45.5 Night 61.0 66.6 58.8 66.0 65.5 64.3 63.3 61.6 60.8 59.4 59.2 58.9



58.5

57.0

55.9

54.3

53.9

53.5

Average

60.3

59.9

59.1

Max

58.2

**Energy Average** 

### 24-Hour Noise Level Measurement Summary Date: Tuesday, June 21, 2022 Location: L2 - Located south of the existing noise sensitive residence at Meter: Piccolo II JN: 14848 Project: Amargosa and Palmetto High-Cube Warehouse Source: 13164 Avenal Road with the Project Site. Analyst: B. Lawson Hourly L eq dBA Readings (unadjusted) (**qBy**) 80.0 75.0 70.0 65.0 60.0 Hourly 155.0 55.0 45.0 40.0 56.1 56. 56. 57 56. 27 27 20. 49. 50. 40.0 35.0 0 2 3 7 8 18 19 20 21 22 23 1 5 6 9 10 11 12 13 14 15 16 17 **Hour Beginning** Timeframe L1% L2% L5% L8% L25% L50% L90% L95% L99% Adj. L ea Hour L<sub>ea</sub> L max L min L eq Adj. 61.0 51.0 55.0 48.2 54.7 54.2 53.3 52.9 50.5 49.0 48.6 48.3 51.0 10.0 0 51.7 1 51.7 55.1 48.3 54.9 54.6 54.1 53.7 52.5 51.3 49.3 48.9 48.4 51.7 10.0 61.7 2 60.2 59.7 59.2 58.9 56.5 54.1 53.5 56.8 10.0 66.8 56.8 53.4 60.0 57.6 54.6 Night 3 58.3 58.1 54.7 54.4 56.6 10.0 66.6 56.6 58.9 54.3 58.8 58.6 57.2 56.4 55.0 4 57.1 60.0 54.8 59.7 59.5 59.0 58.7 57.7 56.8 55.5 55.3 54.9 57.1 10.0 67.1 5 56.8 53.4 53.2 55.1 10.0 55.1 58.0 53.1 57.8 57.6 57.1 55.6 54.8 53.6 65.1 56.5 54.7 50.7 52.8 10.0 6 52.8 50.3 56.0 55.7 55.2 53.5 52.4 50.9 50.3 62.8 50.9 54.6 48.5 54.3 54.1 53.5 53.1 51.5 50.4 49.1 48.8 48.6 50.9 50.9 0.0 8 49.6 47.1 53.9 52.6 50.0 49.1 47.7 47.4 47.2 49.6 49.6 54.7 54.4 51.7 0.0 9 50.3 55.5 47.1 55.2 54.9 54.0 53.4 50.8 49.2 47.6 47.4 47.2 50.3 0.0 50.3 10 59.9 59.1 57.8 56.8 54.9 52.1 51.7 54.6 0.0 54.6 54.6 51.6 59.5 53.9 52.4 11 55.2 59.6 52.1 59.1 58.6 57.9 57.4 55.8 54.7 53.0 52.6 52.2 55.2 0.0 55.2 12 55.3 58.9 58.5 58.1 57.5 57.1 53.0 52.6 55.3 0.0 55.3 52.5 56.0 54.9 53.4 13 54.7 58.7 51.9 58.3 58.0 57.2 56.7 55.3 54.2 52.7 52.4 52.1 54.7 0.0 54.7 Dav 14 55.6 60.4 52.7 60.0 59.6 58.4 57.8 56.2 55.1 53.5 53.1 52.8 55.6 0.0 55.6 15 59.3 58.9 57.3 54.0 56.7 60.7 53.8 60.4 60.1 56.3 54.7 54.4 56.7 0.0 56.7 16 56.7 61.4 53.8 60.9 60.3 59.2 58.6 57.3 56.3 54.6 54.3 53.9 56.7 0.0 56.7 17 57.9 62.7 54.5 57.9 63.3 54.3 63.0 61.9 61.2 58.0 56.8 55.2 54.9 0.0 57.9 18 57.0 60.9 53.9 60.5 60.0 59.4 59.0 57.8 56.6 54.8 54.5 54.1 57.0 0.0 57.0 19 54.3 57.3 57.3 62.0 54.1 60.0 59.4 57.8 56.7 55.1 54.7 5.0 62.3 61.6 61.1 20 56.1 60.8 53.3 60.3 59.9 59.0 58.4 56.5 55.5 54.0 53.7 53.4 56.1 5.0 61.1 21 53.9 56.7 60.7 53.8 60.4 60.0 59.1 58.5 57.4 56.4 54.7 54.4 56.7 5.0 61.7 22 58.9 10.0 56.2 61.0 53.0 60.6 60.1 58.4 57.0 55.7 53.9 53.5 53.1 56.2 66.2 Night 23 55.3 59.4 51.8 59.0 58.5 57.9 57.5 56.1 54.8 52.9 52.5 52.0 55.3 10.0 65.3 L<sub>eq</sub> (dBA) **Timeframe** Hour L<sub>eq</sub> L max $L_{min}$ L1% L2% L5% L8% L25% L50% L90% L95% L99% 54.3 51.7 49.1 Daytime Nighttime Min 49.6 54.6 47.1 53.9 52.6 50.0 47.6 47.4 47.2 24-Hour Dav Max 57.9 63.3 54.3 63.0 62.7 61.9 61.2 58.0 56.8 55.2 54.9 54.5 (7am-10pm) (10pm-7am) **Energy Average** 55.6 Average 59.1 58.7 57.8 57.2 55.5 54.4 52.8 52.5 52.2 55.4 55.6 55.2 51.0 55.0 54.7 54.2 53.3 52.9 51.7 50.5 49.0 48.6 48.3 Min 48.2 Night 57.1 61.0 54.8 60.6 60.1 59.2 58.9 57.7 56.8 55.5 55.3 54.9 Max



56.6

55.4

54.4

52.7

52.4

52.0

Average

57.9

57.6

57.0

**Energy Average** 

55.2

### 24-Hour Noise Level Measurement Summary Date: Tuesday, June 21, 2022 Location: L3 - Located east of the Project site near the existing noise Meter: Piccolo II JN: 14848 Project: Amargosa and Palmetto High-Cube Warehouse Source: sensitive residence at 10445 Avenal Street. Analyst: B. Lawson Hourly L eq dBA Readings (unadjusted) (**qBy**) 80.0 75.0 70.0 65.0 60.0 Hourly 155.0 55.0 45.0 40.0 60.7 57.0 61. 61 59 59 59 53. 40.0 35.0 0 2 3 5 7 8 9 10 13 15 17 18 19 20 21 22 23 1 6 11 12 14 16 **Hour Beginning** Timeframe L1% L2% L5% L8% L25% L50% L90% L95% L99% Adj. L ea Hour L<sub>ea</sub> L max L min L eq Adj. 54.7 57.9 54.1 62.5 60.3 58.5 54.2 57.9 10.0 67.9 0 63.7 63.2 61.1 57.1 55.1 1 55.2 60.7 51.4 60.4 60.0 58.5 57.7 55.8 54.4 52.3 51.9 51.5 55.2 10.0 65.2 2 62.5 52.7 60.2 59.0 56.9 55.5 53.3 52.8 56.4 10.0 66.4 56.4 62.2 61.7 53.6 Night 3 60.9 58.4 55.7 55.2 58.8 10.0 68.8 58.8 62.7 55.1 62.5 62.2 61.5 59.6 56.1 4 59.2 64.5 55.6 64.4 64.0 62.9 61.8 59.6 58.5 56.5 56.1 55.7 59.2 10.0 69.2 5 55.7 55.4 58.8 10.0 68.8 58.8 66.5 55.3 66.1 65.4 63.2 61.6 58.5 57.5 56.0 62.6 55.0 54.7 58.4 10.0 6 58 4 65.8 54.6 65.4 64.8 61.4 58.5 57.2 55.3 68.4 55.7 51.1 60.9 59.0 55.5 53.7 51.5 51.2 55.7 64.3 64.0 63.3 51.8 0.0 55.7 8 55.4 62.3 59.8 49.7 49.3 55.4 55.4 65.4 49.2 65.1 64.6 54.0 51.9 50.0 0.0 9 53.8 64.6 48.2 64.1 63.1 60.0 57.3 52.1 50.7 49.0 48.7 48.3 53.8 0.0 53.8 10 55.6 48.6 62.2 60.1 49.1 48.7 55.6 0.0 55.6 65.9 65.4 64.6 54.3 51.8 49.5 11 58.8 68.1 50.0 67.7 67.2 65.5 63.6 58.4 55.5 51.5 50.9 50.3 58.8 0.0 58.8 12 58.3 49.8 67.5 64.1 62.3 58.5 55.3 50.6 50.0 58.3 0.0 58.3 68.1 66.6 51.2 13 57.0 67.2 49.2 66.8 66.0 63.8 61.7 56.2 53.2 50.2 49.8 49.3 57.0 0.0 57.0 Dav 14 58.4 68.2 50.8 67.6 66.7 64.1 62.9 58.0 55.5 52.6 51.9 51.0 58.4 0.0 58.4 15 52.4 51.5 59.4 67.7 51.3 67.2 66.6 64.8 63.4 60.0 57.1 53.1 59.4 0.0 59.4 16 59.3 67.6 52.1 67.2 66.6 64.8 63.4 59.6 56.9 53.4 52.9 52.3 59.3 0.0 59.3 17 59.0 52.9 59.0 67.4 52.7 66.9 66.2 64.1 63.0 59.2 56.9 54.0 53.4 0.0 59.0 18 58.3 66.1 53.4 65.6 64.9 62.7 61.5 58.6 56.6 54.4 54.0 53.6 58.3 0.0 58.3 19 61.0 67.9 56.7 67.3 66.7 64.9 63.7 59.9 57.8 57.3 56.9 61.0 5.0 66.0 61.4 20 60.7 67.3 56.6 66.8 66.2 64.5 63.4 61.2 59.7 57.7 57.3 56.8 60.7 5.0 65.7 21 64.5 61.2 57.4 66.8 66.3 63.7 61.8 60.4 58.5 58.1 57.6 61.2 5.0 66.2 22 10.0 59.3 66.8 55.1 66.3 65.7 63.4 62.0 59.4 58.0 56.1 55.7 55.3 59.3 69.3 Night 23 59.5 67.5 54.6 67.1 66.5 64.4 62.9 59.4 57.9 55.8 55.3 54.8 59.5 10.0 69.5 L<sub>eq</sub> (dBA) **Timeframe** Hour L<sub>eq</sub> L max $L_{min}$ L1% L2% L5% L8% L25% L50% L90% L95% L99% 64.0 57.3 50.7 Daytime Nighttime Min 53.8 64.3 48.2 63.1 60.0 52.1 49.0 48.7 48.3 24-Hour Dav Max 61.2 68.2 57.4 67.7 67.2 65.5 63.7 61.8 60.4 58.5 58.1 57.6 (7am-10pm) (10pm-7am) **Energy Average** 58.6 Average 66.4 65.7 63.5 61.9 57.9 55.7 53.0 52.5 52.0 58.6 58.5 58.4 55.2 60.7 60.4 60.0 58.5 57.7 55.8 54.4 52.3 51.9 51.5 Min 51.4 Night 59.5 67.5 55.6 67.1 66.5 64.4 62.9 59.6 58.5 56.5 56.1 55.7 Max



60.8

58.5

57.2

55.2

54.8

54.4

Average

64.2

63.7

62.0

58.4

**Energy Average** 

### 24-Hour Noise Level Measurement Summary Date: Tuesday, June 21, 2022 Location: L4 - Located southeast of the Project site near the existing Meter: Piccolo II JN: 14848 Project: Amargosa and Palmetto High-Cube Warehouse Source: noise sensitive residence at 10122 Mt. Whitney Way. Analyst: B. Lawson Hourly L eq dBA Readings (unadjusted) (**qBy**) 80.0 75.0 70.0 65.0 60.0 Hourly 155.0 55.0 45.0 40.0 65. 6.09 65 63. 62 61. e e 59. 59 40.0 35.0 0 2 3 4 6 7 8 9 10 12 13 18 19 20 21 22 23 1 5 11 14 15 16 17 **Hour Beginning** Timeframe L1% L2% L5% L8% L25% L50% L90% L95% L99% Adj. Adj. L ea Hour $L_{eq}$ L max L min L eq 59.7 55.7 66.4 64.6 63.2 59.5 57.9 56.4 56.1 55.8 59.7 10.0 69.7 0 67.3 67.0 1 59.5 66.9 55.5 66.5 66.0 64.0 62.1 59.6 58.3 56.5 56.1 55.7 59.5 10.0 69.5 2 59.9 63.7 62.2 60.1 59.1 57.3 56.9 56.5 59.9 10.0 69.9 66.4 56.4 66.0 65.6 Night 3 54.3 54.0 59.8 10.0 69.8 59.8 69.7 53.9 69.4 68.9 66.3 63.8 58.3 56.6 54.8 4 61.8 71.2 54.5 71.0 70.5 68.3 66.8 61.1 57.5 55.2 54.9 54.6 61.8 10.0 71.8 5 69.5 64.4 60.4 60.1 66.1 10.0 76.1 66.1 77.4 60.0 76.8 75.9 72.2 62.4 60.7 72.3 68.8 54.9 10.0 6 62.4 548 71.9 71.2 67.3 61.8 57.7 55.5 55.2 62.4 72.4 70.4 48.0 70.1 69.5 65.9 59.0 52.5 48.8 48.4 48.1 60.0 60.0 67.4 60.0 0.0 8 59.4 69.9 68.9 66.9 65.4 47.5 47.2 46.8 59.4 0.0 59.4 46.6 69.6 58.2 51.4 9 58.2 69.7 45.8 69.4 68.6 65.7 63.3 56.1 50.2 46.7 46.4 46.0 58.2 0.0 58.2 10 59.4 71.1 47.2 70.6 69.9 66.7 64.3 57.3 52.5 48.5 48.0 47.4 59.4 0.0 59.4 11 61.2 71.2 50.0 70.8 70.1 67.8 66.0 61.0 57.1 51.9 51.1 50.3 61.2 0.0 61.2 12 70.3 67.2 66.0 61.9 52.7 51.7 61.4 0.0 61.4 61.4 51.4 69.9 69.0 58.2 53.6 13 62.3 73.7 50.7 73.4 72.4 69.0 66.7 61.1 57.1 52.5 51.7 50.9 62.3 0.0 62.3 Dav 14 61.6 70.1 51.6 69.7 69.1 67.3 66.2 62.2 58.7 54.1 52.9 51.9 61.6 0.0 61.6 15 68.3 60.8 55.1 53.8 63.1 70.8 53.4 70.4 69.8 67.4 64.1 56.0 63.1 0.0 63.1 16 63.6 71.8 54.2 71.4 70.7 68.8 67.8 64.4 61.1 56.5 55.6 54.5 63.6 0.0 63.6 17 72.3 69.4 53.7 63.7 72.8 53.4 71.6 68.1 64.3 60.3 55.4 54.6 63.7 0.0 63.7 18 63.3 72.0 53.6 71.6 71.0 69.2 68.1 64.0 59.9 55.1 54.5 53.8 63.3 0.0 63.3 19 58.1 65.8 70.8 65.8 74.9 57.8 74.7 73.9 71.0 69.8 66.0 63.4 59.6 58.9 5.0 20 65.4 75.0 57.1 74.6 74.1 71.5 69.6 65.2 62.2 58.6 57.9 57.3 65.4 5.0 70.4 21 58.4 69.1 64.1 70.4 58.2 70.1 69.7 68.4 67.7 65.0 62.7 59.6 59.0 64.1 5.0 22 54.5 10.0 60.9 69.8 69.5 69.0 66.8 65.2 60.5 57.8 55.6 55.2 54.7 60.9 70.9 Night 23 60.5 68.1 55.0 67.8 67.3 65.3 64.1 60.8 58.8 56.3 55.9 55.2 60.5 10.0 70.5 L<sub>eq</sub> (dBA) **Timeframe** Hour L<sub>eq</sub> L max $L_{min}$ L1% L2% L5% L8% L25% L50% L90% L95% L99% 50.2 Daytime Nighttime Min 58.2 69.7 45.8 69.4 68.6 65.7 63.3 56.1 46.7 46.4 46.0 24-Hour Dav Max 65.8 75.0 58.2 74.7 74.1 71.5 69.8 66.0 63.4 59.6 59.0 58.4 (7am-10pm) (10pm-7am) **Energy Average** 62.7 Average 71.2 70.5 68.3 66.8 62.0 57.9 53.6 52.9 52.2 62.7 54.0 62.4 61.7 59.5 66.4 66.0 65.6 63.7 62.1 58.3 56.6 54.8 54.3 Min 53.9 Night 60.1 66.1 77.4 60.0 76.8 75.9 72.2 69.5 64.4 62.4 60.7 60.4 Max



64.9

60.7

58.4

56.5

56.1

55.7

Average

69.6

69.0

66.7

**Energy Average** 

61.7

### 24-Hour Noise Level Measurement Summary Date: Tuesday, June 21, 2022 Location: L5 - Located south of the existing noise sensitive residence at Meter: Piccolo II JN: 14848 Project: Amargosa and Palmetto High-Cube Warehouse Source: 10376 Wellington Road. Analyst: B. Lawson Hourly L eq dBA Readings (unadjusted) (**qBy**) 80.0 75.0 70.0 65.0 60.0 Hourly 155.0 55.0 45.0 40.0 50.5 45.4 48.9 51.8 55. 45. ñ, 52. 40.0 35.0 0 2 3 7 8 9 19 20 22 23 1 5 6 10 11 12 13 14 15 16 17 18 21 **Hour Beginning** Timeframe L1% L2% L5% L8% L25% L50% L90% L95% L99% Adj. L ea Hour L<sub>ea</sub> L max L min L eq Adj. 47.1 49.8 44.9 49.6 49.3 48.8 48.5 47.6 45.3 45.0 47.1 10.0 57.1 0 46.9 45.6 1 46.0 48.6 43.8 48.4 48.2 47.8 47.6 46.6 45.8 44.5 44.2 43.9 46.0 10.0 56.0 2 53.7 48.1 52.7 52.3 48.6 48.2 50.5 10.0 60.5 50.5 53.5 53.2 51.2 50.2 48.8 Night 3 54.1 53.2 48.6 51.2 10.0 61.2 51.2 56.9 48.5 56.4 55.8 51.6 50.6 49.2 48.9 4 54.9 57.3 53.1 57.1 56.9 56.4 56.2 55.4 54.6 53.7 53.5 53.2 54.9 10.0 64.9 5 55.1 54.3 52.3 53.9 10.0 63.9 53.9 56.2 52.2 56.0 55.8 55.4 53.7 52.7 52.5 48 9 48.5 60.0 6 50.0 54.3 48.4 53.4 52.6 51.3 51.0 50.4 49.8 48.7 50.0 10.0 45.8 50.9 50.1 49.2 48.0 47.3 46.1 44.4 44.2 44.0 45.8 43.9 45.3 0.0 45.8 8 45.4 52.3 42.4 50.5 49.2 45.4 43.0 42.8 42.5 45.4 45.4 51.4 48.2 44.4 0.0 9 47.7 56.0 43.0 54.9 54.0 51.8 51.0 48.4 46.0 43.8 43.5 43.1 47.7 0.0 47.7 10 52.3 60.0 47.0 58.2 56.4 55.6 50.9 47.9 47.5 47.2 52.3 0.0 52.3 59.2 53.1 11 51.6 59.6 46.7 59.0 58.3 56.0 55.0 51.9 49.6 47.5 47.2 46.8 51.6 0.0 51.6 12 52.3 46.8 59.9 59.1 57.4 50.2 47.7 47.3 46.9 52.3 0.0 52.3 60.4 56.2 52.7 13 48.9 53.9 46.2 53.4 52.9 51.8 51.0 49.4 48.3 46.8 46.6 46.3 48.9 0.0 48.9 Dav 14 53.3 61.2 47.8 60.6 59.8 58.1 56.7 53.7 51.6 48.8 48.3 47.9 53.3 0.0 53.3 15 59.4 49.7 49.2 55.3 55.3 55.3 63.1 49.0 62.5 61.8 60.4 55.8 53.2 50.2 0.0 16 55.4 63.8 49.4 63.1 62.3 60.6 59.3 55.7 53.3 50.5 50.1 49.5 55.4 0.0 55.4 17 52.9 50.0 54.9 63.1 49.9 62.4 61.6 59.8 58.6 54.9 50.9 50.5 54.9 0.0 54.9 18 52.0 59.0 48.6 58.2 57.4 55.5 54.7 52.4 51.0 49.3 49.0 48.7 52.0 0.0 52.0 19 49.1 51.8 57.8 49.0 56.9 56.2 54.6 53.9 52.3 51.2 49.7 49.4 51.8 5.0 56.8 20 52.5 57.4 49.4 57.0 56.5 55.7 55.1 53.1 51.8 50.2 49.9 49.5 52.5 5.0 57.5 21 50.0 52.6 52.6 49.9 56.8 56.3 55.4 54.8 53.2 52.0 50.7 50.4 5.0 57.6 22 10.0 51.7 55.4 48.9 55.1 54.7 54.2 53.8 52.5 51.1 49.8 49.5 49.1 51.7 61.7 Night 23 51.2 55.5 48.3 55.1 54.6 53.8 53.3 51.7 50.7 49.1 48.8 48.4 51.2 10.0 61.2 L<sub>eq</sub> (dBA) **Timeframe** Hour L<sub>eq</sub> L max $L_{min}$ L1% L2% L5% L8% L25% L50% L90% L95% L99% 50.1 49.2 48.0 Daytime Nighttime Min 45.4 50.9 42.4 47.3 45.4 44.4 43.0 42.8 42.5 24-Hour Dav Max 55.4 63.8 49.9 63.1 62.3 60.6 59.4 55.8 53.3 50.9 50.5 50.0 (7am-10pm) (10pm-7am) **Energy Average** 52.3 Average 57.7 56.9 55.4 54.5 51.9 50.1 48.1 47.8 47.4 52.3 52.0 51.5 46.0 48.6 48.4 48.2 47.8 47.6 46.6 45.8 44.5 44.2 43.9 Min 43.8



56.2

52.3

55.4

51.3

54.6

50.4

53.7

49.1

53.5

48.9

53.2

48.6

57.3

Average

53.1

57.1

53.8

56.9

53.5

56.4

52.7

54.9

51.5

Max

**Energy Average** 

Night



# **APPENDIX 7.1:**

**OFF-SITE TRAFFIC NOISE CONTOURS** 





	FHWA-RD-	77-108 HIGH	WAY	NOISE	PREDIC	CTION N	MODEL	(9/12/2	021)		
	o: E e: Key Pointe D ht: s/o Amargosa						t Name: Number:		osa and P	almetto	
SITE S	SPECIFIC INP	UT DATA			ita Car				L INPUT	S	
				-	nie Con	iditions	(паги				
Average Daily	. ,	430 vehicle	es			T-		Autos			
		0.00%				edium Ti		,			
	our Volume:	43 vehicles	3		HE	eavy Tru	ICKS (3+	Axies).	15		
ver Near/Far Lar	nicle Speed:	45 mph		١	/ehicle	Mix					
Near/Far Lar	ne Distance:	25 feet			Veh	icleType	е	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	6 12.9%	9.6%	93.94%
Bar	rier Height:	0.0 feet			М	ledium 7	rucks:	84.8%	4.9%	10.3%	1.74%
Barrier Type (0-Wa	all, 1-Berm):	0.0				Heavy 7	rucks:	86.5%	2.7%	10.8%	4.32%
Centerline Dis	t. to Barrier:	40.0 feet			Inisa Si	ource E	levatio	ne (in f	oot)		
Centerline Dist. t	to Observer:	40.0 feet			10/36 01	Auto		0.000	coty		
Barrier Distance t	o Observer:	0.0 feet			Mediu	ım Truck		2.297			
Observer Height (/	Above Pad):	5.0 feet				vv Truck		3.004	Grade Ad	liustment	0.0
Pa	d Elevation:	0.0 feet				,				,	
Roa	d Elevation:	0.0 feet		L	ane Eq	uivalen			feet)		
F	Road Grade:	0.0%				Auto		3.324			
	Left View:	-90.0 degree				m Truck		3.093			
	Right View:	90.0 degree	es		Hea	vy Truck	ks: 38	3.115			
FHWA Noise Mode											
VehicleType		Traffic Flow	Dis	stance		Road	Fres		Barrier Att		m Atten
Autos:	68.46	-15.77		1.63		-1.20		-4.59		000	0.000
Medium Trucks:	79.45	-33.10		1.67		-1.20		-4.87		000	0.000
Heavy Trucks:	84.25	-29.14		1.66		-1.20		-5.56	0.0	000	0.000
VehicleType	Levels (withou Leg Peak Hour	It Topo and Leg Day		er atteni Leg Ev		l en	Night	_	Ldn	0	NEL
Autos:	53.1		51.2	LUYLV	49.5		43	4	52.		52.6
Medium Trucks:	46.8		45.3		38.9		37		45.	-	46.1
Heavy Trucks:	55.6		54.2		45.1		46		54.	-	54.8
Vehicle Noise:	57.9		56.3		51.1		48	.5	56.	9	57.2
Centerline Distanc	e to Noise Con	tour (in feet)									
				70 a		65	dBA		60 dBA		dBA
			Ldn:		5			2	25		54
		CI	VEL:		6		1	2	26	5	56

	FHWA-RD	)-77-108 HIGH	WAY N	IOISE P	REDIC	CTION MO	ODEL (	9/12/2	021)		
Scenario									osa and P	almetto	
	Key Pointe					Job Nu	ımber:	14848			
Road Segment	: s/o Amargo	sa Rd.									
SITE S Highway Data	PECIFIC IN	PUT DATA		e,	to Con	Neditions (			L INPUT	S	
· ·	#E- (A-#).	4.000		- 0,	10 0011	unions (		Autos:			
Average Daily T Peak Hour P	. ,	1,692 vehicle 10.00%	es		Ma	dium Tru					
	ur Volume:	169 vehicle				avy Truc		,			
	icle Speed:	45 mph	3				13 (0 )	12103).	10		
Near/Far Lane		25 feet		Ve	ehicle i						
	Diotarioo.	20 1001			Veh	icleType		Day	Evening	Night	Daily
Site Data								77.5%		9.6%	
Barr	ier Height:	0.0 feet				edium Tru		84.8%		10.3%	
Barrier Type (0-Wa	II, 1-Berm):	0.0			-	Heavy Tri	ucks:	86.5%	2.7%	10.8%	8.20
Centerline Dist		40.0 feet		No	oise So	ource Ele	vations	s (in fe	eet)		
Centerline Dist. to		40.0 feet				Autos	: 0.0	200	,		
Barrier Distance to		0.0 feet			Mediu	m Trucks	: 2.	297			
Observer Height (A	,	5.0 feet			Heav	y Trucks	: 8.0	004	Grade Ad	justment	0.0
	f Elevation:	0.0 feet					<b>.</b>				
	Elevation:	0.0 feet		Lá	ine Eq	uivalent			reet)		
R	oad Grade:	0.0%				Autos					
	Left View:	-90.0 degre				m Trucks					
,	Right View:	90.0 degre	es		near	y Trucks	38.	115			
FHWA Noise Model											
VehicleType	REMEL	Traffic Flow	Dista		Finite	Road	Fresn		Barrier Att		rm Atten
Autos:	68.46	-10.03		1.63		-1.20		-4.59		000	0.00
Medium Trucks:	79.45	-26.16		1.67		-1.20		-4.87		000	0.00
Heavy Trucks:	84.25	-20.42		1.66		-1.20		-5.56	0.0	000	0.00
Unmitigated Noise							E l- 4		Ldn		NE
VehicleType L Autos:	eq Peak Hou 58	- 1 - 2	57.0	Leq Eve	ning 55.2	Leq N	ugnt 49.1		57.1		NEL 58
Medium Trucks:	53		52.2		45.9		49.1		52.6	-	53
Heavy Trucks:	64		62.9		53.8		55.1		63.4	-	63
Vehicle Noise:	65		64.2		57.9		56.4		64.		65
Centerline Distance	to Noise Co	ntour (in feet	)								
				70 dE	BA .	65 d	BA	6	60 dBA	55	dBA
			Ldn:		18		39		83	1	17

Scenari	o: OY	•				Project	Vame ·	Amaro	osa and Pa	almetto	
	e: Kev Pointe	Dr.				Job Ni			ood and i		
Road Segmer						000 / 10					
SITE	SPECIFIC IN	PUT DATA				N	DISE	MODE	L INPUT	s	
Highway Data				S	ite Con	ditions (	Hard =	10, So	ft = 15)		
Average Daily	Traffic (Adt):	1,000 vehicle	es					Autos:	15		
Peak Hour	Percentage:	10.00%			Ме	dium Tru	cks (2	Axles):	15		
Peak H	our Volume:	100 vehicle	s		He	avy Truc	ks (3+	Axles):	15		
Ve	hicle Speed:	45 mph		1/	ehicle l	Miss					
Near/Far Lai	ne Distance:	25 feet				icleType		Dav	Evening	Night	Daily
Site Data							utos:	77.5%	-	9.6%	,
	rier Height:	0.0 feet			М	edium Tri	ıcks:	84.8%	4.9%	10.3%	
Barrier Type (0-W	-	0.0			1	Heavy Tri	ıcks:	86.5%	2.7%	10.8%	4.329
Centerline Dis	t. to Barrier:	40.0 feet		A/	nien Sa	ource Ele	vation	e (in fo	of)		
Centerline Dist.	to Observer:	40.0 feet		/4	0136 30	Autos		.000	ei)		
Barrier Distance	to Observer:	0.0 feet			Modiu	Autos m Trucks		.297			
Observer Height (	Above Pad):	5.0 feet				vy Trucks		.004	Grade Ad	iuctment	. 0.0
Pa	d Elevation:	0.0 feet			пеач	ry Trucks	. 0	.004	Grade Adj	usuneni	0.0
Roa	d Elevation:	0.0 feet		L	ane Eq	uivalent	Distan	ce (in f	eet)		
F	Road Grade:	0.0%				Autos	: 38	.324			
	Left View:	-90.0 degree	es		Mediu	m Trucks	38	.093			
	Right View:	90.0 degree	es		Heav	y Trucks	38	.115			
FHWA Noise Mode	l Calculation:	S									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fresi	nel	Barrier Att	en Ber	m Atten
Autos:	68.46	-12.11		1.63		-1.20		-4.59	0.0	000	0.00
Medium Trucks:	79.45	-29.44		1.67		-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	84.25	-25.48		1.66		-1.20		-5.56	0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo and	barri	er attenu	ation)						
	Leq Peak Hou			Leq Eve		Leq N	_		Ldn	_	NEL
Autos:	56		54.9		53.1		47.		55.7		56.
Medium Trucks:	50		49.0		42.6		41.		49.5	-	49.
Heavy Trucks:	59		57.8		48.8		50.		58.4		58.
Vehicle Noise:	61	.5	60.0		54.8		52.	2	60.6	3	60.
Centerline Distanc	e to Noise Co	ntour (in feet	)	70.0			-				/5.4
			, L	70 dl		65 a			0 dBA		dBA
			Ldn:		9		20	)	44		98
		0	NEL:		10		21		46		99

Thursday, September 15, 2022

FHWA-I	RD-77-108 HIGHW	AY NOIS	SE PREDIC	TION M	DDEL	(9/12/2	021)		
Scenario: GP Road Name: Key Point Road Segment: s/o Amar						Amarç 14848	osa and P	almetto	
SITE SPECIFIC Highway Data	NPUT DATA		Site Con				L INPUT	S	
Average Daily Traffic (Adt):  Peak Hour Percentage:  Peak Hour Volume:  Vehicle Speed:	4,700 vehicles 10.00% 470 vehicles 45 mph		Me He	dium Tru avy Truc	cks (2	Autos. Axles).	15		
Near/Far Lane Distance:	25 feet		Vehicle I	icleType	Т	Dav	Evening	Night	Dailv
Site Data					utos:	77.5% 84.8%	6 12.9%	9.6% 10.3%	93.94%
Barrier Height: Barrier Type (0-Wall, 1-Berm):				Heavy Tri		86.59		10.3%	1.74% 4.32%
Centerline Dist. to Barrier:			Noise So	ource Ele	vatio	ns (in f	eet)		
Centerline Dist. to Observer: Barrier Distance to Observer: Observer Height (Above Pad): Pad Elevation:	0.0 feet 5.0 feet			Autos m Trucks vy Trucks	: 2	0.000 2.297 3.004	Grade Ad	justment	0.0
Road Elevation:			Lane Eq	uivalent	Distai	nce (in	feet)		
Road Grade:	0.0%			Autos	: 38	3.324			
Left View: Right View:	00.0 009.000			m Trucks vy Trucks		3.093 3.115			
FHWA Noise Model Calculation	ns		1						
VehicleType REMEL	Traffic Flow	Distance	Finite	Road	Fres	nel	Barrier Att	en Ber	m Atten
Autos: 68.4	6 -5.39	1	.63	-1.20		-4.59	0.0	000	0.000
Medium Trucks: 79.4	5 -22.72	1	.67	-1.20		-4.87	0.0	000	0.000
Heavy Trucks: 84.2			.66	-1.20		-5.56	0.0	000	0.000
Unmitigated Noise Levels (with VehicleType Leq Peak H		_		Leq N	liabt	_	Ldn		VEL
	our Leq Day 63.5 61		Evening 59.8		ugnt 53	8	Lan 62.4		VEL 63.0
	57.2 55		49.3		47		56.5		56.5
	36.0 64		55.5		56		65.	_	65.2
· · · · · · · · · · · · · · · · · · ·	88.3 66		61.5		58		67.3		67.6
Centerline Distance to Noise	Contour (in feet)							Ι	
			0 dBA	65 a			60 dBA		dBA
	Lo CNE		27 28		5 6		123 129		265 278

Thursday, September 15, 2022 Thursday, September 15, 2022

	FHWA-RI	D-77-108 HIGH	IWAY	NOISE	PREDIC	TION N	IODEL	(9/12/2	021)		
Road Nam	io: GP+P ne: Key Pointe nt: s/o Amargo						Name: lumber:		osa and P	almetto	
	SPECIFIC IN	IPUT DATA			o:. o				L INPUT	s	
Highway Data					Site Con	aitions	(Hara =	= 10, Sc	ort = 15)		
Average Daily	Traffic (Adt):	5,392 vehicle	es					Autos:			
	Percentage:	10.00%				dium Tr					
Peak H	lour Volume:	539 vehicle	S		He	avy Tru	cks (3+	Axles):	15		
Ve	hicle Speed:	45 mph		h	Vehicle i	Mix					
Near/Far La	ne Distance:	25 feet		F		icleType	,	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	12.9%	9.6%	92.58%
Ra	rrier Height:	0.0 feet			М	edium T	rucks:	84.8%	4.9%	10.3%	1.88%
Barrier Type (0-W		0.0				Heavy T	rucks:	86.5%	2.7%	10.8%	5.54%
Centerline Di	st. to Barrier:	40.0 feet		,	Noise So	urce F	lovation	ne (in f	not)		
Centerline Dist.	to Observer:	40.0 feet		ľ	10/30 00	Auto		.000			
Barrier Distance	to Observer:	0.0 feet			Modiu	m Truck		.297			
Observer Height	(Above Pad):	5.0 feet				vy Truck		.004	Grade Ad	liustman	t· 0.0
P	ad Elevation:	0.0 feet								, acamon	0.0
Ro	ad Elevation:	0.0 feet		1	Lane Eq	uivalen	t Distar	ce (in	feet)		
	Road Grade:	0.0%				Auto	s: 38	.324			
	Left View:	-90.0 degre	es		Mediu	m Truck	s: 38	.093			
	Right View:	90.0 degre	es		Heav	y Truck	s: 38	.115			
FHWA Noise Mode	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fres	nel	Barrier Att	ten Be	rm Atten
Autos:	68.46			1.6	-	-1.20		-4.59		000	0.000
Medium Trucks:	79.45	-21.78		1.6	7	-1.20		-4.87	0.0	000	0.000
Heavy Trucks:	84.25	-17.09		1.6	6	-1.20		-5.56	0.0	000	0.000
Unmitigated Noise	e Levels (with	out Topo and	barrie	er atten	uation)						
VehicleType	Leq Peak Hou	ur Leq Day	/	Leq E	vening	Leq	Night		Ldn	C	NEL
Autos:	-	1.0	62.1		60.4		54.	-	62.	-	63.5
Medium Trucks:		3.1	56.6		50.3		48.		57.	-	57.4
Heavy Trucks:		7.6	66.2		57.2		58.		66.	-	66.9
Vehicle Noise:	69	0.5	68.0		62.3		60.	2	68.	6	68.9
Centerline Distance	ce to Noise C	ontour (in feet	)								
	-			70 c	dBA	65	dBA	(	60 dBA	55	5 dBA
			Ldn:		32		70	)	150	)	323
		C	NEL:		34		72	2	156	3	336

Scenario	o: OV					Draine	Momo	Amora	osa and Pa	almette	
	o: O1 e: Amargosa F	24						14848	osa and P	aimetto	
Road Segmen						JOD I	iuiiibei.	14040			
	SPECIFIC IN						IOISE	MODE	L INPUT	s	
Highway Data	), E011 10 114	TOT DATA		s	ite Cor	ditions					
Average Daily	Traffic (Adt):	9.130 vehicl	les					Autos:	15		
Peak Hour I	Percentage:	10.00%			Me	dium Tr	ucks (2	Axles):	15		
Peak Ho	our Volume:	913 vehicle	es		He	avy Tru	cks (3+	Axles):	15		
Vel	nicle Speed:	50 mph		1/	ehicle	Miv					
Near/Far Lar	ne Distance:	48 feet				icleType		Day	Evening	Night	Daily
Site Data							Autos:	77.5%	-	9.6%	,
Par	rier Height:	0.0 feet			М	edium T	rucks:	84.8%	4.9%	10.3%	1.74%
Barrier Type (0-Wa		0.0				Heavy T	rucks:	86.5%	2.7%	10.8%	4.329
Centerline Dis	t. to Barrier:	50.0 feet		N	loise Si	ource E	levatio	ns (in fe	et)		
Centerline Dist. t	to Observer:	50.0 feet			0,00	Auto		0.000	,		
Barrier Distance t	o Observer:	0.0 feet			Mediu	m Truck		2.297			
Observer Height (/	Above Pad):	5.0 feet				/y Truck		3.004	Grade Ad	iustment	0.0
Pa	d Elevation:	0.0 feet				•					
Roa	d Elevation:	0.0 feet		L	ane Eq	uivalen			feet)		
F	Road Grade:	0.0%				Auto		1.147			
	Left View:	-90.0 degre	es			m Truck		3.947			
	Right View:	90.0 degre	es		Hea	ry Truck	s: 43	3.966			
FHWA Noise Mode				<u>'</u>							
VehicleType	REMEL	Traffic Flow		stance		Road	Fres		Barrier Att		m Atten
Autos:	70.20	-2.96		0.71		-1.20		-4.65		000	0.00
Medium Trucks:	81.00	-20.29		0.74		-1.20		-4.87		000	0.00
Heavy Trucks:	85.38	-16.33		0.73		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise								-			
VehicleType Autos:	Leq Peak Hou 66		64.9	Leq Ev	ening 63.1	Leq	Night 57		Ldn 65.7		NEL 66.
Medium Trucks:	60		58.7		52.4		50		59.		59.
Heavy Trucks:	68		67.2		58.1		59		67.	-	67.
Vehicle Noise:	71		69.5		64.6		61		70.2		70.
Centerline Distanc	e to Noise Co	ntour (in fee	t)								
zamana ziotario		(111 100)	7	70 d	BA	65	dBA	6	0 dBA	55	dBA
			Ldn:		51		11	1	239		515
			NEL:		54			6	251		540

Scenario Road Name Road Segmen	e: Amargosa						Name: lumber:		osa and Pa	almetto	
SITE S Highway Data	SPECIFIC IN	IPUT DATA			Site Con				L INPUT	S	
					Site Con	uitions	(naru -				
Average Daily	. ,	8,610 vehicl	es					Autos:	15		
	Percentage:	10.00%				dium Tr			15		
	our Volume:	861 vehicle	:S		He	avy Tru	cks (3+	Axles):	15		
	nicle Speed:	50 mph			Vehicle	Mix					
Near/Far Lar	ne Distance:	48 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						,	Autos:	77.5%	12.9%	9.6%	93.949
Ran	rier Height:	0.0 feet			М	edium T	rucks:	84.8%	4.9%	10.3%	1.749
Barrier Type (0-Wa	-	0.0				Heavy T	rucks:	86.5%	2.7%	10.8%	4.329
Centerline Dis	t. to Barrier:	50.0 feet			Noise S	ouroe E	lovestion	an (in fe	net)		
Centerline Dist. t	to Observer:	50.0 feet		H.	WOISE S	Auto		.000	ei)		
Barrier Distance t	o Observer:	0.0 feet			Modiu	m Truck		297			
Observer Height (/	Above Pad):	5.0 feet				n Truck vy Truck		.004	Grade Ad	iuctment	0.0
Pa	d Elevation:	0.0 feet			пеа	ry Truck	s. o	.004	Grade Adj	usunent	0.0
Roa	d Elevation:	0.0 feet			Lane Eq	uivalen	t Distar	ice (in i	feet)		
F	Road Grade:	0.0%				Auto	s: 44	.147			
	Left View:	-90.0 degre	es		Mediu	m Truck	s: 43	.947			
	Right View:	90.0 degre	es		Hear	y Truck	s: 43	.966			
FHWA Noise Mode	l Calculation	s		-							
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fres	nel	Barrier Att	en Ber	m Atten
Autos:	70.20	-3.22		0.7	1	-1.20		-4.65	0.0	000	0.00
Medium Trucks:	81.00	-20.54		0.7	4	-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	85.38	-16.59		0.7	3	-1.20		-5.43	0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo and	barri	er atten	uation)						
VehicleType	Leq Peak Ho	ur Leq Da	y	Leq E	vening	Leq	Night		Ldn	CI	VEL
Autos:	66	3.5	64.6		62.8		56.	.8	65.4	1	66.
Medium Trucks:	60	0.0	58.5		52.1		50.	.6	59.0	)	59.
Heavy Trucks:		3.3	66.9		57.9		59.		67.5	5	67.
Vehicle Noise:	70	).9	69.3		64.3		61.	.5	69.9	9	70.
Centerline Distanc	e to Noise C	ontour (in feet	!)								
			L	70 (	dBA	65	dBA		i0 dBA		dBA
			Ldn:		50 52		10		230 241		49: 51:

Thursday, September 15, 2022

FHWA-R	D-77-108 HIGHW	AY NOISE	PREDIC	TION M	ODEL (9/12	/2021)	
Scenario: OY+P Road Name: Amargosa Road Segment: n/o Palmet					Name: Ama umber: 1484	irgosa and Pal 18	metto
SITE SPECIFIC II	NPUT DATA			N	IOISE MOI	EL INPUTS	
Highway Data			Site Con	ditions	(Hard = 10,	Soft = 15)	
Average Daily Traffic (Adt):  Peak Hour Percentage:  Peak Hour Volume:  Vehicle Speed:  Near/Far Lane Distance:	9,328 vehicles 10.00% 933 vehicles 50 mph 48 feet		He Vehicle i	avy True Mix	Auto ucks (2 Axle cks (3+ Axle	s): 15 s): 15	
	.0		Veh	icleType			Night Daily
Barrier Height: Barrier Type (0-Wall, 1-Berm): Centerline Dist. to Barrier: Centerline Dist. to Observer: Barrier Distance to Observer:	0.0 feet 0.0 50.0 feet 50.0 feet 0.0 feet		Noise So	edium T Heavy T	rucks: 86. evations (in s: 0.000	3% 4.9% 5% 2.7%	9.6% 94.07% 10.3% 1.70% 10.8% 4.23%
Observer Height (Above Pad): Pad Elevation:	5.0 feet 0.0 feet			y Truck		Grade Adju	stment: 0.0
Road Elevation: Road Grade: Left View: Right View:	0.0 feet 0.0% -90.0 degrees 90.0 degrees		Mediu	Auto m Truck yy Truck	s: 43.947	птеец	
FHWA Noise Model Calculation	ıs						
VehicleType REMEL	Traffic Flow	Distance	Finite	Road	Fresnel	Barrier Atte	n Berm Atten
Autos:         70.20           Medium Trucks:         81.00           Heavy Trucks:         85.38	-20.29	0.7 0.7 0.7	74	-1.20 -1.20 -1.20	-4.6 -4.8 -5.4	7 0.00	0.000
Unmitigated Noise Levels (with	out Tono and ha	rrier atte	nuation)				
VehicleType Leg Peak Ho			vening	Lea	Night	Ldn	CNEL
	5.8 64		63.2	,	57.1	65.8	66.4
Medium Trucks: 60	0.2 58	.7	52.4		50.8	59.3	59.5
Heavy Trucks: 68	3.6 67	.2	58.1		59.4	67.7	67.9
Vehicle Noise: 7	1.2 69	.6	64.6		61.8	70.2	70.5
Centerline Distance to Noise C	ontour (in feet)	70	dBA	C.F.	dBA	60 dBA	55 dBA
	La		ава 52	05	112	60 dBA 240	55 dBA 518
	CNE		54		117	252	543

September 15, 2022 Thursday, September 15, 2022

	FHWA-RI	)-77-108 HIGH	IWAY	' NOISE	PREDIC	CTION N	IODEL	(9/12/20	021)		
Road Na	ario: GP me: Amargosa l ent: n/o Palmett						Name: lumber:		osa and P	almetto	
	SPECIFIC IN	PUT DATA			0:4- 0				L INPUT	S	
Highway Data					Site Cor	laitions	(Hara =				
	y Traffic (Adt):	13,110 vehicle	es					Autos:	15		
	ır Percentage:	10.00%				edium Tr		,	15		
	Hour Volume:	1,311 vehicle	S		He	eavy Tru	cks (3+	Axles):	15		
	'ehicle Speed:	50 mph			Vehicle	Mix					
Near/Far L	ane Distance:	48 feet			Veh	icleType		Dav	Evenina	Niaht	Dailv
Site Data							Autos:	77.5%	12.9%	9.6%	93.94%
	arrier Height:	0.0 feet			М	edium T	rucks:	84.8%	4.9%	10.3%	1.74%
Barrier Type (0-		0.0				Heavy T	rucks:	86.5%	2.7%	10.8%	4.32%
	Dist. to Barrier:	50.0 feet		L							
Centerline Dis		50.0 feet			Noise S			_ •	eet)		
Barrier Distanc	e to Observer:	0.0 feet				Auto		.000			
Observer Height	t (Above Pad):	5.0 feet				m Truck		.297	0	·	
	Pad Elevation:	0.0 feet			Hea	vy Truck	s: 8	.004	Grade Ad	justment	: 0.0
R	oad Elevation:	0.0 feet			Lane Eq	uivalent	Distan	ce (in i	feet)		
	Road Grade:	0.0%				Auto	s: 44	.147			
	Left View:	-90.0 degre	es		Mediu	m Truck	s: 43	.947			
	Right View:	90.0 degre	es		Hea	vy Truck	s: 43	.966			
FHWA Noise Mo	del Calculation	S									
VehicleType	REMEL	Traffic Flow		stance		Road	Fres		Barrier Att		m Atten
Autos		-1.39		0.7		-1.20		-4.65		000	0.000
Medium Trucks		-18.72		0.7		-1.20		-4.87		000	0.000
Heavy Trucks		-14.76		0.7		-1.20		-5.43	0.0	000	0.000
Unmitigated Noi: VehicleType	Lea Peak Hou				vening	Loca	Night		Ldn		NEL
Autos	1 . ,		66.4	Ley L	64.7		58.	6	67.2		67.8
Medium Trucks			60.3		53.9		52.		60.9		61.1
Heavy Trucks			68.7		59.7		60.		69.3		69.4
Vehicle Noise			71.1		66.1		63.		71.8		72.
Centerline Dista	nce to Noise Co	ntour (in feet	)								
			Į	70	dBA	65	dBA		0 dBA		dBA
			Ldn:		66		141		304		655
		C	NEL:		69		148	3	319		687

	FHWA-R	D-77-108 HIGH	HWAY	NOISE	PREDIC	TION N	MODEL (9/1	12/2021)		
Scenari Road Name Road Segmen	e: Amargosa						t Name: An Iumber: 14		nd Palm	etto
SITE S	SPECIFIC II	IPUT DATA					NOISE MC			
Highway Data				S	ite Cor	ditions	(Hard = 10	), Soft = 1	15)	
Peak H	Traffic (Adt): Percentage: our Volume: hicle Speed:	6,530 vehicl 10.00% 653 vehicle 50 mph		1		avy Tru	Au rucks (2 Axi cks (3+ Axi	,	5	
Near/Far Lar	ne Distance:	48 feet				icleType	e Di	ay Ever	nina M	ight Daily
Site Data Bar	rier Height:	0.0 feet					Autos: 77	7.5% 12	2.9%	9.6% 93.94% 0.3% 1.74%
Barrier Type (0-W	all, 1-Berm):	0.0				Heavy 7	rucks: 86	6.5% 2	2.7% 1	0.8% 4.32%
Centerline Dis	st. to Barrier:	50.0 feet		٨	loise S	ource E	levations (	in feet)		
Roa	to Observer:	50.0 feet 0.0 feet 5.0 feet 0.0 feet 0.0 feet 0.0% -90.0 degre 90.0 degre		L	Hea ane Eq Mediu	Auto m Truck ry Truck uivalen Auto m Truck ry Truck	s: 2.29 s: 8.00 t Distance s: 44.14 s: 43.94	7 4 Grad (in feet) 7	de Adjust	tment: 0.0
FHWA Noise Mode	l Calculation	s								
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresnel	Barrie	er Atten	Berm Atten
Autos:	70.20	-4.42		0.71		-1.20	-4	.65	0.000	0.000
Medium Trucks: Heavy Trucks:	81.00 85.38			0.74		-1.20 -1.20		.87 .43	0.000	
						-1.20	-5	.43	0.000	0.000
Unmitigated Noise							A II I- 4	Ldn		ONE
VehicleType Autos:	Leq Peak Ho	ur Leq Da	63.4	Leq Ev	ening 61.6		Night 55.6	Lan	64.2	CNEL 64.8
Medium Trucks:		3.8	57.3		50.9		49.4		57.8	58.1
Heavy Trucks:		7.1	65.7		56.7		57.9		66.3	66.4
Vehicle Noise:		9.7	68.1		63.1		60.3		68.7	69.0
Centerline Distance	e to Noise C	ontour (in fee	t)							
				70 d	BA	65	dBA	60 dB	4	55 dBA
			Ldn:		41		89		191	412
		C	NEL:		43		93		200	432

Scenari	o: GP+P					Project	Name:	Amaro	osa and P	almetto	
	e: Amargosa	Rd					ıvanıc. umber:			aimetto	
Road Segmen						00074	umber.	14040			
	SPECIFIC IN								L INPUT	s	
Highway Data				Si	te Con	ditions	(Hard =	= 10, S	oft = 15)		
Average Daily	Traffic (Adt):	13,308 vehicle	es					Autos.	15		
Peak Hour	Percentage:	10.00%			Me	dium Tr	ıcks (2	Axles).	15		
Peak H	our Volume:	1,331 vehicle	s		He	avy Truc	cks (3+	Axles).	15		
Vel	hicle Speed:	50 mph		V	ehicle l	Miv					
Near/Far Lar	ne Distance:	48 feet		-		icleType		Day	Evening	Night	Daily
Site Data							Autos:	77.5%	12.9%	9.6%	94.039
Rar	rier Heiaht:	0.0 feet			Me	edium T	rucks:	84.89	4.9%	10.3%	1.719
Barrier Type (0-W		0.0			F	leavy T	rucks:	86.5%	2.7%	10.8%	4.269
Centerline Dis		50.0 feet		No	oise Sc	urce El	evation	ns (in f	eet)		
Centerline Dist.		50.0 feet				Auto.	s: 0	.000			
Barrier Distance t		0.0 feet			Mediui	m Truck	s: 2	.297			
Observer Height (		5.0 feet			Heav	y Truck	s: 8	.004	Grade Ad	justment.	0.0
	d Elevation:	0.0 feet									
	d Elevation:	0.0 feet		Lá	ne Eq	uivalent			reet)		
F	Road Grade:	0.0%				Auto		.147			
	Left View:	-90.0 degre				m Truck		.947			
	Right View:	90.0 degre	es		Heav	y Truck	s: 43	.966			
FHWA Noise Mode		-									
VehicleType	REMEL	Traffic Flow		ance	Finite		Fres		Barrier Att		m Atten
Autos:	70.20			0.71		-1.20		-4.65		000	0.00
Medium Trucks:	81.00			0.74		-1.20		-4.87		000	0.00
Heavy Trucks:	85.38			0.73		-1.20		-5.43	0.	000	0.00
Unmitigated Noise VehicleType	Levels (with Leg Peak Hou			r <b>attenu</b> Leg Eve		100	Night		Ldn		VEL
Autos:	Ley reak not		66.5	Ley Eve	64.7	Leq	ivigrit 58.	7	67.		67.
Medium Trucks:	61		60.3		53.9		52		60.	-	61.
Heavy Trucks:	70		68.7		59.7		60		69.	-	69.
Vehicle Noise:	72	·-	71.1		66.2		63.	-	71.	-	72.
Centerline Distanc	e to Noise Co	ontour (in feet	)								
				70 dE	BA	65	dBA		60 dBA	55	dBA
			–								658
			Ldn: NEL:		66		14:	2	305	•	000

Thursday, September 15, 2022

FHWA	RD-77-108 HIG	HWAY	NOISE	PREDIC	TION N	IODEL (	9/12/2	(021)		
Scenario: OY Road Name: Amargos Road Segment: w/o Key						Name: lumber:		gosa and Pa	Imetto	
SITE SPECIFIC	INPUT DATA							L INPUTS	3	
Average Daily Traffic (Adt)		les	5			•	Autos			
Peak Hour Percentage Peak Hour Volume	738 vehicle	es			dium Tr avy Tru		/			
Vehicle Speed Near/Far Lane Distance	1		١	<b>/ehicle</b> I Veh	<b>Mix</b> icleType	:	Day	Evening	Night	Daily
Site Data					,	Autos:	77.5%		9.6%	93.94%
Barrier Height Barrier Type (0-Wall, 1-Berm)					edium T Heavy T		84.89 86.59		10.3% 10.8%	
Centerline Dist. to Barrier			1	loise So	ource El	evation	s (in f	eet)		
Centerline Dist. to Observer Barrier Distance to Observer Observer Height (Above Pad, Pad Elevation	0.0 feet 5.0 feet				Auto m Truck ry Truck	s: 2.	000 297 004	Grade Adj	ustment	t: 0.0
Road Elevation	: 0.0 feet		L	ane Eq	uivalen	t Distan	ce (in	feet)		
Road Grade	: 0.0%				Auto	s: 44	147			
Left View Right View					m Truck vy Truck	10	.947 .966			
FHWA Noise Model Calculati	ons									
VehicleType REMEL	Traffic Flow	Dist	tance	Finite	Road	Fresi	nel	Barrier Atte	en Bei	rm Atten
Autos: 70.		-	0.7		-1.20		-4.65	0.0		0.000
Medium Trucks: 81.		-	0.74		-1.20		-4.87			0.000
Heavy Trucks: 85.			0.73		-1.20		-5.43	0.0	00	0.000
VehicleType Leq Peak F			er atten Leg Ev		Loc	Night	T	Ldn	_	NEL
Autos:	65.8	63.9	LUG LV	62.2	LCY	56.	1	64.7		65.3
Medium Trucks:	59.3	57.8		51.5		49.		58.4		58.6
Heavy Trucks:	67.7	66.2		57.2		58.	4	66.8		66.9
Vehicle Noise:	70.2	68.6		63.6		60.	8	69.3		69.6
Centerline Distance to Noise	Contour (in fee	t)					_			
		Later	70 c		65	dBA		60 dBA	55	dBA
	(	Ldn: CNEL:		45 47		96 101		207 217		447 469

Thursday, September 15, 2022

	FHWA-RI	D-77-108 HIGH	WAY	NOISE	PREDIC	TION N	IODEL	9/12/2	021)		
Road Nan	io: OY+P ne: Amargosa nt: w/o Key Po						Name: lumber:		osa and P	almetto	
	SPECIFIC IN	IPUT DATA			0:4- 0				L INPUT	s	
Highway Data					Site Cor	aitions	(Hara =				
Average Daily	. ,	7,396 vehicle	es					Autos:			
Peak Hour	Percentage:	10.00%				dium Tr					
	lour Volume:	740 vehicle	S		He	avy Tru	cks (3+	Axles):	15		
Ve	hicle Speed:	50 mph		1	Vehicle	Mix					
Near/Far La	ne Distance:	48 feet		F		icleType		Day	Evening	Night	Daily
Site Data							Autos:	77.5%	12.9%	9.6%	93.95%
Ra	rrier Height:	0.0 feet			М	edium T	rucks:	84.8%	4.9%	10.3%	1.73%
Barrier Type (0-W		0.0				Heavy T	rucks:	86.5%	2.7%	10.8%	4.31%
Centerline Di		50.0 feet		- 1	Noise S	roo E	laveatian	o (in f	2041		
Centerline Dist.	to Observer:	50.0 feet		Ľ	voise 3	Auto		000	ei)		
Barrier Distance	to Observer:	0.0 feet			A de elle	m Truck		297			
Observer Height	(Above Pad):	5.0 feet				/y Truck		004	Grade Ad	livatman	t: 0 0
P	ad Elevation:	0.0 feet			пеа	ry Truck	s. o	.004	Grade Ad	jusunen	ι. υ.υ
Ro	Road Elevation: 0.0 feet			1	Lane Eq	uivalen	t Distan	ce (in	feet)		
	Road Grade:	0.0%				Auto	s: 44	.147			
	Left View:	-90.0 degree	es		Mediu	m Truck	s: 43	.947			
	Right View:	90.0 degree	es		Hea	y Truck	s: 43	.966			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fres	nel	Barrier Att	en Be	rm Atten
Autos:	70.20			0.7		-1.20		-4.65		000	0.000
Medium Trucks:				0.7		-1.20		-4.87		000	0.000
Heavy Trucks:	85.38	-17.26		0.7	3	-1.20		-5.43	0.0	000	0.000
Unmitigated Noise	e Levels (with	out Topo and	barrie	er atten	uation)						
VehicleType	Leq Peak Hou	ır Leq Day	/	Leq E	vening	Leq	Night		Ldn	C	NEL
Autos:			63.9		62.2		56.	1	64.		65.3
Medium Trucks:			57.8		51.5		49.	9	58.	4	58.6
Heavy Trucks:		**	66.2		57.2		58.	•	66.	-	66.9
Vehicle Noise:	70	).2	68.6		63.6		60.	8	69.	3	69.6
Centerline Distant	ce to Noise C	ontour (in feet	)								
				70 (	dBA	65	dBA	6	60 dBA	55	5 dBA
			Ldn:		45		96	3	207	, —	447
		C	NEL:		47		101	ĺ	218	3	469

	FHWA-RD	-77-108 HIGH	IWAY	NOISE	PREDIC	TION N	IODEL	(9/12/2	021)		
Road Nam	io: GP+P ne: Amargosa F nt: w/o Key Poi							Amarg 14848	osa and Pa	almetto	
	SPECIFIC IN	PUT DATA			):4- O				L INPUT	s	
Peak H Ve	Traffic (Adt): Percentage: lour Volume: hicle Speed: ne Distance:	11,296 vehicle 10.00% 1,130 vehicle 50 mph 48 feet			Me He <b>/ehicle</b> :		ucks (2 cks (3+	Autos: Axles): Axles):	15 15 15		
Site Data					ven	icleType	Autos:	77.5%	Evening 12.9%	Night 9.6%	Daily 93.95%
	rrier Height: 'all, 1-Berm):	0.0 feet 0.0				edium T Heavy T	rucks:	84.8% 86.5%	4.9%	10.3%	1.74%
Centerline Dist. Centerline Dist. Barrier Distance Observer Height (	to Observer: to Observer:	50.0 feet 50.0 feet 0.0 feet 5.0 feet 0.0 feet		۸	Mediu	Auto Marce Marce Marce Auto Marce Ma Marce Marce Marce Marce Marce Marce Marce Marce Marce Marce Ma Marce Marce Marce Marce Marce Marce Marce Marce Marce Marce Marce Ma Ma Marce Ma Ma Ma Ma Ma Ma Ma Ma Ma Ma Ma Ma Ma	s: (	ns (in fe 0.000 2.297 3.004	e <b>et)</b> Grade Adj	iustment	: 0.0
	Road Elevation: 0.0 feet  Road Grade: 0.0%  Left View: -90.0 degrees  Right View: 90.0 degrees				Lane Equivalent Distance (in feet) Autos: 44.147 Medium Trucks: 43.947 Heavy Trucks: 43.966						
FHWA Noise Mode	el Calculations	3									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fres	inel	Barrier Att	en Bei	m Atten
Autos: Medium Trucks: Heavy Trucks:	70.20 81.00 85.38	-2.04 -19.37 -15.41		0.71 0.74 0.73	1	-1.20 -1.20 -1.20		-4.65 -4.87 -5.43	0.0	000 000 000	0.000 0.000 0.000
Unmitigated Noise	Levels (with	out Topo and	barri	er atteni	uation)						
VehicleType	Leq Peak Hou			Leg Ev		Leg	Night		Ldn	С	NEL
Autos:	67.		65.8		64.0		58	.0	66.6	3	67.2
Medium Trucks:	61.	2	59.7		53.3		51	.8	60.2	2	60.4
Heavy Trucks: Vehicle Noise:	69. 72.		68.1 70.5		59.0 65.5		60 62		68.6 71.1		68.8 71.4
Centerline Distance	e to Noise Co	ntour (in feet	)								
				70 d	IBA	65	dBA	- 6	0 dBA	55	dBA
			Ldn:		59		12	-	275		593
		C	NEL:		62		13	4	289		622

Scenar	io: GP					Project	Nama:	Amar	osa and P	almetto	
	ne: Amargosa	Rd					umber:			aimeno	
	nt: w/o Key Po					JUD 11	uiiibei.	14040			
	SPECIFIC IN						IOISE	MODE	L INPUT	s	
Highway Data				s	ite Con				oft = 15)		
Average Daily	Traffic (Adt):	11.280 vehic	les					Autos.	15		
Peak Hour	Percentage:	10.00%			Me	dium Tr	ucks (2	Axles).	15		
Peak H	lour Volume:	1,128 vehicle	es		He	avy Tru	cks (3+	Axles).	15		
Ve	hicle Speed:	50 mph		V	ehicle l	Miv					
Near/Far La	ne Distance:	48 feet				icleType		Day	Evening	Night	Daily
Site Data							Autos:	77.5%	6 12.9%	9.6%	93.949
Bai	rrier Heiaht:	0.0 feet			Me	edium T	rucks:	84.89	6 4.9%	10.3%	1.749
Barrier Type (0-W		0.0			F	Heavy T	rucks:	86.5%	6 2.7%	10.8%	4.329
Centerline Di	st. to Barrier:	50.0 feet		N	loise Sc	ource El	evation	ns (in f	eet)		
Centerline Dist.	to Observer:	50.0 feet			0.00 00	Auto		.000	000,		
Barrier Distance	to Observer:	0.0 feet			Mediu	m Truck		297			
Observer Height (	(Above Pad):	5.0 feet				v Truck		.004	Grade Ad	liustment	0.0
Pa	ad Elevation:	0.0 feet				,				,	
Roa	ad Elevation:	0.0 feet		L	ane Eq	uivalen	Distar	ice (in	feet)		
	Road Grade:	0.0%				Auto	s: 44	.147			
	Left View:	-90.0 degre	es		Mediui	m Truck	s: 43	.947			
	Right View:	90.0 degre	ees		Heav	y Truck	s: 43	.966			
FHWA Noise Mode	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fres	nel	Barrier Att	en Ber	m Atten
Autos:	70.20	-2.04	ļ	0.71		-1.20		-4.65	0.0	000	0.00
Medium Trucks:	81.00	-19.37	7	0.74		-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	85.38	-15.41		0.73		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise	e Levels (with	out Topo and	barrie	er attenu	ıation)						
VehicleType	Leq Peak Hot		_	Leq Ev		Leq	Night		Ldn		NEL
Autos:		7.7	65.8		64.0		57.	-	66.0	-	67.
Medium Trucks:	-	1.2	59.7		53.3		51.	-	60.	_	60.
Heavy Trucks:		9.5	68.1		59.0		60.	-	68.	-	68.
Vehicle Noise:	72	2.1	70.5		65.5		62.	.7	71.	1	71.
Centerline Distant	ce to Noise C	ontour (in fee	t)	70							
			L	70 di		65	dBA		60 dBA		dBA
		,	Ldn:		59 62		12	-	275		593 623

Thursday, September 15, 2022

FHWA-RI	D-77-108 HIGHW	AY NOISI	E PREDIC	TION M	IODEL (	9/12/2	(021)		
Scenario: E Road Name: Amargosa Road Segment: e/o Key Po					Name: lumber:		gosa and Pa	almetto	
SITE SPECIFIC IN	IPUT DATA						L INPUT	S	
Highway Data			Site Con	ditions	(Hard =	10, S	oft = 15)		
Average Daily Traffic (Adt): Peak Hour Percentage: Peak Hour Volume:	6,340 vehicles 10.00% 634 vehicles			dium Tri avy Truc	ucks (2 )	,	: 15		
Vehicle Speed:	50 mph		Vehicle I	Wix					
Near/Far Lane Distance:	48 feet		Veh	icleType		Dav	Evening	Night	Dailv
Site Data					Autos:	77.59		9.6%	6 93.94%
Barrier Height:	0.0 feet		М	edium Ti	rucks:	84.89	6 4.9%	10.3%	6 1.74%
Barrier Type (0-Wall, 1-Berm):	0.0		1	Heavy T	rucks:	86.5%	6 2.7%	10.8%	4.32%
Centerline Dist. to Barrier:	50.0 feet		Noise So	ource El	evation	s (in f	eet)		
Centerline Dist. to Observer:	50.0 feet			Auto.	s: 0.	000			
Barrier Distance to Observer:	0.0 feet		Mediu	m Truck	s: 2.	297			
Observer Height (Above Pad):	5.0 feet		Heav	y Truck	s: 8.	004	Grade Ad	iustmen	t: 0.0
Pad Elevation:	0.0 feet			•					
Road Elevation:	0.0 feet		Lane Eq				feet)		
Road Grade:	0.0%			Auto.		147			
Left View:	-90.0 degrees			m Truck	10.	947			
Right View:	90.0 degrees		Heav	y Truck	s: 43.	966			
FHWA Noise Model Calculation	s								
VehicleType REMEL	Traffic Flow	Distance	Finite	Road	Fresi	nel	Barrier Att	en Be	rm Atten
Autos: 70.20	-4.55	0.	71	-1.20		-4.65	0.0	000	0.000
Medium Trucks: 81.00	-21.87	0.	74	-1.20		-4.87	0.0	000	0.000
Heavy Trucks: 85.38			73	-1.20		-5.43	0.0	000	0.000
Unmitigated Noise Levels (with									
VehicleType Leq Peak Hot			ening		Night		Ldn		NEL
	5.2 63		61.5		55.4		64.1		64.7
	3.7 57.	-	50.8		49.3	-	57.7		57.9
	7.0 65		56.5		57.8	_	66.		66.3
	9.6 68	.0	63.0		60.2	2	68.6	6	68.9
Centerline Distance to Noise Co	ontour (in feet)	70	dBA	65	dBA	1	60 dBA	5/	5 dBA
	Ld		40	00	87		187		404
	CNE		42		91		197		423

Thursday, September 15, 2022 Thursday, September 15, 2022

	FHWA-R	D-77-108 HIGH	IWAY	NOISE	PREDIC	TION N	IODEL (	9/12/2	021)		
	io: OY ne: Amargosa nt: e/o Key Po						Name: lumber:		osa and Pa	almetto	
	SPECIFIC II	IPUT DATA							L INPUT	S	
Highway Data					Site Con	ditions	(Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	6,620 vehicl	es					Autos:	15		
Peak Hour	Percentage:	10.00%			Me	dium Tr	ucks (2 )	4xles):	15		
Peak F	lour Volume:	662 vehicle	S		He	avy Tru	cks (3+ )	Axles):	15		
Ve	hicle Speed:	50 mph		ŀ	Vehicle	Mix					
Near/Far La	ne Distance:	48 feet		-		icleType		Day	Evening	Night	Daily
Site Data							Autos:	77.5%	12.9%	9.6%	93.94%
Ra	rrier Height:	0.0 feet			М	edium T	rucks:	84.8%	4.9%	10.3%	1.74%
Barrier Type (0-W		0.0			1	Heavy T	rucks:	86.5%	2.7%	10.8%	4.32%
Centerline Di	st. to Barrier:	50.0 feet		-	Noise So	urce F	lovation	e (in fa	not)		
Centerline Dist.	to Observer:	50.0 feet		1	140/36 00	Auto		000	,		
Barrier Distance	to Observer:	0.0 feet			Modiu	m Truck		297			
Observer Height	(Above Pad):	5.0 feet				ry Truck		004	Grade Ad	iustman	- 00
P	Pad Elevation:									, ao amon	0.0
Ro	Road Elevation:				Lane Eq	uivalen	t Distan	ce (in i	feet)		
	Road Grade:	0.0%				Auto		147			
	Left View:	-90.0 degre	es		Mediu	m Truck	s: 43.	947			
	Right View:	90.0 degre	es		Heav	y Truck	s: 43.	966			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow		stance		Road	Fresr	_	Barrier Att		rm Atten
Autos:	70.20			0.7		-1.20		-4.65		000	0.000
Medium Trucks:				0.7		-1.20		-4.87		000	0.000
Heavy Trucks:	85.38	-17.73		0.7	73	-1.20		-5.43	0.0	000	0.000
Unmitigated Nois			barri	er attei	nuation)						
VehicleType	Leq Peak Ho			Leq E	vening		Night		Ldn	_	NEL
Autos:		5.4	63.5		61.7		55.6	-	64.3	-	64.9
Medium Trucks:		3.9	57.3		51.0		49.4		57.9	-	58.1
Heavy Trucks:		7.2	65.8		56.7		58.0		66.3		66.5
Vehicle Noise:		9.7	68.1		63.2		60.3	3	68.8	3	69.1
Centerline Distan	ce to Noise C	ontour (in feet	)					_			
			L	70	dBA	65	dBA	4 - 7	60 dBA		dBA
		_	Ldn: NFL:		42		90		193		416
					44	4 94			202		436

Scenario: Road Name: Road Segment:	GP										
		D.J							osa and Pa	almetto	
Road Segment:						JOD N	iumber	14848			
	e/o Key Po	inte Dr.									
	ECIFIC IN	IPUT DATA							L INPUT	S	
Highway Data					Site Con	ditions	(Hard	= 10, Sc	oft = 15)		
Average Daily Tra	affic (Adt):	7,360 vehic	cles					Autos:	15		
Peak Hour Pe	ercentage:	10.00%			Me	dium Tr	ucks (2	Axles):	15		
Peak Hou	r Volume:	736 vehicl	es		He	avy Tru	cks (3+	- Axles):	15		
Vehic	de Speed:	50 mph		- 1	Vehicle I	Mix					
Near/Far Lane	Distance:	48 feet				icleType	,	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	12.9%	9.6%	93.949
Rarrie	er Height:	0.0 feet			Me	edium T	rucks:	84.8%	4.9%	10.3%	1.74%
Barrier Type (0-Wall		0.0			F	leavy T	rucks:	86.5%	2.7%	10.8%	4.32%
Centerline Dist.		50.0 feet		1	Voise So	urce E	levatio	ns (in fe	eet)		
Centerline Dist. to		50.0 feet				Auto	s: (	0.000	-		
Barrier Distance to		0.0 feet			Mediui	n Truck	s:	2.297			
Observer Height (Ab		5.0 feet			Heav	y Truck	s: (	3.004	Grade Adj	iustment	0.0
	Elevation:	0.0 feet		L		•					
	Elevation:	0.0 feet		4	Lane Equ				reet)		
	ad Grade:	0.0%				Auto		4.147			
	Left View:	-90.0 degr				n Truck		3.947			
R	right View:	90.0 degr	ees		neav	y Truck	S: 4	3.966			
FHWA Noise Model (			,		,						
VehicleType	REMEL	Traffic Flow		stance	Finite		Fre		Barrier Atte		m Atten
Autos:	70.20	-3.9	-	0.7		-1.20		-4.65	0.0		0.00
Medium Trucks:	81.00		-	0.7		-1.20		-4.87		000	0.00
Heavy Trucks:	85.38			0.7		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise L								_			
	eq Peak Hou			Leq E		Leq	Night		Ldn		NEL
Autos:	65	5.8 9.3	63.9		62.1 51.4		56		64.7		65. 58.
Medium Trucks:			57.8				49		58.4		
Heavy Trucks:		7.6	66.2		57.2		58		66.8		66.
Vehicle Noise:			68.6		63.6		60	1.8	69.3	5	69.
Centerline Distance	to Noise Co	ontour (in fee	et)	70 -	VDA I	er.	dD A	٠ ,	EO ADA		dD1
			Ldn:	70 c	1BA 45	05	dBA	16	60 dBA 207		dBA 446
			Lan:		45		٤	O	207		446

Scenario: Road Name:		d.				Project N Job Nu			osa and P	almetto	
Road Segment:	e/o Key Poin	ite Dr.									
	ECIFIC IN	PUT DATA							L INPUT	S	
Highway Data					Site Con	ditions (F	lard =	10, So	ft = 15)		
Average Daily Tra	affic (Adt):	7,328 vehicle	S					Autos:	15		
Peak Hour Pe	ercentage:	10.00%			Me	dium Truc	ks (2 )	Axles):	15		
Peak Hou	ır Volume:	733 vehicles			He	avy Truck	s (3+ )	Axles):	15		
Vehic	le Speed:	50 mph		1	/ehicle l	Miv					
Near/Far Lane	Distance:	48 feet		Ľ.		icleType		Dav	Evening	Night	Dailv
Site Data							itos:	77.5%			92.95
Rarrie	er Height:	0.0 feet			Me	edium Tru	cks:	84.8%	4.9%	10.3%	1.849
Barrier Type (0-Wall	-	0.0			F	Heavy Tru	cks:	86.5%	2.7%	10.8%	5.219
Centerline Dist.	. ,	50.0 feet			Vaina Ca	urce Ele	ration	a (in fa	net)		
Centerline Dist. to	Observer:	50.0 feet		,	voise sc	Autos:		000	el)		
Barrier Distance to	Observer:	0.0 feet			A desertion	Autos: m Trucks:		000 297			
Observer Height (Ab	ove Pad):	5.0 feet						297 004	Grade Ad	iuatmant	
Pad	Elevation:	0.0 feet			неач	y Trucks:	8.	004	Grade Ad	usunen	. 0.0
Road	Elevation:	0.0 feet		L	Lane Eq	uivalent L	Distan	ce (in f	feet)		
Ro	ad Grade:	0.0%				Autos:	44.	147			
	Left View:	-90.0 degree	S		Mediui	m Trucks:	43.	947			
R	ght View:	90.0 degree	8		Heav	y Trucks:	43.	966			
FHWA Noise Model (	Calculations										
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresi	nel .	Barrier Att	en Ber	m Atten
Autos:	70.20	-3.96		0.7	1	-1.20		-4.65	0.0	000	0.00
Medium Trucks:	81.00	-21.00		0.74	4	-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	85.38	-16.48		0.73	3	-1.20		-5.43	0.0	000	0.00
Unmitigated Noise L	evels (witho	ut Topo and b	arrie	er atten	uation)						
VehicleType Le	eq Peak Hour	Leq Day		Leq Ev	ening/	Leq N	ight		Ldn		NEL
Autos:	65.		3.9		62.1		56.0	-	64.		65.
Medium Trucks:	59.	5 5	8.0		51.7		50.	1	58.0	3	58.
Heavy Trucks:	68.		7.0		58.0		59.2		67.0		67.
Vehicle Noise:	70.	7 6	9.1		63.8		61.3	3	69.	7	70
Centerline Distance	to Noise Co	ntour (in feet)		70					0 104		
		,	L	70 c		65 dl			i0 dBA		dBA
		_	.dn:		48 50		103		222		47
		CN	ĽL.				108		232		50

Thursday, September 15, 2022

Barrier Height:   0.0   feet   0.0   feet		FHWA-RI	D-77-108 HIGH	IWAY	NOIS	E PREDIC	TION M	ODEL	(9/12/2	021)		
Autos: 15   Site Conditions (Hard = 10, Soft = 15)	Road Na	me: Amargosa									almetto	
Average Daily Traffic (Adt): 8,068 vehicles   Peak Hour Percentage: 10,00%   Medium Trucks (2 Axles): 15   Heavy Trucks (3 + Axles): 15		SPECIFIC IN	IPUT DATA			Sito Con					s	
Near/Far Lane   Distance:   48   feet     VehicleType   Day   Evening   Night   Daily	Average Dail Peak Hou Peak	ır Percentage: Hour Volume:	10.00% 807 vehicle			Ме Не	edium Tru eavy Truc	icks (2	Autos Axles)	15		
Autos: 77.5%   12.9%   9.6%   93.049	Near/Far L	.ane Distance:	48 feet						Dav	Evenina	Night	Daily
Noise Source Elevations (in feet)	В					М	A edium Tr	ucks:	84.89	6 12.9% 6 4.9%	9.6%	1.83%
Autos: 0.000		. ,				Maine C	ourse Ele	nicatio	na (in f	o net)		
Road Grade: 0.0%	Barrier Distanc Observer Heigh	e to Observer: t (Above Pad):	0.0 feet 5.0 feet			Mediu	Autos m Trucks	i: (	0.000 2.297		ljustmen	t: 0.0
Left View:	R	oad Elevation:	0.0 feet			Lane Eq	uivalent	Dista	nce (in	feet)		
VehicleType		Left View:	-90.0 degre				m Trucks	: 40	3.947			
Autos:         70.20         -3.54         0.71         -1.20         -4.65         0.000         0.00           Medium Trucks:         81.00         -20.61         0.74         -1.20         -4.87         0.000         0.00           Heavy Trucks:         85.38         -16.13         0.73         -1.20         -5.43         0.000         0.00           Unmitigated Noise Levels (without Topo and barrier attenuation)         VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         66.2         64.3         62.5         56.5         65.1         66.5           Medium Trucks:         59.9         58.4         52.1         50.5         59.0         59.           Heavy Trucks:         68.8         67.4         58.3         59.6         67.9         68.           Vehicle Noise:         71.0         69.5         64.2         61.6         70.1         70.           Centerline Distance to Noise Contour (in feet)	FHWA Noise Mo	del Calculation	s									
Medium Trucks:   81.00   -20.61   0.74   -1.20   -4.87   0.000   0.00     Heavy Trucks:   85.38   -16.13   0.73   -1.20   -5.43   0.000   0.00     Unmitigated Noise Levels (without Topo and barrier attenuation)	VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fres	snel	Barrier Att	ten Be	rm Atten
Heavy Trucks: 85.38	Autos	3: 70.20	-3.54		0.7	71	-1.20		-4.65	0.	000	0.000
VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         66.2         64.3         62.5         56.5         65.1         65.5           Medium Trucks:         59.9         58.4         52.1         50.5         59.0         59.           Heavy Trucks:         68.8         67.4         58.3         59.6         67.9         68.           Vehicle Noise:         71.0         69.5         64.2         61.6         70.1         70.           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         51         109         235         500												0.000
VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         66.2         64.3         62.5         56.5         65.1         65.5           Medium Trucks:         59.9         58.4         52.1         50.5         59.0         59.           Heavy Trucks:         68.8         67.4         58.3         59.6         67.9         68.           Vehicle Noise:         71.0         69.5         64.2         61.6         70.1         70.           Centerline Distance to Noise Contour (in feet)           Ldn:         51         109         235         50	Inmitiaated Noi	ea I avale (with	out Tono and	harri	or atto	nuation)						
Autos:         66.2         64.3         62.5         56.5         65.1         65.           Medium Trucks:         59.9         58.4         52.1         50.5         59.0         59.0         59.0         59.0         67.9         68.           Vehicle Noise:         71.0         69.5         64.2         61.6         70.1         70.           Centerline Distance to Noise Contour (in feet)           Ldn:         51         109         235         500							Leg I	Vight	T	Ldn	С	NEL
Heavy Trucks:   68.8   67.4   58.3   59.6   67.9   68.   Vehicle Noise:   71.0   69.5   64.2   61.6   70.1   70.   70.									.5	65.	1	65.7
Vehicle Noise:         71.0         69.5         64.2         61.6         70.1         70.           Centerline Distance to Noise Contour (in feet)           70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         51         109         235         507	Medium Trucks	s: 59	0.9	58.4		52.1		50	.5	59.	0	59.2
Centerline Distance to Noise Contour (in feet)           70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         51         109         235         500	Heavy Trucks	68	3.8	67.4		58.3		59	.6	67.	9	68.1
70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         51         109         235         507	Vehicle Noise	e: 71	.0	69.5	,	64.2		61	.6	70.	1	70.4
Ldn: 51 109 235 507	Centerline Dista	nce to Noise Co	ontour (in feet	)								
				L	70		65 0					
CNEL: 53 114 246 530									-		-	507
			С	NEL:		53		11	4	246	3	530

, September 15, 2022 Thursday, September 15, 2022

		FHWA-RD-	-77-108 HIGH	WAY	NOISE	PREDIC	CTION N	IODEL	(9/12/20	021)		
Average Daily Traffic (Adt):	Road Nam	e: Main St.	nte Dr.							osa and Pa	almetto	
Average Daily Traffic (Adf): 20,470 vehicles   Peak Hour Percentage: 10,00%   Medium Trucks: (2 Axles): 15   Heavy Trucks (3 + Axles): 15   Heavy Trucks: 17   Heavy Trucks: 17   Heavy Trucks: 18   Heavy Tru		SPECIFIC INF	PUT DATA								S	
Peak Hour Volume: 2,047 vehicles   Heavy Trucks (2 Axles): 15	Highway Data					Site Cor	ditions	(Hard :	= 10, Sc	ft = 15)		
Peak Hour Volume: 2,047 vehicles   Vehicle Speed: 55 mph   Vehicle Mix   Vehicle Mix   Vehicle Mix   Vehicle Mix   Vehicle Type   Day   Evening   Night   Daily   Site Data   Pearier Type (0-Wall, 1-Berm): 0.0   Heavy Trucks: 84.8%   4.9%   10.3%   1.74%   Heavy Trucks: 86.6%   2.7%   10.8%   4.32%   Medium Trucks: 85.000   Medium Trucks: 8.004   Grade Adjustment: 0.0   Medium Trucks: 8.004   Grade Adjustment: 0.0	Average Daily	Traffic (Adt): 2	20,470 vehicle	es					Autos:	15		
Vehicle Speed: Near/Far Lane Distance:         55 mph (78 feet)         Vehicle Mix         Vehicle Type         Day         Evening (Night)         Daily         Daily         Night         Daily         Daily         Night         Daily         Daily         Night         Nail         Night         Nail         Night         Nail         Nail <td>Peak Hour</td> <td>Percentage:</td> <td>10.00%</td> <td></td> <td></td> <td>Me</td> <td>edium Tr</td> <td>ucks (2</td> <td>Axles):</td> <td>15</td> <td></td> <td></td>	Peak Hour	Percentage:	10.00%			Me	edium Tr	ucks (2	Axles):	15		
Near/Far Lane Distance:   78 feet     VehicleType   Day   Evening   Night   Daily   Site Data     Night   Daily   Site Data   Night   Daily   Site Data   Night   Daily   Site Data   Night   Daily   Site Data   Night   Daily   Site Data   Night   Daily   Site Data   Night   Daily   Site Data   Night   Daily   Night   Da	Peak H	our Volume: 2	2,047 vehicle	S		He	eavy Tru	cks (3+	Axles):	15		
Near/Far Lane Distance: 78   feet     VehicleType   Day   Evening   Night   Daily	Ve	hicle Speed:	55 mph		- 1	Vehicle	Mix					
Medium Trucks: 84.8%   4.9%   10.3%   17.45	Near/Far La	ne Distance:	78 feet		Ė			9	Day	Evening	Night	Daily
Barrier Type (0-Wall, 1-Berm): 0.0   Heavy Trucks: 86.5% 2.7% 10.8% 4.325	Site Data							Autos:	77.5%	12.9%	9.6%	93.949
Barrier Type (0-Wall, 1-Berm): Centerline Dist. to Barrier: 60.0 feet Centerline Dist. to Observer: 60.0 feet Barrier Distance feet Barrier Distance feet Distance Finite Road Fresnet Barrier Atten Berrier Atten Berrier Distance feet Barrier Atten Berrier Distance feet Distance f	Rai	rier Height	0.0 feet			М	edium T	rucks:	84.8%	4.9%	10.3%	1.749
Centerline Dist. to Observer: Barrier Distance to Observer: 0.0 feet Barrier Distance to Observer: 0.0 feet Pad Elevation: 0.0 feet Pad Freside Pad Freside Pad Freside Pad Freside Pad Freside Pad							Heavy T	rucks:	86.5%	2.7%	10.8%	4.329
Autos: 0.000   Auto	Centerline Dis	st. to Barrier:	60.0 feet		1	Noise S	ource E	levatio	ns (in fe	et)		
Barrier Distance to Observer:   Observer Height (Above Pad): 5.0 feet   Heavy Trucks: 8.004   Grade Adjustment: 0.0     Pad Elevation: 0.0 feet   Have Trucks: 8.004   Grade Adjustment: 0.0     Road Elevation: 0.0 feet   Have Trucks: 8.004   Grade Adjustment: 0.0     Road Glevation: 0.00 feet   Have Trucks: 45.676     Autos: 45.676   Heavy Trucks: 45.676     Heavy Trucks: 82.40   -17.20   0.46   -1.20   -4.69   0.000   0.00     Heavy Trucks: 82.40   -17.20   0.49   -1.20   -4.69   0.000   0.00     Heavy Trucks: 82.40   -17.20   0.49   -1.20   -4.88   0.000   0.00     Heavy Trucks: 86.40   -13.24   0.48   -1.20   -5.34   0.000   0.00     Heavy Trucks: 10.00   Hea	Centerline Dist.	to Observer:	60.0 feet		F							
Distance   Helay   Trucks:   8.004   Grade   Adjustment: 0.0	Barrier Distance	to Observer:	0.0 feet			Mediu						
Pad Elevation: 0.0 feet	Observer Height (	Above Pad):	5.0 feet							Grade Ad	iustment	0.0
Road Grade:	Pá	ad Elevation:			L							
Left View:	Ros	ad Elevation:	0.0 feet		1	Lane Eq			_ •	eet)		
Right View: 90.0 degrees   Heavy Trucks: 45.695	I	Road Grade:	0.0%									
Private   Priv		Left View:										
VehicleType		Right View:	90.0 degree	es		Hea	vy Truck	s: 45	.695			
Autos:         71.78         0.13         0.46         -1.20         -4.69         0.000         0.00           Medium Trucks:         82.40         -17.20         0.49         -1.20         -4.88         0.000         0.00           Inmitigated Noise Levels (without Topo and barrier attenuation)	FHWA Noise Mode											
Medium Trucks: 82.40	- ''			Dis				Fres				
Heavy Trucks: 86.40						-						
Dimitigated Noise   Levels (without Topo and barrier attenuation)   VehicleType   Leq Peak Hour   Leq Day   Leq Evening   Leq Night   Ldn   CNEL						-						
VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         71.2         69.3         67.5         61.5         70.1         70.0           Medium Trucks:         64.5         63.0         56.6         55.1         63.5         63.           Heavy Trucks:         72.4         71.0         62.0         63.2         71.6         71.           Vehicle Noise:         75.2         73.6         68.8         65.8         74.3         74.           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         116         250         538         1,156							-1.20		-5.34	0.0	000	0.00
Autos:         71.2         69.3         67.5         61.5         70.1         70.           Medium Trucks:         64.5         63.0         56.6         55.1         63.5         63.           Heavy Trucks:         72.4         71.0         62.0         63.2         71.6         71.           Vehicle Noise:         75.2         73.6         68.8         65.8         74.3         74.           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         116         250         538         1,158		•					Log	Night		l dn		NEI
Medium Trucks:         64.5         63.0         56.6         55.1         63.5         63.           Heavy Trucks:         72.4         71.0         62.0         63.2         71.6         71.           Vehicle Noise:         75.2         73.6         68.8         65.8         74.3         74.           Centerline Distance to Noise Contour (in few)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         116         250         538         1,156					LUY LI				5			
Heavy Trucks:   72.4   71.0   62.0   63.2   71.6   71.0			_						-			
Vehicle Noise:         75.2         73.6         68.8         65.8         74.3         74.           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         116         250         538         1,158			-								-	
70 dBA 65 dBA 60 dBA 55 dBA Ldn: 116 250 538 1,158	-											74.
Ldn: 116 250 538 1,158	Centerline Distanc	e to Noise Cor	ntour (in feet	)								
110 250 550 1,150					70 0	dBA	65	dBA	6	0 dBA	55	dBA
CNEL: 122 262 565 1,218						116		25	)	538		1,159
			C	NEL:		122		26	2	565		1,218

Average Daily Traffic (Adt): 39,264 vehicles   Peak Hour Percentage: 10,00%   Medium Trucks (2 Axles): 15   Medium Trucks (2 Axles): 15   Vehicle Speed: NosiriFar Lane Distance: 78 feet   Vehicle Mix   Vehicle Type   Day   Evening   Night   Daily   Daily   Night   Night   Night   Daily   Night   Night												
Site Specific Input Data   Site Conditions (Hard = 10, Soft = 15)											almetto	
SITE SPECIFIC INPUT DATA   Site Conditions (Hard = 10, Soft = 15)							Job N	lumber.	14848			
Average Daily Traffic (Adt): 39,264 vehicles   Peak Hour Percentage: 10,00%   Peak Hour Volume: 3,926 vehicles   Vehicle Speed: Near/Far Lane Distance: 78 feet   Vehicle Mix   Vehicl	Road Segmen	it: w/o Key Po	ointe Dr.									
Average Daily Traffic (Adt): 39,264 vehicles   Peak Hour Pecrentage: 10,00%   Medium Trucks (2 Axles): 15   Heavy Trucks (3+ Axles): 15		SPECIFIC II	IPUT DATA			Cita Cas					S	
Peak Hour Percentage: 10.00%   Medium Trucks (2 Axles): 15	· ·					Site Cor	iaitions	(Hara	-			
Peak Hour Volume: Vehicle Speed: Vehicle Speed: Near/Far Lane Distance: 78 feet   Vehicle Mix   Vehicle Vehi		. ,	,	les								
Vehicle Speed: Near/Far Lane Distance: 78 feet   Vehicle Mix   Vehicle Type   Day   Evening   Night   Daily									,			
Near/Far Lane Distance:   78 feet   VehicleType   Day   Evening   Night   Daily			- ,	es		He	eavy Tru	icks (3+	Axles)	: 15		
Site Data   Autos: 77.5%   12.9%   9.6%   93.94					1	Vehicle	Mix					
Barrier Height:   0.0   feet	Near/Far Lar	ne Distance:	78 feet			Ver	icleType	е	Day	Evening	Night	Daily
Barrier Telgrit:   0.0   10   10   10   10   10   10   1	Site Data							Autos:	77.59	6 12.9%	9.6%	93.94%
Barrier Type (0-Wall, 1-Berm): 0.0   Centerline Dist. to Darrier: 60.0 feet   Centerline Dist. to Darrier: 60.0 feet   Centerline Dist. to Observer: 60.0 feet   Barrier Distance to Observer: 0.0 feet   Centerline Dist. to Observer: 60.0 feet   Centerline Distance to Observer: 60.0 feet   Centerline Distance to Observer: 60.0 feet   Centerline Distance In Interval I	Rar	rier Heiaht	0.0 feet			M	ledium 7	rucks:	84.89	6 4.9%	10.3%	1.74%
Centerline Dist. to Observer: Barrier Distance to Observer: Barrier Distance to Observer: Barrier Distance to Observer: 0.0 feet	Barrier Type (0-W	all, 1-Berm):	0.0				Heavy 7	rucks:	86.59	6 2.7%	10.8%	4.32%
Barrier Distance to Observer:					1	Noise S	ource E	levatio	ns (in t	eet)		
Medium Trucks:   2.297   Medium Trucks:   8.004   Grade Adjustment: 0.0							Auto	os: (	0.000	,		
Pad Elevation:			0.0 feet			Mediu	m Truck					
Pad Elevation: 0.0 feet   Lane Equivalent Distance (in feet)		,	5.0 feet			Hea	vv Truck	(S: 8	3.004	Grade Ad	justment	t: 0.0
Road Grade: 0.0%   Left View: 90.0 degrees   Medium Trucks: 45.869   Medium Trucks: 45.676   Heavy Trucks: 45.676   Heavy Trucks: 45.676   Heavy Trucks: 45.676   Heavy Trucks: 45.695   Heavy Trucks: 45.69			0.0 feet		L		•					
Left View:			0.0 feet		-	Lane Eq				feet)		
Right View: 90.0 degress   Heavy Trucks: 45.695	F											
		Left View:	-90.0 degre	ees								
VehicleType		Right View:	90.0 degre	ees		Hea	vy Truck	(S: 4	5.695			
Autos: 71.78   2.96   0.46   -1.20   -4.69   0.000   0.00				,								
Medium Trucks:   82.40								Fres				
Heavy Trucks:   86.40   -10.41   0.48   -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							-1.20		-5.34	0.0	000	0.00
Autos:         74.0         72.1         70.3         64.3         72.9         73.           Medium Trucks:         67.3         65.8         59.4         57.9         66.4         66.           Heavy Trucks:         75.3         73.8         64.8         66.1         74.4         74.           Vehicle Noise:         78.1         76.5         71.7         68.7         77.1         77.           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         179         385         830         1,781									_			
Medium Trucks:         67.3         65.8         59.4         57.9         66.4         66.           Heavy Trucks:         75.3         73.8         64.8         66.1         74.4         74.           Vehicle Noise:         78.1         76.5         71.7         68.7         77.1         77.           Centerline Distance to Noise:         Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         179         385         830         1,781				,	Leq E							
Heavy Trucks:   75.3   73.8   64.8   66.1   74.4   74.     Vehicle Noise:   78.1   76.5   71.7   68.7   77.1   77.     Centerline Distance to Noise Contour (in feet)											-	
Vehicle Noise:         78.1         76.5         71.7         68.7         77.1         77.1           Centerline Distance to Noise Contour (in feet)           To dBA         65 dBA         60 dBA         55 dBA           Ldn:         179         385         830         1,781												
Centerline Distance to Noise Contour (in feet)           70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         179         385         830         1,781	· -											
70 dBA 65 dBA 60 dBA 55 dBA Ldn: 179 385 830 1,78						71.7		68	.7	77.	1	77.
Ldn: 179 385 830 1,78	Centerline Distanc	e to Noise C	ontour (in fee	t)	70 -	ND A	e.	dBA		60 dB1	E E	dDA
				I do:	700		05					
CNEL: 188 400 872 1,879			_									,
			C	// 4LL.		100		40	0	012		1,078

Scenario Road Name Road Segmen	e: Main St.	inte Dr.					Name: umber:		osa and Pa	almetto	
SITE S Highway Data	PECIFIC IN	IPUT DATA		Ci	ita Can	N ditions			L INPUT	S	
				31	ile Con	uitions					
Average Daily T	. ,	39,240 vehicle	es					Autos:	15		
Peak Hour I		10.00%				dium Tru		,	15		
	our Volume:	3,924 vehicle	S		He	avy Truc	ks (3+ )	Axles):	15		
	icle Speed:	55 mph		Ve	ehicle l	Mix					
Near/Far Lan	e Distance:	78 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						F	lutos:	77.5%	12.9%	9.6%	93.94%
Ran	rier Height:	0.0 feet			M	edium Tr	ucks:	84.8%	4.9%	10.3%	1.749
Barrier Type (0-Wa	-	0.0			1	Heavy Tr	ucks:	86.5%	2.7%	10.8%	4.329
Centerline Dis	. ,	60.0 feet		-							
Centerline Dist. t		60.0 feet		N	oise Sc	ource El			eet)		
Barrier Distance t	o Observer:	0.0 feet				Autos		000			
Observer Height (A		5.0 feet				m Trucks		297			
	d Elevation:	0.0 feet			Heav	y Trucks	s: 8.	004	Grade Ad	iustment.	0.0
Roa	d Elevation:	0.0 feet		Lá	ane Eq	uivalent	Distan	ce (in t	eet)		
F	Road Grade:	0.0%				Autos	s: 45	869			
	Left View:	-90.0 degree	es		Mediu	m Trucks	3: 45	676			
	Right View:	90.0 degree	es		Heav	y Trucks	s: 45	695			
FHWA Noise Mode	l Calculation	s									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresi	nel	Barrier Att	en Ber	m Atten
Autos:	71.78	2.96		0.46		-1.20		-4.69	0.0	000	0.00
Medium Trucks:	82.40			0.49		-1.20		-4.88		000	0.00
Heavy Trucks:	86.40	-10.41		0.48		-1.20		-5.34	0.0	000	0.00
Unmitigated Noise											
	Leq Peak Hοι			Leq Eve		Leq			Ldn	-	VEL
Autos:			72.1		70.3		64.	-	72.9	-	73.
Medium Trucks:			65.8		59.4		57.	-	66.4		66.
Heavy Trucks:		i.3	73.8		64.8		66.		74.4		74.
Vehicle Noise:	78	3.1	76.5		71.7		68.	7	77.	1	77.
Centerline Distance	e to Noise Co	ontour (in feet	)	70 dE	21	65.4	4D A	- 6	O ARA	55	AD A
	e to Noise Co	ontour (in feet	Ldn:	70 dE	3 <i>A</i> 179	65 (	dBA 385		0 dBA 830		dBA 1.788

Thursday, September 15, 2022

FHWA-F	D-77-108 HIGHWA	Y NOISE	PREDIC	TION M	ODEL (9/1	2/2021)		
Scenario: GP Road Name: Main St. Road Segment: w/o Key P	ointe Dr.				Name: Am lumber: 148	nargosa and F 848	Palmetto	
SITE SPECIFIC I	NPUT DATA					DEL INPUT	rs	
Highway Data			Site Con	ditions	(Hard = 10	, Soft = 15)		
Average Daily Traffic (Adt):	41,730 vehicles				Au	tos: 15		
Peak Hour Percentage:	10.00%				ucks (2 Axl	,		
Peak Hour Volume:	4,173 vehicles		He	avy Truc	cks (3+ Axl	es): 15		
Vehicle Speed:	55 mph	ŀ	Vehicle	Mix				
Near/Far Lane Distance:	78 feet	F		icleType	Da	y Evening	Night	Daily
Site Data					Autos: 77	.5% 12.9%	9.69	6 93.94%
Barrier Height:	0.0 feet		М	edium T	rucks: 84	.8% 4.9%	10.39	6 1.74%
Barrier Type (0-Wall, 1-Berm):	0.0			Heavy T	rucks: 86	5.5% 2.7%	10.89	6 4.32%
Centerline Dist. to Barrier:	60.0 feet	ŀ	Noise Si	ource Fl	evations (i	in feet)		
Centerline Dist. to Observer:	60.0 feet	ŀ		Auto				
Barrier Distance to Observer:	0.0 feet		Mediu	m Truck		-		
Observer Height (Above Pad):	5.0 feet			y Truck			diustmer	nt: 0.0
Pad Elevation:	0.0 feet			•			,	
Road Elevation:	0.0 feet		Lane Eq	uivalent Auto	Distance s: 45.86			
Road Grade:	0.0%							
Left View:	-90.0 degrees			m Truck		-		
Right View:	90.0 degrees		Heav	y Truck	s: 45.69	5		
FHWA Noise Model Calculation	าร							
VehicleType REMEL	Traffic Flow D	Distance	Finite	Road	Fresnel	Barrier At	ten Be	erm Atten
Autos: 71.78	3.22	0.4	6	-1.20	-4.	.69 0	.000	0.000
Medium Trucks: 82.4		0.4	-	-1.20			.000	0.000
Heavy Trucks: 86.4	-10.15	0.4	8	-1.20	-5.	.34 0	.000	0.000
Unmitigated Noise Levels (with	hout Topo and bar	rier atter	nuation)					
VehicleType Leq Peak Ho			vening	Leq	Night	Ldn	_	CNEL
	4.3 72.4		70.6		64.5	73		73.8
	7.6 66.		59.7		58.2	66		66.9
	5.5 74.		65.1		66.3	74		74.8
Vehicle Noise: 7	8.3 76.7	7	71.9		68.9	77	.4	77.7
Centerline Distance to Noise C	contour (in feet)		10.4			00 /04	1 -	- 10.1
			dBA	65	dBA 404	60 dBA		5 dBA
	Ldn		186		401	86		1,863
	CNEL	-	196		422	90	9	1,958

	FHWA-RD	-77-108 HIGH	WAY	NOISE	PREDIC	CTION N	/IODEL	(9/12/2	021)		
Road Na	ario: GP+P me: Main St. ent: w/o Key Po	nte Dr.					t Name: lumber:		josa and P	almetto	
	SPECIFIC IN	PUT DATA							L INPUT	S	
Highway Data					Site Cor	nditions	(Hard =		oft = 15)		
	y Traffic (Adt):	41,754 vehicle 10.00%	es		1.6	edium Tı	ruelre (2	Autos:			
	ır Percentage: Hour Volume:	4.175 vehicles				eavy Tru		,			
	/ehicle Speed:	55 mph	•				cno (o ·	Axico).	. 10		
	ane Distance:	78 feet		1	/ehicle						
					Ver	nicleType		Day	Evening	Night	Daily
Site Data						ledium 7	Autos:	77.5% 84.8%		9.6%	
	arrier Height:	0.0 feet				Heavy T		86.5%		10.3%	
Barrier Type (0-		0.0				incuvy i	ruons.	00.57	0 2.170	10.0 /	9.3270
	Dist. to Barrier: t. to Observer:	60.0 feet 60.0 feet		1	Voise S	ource E	levation	ıs (in f	eet)		
Barrier Distance		0.0 feet				Auto		.000			
Observer Heigh		5.0 feet				m Truck		.297			
	Pad Elevation:	0.0 feet			Hea	vy Truck	(s: 8	.004	Grade Ad	justmen	t: 0.0
	oad Elevation:	0.0 feet		I	ane Eq	uivalen	t Distan	ce (in	feet)		
	Road Grade:	0.0%				Auto	s: 45	.869			
	Left View:	-90.0 degree	es		Mediu	m Truck	s: 45	.676			
	Right View:	90.0 degree	es		Hea	vy Truck	s: 45	.695			
FHWA Noise Mo	del Calculations	5									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fres	nel	Barrier Att	en Be	rm Atten
Autos		3.23		0.46	-	-1.20		-4.69		000	0.000
Medium Trucks		-14.10		0.49	-	-1.20		-4.88		000	0.000
Heavy Trucks		-10.15		0.48		-1.20		-5.34	0.0	000	0.000
Unmitigated Noi			_								
VehicleType	Leq Peak Hou			Leq E			Night		Ldn		NEL
Autos Medium Trucks		-	72.4 66.1		70.6 59.7		64. 58.	-	73. 66.	_	73.8 66.9
Heavy Trucks		-	74.1		65.1		66.	_	74.	-	74.8
Vehicle Noise			76.7		71.9		68.	-	77.		77.7
Centerline Dista	nce to Noise Co	ntour (in feet	)								
				70 c	IBA	65	dBA	-	60 dBA	55	dBA
			Ldn:		186		401	1	865	5	1,863
		CI	VEL:		196		422	2	909	)	1,958

	FHWA-R	D-77-108 HIGH	HWAY	NOISE	PREDIC	CTION N	MODEL (9/	12/2021)		
Scenari Road Nam Road Segmer	e: Main St.	inte Dr.					t Name: An Number: 14	nargosa and 848	Palme	tto
SITE	SPECIFIC II	NPUT DATA						DEL INPU	TS	
Highway Data				S	Site Cor	nditions	(Hard = 10	0, Soft = 15)		
Peak H	Traffic (Adt): Percentage: our Volume: hicle Speed:	29,510 vehicle 10.00% 2,951 vehicle 55 mph			He	eavy Tru	Au rucks (2 Ax icks (3+ Ax	,		
Near/Far Lai	ne Distance:	78 feet		V	/ehicle		- 10	5		64 D-3-
Site Data					ver	nicleType		ay Evening 7.5% 12.9%	_	ht Daily .6% 93.94%
Bar	rier Height:	0.0 feet			M	ledium 7	rucks: 84	4.8% 4.9%	6 10	.3% 1.74%
Barrier Type (0-W		0.0				Heavy 7	rucks: 86	6.5% 2.7%	6 10	.8% 4.32%
Centerline Dis	t. to Barrier:	60.0 feet			Inica S	ource F	levations (	(in foot)		
Roa	to Observer:	60.0 feet 0.0 feet 5.0 feet 0.0 feet 0.0 feet 0.0 feet 0.0% -90.0 degre	es	L	Hea ane Eq	Auto im Truck vy Truck iuivalen Auto im Truck	ks: 2.29 ks: 8.00 ht Distance	7 4 Grade A (in feet)	idjustn	nent: 0.0
	Right View:	90.0 degre	es		Hea	vy Truck	ks: 45.69	95		
VehicleType	REMEL	Traffic Flow	Die	tance	Einite	Road	Fresnel	Barrier A	Hon	Berm Atten
Autos:	71.78			0.46		-1.20			0.000	0.000
Medium Trucks:	82.40			0.49		-1.20			0.000	0.000
Heavy Trucks:	86.40			0.48		-1.20			0.000	0.000
Unmitigated Noise	Levels (with	out Topo and	barrie	er atteni	uation)					
VehicleType	Leq Peak Ho	ur Leq Da		Leq Ev	ening	Leq	Night	Ldn		CNEL
Autos:		2.8	70.9		69.1		63.0		1.7	72.3
Medium Trucks:		3.1	64.6		58.2		56.7		5.1	65.4
Heavy Trucks:		1.0	72.6		63.6		64.8		3.2	73.3
Vehicle Noise:	76	3.8	75.2		70.4		67.4	75	5.9	76.2
Centerline Distance	e to Noise C	ontour (in fee	1)	70 d	ID A		dBA	60 dBA		55 dBA
			Ldn:	700	148	05	319	60 dBA	06	1.479
		_	NEL:		155		335	72		1,479
		C	IVEL:		100		335	12	1 2	1,554

Scenario	: E					Project N	lame: i	Amarg	osa and P	almetto	
Road Name	: Main St.					Job Nu	mber:	14848			
Road Segment	t: e/o Key Poi	nte Dr.									
	PECIFIC IN	PUT DATA							L INPUT	S	
Highway Data				S	ite Con	ditions (l					
Average Daily T	. ,	11,910 vehicle	s				-	Autos:	15		
Peak Hour F	-	10.00%				dium Truc			15		
	ur Volume:	1,191 vehicles			He	avy Truck	s (3+ A	(xles	15		
	icle Speed:	55 mph		ν	ehicle I	Mix					
Near/Far Lan	e Distance:	78 feet			Vehi	icleType		Day	Evening	Night	Daily
Site Data						Au	itos:	77.5%	12.9%	9.6%	93.94
Barı	ier Heiaht:	0.0 feet			Me	edium Tru	cks:	84.8%	4.9%	10.3%	1.74
Barrier Type (0-Wa		0.0			F	Heavy Tru	cks:	86.5%	2.7%	10.8%	4.32
Centerline Dist	t. to Barrier:	60.0 feet			loisa So	urce Ele	vation	e (in fo	of)		
Centerline Dist. to	Observer:	60.0 feet			10/36 00	Autos:		000	icij		
Barrier Distance to	Observer:	0.0 feet			Modius	m Trucks:		297			
Observer Height (A	lbove Pad):	5.0 feet				v Trucks:		004	Grade Ad	iustmant	- 0.0
Pad	d Elevation:	0.0 feet			ricav	y ITUCKS.	0.1	004	Orauc Au	justinoni	. 0.0
Road	d Elevation:	0.0 feet		L	ane Equ	uivalent l	Distand	ce (in t	eet)		
R	oad Grade:	0.0%				Autos:	45.	869			
	Left View:	-90.0 degree	S		Mediur	m Trucks:	45.	676			
	Right View:	90.0 degree	S		Heav	y Trucks:	45.	695			
FHWA Noise Model	Calculations	3									
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite	Road	Fresn	el	Barrier Att	en Bei	m Atter
Autos:	71.78	-2.22		0.46	i	-1.20		-4.69	0.0	000	0.0
Medium Trucks:	82.40	-19.55		0.49	)	-1.20		-4.88	0.0	000	0.00
Heavy Trucks:	86.40	-15.59		0.48	}	-1.20		-5.34	0.0	000	0.0
Unmitigated Noise			oarriei	attenu	ıation)						
	.eq Peak Hou		_	Leq Ev		Leq N	•		Ldn		NEL
Autos:	68		6.9		65.2		59.1		67.		68
Medium Trucks:	62		6.0		54.3		52.7		61.3	_	61
Heavy Trucks:	70		8.7		59.6		60.9		69.:		69
Vehicle Noise:	72	.9 7	1.3		66.5		63.5	5	71.	9	72
Centerline Distance	e to Noise Co	ntour (in feet)						,		1	
			L	70 d		65 di			i0 dBA		dBA
		_	.dn:		81		174		375		80
		CA	IEL:		85		183		394		84

Thursday, September 15, 2022

Heavy Trucks: 86.5% 2.7% 10.8% 4.54%		FHWA-R	D-77-108 HIG	HWA'	Y NOIS	E PREDIC	CTION M	ODEL	(9/12/2	021)		
Average Daily Traffic (Adt): 30,178 vehicles   Peak Hour Percentage: 10,00%   Peak Hour Volume: 3,018 vehicles   Vehicle Speed: 55 mph   Near/Far Lane Distance: 78 feet   Vehicle Mix   Vehicle Type   Day   Evening   Night   Daily   Site Data   Data   Data   Notes: 77.5%   12,9%   9,6%   93,69%   Notes Peak Hour Distance to Noise Centerline Dist. to Barrier: 60,0 feet   Barrier Distance to Observer: 60,0 feet   Centerline Dist. to Barrier: 60,0 feet   Centerline Dist. to Observer: 60,0 feet   Centerline Dist. to Observer: 60,0 feet   Road Elevation: 0,0 feet   Lane Equivalent Distance (in feet)   Lane Equiva	Road Na	me: Main St.	ointe Dr.								almetto	
Average Daily Traffic (Adt): 30,178 vehicles   Peak Hour Percentage: 10,00%   Medium Trucks (2 Axles): 15   Heavy Trucks (3+ Axles): 15		SPECIFIC II	NPUT DATA			Sito Con					s	
Near/Far Lane Distance: 78 feet   Verhicle Type   Day   Evening   Night   Daily	Average Dail Peak Hot Peak	ur Percentage: Hour Volume:	10.00% 3,018 vehicl			Ме	edium Tru	cks (2	Autos Axles)	15		
Site Data												
Barrier Height:   D.0   feet   Barrier Type (0-Wall, 1-Berm):   0.0   feet   Heavy Trucks:   84.8%   4.9%   10.3%   1.76%   Heavy Trucks:   86.5%   2.7%   10.8%   4.54%   Moise Source Elevations (in feet)   Moise Source Elevations (in feet)   Moise Source Elevations (in feet)   Heavy Trucks:   2.287   Heavy Trucks:   8.004   Grade Adjustment:   0.0   Grade Adjustment:		ane Distance.	70 1001			Veh				-		. ,
Centerline Dist. to Observer: Barrier Distance to Observer: Borner Distance to Observer: Barrier Distance to Observer: 0.0 feet	В						edium Tr	ucks:	84.89	6 4.9%	10.3%	1.76%
Centerline Dist. to Observer: 6.0.0 feet   Barrier Distance to Observer Pad]: 5.0 feet   Pad Elevation: 0.0 feet   Pad Elevation: 0.0 feet   Pad Elevation: 0.0 feet   Road Grade: 0.0%   Pad Elevation: 0.0 feet   Road Grade: 0.0%   Pad Elevation: 0.0 feet   Pad Elevation: 0.0	Centerline L	Dist. to Barrier:	60.0 feet			Noise S	ource Fla	vatio	ne (in f	oot)		
Road Elevation:	Barrier Distance Observer Heigh	e to Observer: t (Above Pad):	0.0 feet 5.0 feet			Mediu	Autos m Trucks	: 0 : 2	0.000 2.297		ljustment	± 0.0
Left View:	R	oad Elevation:				Lane Eq	uivalent	Distar	nce (in	feet)		
VehicleType		Left View:	-90.0 degr				m Trucks	: 45	5.676			
VehicleType	FHWA Noise Mo	del Calculation	18									
Autos: 71.78   1.80   0.46   -1.20   -4.69   0.000   0.00				D	istance	Finite	Road	Fres	nel	Barrier Att	ten Bei	rm Atten
Heavy Trucks: 86.40	Autos	s: 71.78	3 1.8	0	0.	46	-1.20		-4.69	0.	000	0.000
Unmitigated Noise Levels (without Topo and barrier attenuation)   VehicleType   Leq Peak Hour   Leq Day   Leq Evening   Leq Night   Ldn   CNEL	Medium Trucks	s: 82.40	-15.4	5	0.	49	-1.20		-4.88	0.	000	0.000
VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         72.8         70.9         69.2         63.1         71.7         77.2           Medium Trucks:         66.2         64.7         58.4         56.8         65.3         65.           Heavy Trucks:         74.3         72.9         63.9         65.1         73.5         73.1           Vehicle Noise:         77.0         75.4         70.6         67.6         76.1         76.           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         153         329         709         1,526	Heavy Trucks	s: 86.40	-11.3	4	0.	48	-1.20		-5.34	0.	000	0.000
Autos:         72.8         70.9         69.2         63.1         71.7         72.7           Medium Trucks:         66.2         64.7         58.4         56.8         65.3         65.           Heavy Trucks:         74.3         72.9         63.9         65.1         73.5         73.           Vehicle Noise:         77.0         75.4         70.6         67.6         76.1         76.           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         153         329         709         1,528	Unmitigated Noi	se Levels (with	hout Topo and	d barr	ier atte	nuation)						
Medium Trucks:         66.2         64.7         58.4         56.8         65.3         65.           Heavy Trucks:         74.3         72.9         63.9         65.1         73.5         73.           Vehicle Noise:         77.0         75.4         70.6         67.6         76.1         76.           Centerline Distance to Noise:         Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         153         329         709         1,526				-	,							
Heavy Trucks: 74.3 72.9 63.9 65.1 73.5 73.1												72.4
Vehicle Noise:         77.0         75.4         70.6         67.6         76.1         76.           Centerline Distance to Noise Contour (in feet)           70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         153         329         709         1,526		-									-	
70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         153         329         709         1,526											-	73.6 76.4
70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         153         329         709         1,526	Centerline Dista	nce to Noise C	ontour (in fee	et)								
	Contonine Dista		omour (m rec	,	70	dBA	65 0	iBA		60 dBA	55	dBA
CNEL: 160 346 745 1,605				Ldn:		153		32	9	709	)	1,529
			(	CNEL:		160		34	6	745	5	1,605

Thursday, September 15, 2022

	FHWA-R	D-77-108 HIGH	WAY	NOISE	PREDIC	CTION N	MODEL (	(9/12/2	(021)		
	io: GP le: Main St. nt: e/o Key Po	inte Dr.					t Name: lumber:		gosa and P	almetto	
	SPECIFIC II	NPUT DATA			0				L INPUT	S	
Highway Data					Site Cor	aitions	(Hara =				
Average Daily	. ,	27,250 vehicle	es					Autos			
	Percentage:	10.00%					rucks (2	,			
	lour Volume:	2,725 vehicle	S		He	eavy Tru	icks (3+	Axles)	: 15		
	hicle Speed:	55 mph		ľ	Vehicle	Mix					
Near/Far La	ne Distance:	78 feet		ľ	Veh	icleType	9	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	6 12.9%	9.69	6 93.94%
Bai	rrier Height:	0.0 feet			М	edium 7	rucks:	84.89	6 4.9%	10.39	6 1.74%
Barrier Type (0-W		0.0				Heavy 7	rucks:	86.5%	6 2.7%	10.89	6 4.32%
Centerline Dis	st. to Barrier:	60.0 feet		ŀ	Noise S	nurca E	lovation	e (in f	oot)		
Centerline Dist.	to Observer:	60.0 feet		ŀ	NOISE S	Auto		.000	eeij		
Barrier Distance	to Observer:	0.0 feet			Modiu	m Truck		.297			
Observer Height (	Above Pad):	5.0 feet				vy Truck		.004	Grade Ad	liuetmar	t: 0.0
Pa	ad Elevation:	0.0 feet			i ica	vy IIucr	13. 0	.004	Orauc Au	justinoi	12. 0.0
Roa	ad Elevation:	0.0 feet			Lane Eq	uivalen	t Distan	ce (in	feet)		
1	Road Grade:	0.0%				Auto	s: 45	.869			
	Left View:	-90.0 degre	es		Mediu	m Truck	s: 45	.676			
	Right View:	90.0 degre	es		Hea	vy Truck	(s: 45	.695			
FHWA Noise Mode	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	tance	_	Road	Fres	_	Barrier Att		erm Atten
Autos:	71.78			0.4		-1.20		-4.69		000	0.000
Medium Trucks:	82.40			0.4		-1.20		-4.88		000	0.000
Heavy Trucks:	86.40	-12.00		0.4	18	-1.20		-5.34	0.0	000	0.000
Unmitigated Noise	e Levels (with	out Topo and	barrie	er attei	nuation)						
VehicleType	Leq Peak Ho			Leq E	vening		Night		Ldn		CNEL
Autos:		2.4	70.5		68.7		62.		71.	-	71.9
Medium Trucks:		5.7	64.2		57.9		56.	-	64.	-	65.0
Heavy Trucks:		3.7	72.3		63.2		64.		72.		73.0
Vehicle Noise:	76	3.5	74.9		70.1		67.	1	75.	5	75.9
Centerline Distance	e to Noise C	ontour (in feet	)								
			L	70	dBA	65	dBA		60 dBA	_	5 dBA
			Ldn:		140		302	-	651		1,402
		C	VEL:		147		317	7	684	ļ.	1,474

	THWA-K	D-77-108 HIG	лιννΑι	NOISE	- PKEDIC	STION I	MODEL	(9/12/2	02-1)		
Scenario									osa and P	almetto	
Road Name						Job N	lumber:	14848			
Road Segmen	t: e/o I-15 NE	3 Ramps									
	SPECIFIC IN	NPUT DATA	١		0				L INPUT	S	
Highway Data					Site Cor	nditions	(Hard				
Average Daily	. ,	41,530 vehi	cles					Autos:			
	Percentage:	10.00%				edium Ti		,			
	our Volume:	4,153 vehic	les		He	eavy Tru	icks (3+	Axles):	15		
	nicle Speed:	55 mph		- 1	Vehicle	Mix					
Near/Far Lar	ne Distance:	78 feet		F	Veh	nicleType	9	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	12.9%	9.6%	93.94%
Bar	rier Heiaht:	0.0 feet			M	1edium 7	rucks:	84.8%	4.9%	10.3%	1.74%
Barrier Type (0-Wa		0.0				Heavy 1	rucks:	86.5%	2.7%	10.8%	4.32%
Centerline Dis		60.0 feet		ı	Noise S	ource E	levatio	ns (in f	eet)		
Centerline Dist. t		60.0 feet				Auto	s: (	0.000	,		
Barrier Distance t		0.0 feet			Mediu	ım Truck		2.297			
Observer Height (	,	5.0 feet			Hea	vy Truck	(s: 8	3.004	Grade Ad	justment	0.0
	d Elevation:	0.0 feet				•					
	d Elevation:	0.0 feet			Lane Eq				reet)		
F	Road Grade:	0.0%				Auto		5.869			
	Left View:	-90.0 degr				ım Truck		5.676			
	Right View:	90.0 degr	ees		неа	vy Truck	(S: 45	5.695			
FHWA Noise Mode	l Calculation	ıs									
VehicleType	REMEL	Traffic Flow		istance		Road	Fres		Barrier Att		m Atten
Autos:	71.78			0.4	-	-1.20		-4.69		000	0.00
Medium Trucks:	82.40		_	0.4	-	-1.20		-4.88		000	0.00
Heavy Trucks:	86.40			0.4		-1.20		-5.34	0.0	000	0.00
Unmitigated Noise								_			
	Leq Peak Ho				vening		Night		Ldn		VEL
Autos:		4.2	72.3		70.6		64		73.		73.
Medium Trucks:		7.6	66.1		59.7		58		66.0	-	66.
Heavy Trucks:		5.5	74.1		65.1		66		74.		74.
Vehicle Noise:	78	3.3	76.7		71.9	)	68	.9	77.4	4	77.
Centerline Distanc	e to Noise C	ontour (in fe	et)	70	-/D.4		-10.4	1 .	CO -(D.4		-/D.4
			1 4		dBA	65	dBA		60 dBA		dBA
			Ldn: CNFL:		186 195		40 42	-	862 906		1,857
			CIVEL:		195		42	U	900		1,951

	io: GP+P								osa and P	almetto	
	ne: Main St. nt: e/o Key Po	into Dr				Job Nu	mber:	14848			
	SPECIFIC II	NPUT DATA							L INPUT	S	
Highway Data				Si	te Con	ditions (i					
Average Daily	. ,	27,918 vehicle	es				-	Autos:	15		
	Percentage:	10.00%				dium Tru		,			
	lour Volume:	2,792 vehicle	S		He	avy Truck	ks (3+ A	(xles	15		
	hicle Speed:	55 mph		Ve	ehicle l	Иiх					
Near/Far La	ne Distance:	78 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						A	ıtos:	77.5%	12.9%	9.6%	93.679
Bai	rrier Height:	0.0 feet			Me	edium Tru	icks:	84.8%	4.9%	10.3%	1.779
Barrier Type (0-W	-	0.0			F	Heavy Tru	icks:	86.5%	2.7%	10.8%	4.569
Centerline Di	st. to Barrier:	60.0 feet		N	niee Sc	urce Ele	vation	e (in fa	not)		
Centerline Dist.	to Observer:	60.0 feet		/**	<i>7</i> 136 00	Autos.		000	.01)		
Barrier Distance	to Observer:	0.0 feet			Modiu	m Trucks.		297			
Observer Height (	Above Pad):	5.0 feet				y Trucks.		004	Grade Ad	iustment	0.0
Pa	ad Elevation:	0.0 feet			ricav	y mucho.	0.1	004	0,000,10	Juotimom	0.0
Roa	ad Elevation:	0.0 feet		Lá	ne Eq	uivalent l	Distand	ce (in i	feet)		
	Road Grade:	0.0%				Autos.					
	Left View:	-90.0 degre	es			m Trucks.					
	Right View:	90.0 degre	es		Heav	y Trucks.	45.	695			
FHWA Noise Mode	el Calculation	s									
	REMEL	Traffic Flow	Distai		Finite	Road	Fresn	_	Barrier Att		m Atten
VehicleType				0.46		-1.20		-4.69	0.0	000	0.00
Autos:	71.78										
Autos: Medium Trucks:	82.40	-15.78		0.49		-1.20		-4.88		000	
Autos:		-15.78								000	
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise	82.40 86.40 <b>e Levels (with</b>	-15.78 -11.66 nout Topo and	barrier a	0.49 0.48 attenu		-1.20 -1.20		-4.88	0.0	000	0.00
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType	82.40 86.40 <b>E Levels (with</b> Leq Peak Ho	-15.78 -11.66 nout Topo and ur Leq Daj	barrier a	0.49	ning	-1.20	light	-4.88 -5.34	0.0	000 C	0.00 VEL
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos:	82.40 86.40 E Levels (with Leq Peak Ho	-15.78 -11.66 nout Topo and ur Leq Day 2.5	barrier a	0.49 0.48 attenu	ning 68.8	-1.20 -1.20	light 62.8	-4.88 -5.34	0.0 Ldn 71.4	000 Ci	0.00 VEL 72
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks:	82.40 86.40 E Levels (with Leq Peak Ho	-15.78 -11.66 	barrier a / L 70.6 64.4	0.49 0.48 attenu	68.8 58.0	-1.20 -1.20	light 62.8 56.5	-4.88 -5.34	0.0 <i>Ldn</i> 71	C/4	0.00 VEL 72. 65.
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise Vehicle Type Autos: Medium Trucks: Heavy Trucks:	82.40 86.40 8 Levels (with Leq Peak Ho 72 68	-15.78 -11.66 -11.66 -10ut Topo and ur Leq Day 2.5 5.9 4.0	barrier a / L 70.6 64.4 72.6	0.49 0.48 attenu	68.8 58.0 63.6	-1.20 -1.20	light 62.8 56.5 64.8	-4.88 -5.34	0.0 Ldn 71.4 65.0 73.3	Ci 4 0 2	72. 65. 73.
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noiss VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	82.40 86.40 8 Levels (with Leq Peak Hon 72 68 74	-15.78 -11.66 -11.66 -10ut Topo and ur Leq Day 2.5 5.9 4.0 6.7	barrier a / L 70.6 64.4 72.6 75.1	0.49 0.48 attenu	68.8 58.0	-1.20 -1.20	light 62.8 56.5	-4.88 -5.34	0.0 <i>Ldn</i> 71	Ci 4 0 2	0.00 VEL 72 65 73
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noiss VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	82.40 86.40 8 Levels (with Leq Peak Hon 72 68 74	-15.78 -11.66 -11.66 -10ut Topo and ur Leq Day 2.5 5.9 4.0 6.7	barrier a / L 70.6 64.4 72.6 75.1	0.49 0.48 attenue eq Eve	68.8 58.0 63.6 70.2	-1.20 -1.20	light 62.8 56.5 64.8 67.3	-4.88 -5.34	0.0 Ldn 71.4 65.0 73.3 75.4	Ci 4 0 2 8	0.00 VEL 72 65 73 76
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noiss VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	82.40 86.40 8 Levels (with Leq Peak Hon 72 68 74	-15.78 -11.66 -11.66 -10ut Topo and ur Leq Day 2.5 5.9 4.0 6.7	barrier a 70.6 64.4 72.6 75.1	0.49 0.48 attenu	68.8 58.0 63.6 70.2	-1.20 -1.20	62.8 56.5 64.8 67.3	-4.88 -5.34	0.0 Ldn 71.4 65.1 73.3 75.6	Ci 4 0 2 8	0.00 VEL  72. 65. 73. 76.
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks:	82.40 86.40 8 Levels (with Leq Peak Hon 72 68 74	15.78 1.66 1.60 1.60 1.60 1.60 1.60 1.60 1.60	barrier a / L 70.6 64.4 72.6 75.1	0.49 0.48 attenue eq Eve	68.8 58.0 63.6 70.2	-1.20 -1.20	light 62.8 56.5 64.8 67.3	-4.88 -5.34	0.0 Ldn 71.4 65.0 73.3 75.4	C/4 4 00 22 BB	72. 65. 73. 76.

Thursday, September 15, 2022

	FHWA-RI	D-77-108 HIGHV	VAY NOIS	SE PREDIC	TION M	ODEL (	9/12/2	(021)		
Scenario Road Name Road Segment	: Main St.	Ramps				Name: umber:		gosa and P	almetto	)
	PECIFIC IN	IPUT DATA						L INPUT	S	
Highway Data				Site Con	ditions	(Hard =	10, S	oft = 15)		
Average Daily T Peak Hour F Peak Ho	. ,	46,730 vehicles 10.00% 4,673 vehicles	3		edium Tru eavy Truc	ıcks (2	/	: 15		
Veh	icle Speed:	55 mph		Vehicle	Mix					
Near/Far Lan	e Distance:	78 feet			icleType		Dav	Evening	Night	Daily
Site Data				1		Autos:	77.59		9.6	
Pare	ier Height:	0.0 feet		М	edium Ti	rucks:	84.89	6 4.9%	10.3	% 1.74%
Barrier Type (0-Wa	ill, 1-Berm):	0.0		1	Heavy Ti	rucks:	86.5%	6 2.7%	10.8	% 4.32%
Centerline Dist		60.0 feet		Noise S	ource El	evation	s (in f	eet)		
Centerline Dist. to		60.0 feet			Auto	s: 0.	000			
Barrier Distance to		0.0 feet		Mediu	m Truck:	s: 2.	297			
Observer Height (A	,	5.0 feet		Heav	vy Trucks	s: 8.	004	Grade Ad	justme	nt: 0.0
	d Elevation:	0.0 feet			•					
Road	d Elevation:	0.0 feet		Lane Eq				feet)		
R	oad Grade:	0.0%			Auto		.869			
	Left View:	-90.0 degrees	3	Mediu	m Truck	s: 45	.676			
	Right View:	90.0 degrees	3	Hear	y Truck:	s: 45	.695			
FHWA Noise Model	Calculation	s								
VehicleType	REMEL	Traffic Flow	Distance	Finite	Road	Fresi	nel	Barrier Att	en B	erm Atten
Autos:	71.78	3.72	0	.46	-1.20		-4.69	0.0	000	0.000
Medium Trucks:	82.40	-13.61	0	.49	-1.20		-4.88	0.0	000	0.000
Heavy Trucks:	86.40	-9.65	0	.48	-1.20		-5.34	0.0	000	0.000
Unmitigated Noise										
	Leq Peak Hou			Evening	,	Night		Ldn		CNEL
Autos:	74		2.9	71.1		65.		73.		74.3
Medium Trucks:	68		6.6	60.2		58.		67.		67.4
Heavy Trucks:	76		4.6	65.6		66.	-	75.:		75.3
Vehicle Noise:	78		7.2	72.4		69.	4	77.9	9	78.2
Centerline Distance	to Noise Co	ontour (in feet)	7	0 dBA	65	dBA		60 dBA	-	55 dBA
		,	dn:	201	00	и <i>в</i> м 433		932		2.009
		CN		201		455		932		2,009
		CN	LL.	211		455	,	980	'	2,111

FHW	\-RD-7	7-108 HIGH	WAY	NOISE	PREDIC	TION N	MODEL	(9/12/2	021)		
Scenario: OY+P Road Name: Main S Road Segment: e/o I-15	-	amps					t Name: lumber:		osa and P	almetto	
SITE SPECIFIC	INP	UT DATA							L INPUT	s	
Highway Data				8	Site Cor	ditions	(Hard :	= 10, Sc	oft = 15)		
Average Daily Traffic (Ad	,	3,967 vehicle	es					Autos:			
Peak Hour Percentag		0.00%				edium Tr		,			
Peak Hour Volum		697 vehicles	3		He	eavy Tru	icks (3+	Axles):	15		
Vehicle Spee		55 mph		١	/ehicle	Mix					
Near/Far Lane Distant	e:	78 feet			Veh	icleType	9	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	12.9%	9.6%	93.97%
Barrier Heigi	t:	0.0 feet			М	edium T	rucks:	84.8%	4.9%	10.3%	1.73%
Barrier Type (0-Wall, 1-Berr		0.0				Heavy T	rucks:	86.5%	2.7%	10.8%	4.30%
Centerline Dist. to Barri		60.0 feet			Voise S	ource E	levatio	ns (in f	eet)		
Centerline Dist. to Observe		60.0 feet				Auto	s: 0	0.000	,		
Barrier Distance to Observ		0.0 feet			Mediu	m Truck	(s: 2	2.297			
Observer Height (Above Pa	/	5.0 feet			Hear	vy Truck	(s: 8	3.004	Grade Ad	justment	0.0
Pad Elevation		0.0 feet		١.							
Road Elevation		0.0 feet		L	ane Eq	uivalen			feet)		
Road Grad		0.0%				Auto		5.869			
Left Vie		-90.0 degree				m Truck		5.676			
Right Vie	W:	90.0 degree	es		Hea	vy Truck	(S: 45	5.695			
FHWA Noise Model Calcula					,						
VehicleType REMEL	_	raffic Flow	Dis	stance		Road	Fres		Barrier At		m Atten
	.78	3.74		0.46	-	-1.20		-4.69		000	0.000
	.40	-13.61		0.49	-	-1.20		-4.88		000	0.000
Heavy Trucks: 86	.40	-9.65		0.48	3	-1.20		-5.34	0.	000	0.000
Unmitigated Noise Levels (		•						_			
VehicleType Leq Peak Autos:	74.8	Leq Day	72.9	Leq Ev	rening 71.1		Night 65	4	Ldn 73.		NEL 74.3
			66.6		60.2		58		73. 67.	•	67.4
Medium Trucks:	68.1 76.0		74.6		65.6		66		75.		
Heavy Trucks: Vehicle Noise:	78.8		77.2		72.4		69		77.		75.3 78.2
Centerline Distance to Nois	e Cont	our (in feet)									
Diotance to Nois	. 00.11	( 1361)		70 a	ID A	65	dBA	-	60 dBA	55	dBA
				700	IDA	00	0271	١,	, ab,	00	uD, i
			Ldn:	700	201	00	43		934		2,012

	FHWA-RD-7	77-108 HIGHW	AY NOIS	E PREDIC	CTION IV	IODEL (9/1	2/2021)	
Scenario Road Name Road Segment	: Main St.	amps				Name: Am lumber: 148	argosa and Pal 48	lmetto
	PECIFIC INP	UT DATA					DEL INPUTS	
Highway Data				Site Con	ditions	(Hard = 10,	Soft = 15)	
	Percentage: 1 ur Volume: 5 icle Speed:	1,517 vehicles 0.00% ,152 vehicles 55 mph 78 feet		Vehicle	eavy Trui Mix	Aut ucks (2 Axle cks (3+ Axle	es): 15 es): 15	
	Dictarioo.	70 1001		Veh	icleType			Night Daily
Barrier Type (0-Wa Centerline Dist Centerline Dist. to Barrier Distance to	to Barrier: Observer: Observer:	0.0 feet 0.0 60.0 feet 60.0 feet 0.0 feet		Noise S	edium T Heavy T	rucks: 84 rucks: 86 <b>evations (i</b> s: 0.000	,	9.6% 93.97% 10.3% 1.73% 10.8% 4.30%
Observer Height (A	,	5.0 feet			vy Truck			stment: 0.0
	d Elevation:	0.0 feet 0.0 feet				Distance (		
		0.0% -90.0 degrees 90.0 degrees			Auto m Truck vy Truck	s: 45.676	5	
FHWA Noise Model	Calculations							
VehicleType	REMEL 1	raffic Flow	Distance	Finite	Road	Fresnel	Barrier Atte	n Berm Atten
Autos:	71.78	4.14	0	.46	-1.20	-4.	69 0.00	0.000
Medium Trucks:	82.40	-13.21	-	.49	-1.20	-4.		
Heavy Trucks:	86.40	-9.25	0	.48	-1.20	-5.	34 0.00	0.000
Unmitigated Noise	Levels (withou	t Topo and ba	arrier atte	enuation)				
VehicleType L	eq Peak Hour.	Leq Day	Leq	Evening	Leq	Night	Ldn	CNEL
Autos:	75.2	73	3.3	71.5		65.5	74.1	74.7
Medium Trucks:	68.5		7.0	60.6		59.1	67.5	67.8
Heavy Trucks:	76.4		5.0	66.0		67.2	75.6	75.7
Vehicle Noise:	79.2	77	7.6	72.9		69.8	78.3	78.6
Centerline Distance	to Noise Con	tour (in feet)						
				0 dBA	65	dBA	60 dBA	55 dBA
			in:	214		461	993	2,140
		CNE	:L:	225		485	1,044	2,249

Thursday, September 15, 2022

	FHWA-RI	D-77-108 HIGH	WAY I	NOISE	PREDIC	TION MC	DDEL (	9/12/2	021)		
Scenario	o: GP					Project I	Vame:	Amarg	osa and P	almetto	
Road Name	e: Main St.					Job Nu	mber:	14848			
Road Segmen	t: e/o I-15 NB	Ramps									
	SPECIFIC IN	IPUT DATA							L INPUT	S	
Highway Data					Site Con	ditions (l	Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	51,280 vehicle	s					Autos:	15		
Peak Hour I	Percentage:	10.00%			Me	dium Tru	cks (2 .	Axles):	15		
Peak He	our Volume:	5,128 vehicles			He	avy Truck	ks (3+ .	Axles):	15		
Vel	nicle Speed:	55 mph		H	Vehicle I	Miv					
Near/Far Lar	ne Distance:	78 feet		F		icleType		Dav	Evenina	Night	Dailv
Site Data							utos:	77.5%	12.9%	9.6%	93.949
Bar	rier Height:	0.0 feet			Me	edium Tru	icks:	84.8%	4.9%	10.3%	1.749
Barrier Type (0-Wa	-	0.0			F	leavy Tru	icks:	86.5%	2.7%	10.8%	4.329
Centerline Dis	. ,	60.0 feet		-	M-: 0-			- (:- 5	41		
Centerline Dist. t		60.0 feet		Ľ	Noise Sc	urce Ele			eet)		
Barrier Distance t	o Observer:	0.0 feet				Autos.		000			
Observer Height (		5.0 feet				m Trucks.	_	297			
	d Elevation:	0.0 feet			Heav	y Trucks.	8.	004	Grade Ad	justmen	1. 0.0
Roa	d Elevation:	0.0 feet		1	Lane Eq	uivalent l	Distan	ce (in	feet)		
F	Road Grade:	0.0%		Ī		Autos.	45	.869			
	Left View:	-90.0 degree	s		Mediui	m Trucks.	45	.676			
	Right View:	90.0 degree	s		Heav	y Trucks.	45	.695			
FHWA Noise Mode	l Calculation	s									
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite	Road	Fresi	nel	Barrier Att	en Be	rm Atten
Autos:	71.78	4.12		0.4	6	-1.20		-4.69	0.0	000	0.00
Medium Trucks:	82.40	-13.21		0.4	9	-1.20		-4.88	0.0	000	0.00
Heavy Trucks:	86.40	-9.25		0.4	8	-1.20		-5.34	0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo and I	arrie	r atten	uation)						
VehicleType	Leq Peak Hοι	ır Leq Day		Leq E	vening	Leq N	light		Ldn	С	NEL
Autos:	75		73.3		71.5		65.		74.		74.
Medium Trucks:	68	3.5	37.0		60.6		59.	1	67.	5	67.
Heavy Trucks:	76	5.4	75.0		66.0		67.	2	75.0	6	75.
Vehicle Noise:	79	0.2	77.6		72.8		69.	8	78.	3	78.
Centerline Distanc	e to Noise Co	ontour (in feet)									
			L	70 (	dBA	65 d			60 dBA		dBA
		-	.dn:		214		460		992		2,137
		CN	IEL:		225		484		1.043		2.246



# **APPENDIX 9.1:**

**CADNAA OPERATIONAL NOISE MODEL INPUTS** 





# 14848 - Amargosa and Palmetto CadnaA Noise Prediction Model: 14848-02.cna

Date: 16.09.22 Analyst: B. Lawson

**Calculation Configuration** 

Configurat	ion
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.01
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	999.99
Min. Length of Section (#(Unit,LEN))	1.01
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
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	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
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 (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

## **Receiver Noise Levels**

Name	M.	ID		Level Lr		Lir	nit. Val	ue		Land	Use	Height	:	Co	oordinates	
			Day	Night	CNEL	Day	Night	CNEL	Туре	Auto	Noise Type			Х	Υ	Z
			(dBA)	(dBA) (dBA) (dBA)		(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	45.9	45.9	52.6	60.0	55.0	0.0				5.00	а	6221305.09	2468653.38	5.00
RECEIVERS		R2	41.2	41.2	47.8	60.0	55.0	0.0				5.00	а	6222005.62	2468653.38	5.00
RECEIVERS		R3	37.6	37.5	44.2	60.0	55.0	0.0				5.00	а	6224255.62	2468671.61	5.00
RECEIVERS		R4	43.7	43.7	50.3	60.0	55.0	0.0				5.00	а	6223760.69	2467691.18	5.00
RECEIVERS		R5	47.8	47.8	54.4	60.0	55.0	0.0				5.00	a	6220761.76	2468813.86	5.00

Point Source(s)

		<del>-,-,</del>														
Name	M.	ID	R	esult. PW	/L		Lw/L	i	Ope	erating Ti	ime	Heigh	t	Co	oordinates	
			Day	Evening	Night	Туре	Value	norm.	Day	Special	Night			Х	Υ	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	6222315.08	2468173.13	50.00
POINTSOURCE		AC02	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g	6222272.06	2468172.08	50.00
POINTSOURCE		TRASH01	89.0	89.0	89.0	Lw	89		150.00	0.00	90.00	5.00	а	6222145.08	2468032.52	5.00
POINTSOURCE		CAR01	81.1	81.1	81.1	Lw	81.1					5.00	а	6222438.91	2468247.64	5.00
POINTSOURCE		CAR02	81.1	81.1	81.1	Lw	81.1					5.00	а	6222472.49	2468280.17	5.00
POINTSOURCE		CAR03	81.1	81.1	81.1	Lw	81.1					5.00	а	6222500.82	2468246.59	5.00
POINTSOURCE		CAR04	81.1	81.1	81.1	Lw	81.1					5.00	а	6222607.86	2468355.72	5.00
POINTSOURCE		CAR05	81.1	81.1	81.1	Lw	81.1					5.00	а	6222566.93	2468354.67	5.00
POINTSOURCE		CAR06	81.1	81.1	81.1	Lw	81.1					5.00	а	6222498.72	2468355.72	5.00
POINTSOURCE		CAR07	81.1	81.1	81.1	Lw	81.1					5.00	а	6222451.50	2468354.67	5.00
POINTSOURCE		CAR08	81.1	81.1	81.1	Lw	81.1					5.00	а	6222445.20	2468309.55	5.00
POINTSOURCE		CAR09	81.1	81.1	81.1	Lw	81.1					5.00	а	6222497.67	2468309.55	5.00
POINTSOURCE		CAR10	81.1	81.1	81.1	Lw	81.1					5.00	а	6222557.49	2468309.55	5.00

Name	M.	ID	R	esult. PW	'L		Lw / L	i	Ор	erating Ti	me	Heigh	t	Co	oordinates	
			Day	Evening	Night	Туре	Value	norm.	Day	Special	Night			Х	Υ	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		CAR11	81.1	81.1	81.1	Lw	81.1					5.00	a	6222599.46	2468309.55	5.00
POINTSOURCE		CAR12	81.1	81.1	81.1	Lw	81.1					5.00	a	6222604.71	2468416.59	5.00
POINTSOURCE		CAR13	81.1	81.1	81.1	Lw	81.1					5.00	a	6222565.88	2468417.64	5.00
POINTSOURCE		CAR14	81.1	81.1	81.1	Lw	81.1					5.00	a	6222499.77	2468418.68	5.00
POINTSOURCE		CAR15	81.1	81.1	81.1	Lw	81.1					5.00	a	6222453.60	2468418.68	5.00
POINTSOURCE		CAR16	81.1	81.1	81.1	Lw	81.1					5.00	a	6222456.75	2468482.70	5.00
POINTSOURCE		CAR17	81.1	81.1	81.1	Lw	81.1					5.00	a	6222498.72	2468481.65	5.00
POINTSOURCE		CAR18	81.1	81.1	81.1	Lw	81.1					5.00	a	6222566.93	2468480.60	5.00
POINTSOURCE		CAR19	81.1	81.1	81.1	Lw	81.1					5.00	a	6222603.66	2468480.60	5.00
POINTSOURCE		CAR20	81.1	81.1	81.1	Lw	81.1					5.00	a	6222374.90	2468243.44	5.00
POINTSOURCE		CAR21	81.1	81.1	81.1	Lw	81.1					5.00	а	6222376.99	2468305.35	5.00
POINTSOURCE		CAR22	81.1	81.1	81.1	Lw	81.1					5.00	a	6222376.99	2468370.41	5.00
POINTSOURCE		CAR23	81.1	81.1	81.1	Lw	81.1					5.00	a	6222379.09	2468422.88	5.00
POINTSOURCE		CAR24	81.1	81.1	81.1	Lw	81.1					5.00	a	6222379.09	2468479.55	5.00
POINTSOURCE		CAR25	81.1	81.1	81.1	Lw	81.1					5.00	a	6222407.43	2468528.87	5.00
POINTSOURCE		CAR26	81.1	81.1	81.1	Lw	81.1					5.00	a	6222458.85	2468526.77	5.00
POINTSOURCE		CAR27	81.1	81.1	81.1	Lw	81.1					5.00	a	6222514.46	2468525.72	5.00
POINTSOURCE		CAR28	81.1	81.1	81.1	Lw	81.1					5.00	a	6222562.73	2468525.72	5.00
POINTSOURCE		CAR29	81.1	81.1	81.1	Lw	81.1					5.00	a	6222616.25	2468525.72	5.00
POINTSOURCE		CAR30	81.1	81.1	81.1	Lw	81.1					5.00	a	6222666.62	2468511.03	5.00
POINTSOURCE		CAR31	81.1	81.1	81.1	Lw	81.1					5.00	a	6222666.62	2468462.76	5.00
POINTSOURCE		CAR32	81.1	81.1	81.1	Lw	81.1					5.00	a	6222666.62	2468413.44	5.00
POINTSOURCE		CAR33	81.1	81.1	81.1	Lw	81.1					5.00	a	6222668.72	2468363.07	5.00

### Line Source(s)

		- ( - /																		
Name	M.	ID	R	esult. PW	'L	R	esult. PW	L'		Lw/L	i	Ope	erating Ti	me		Moving	Pt. Src		Heigh	nt
			Day	Evening	Night	Day	Evening	Night	Туре	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	74.2	74.2	74.2	Lw	93.2									8	а
LINESOURCE	=	TRUCK02	93.2	93.2	93.2	64.1	64.1	64.1	Lw	93.2									8	а
LINESOURCE	<b>=</b>	TRUCK03	93.2	93.2	93.2	75.5	75.5	75.5	Lw	93.2									8	а
LINESOURCE		TRUCK04	93.2	93.2	93.2	69.9	69.9	69.9	Lw	93.2									8	а

Name	8.00 8.00 8.00		ght		Coordinat	es	
	Begin		End	х	у	Z	Ground
	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
LINESOURCE	8.00	а		6220795.59	2468109.12	8.00	0.00
				6221058.86	2468106.96	8.00	0.00
LINESOURCE	8.00	а		6220414.67	2468018.87	8.00	0.00
				6220431.71	2467971.88	8.00	0.00
				6220445.48	2467925.91	8.00	0.00
				6220574.79	2467946.60	8.00	0.00
				6220714.56	2467953.62	8.00	0.00
				6221789.31	2467947.40	8.00	0.00
				6222137.72	2467947.09	8.00	0.00
				6222289.45	2467963.50	8.00	0.00
				6222458.91	2468004.71	8.00	0.00
				6222640.56	2468078.75	8.00	0.00
				6222808.40	2468180.29	8.00	0.00
				6222868.70	2468226.49	8.00	0.00
				6222911.12	2468183.63	8.00	0.00
LINESOURCE	8.00	а		6220850.17	2467952.84	8.00	0.00
				6220854.32	2468147.29	8.00	0.00
LINESOURCE	8.00	а		6222188.00	2468095.59	8.00	0.00
				6222356.01	2468093.38	8.00	0.00
				6222411.62	2468104.92	8.00	0.00
				6222669.77	2468279.12	8.00	0.00
				6222754.25	2468143.53	8.00	0.00

### Area Source(s)

	-	- ( - )														
Name	M.	ID	R	esult. PW	/L	Re	esult. PW	L"		Lw/L	i	Op	erating Ti	ime	Height	t
			Day	Evening	Night	Day	Evening	Night	Туре	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
AREASOURCE		DOCK01	111.5	111.5	111.5	68.6	68.6	68.6	Lw	111.5					8	а
AREASOURCE		TRAILER01	103.4	103.4	103.4	60.7	60.7	60.7	Lw	103.4					8	а

94

Name	H	lei	ght		Coordinat	es	
	Begin		End	х	у	z	Ground
	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
AREASOURCE	8.00	а		6221057.94	2468203.56	8.00	0.00
				6222188.11	2468198.32	8.00	0.00
				6222189.16	2468138.50	8.00	0.00
				6222186.01	2468022.02	8.00	0.00
				6222083.17	2468011.53	8.00	0.00
				6221055.84	2468014.68	8.00	0.00

Name	ŀ	lei	ght		Coordinat	es	
	Begin		End	х	у	Z	Ground
	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
				6221060.03	2468142.70	8.00	0.00
AREASOURCE	8.00	а		6220691.71	2468556.15	8.00	0.00
				6220943.55	2468556.15	8.00	0.00
				6220950.90	2468147.95	8.00	0.00
				6220795.59	2468146.90	8.00	0.00
				6220795.59	2468075.54	8.00	0.00
				6220753.62	2468075.54	8.00	0.00
				6220747.32	2468018.87	8.00	0.00
				6220339.12	2468018.87	8.00	0.00
				6220339.12	2468214.06	8.00	0.00
				6220390.54	2468215.11	8.00	0.00
				6220392.63	2468269.67	8.00	0.00
				6220693.80	2468271.77	8.00	0.00

Building(s)

Name	М.	ID	RB	Residents	Absorption	Height			Coordinat	es	
						Begin		х	У	z	Ground
						(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING		PROJECT	х	0		45.00	a	6220943.55	2468556.15	45.00	0.00
								6222340.27	2468549.86	45.00	0.00
								6222336.07	2468144.80	45.00	0.00
								6222189.16	2468138.50	45.00	0.00
								6222188.11	2468198.32	45.00	0.00
								6221057.94	2468203.56	45.00	0.00
								6221060.03	2468142.70	45.00	0.00
								6220950.90	2468147.95	45.00	0.00
								6220945.65	2468204.61	45.00	0.00



# **APPENDIX 10.1:**

**CADNAA CONSTRUCTION NOISE MODEL INPUTS** 





# 14848 - Amargosa and Palmetto CadnaA Noise Prediction Model: 14848-02\_Construction.cna

Date: 16.09.22 Analyst: B. Lawson

Calculation Configuration

Configurat	ion
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.01
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	999.99
Min. Length of Section (#(Unit,LEN))	1.01
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
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	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
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 (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

## **Receiver Noise Levels**

Name	M.	ID		Level Lr		Lir	nit. Valı	ue		Land	Use	Height	:	Co	oordinates	
			Day	Night	CNEL	Day	Night	CNEL	Туре	Auto	Noise Type			Х	Υ	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	59.7	59.7	66.4	60.0	55.0	0.0				5.00	а	6221305.09	2468653.38	5.00
RECEIVERS		R2	59.5	59.5	66.2	60.0	55.0	0.0				5.00	а	6222005.62	2468653.38	5.00
RECEIVERS		R3	45.1	45.1	51.8	60.0	55.0	0.0				5.00	а	6224255.62	2468671.61	5.00
RECEIVERS		R4	47.1	47.1	53.7	60.0	55.0	0.0				5.00	а	6223760.69	2467691.18	5.00
RECEIVERS		R5	55.9	55.9	62.6	60.0	55.0	0.0				5.00	a	6220761.76	2468813.86	5.00

Area Source(s)

Name	М.	ID	R	esult. PW	'L	Re	esult. PW	L"		Lw/L	i	Ор	erating Ti	me	Height	
			Day	Evening	Night	Day	Evening	Night	Туре	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
SITEBOUNDARY		CONSTRUCTION	115.0	115.0	115.0	63.7	63.7	63.7	Lw	115					8	а

Name	ŀ	lei	ght	Coordinates							
	Begin	Begin		х	У	Z	Ground				
	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)				
SITEBOUNDARY	8.00	a		6220330.99	2468589.92	8.00	0.00				
				6222996.82	2468570.58	8.00	0.00				
				6222995.76	2468420.93	8.00	0.00				
		Г		6222959.73	2468380.23	8.00	0.00				
		Г		6222921.90	2468341.21	8.00	0.00				
				6222882.34	2468303.93	8.00	0.00				
		Г		6222841.13	2468268.49	8.00	0.00				
				6222798.36	2468234.95	8.00	0.00				

Name	He	eight		Coordinates							
	Begin	End	х	у	Z	Ground					
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)					
			6222754.12	2468203.38	8.00	0.00					
			6222708.49	2468173.85	8.00	0.00					
			6222661.57	2468146.41	8.00	0.00					
			6222613.45	2468121.12	8.00	0.00					
			6222564.25	2468098.04	8.00	0.00					
			6222514.04	2468077.21	8.00	0.00					
			6222462.95	2468058.68	8.00	0.00					
			6222416.45	2468044.04	8.00	0.00					
			6222369.41	2468031.30	8.00	0.00					
			6222321.88	2468020.49	8.00	0.00					
			6222273.95	2468011.62	8.00	0.00					
			6222225.71	2468004.69	8.00	0.00					
			6222177.22	2467999.74	8.00	0.00					
			6222128.57	2467996.76	8.00	0.00					
			6220865.00	2468002.77	8.00	0.00					
			6220805.40	2468005.36	8.00	0.00					
			6220745.74	2468005.80	8.00	0.00					
			6220686.11	2468004.07	8.00	0.00					
			6220626.58	2468000.19	8.00	0.00					
			6220567.22	2467994.15	8.00	0.00					
			6220508.13	2467985.96	8.00	0.00					
			6220449.37	2467975.64	8.00	0.00					
			6220391.02	2467963.20	8.00	0.00					
			6220333.16	2467948.66	8.00	0.00					

# **APPENDIX 10.2:**

**CADNAA CONCRETE POUR NOISE MODEL INPUTS** 





# 14848 - Amargosa and Palmetto CadnaA Noise Prediction Model: 14848-02\_Concrete.cna

Date: 16.09.22 Analyst: B. Lawson

Calculation Configuration

Configuration										
Parameter	Value									
General										
Max. Error (dB)	0.00									
Max. Search Radius (#(Unit,LEN))	2000.01									
Min. Dist Src to Rcvr	0.00									
Partition										
Raster Factor	0.50									
Max. Length of Section (#(Unit,LEN))	999.99									
Min. Length of Section (#(Unit,LEN))	1.01									
Min. Length of Section (%)	0.00									
Proj. Line Sources	On									
Proj. Area Sources	On									
Ref. Time										
Reference Time Day (min)	960.00									
Reference Time Night (min)	480.00									
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	2									
Search Radius Src	100.00									
Search Radius Rcvr	100.00									
Max. Distance Source - Rcvr	1000.00 1000.00									
Min. Distance Rvcr - Reflector	1.00 1.00									
Min. Distance Source - Reflector	0.10									
Industrial (ISO 9613)										
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 (#(Unit,TEMP))	10									
rel. Humidity (%)	70									
Ground Absorption G	0.50									
Wind Speed for Dir. (#(Unit,SPEED))	3.0									
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	Туре	Auto	Noise Type			Х	Υ	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	47.3	47.3	54.0	60.0	55.0	0.0				5.00	а	6221305.09	2468653.38	5.00
RECEIVERS		R2	47.2	47.2	53.8	60.0	55.0	0.0				5.00	а	6222005.62	2468653.38	5.00
RECEIVERS		R3	29.9	29.9	36.5	60.0	55.0	0.0				5.00	а	6224255.62	2468671.61	5.00
RECEIVERS		R4	31.7	31.7	38.3	60.0	55.0	0.0				5.00	а	6223760.69	2467691.18	5.00
RECEIVERS		R5	40.3	40.3	47.0	60.0	55.0	0.0				5.00	a	6220761.76	2468813.86	5.00

Area Source(s)

Name	M.	ID	R	esult. PW	/L	Result. PWL"			Lw / Li			Op	Height	t		
			Day	Evening	Night	Day	Evening	Night	Туре	Value	norm.	Day	Special	Night	(ft)	П
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
BUILDING		PROJECT	100.3	100.3	100.3	53.6	53.6	53.6	Lw	100.3					8	а

Name	H	lei	ght		Coordinates						
	Begin		End		х	У	Z	Ground			
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)			
BUILDING	8.00	a			6220943.55	2468556.15	8.00	0.00			
					6222340.27	2468549.86	8.00	0.00			
					6222336.07	2468144.80	8.00	0.00			
		Г			6222189.16	2468138.50	8.00	0.00			
					6222188.11	2468198.32	8.00	0.00			
					6221057.94	2468203.56	8.00	0.00			
		Г			6221060.03	2468142.70	8.00	0.00			
					6220950.90	2468147.95	8.00	0.00			

Name	Н	eight	Coordinates							
	Begin	End	х	у	Z	Ground				
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)				
			6220945.65	2468204.61	8.00	0.00				

Urban Crossroads, Inc.