Technical Appendix G

Noise Impact Analysis

Modular Logistics Center

NOISE IMPACT ANALYSIS

CITY OF MORENO VALLEY

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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
HVAC	Heating, Ventilation and Air-Conditioning
INCE	institute of Noise Control Engineering
Leq	Equivalent continuous (average) sound level
Lmax	Maximum level measured over the time interval
Lmin	Minimum level measured over the time interval
mph	Miles per hour
NLR	Noise Level Reduction
Project	Modular Logistics Center
RCNM	Roadway Construction Noise Model
REMEL	Reference Energy Mean Emission Level
STC	Sound Transmission Class
VdB	Vibration Decibels

1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Modular Logistics Center ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, describes the local regulatory setting, provides the study methods and procedures for traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term operational noise impacts and short-term construction noise impacts.

1.1 SITE LOCATION

The proposed Modular Logistics Center development is located east of Perris Boulevard and north of Modular Way in the City of Moreno Valley as shown on Exhibit 1-A. The Project site is currently occupied by Eldorado Stone. The site is located within the currently adopted Moreno Valley Industrial Area Plan (SP No. 208) and the proposed Project is an allowable use under SP No. 208 and the property's Industrial (I) zoning classification.

1.2 PROJECT DESCRIPTION

The Project site is currently 50.84-gross acres (50.68-net acres) and contains an approximately 38-acre industrial development (stone and manufactured stone products). The remaining approximately 13 acres of the Project site consist of undeveloped land that receives routine maintenance for fire fuel management and weed abatement. Exhibit 1-B illustrates a preliminary conceptual site plan. The proposed Project involves the demolition and removal of existing buildings and improvements, grading and preparation of the site for redevelopment, and construction and operation of a logistics warehouse structure containing 1,109,378 square feet of building space, consisting of 1,089,378 square feet of warehouse space and 20,000 square feet of office space. The office spaces would be located at the northwest, northeast, southwest and southeast corners of the building.

According the *Modular Logistics Center Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (1), the Project is expected to generate a net total of approximately 1,864 trip-ends per day (actual vehicles) with 122 AM peak hour trips and 133 PM peak hour trips. The net Project trip generation includes 447 truck trip-ends per day with 29 AM peak hour truck trips and 32 PM peak hour truck trips.

A total of 256 loading bays are planned as part of the building for loading, unloading, and short-term parking of truck trailers, with 128 bays proposed on the north and south sides of the building, respectively. Vehicular access to the site is proposed via eight driveways. Two driveways would take access from Perris Boulevard, three driveways would take access from Modular Way, one driveway would take access from Kitching Street, and two driveways would take access from Edwin Road. At Perris Boulevard, the southernmost driveway would have the option to be restricted to use by passenger vehicles only or be fully accessible for use by passenger vehicles and trucks. All other driveways may be used by both passenger cars and trucks. Access to the loading bays and truck parking areas may be gated. Proposed truck check-in points and driveways are positioned interior to the Project site to create interior queuing to minimize the potential for trucks to stack onto public streets when entering the Project site.

At the time this noise analysis was prepared, the future tenants of the proposed Project were unknown. For the purpose of this analysis, the future uses on site are assumed to be any of those uses permitted by the Moreno Valley Industrial Area Plan's "Industrial" designation. Furthermore, this analysis assumes the Project would be operational 24 hours per day, seven days per week. The Project Applicant estimates that the building is designed to accommodate a warehouse distribution, e-logistics, fulfillment center, or light-industrial operator(s). Although the proposed building is not necessarily expected to accommodate a tenant(s) that requires cold storage (refrigeration), this analysis assumes that the building could house a tenant that uses cold storage.

Business operations would primarily be conducted within the enclosed building, with the exception of traffic movement, parking, and the loading and unloading of trucks at designated loading bays. The on-site Project related noise sources are expected to include: idling trucks, delivery truck activities, parking, backup alarms, refrigerated containers or reefers, as well as loading and unloading of dry goods.

1.3 STUDY AREA

The Project site is located within an area developed mostly with commercial and industrial land uses. However, the study area includes several residential homes scattered throughout the Project study area. The March Air Reserve Base / Inland Port Airport is located approximately one mile west of the Project Site. Existing surrounding land uses are graphically presented on Exhibit 1-C.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: PRELIMINARY SITE PLAN

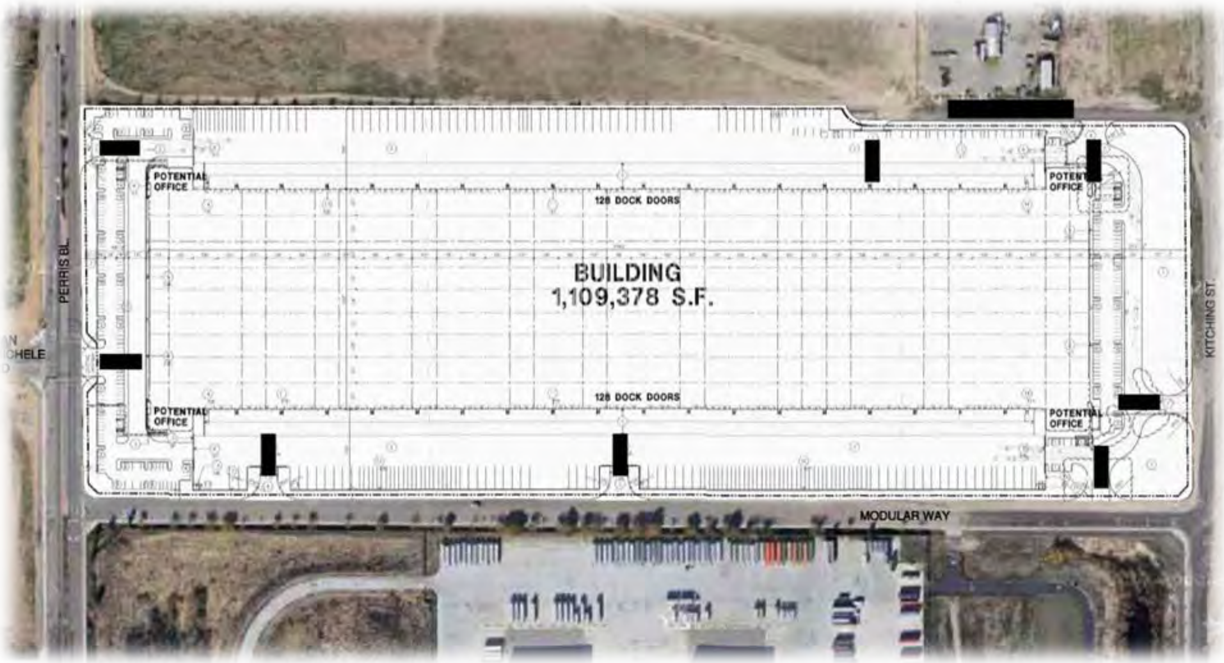
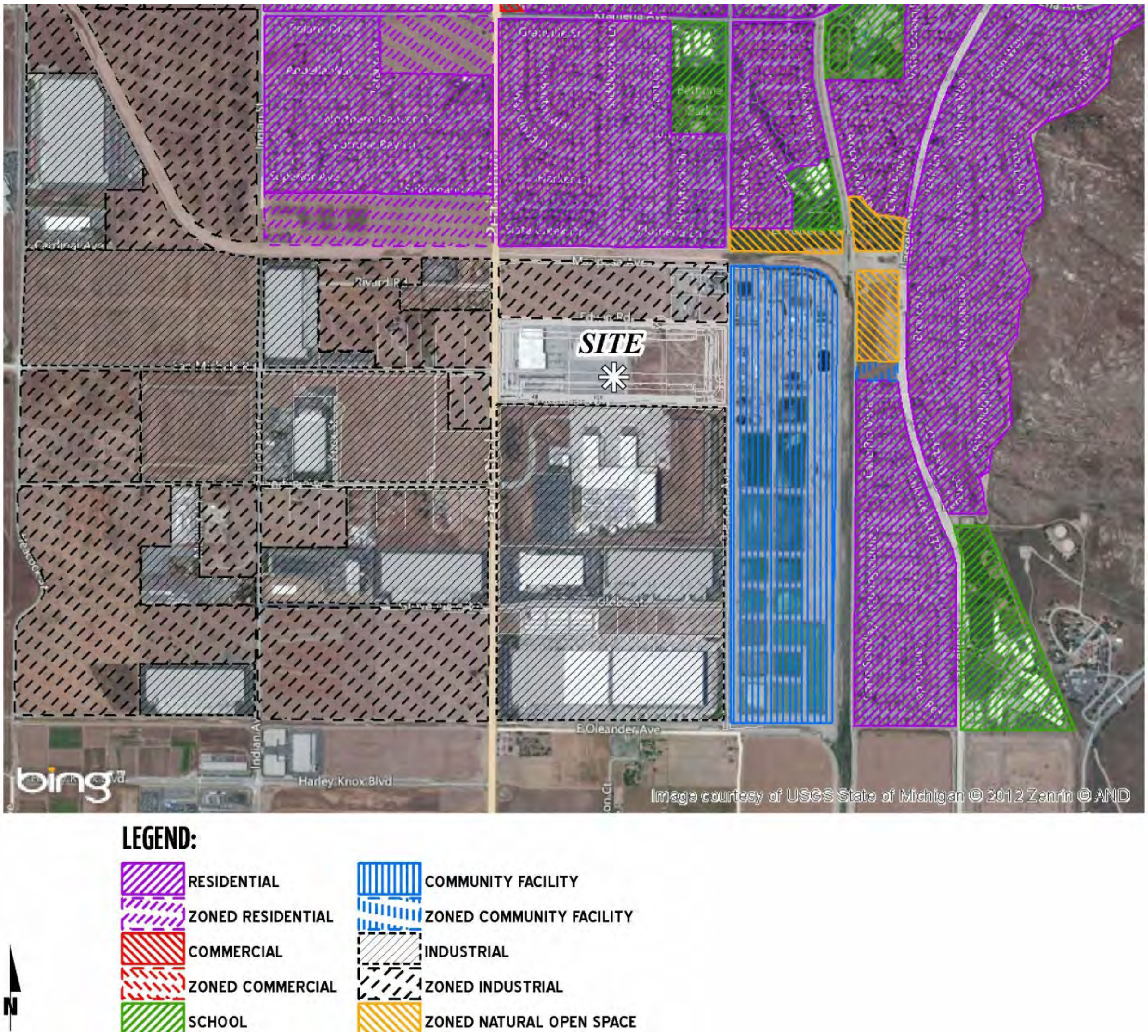


EXHIBIT 1-C: EXISTING LAND USES



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2 FUNDAMENTALS

Noise has been simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

EXHIBIT 2-A: TYPICAL NOISE LEVELS

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

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

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud.(2) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA at approximately 100 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 commonly used figure is the equivalent level (Leq). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than the 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 twenty-four 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 Leq sound levels in the evening from 7 p.m. to 10 p.m., and the addition of 10 decibels to dBA Leq sound levels at night between 10 p.m. and 7 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any particular time, but rather represents the total sound exposure. The City of Moreno Valley 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 manner in which 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.

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receptor 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 receptor, 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 receptor 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.

2.3.3 ATMOSPHERIC EFFECTS

Receptors 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 ft) 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.

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by 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 resident. 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 FHWA does not consider the planting of vegetation to be a noise abatement measure.

2.4 TRAFFIC NOISE PREDICTION

Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires on the roadway. According to the *Highway Traffic Noise Analysis and Abatement Policy and Guidance,* provided by the Federal Highway Administration (FHWA), the level of traffic noise depends on three primary factors: the volume of the traffic, the speed of the traffic, and the vehicle mix within the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and a greater number of trucks.(4) A doubling of the traffic volume, assuming that the speed and vehicle mix do not change, results in a noise level increase of 3 dBA. The vehicle mix on a given roadway may also have an effect on community noise levels. As the number of medium and heavy trucks increases and becomes a larger percentage of the vehicle mix, adjacent noise level impacts will increase.

2.5 NOISE CONTROL

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

2.6 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 receptor. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (4)

2.7 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. (5)

2.8 COMMUNITY RESPONSE TO NOISE

Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon each individual's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- Fear associated with noise producing activities;
- Socio-economic status and educational level;
- Perception that those affected are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Belief that the noise source can be controlled.

Approximately ten 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 will occur. Another twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (6) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (6)

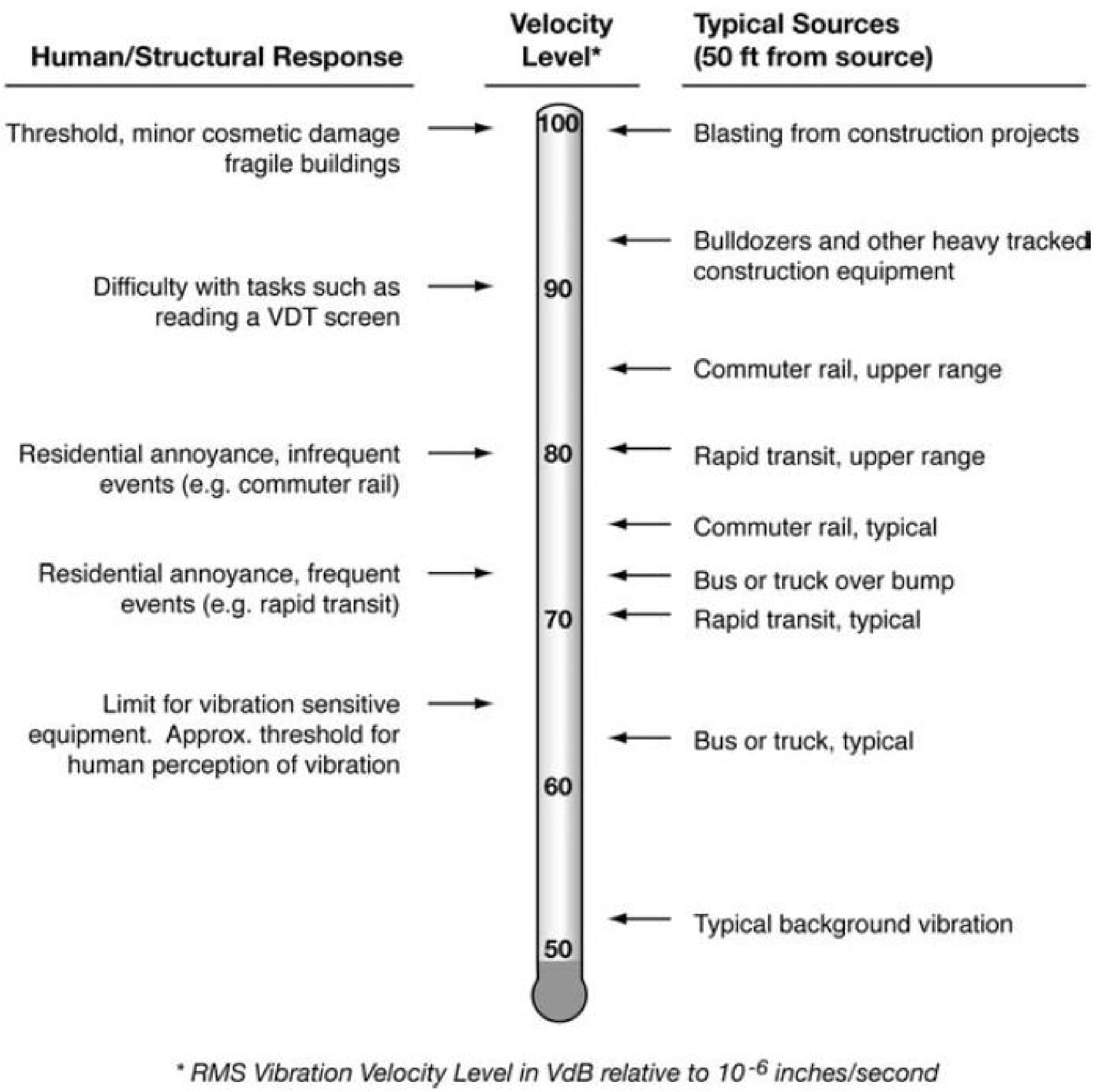
Despite this variability in behavior on an individual level, the population as a whole can be expected to exhibit the following responses to changes in noise levels. An increase or decrease of 1 dBA cannot be perceived except in carefully controlled laboratory experiments, a change of 3 dBA are considered "barely perceptible," and changes of 5 dBA are considered "readily perceptible." (4)

2.9 VIBRATION

According to the Federal Transit Administration (FTA) Transit Noise Impact and Vibration Assessment (7), 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. Vibration is often described in units of velocity (inches per second), and discussed in decibel (dB) units in order to compress the range of numbers required to describe vibration. Vibration impacts are generally associated with activities such as train operations, construction and heavy truck movements.

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-B illustrates common vibration sources and the human and structural response to ground-borne vibration.

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



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

3 REGULATORY SETTING

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains fairly 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 according to guidelines adopted by the Governor's Office of Planning and Research. (8) 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 STATE OF CALIFORNIA BUILDING CODE

The State of California's noise insulation standards are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 2, and the California Building Code. These noise standards are applied to new construction in California for the purpose of controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, or hospitals, are developed near major transportation noise sources, and where such noise sources create an exterior noise level of 60 dBA CNEL or higher. Acoustical studies that accompany building plans for noise-sensitive land uses must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new residential buildings, schools, and hospitals, the acceptable interior noise limit for new construction is 45 dBA CNEL.

3.3 TRANSPORTATION NOISE STANDARDS

The City Noise Element typically provides the standards for land use compatibility for community noise exposure. However, the City of Moreno Valley General Plan does not include a noise element or specific transportation related noise standards. Rather, noise is considered in the Environmental Safety section of the General Plan Safety Element (9) included in Appendix 3.1. While the General Plan provides background and noise fundamentals, it does not identify criteria to assess the impacts associated with off-site transportation related noise impacts.

Therefore, for the purpose of this analysis, the transportation noise criteria are derived from standards contained in the General Plan Guidelines, a publication of the California Office of Planning and Research. The Land Use Compatibility for Community Noise Exposure standards included on Figure 2 in Appendix 3.2 are used by many California cities and counties and specify the maximum noise levels allowable for new developments impacted by transportation noise sources.

The City of Perris Noise Element (10) identifies specific goals, policies and implementation measures to ensure that future land uses are compatible with projected noise environments. To accomplish this goal the City of Perris General Plan requires that the State of California Noise/Land Use Compatibility Criteria is used to determine land use compatibility for new development. The City of Perris General Plan Noise Element Exhibit N-1: Land Use/Noise Compatibility Guidelines are included in Appendix 3.3.

The purpose of the transportation noise criteria is to protect, create, and maintain an environment free from noise and vibration that may jeopardize the health or welfare of sensitive receptors, or degrade quality of life. For the nearby noise sensitive areas, the exterior noise levels should generally remain below 65 dBA CNEL and for interior areas the noise levels must remain below 45 dBA CNEL.

3.4 City of Moreno Valley Municipal Code Standards

The Project operational noise impacts are governed by the City of Moreno Valley Municipal Code, Title 11, Chapter 11, Regulation (Sections 11.80.010 through 11.80.060). (2) These limits are used to describe the time-varying character of the stationary source operational noise levels and they do not compare with the 24-hour total sound exposure transportation related CNEL noise level limits.

3.4.1 Operational Noise Standards

The Noise Ordinance included in the City of Moreno Valley Municipal Code provides performance standards and noise control guidelines for determining and mitigating non-transportation or stationary noise source impacts from operations at private properties. Section 11.80.030 (C.), Nonimpulsive Sound Decibel Limits states the following: No person shall maintain, create, operate or cause to be operated on private property any source of sound in such a manner as to create any nonimpulsive sound which exceeds the limits set forth for the source land use category in Table 11.80.030-2 when measured at a distance of two hundred (200) feet or more from the real property line of the source of the sound, if the sound occurs on privately owned property, or from the source of the sound, if the sound occurs on public right-of-way, public space or other publicly owned property. Any source of sound in violation of this subsection shall be deemed prima facie to be a noise disturbance. Table 11.80.030-02, Maximum Sound Levels (in dBA) For Source Land Uses, shows that the daytime and nighttime standards for (source) commercial uses are 65 dBA and 60 dBA, respectively. The City of Moreno Valley Noise Ordinance is included in Appendix 3.4.

3.4.2 CONSTRUCTION NOISE STANDARDS

The City of Moreno Valley has set restrictions to control noise impacts associated with the construction of the proposed project. According to Section 11.80.030.D.7, Construction and Demolitions, it states: NO person shall operate or cause operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between the hours of eight p.m. and seven a.m. the following day such that the sound there from creates a noise disturbance, except for emergency work by public service utilities or for other work approved by the city manager or designee. In addition to the hours of operations limitations provided in the Noise Ordinance, Section 11.80.030 (C.), Non-impulsive Sound Decibel Limits states the following: NO person shall maintain, create, operate or cause to be operated on private property any source of sound in such a manner as to create any non-impulsive sound which exceeds the limits set forth for the source land use category in Table 11.80.030-2 when measured at a distance of two hundred (200) feet or more from the real property line of the source of the sound, if the sound occurs on privately owned property, or from the source of the sound, if the sound occurs on public right-of-way, public space or other publicly owned property. Any source of sound in violation of this subsection shall be deemed prima facie to be a noise disturbance.

The City of Moreno Valley Municipal Code does not specifically address construction noise limits; however, it does provide noise level limits for the source land use category when measured at a distance of 200 feet. Since the source land use is other than residential, 65 dBA Leq at a distance of 200 feet is used as the limit for this analysis to assess the construction noise level impacts.

3.5 VIBRATION STANDARDS

The City of Moreno Valley has not identified or adopted vibration standards. However, the United States Department of Transportation Federal Transit Administration (FTA) provides guidelines (7) for maximum-acceptable vibration criteria for different types of land uses. These guidelines allow 80 VdB for residential uses and buildings where people normally sleep.

Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. Construction vibration is generally associated with pile driving and rock blasting. Other construction equipment such as air compressors, light trucks, hydraulic loaders, etc., generates little or no ground vibration. Occasionally large bulldozers and loaded trucks can cause perceptible vibration levels at close proximity. While not enforceable regulations within the City of Moreno Valley, the FTA guidelines of 80 VdB for sensitive land uses provide the basis for determining the relative significance of potential Project related vibration impacts.

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4 SIGNIFICANCE CRITERIA

The following significance criteria are based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. For the purposes of this report, impacts would be potentially significant if the Project is determined to result in or cause:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.
- A substantial permanent increase in ambient noise levels in the Project vicinity above existing levels without the proposed Project; or
- A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above noise levels existing without the proposed Project.

While the CEQA Guidelines and the City of Moreno Valley General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts under the first threshold, they do not define the levels at which increases are considered substantial for use under the second, third and fourth threshold. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels and the location of noise-sensitive receptors in order to determine if a noise increase represents a significant adverse environmental impact.

4.1 DIRECT PROJECT IMPACTS

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development:

- If project related operational (stationary source) noise levels exceed the daytime and nighttime maximum sound levels of 65 dBA and 60 dBA, respectively. (City of Moreno Valley Noise Ordinance Table 11.80.030-02)
- If project-related construction activities occur on any weekday between the hours of eight p.m. and seven a.m. the following day such that the sound there from creates a noise disturbance, except for emergency work by public service utilities or for other work approved by the city manager or designee exceeds 65 dBA Leq at a distance of 200 feet during the approved daytime hours.
- If short-term project generated construction source vibration levels could exceed the FTA maximum acceptable vibration standard of 80 vibration decibels (VdB) at noise sensitive receiver locations.

4.2 CUMULATIVE PROJECT IMPACTS

According to the U.S. Environmental Protection Agency (EPA) (12), cumulative impacts represent the combined incremental effects of human activities that accumulate over time. While the incremental impacts may be insignificant by themselves, the combined affect may result in a significant impact. The level of significance attributed to a cumulative project noise impact is based on a comparison of the noise levels with and without the project. The significance of cumulative noise impacts varies depending on the condition of the environment and the project related noise level increases. 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 even though the noise criteria might not be exceeded. Therefore, for the purpose of this analysis, a "readily perceptible" 5 dBA or greater project related noise level increase is considered a significant impact.

According to the EPA (3), 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 since it likely contributes to an existing noise deficiency. Table 4.1 below provides a summary of the cumulative noise impact significance criteria.

TABLE 4-1: SIGNIFICANCE OF CUMULATIVE NOISE IMPACTS

Without Project Noise Level (CNEL)	Project Related Significant Impact
< 60 dBA	5 dBA or more
60 - 65 dBA	3 dBA or more
> 65 dBA	1.5 dBA or more

Based on the Community Response to Noise Surveys contained in the U.S. Environmental Protection Agency Office of Noise Abatement and Control, Noise Effects Handbook-A Desk Reference to Health and Welfare Effect of Noise, October 1979 (revised July 1981).

5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, four long-term noise level measurements were taken at receptor locations in the Project study area. The noise receptor 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. The noise level measurements were recorded by Urban Crossroads, Inc. on Thursday, November 7th, 2013 and Wednesday, December 18th, 2013. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

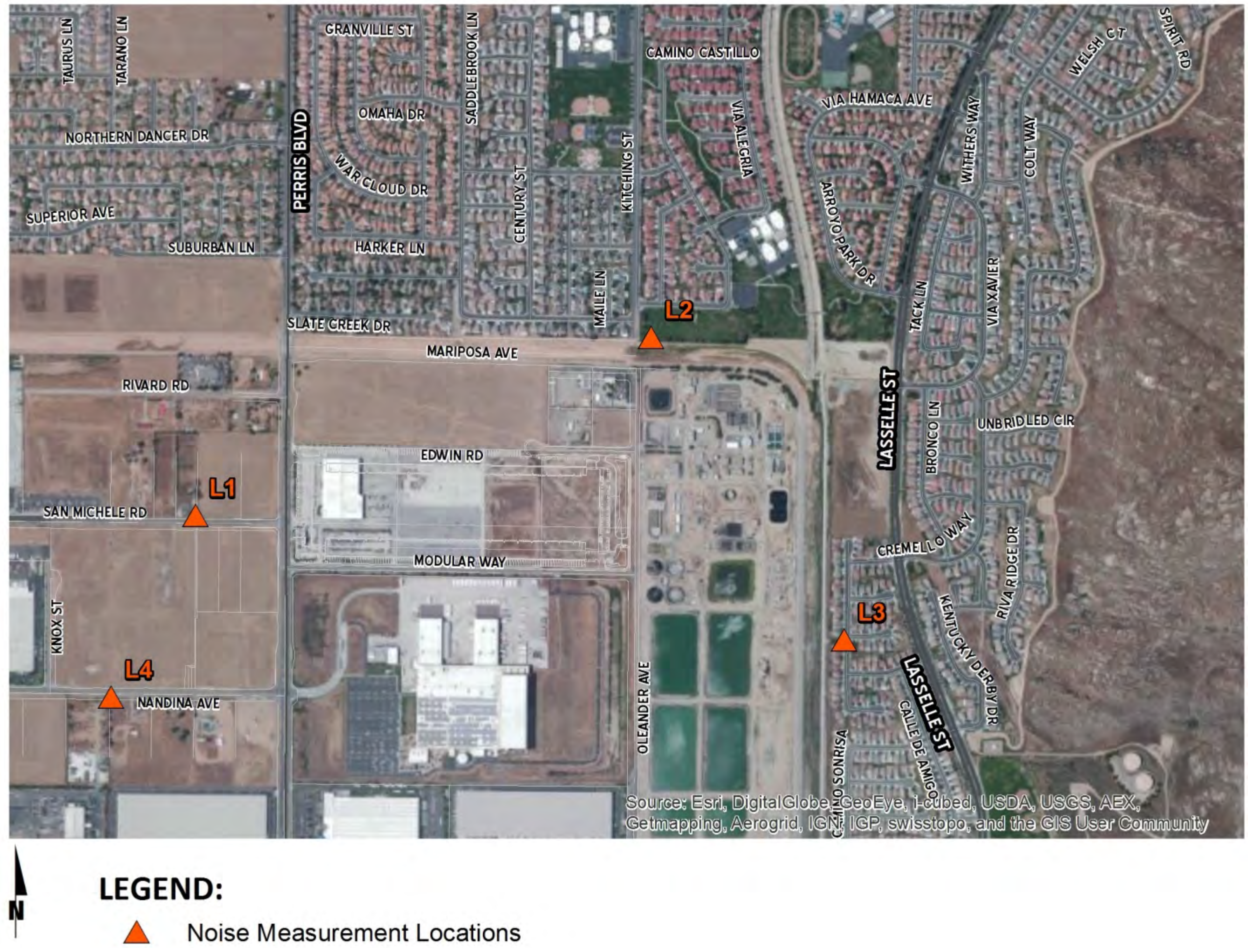
To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment meets American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-1983 (R2006)/ANSI S1.4a-1985 (R2006) (13).

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned at the nearest noise sensitive receptor locations to assess the existing ambient hourly noise levels surrounding the Project site. Due to the Project site's close proximity to the March Air Reserve Base / Inland Port Airport, there are a limited number of nearby noise sensitive receptors. The nearest noise sensitive receptor is located approximately 240 feet northwest of the Project site across Perris Boulevard.

To describe the existing noise environment, it is not necessary to collect measurements at each individual building or residence, because each receptor measurement represents a group of buildings that share acoustical equivalence. In other words, the area represented by the receptor shares similar shielding, terrain, and geometric relationship to the reference noise source. While receptors represent a location of noise sensitive areas, receivers represent noise modeling locations used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receptor locations allows for a comparison of the before and after project noise levels and is necessary to assess the potential cumulative noise impacts.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS



5.3 NOISE MEASUREMENT RESULTS

To describe the existing ambient noise environment, the noise measurements presented below focus on the average or equivalent sound levels (Leq). The equivalent sound level (Leq) 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 average hourly daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) noise levels at each noise level measurement location. Appendix 5.2 provides a summary of the existing hourly ambient noise levels described below:

- Located approximately 717 feet west of the Project site, location L1 represents the off-site noise levels at a nearby noise sensitive residential receptor location just north of San Michelle Road. Based on the noise level measurements, the existing daytime hourly ambient noise levels ranged from 60.3 to 64.1 dBA Leq resulting in an energy (logarithmic) average daytime noise level of 62.2 dBA Leq. During the nighttime hours, the measured ambient noise levels ranged from 57.4 to 66.2 dBA Leq producing an energy (logarithmic) average nighttime noise level of

62.7 dBA Leq. A review of the 24-hour Community Noise Equivalent Level (CNEL) indicates that the overall exterior noise level is 69.2 dBA CNEL which is considered *conditionally acceptable* for residential land use, according to the Land Use Compatibility for Community Noise Exposure(8).

- Location L2 represents the residential community located roughly 911 feet north across the wash basin at the end of Kitching Street. The noise level measurements show an overall 24-hour exterior noise level of 57.8 dBA CNEL which is considered *normally acceptable* for residential use by the Land Use Compatibility for Community Noise Exposure. The hourly noise levels measured at Location L2 ranged from 48.8 to 54.9 dBA Leq during the daytime hours and from 48.8 to 53.4 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 51.8 dBA Leq with an average nighttime noise level of 50.9 dBA Leq.
- Location L3 represents the existing noise sensitive residential noise receptors located some 1,705 feet east of the Project site on Callerio Vista. According the noise measurement results, the overall 24-hour CNEL was calculated at 58.6 dBA based on the hourly noise levels indicating a *normally acceptable* Land Use Compatibility for residential land use. A review of the hourly noise levels show that the existing daytime hourly ambient noise levels ranged from 50.2 to 62.7 dBA Leq resulting in an energy (logarithmic) average daytime noise level of 56.4 dBA Leq. During the nighttime hours, the measured ambient noise levels ranged from 41.4 to 55.8 dBA Leq producing an energy (logarithmic) average nighttime noise level of 50.3 dBA Leq.
- Location L4 represents the existing ambient noise levels 1,688 feet southwest of the Project at an existing residential home south of Nandina Avenue. At this location, the *conditionally acceptable* 24-hour Land Use Compatibility noise level was calculated based on the hourly noise levels at 67.8 dBA CNEL. The existing daytime hourly noise levels were measured at 60.1 to 64.6 dBA Leq with the nighttime hours ranging from 56.8 to 63.9 dBA Leq. The energy (logarithmic) average daytime noise level was calculated at 62.3 dBA Leq with an average nighttime noise level of 61.0 dBA Leq.

TABLE 5-1: LONG-TERM AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Distance From Project Site	Description	Hourly Noise Level (Leq dBA)[2]		CNEL
			Daytime (7am to 10pm)	Nighttime (10pm to 7am)	
L1	717'	Southwest of the Project site across Perris boulevard and north of San Michele Road	62.2	62.7	69.2
L2	911'	North of the Project site across the wash basin at the end of Kitchening Street	51.8	50.9	57.8
L3	1,705'	East of the Project site in an existing residential neighborhood located on Callerio Vista	56.4	50.3	58.6
L4	1,688'	Southwest of the Project site in an existing residential neighborhood south of Nandina Avenue.	62.2	61.0	67.8

[1] See Exhibit 5-A for the location of the noise level measurement locations.
[2] Energy (logarithmic) average hourly levels. The long-term measurements printouts are included in Appendix 5.1.

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 a summary of the hourly noise levels for each hour as well as the minimum and maximum noise level observed during the daytime and nighttime period.

The background ambient noise levels in the Project study area are dominated by the transportation related noise associated with the arterial roadway network. This includes the auto and heavy truck activities near the noise level measurement locations. Additional background ambient noise is also included in the noise level measurements, however these impacts are generally overshadowed by the nearby vehicular traffic noise levels.

6 METHODS AND PROCEDURES

The following section outlines the methods and procedures used to model and analyze the future traffic noise environment.

6.1 FHWA Traffic Noise Prediction Model

The estimated roadway noise impacts from vehicular traffic were calculated using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108.(14) 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.(15) 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.

6.2 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 17 study area roadway segments, the functional roadway classifications according to the General Plan Circulation Element, the number of lanes and the vehicle speeds. For the purpose of this analysis, soft site conditions were used to analyze the traffic noise impacts within the Project study area. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation.

The Existing and Year 2018 average daily traffic volumes used for this study are presented in Table 6-2 and were provided by the *Modular Logistics Center Traffic Impact Analysis* prepared by Urban Crossroads, Inc.(1) Table 6-3 provides the time of day (daytime, evening and nighttime) vehicle splits based on information provided by the County of Riverside Office of Industrial Hygiene. (16)

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. According to the *Modular Logistics Center Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (1), the Project will generate approximately 447 daily truck trips. These trucks will be assigned to the 17 individual off-site study area roadway segments based on the estimated Project truck trip distribution percentages. Using the Project truck trips in combination with the Project trip distribution, it is possible to calculate the number of additional Project truck trips and vehicle mix percentages for each of the study area roadway segments. Table 6-4 describes the distribution of traffic flow by vehicle type (vehicle mix) by roadway segment for each of the off-site Project traffic conditions.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Jurisdiction	Roadway Classification[1]	Lanes	Vehicle Speed (MPH)[2]
1	Patterson Av.	s/o Harley Knox Bl.	Perris	Collector	2	45
2	Indian St.	n/o Grove View Rd.	Moreno Valley	Minor Arterial	4	45
3	Indian St.	s/o Grove View Rd.	Moreno Valley	Minor Arterial	4	45
4	Perris Blvd.	n/o San Michele Rd.	Moreno Valley	Divided Arterial	6	50
5	Perris Blvd.	s/o San Michele Rd.	Moreno Valley	Divided Arterial	6	50
6	Perris Blvd.	n/o Grove View Rd.	Moreno Valley	Divided Arterial	6	50
7	Perris Blvd.	s/o Grove View Rd.	Moreno Valley	Divided Arterial	6	50
8	Perris Blvd.	s/o Harley Knox Bl.	Perris	Divided Arterial	6	50
9	Kitching St.	n/o Modular Wy.	Moreno Valley	Arterial	4	50
10	Kitching St.	s/o Modular Wy.	Moreno Valley	Arterial	4	50
11	Modular Way	e/o Perris Blvd.	Moreno Valley	Collector	2	45
12	Modular Way	w/o Kitching St.	Moreno Valley	Collector	2	45
13	Globe St.	w/o Kitching St.	Moreno Valley	Collector	2	45
14	Harley Knox Blvd.	e/o I-15 Fwy.	Perris	Arterial	4	45
15	Harley Knox Blvd.	w/o Patterson Av.	Perris	Arterial	4	45
16	Harley Knox Blvd.	e/o Patterson Av.	Perris	Arterial	4	45
17	Harley Knox Blvd.	w/o Perris Blvd.	Perris	Arterial	4	45

[1] Road Classifications based upon the General Plan Circulation Element.
[2] Source: Modular Logistics Center Traffic Impact Analysis, Urban Crossroads, Inc. March, 2014.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic (1,000's)[1]			
			Existing		Year 2018	
			No Project	With Project	No Project	With Project
1	Patterson Av.	s/o Harley Knox Bl.	1.4	1.5	1.9	2.0
2	Indian St.	n/o Grove View Rd.	6.6	6.7	23.1	23.2
3	Indian St.	s/o Grove View Rd.	8.1	9.0	22.1	23.0
4	Perris Blvd.	n/o San Michele Rd.	18.8	19.4	25.9	26.5
5	Perris Blvd.	s/o San Michele Rd.	17.9	18.4	24.7	25.1
6	Perris Blvd.	n/o Grove View Rd.	16.9	17.5	28.1	28.8
7	Perris Blvd.	s/o Grove View Rd.	17.3	18.2	28.6	29.5
8	Perris Blvd.	s/o Harley Knox Bl.	16.2	16.6	26.7	27.0
9	Kitching St.	n/o Modular Wy.	0.8	1.7	0.6	1.3
10	Kitching St.	s/o Modular Wy.	0.3	0.9	0.3	1.5
11	Modular Way	e/o Perris Blvd.	0.6	0.8	0.3	0.8
12	Modular Way	w/o Kitching St.	0.6	0.7	0.3	0.8
13	Globe St.	w/o Kitching St.	1.4	2.6	1.6	2.7
14	Harley Knox Blvd.	e/o I-15 Fwy.	13.3	14.7	31.1	32.5
15	Harley Knox Blvd.	w/o Patterson Av.	12.2	13.6	33.1	34.4
16	Harley Knox Blvd.	e/o Patterson Av.	10.8	12.2	31.7	33.1
17	Harley Knox Blvd.	w/o Perris Blvd.	5.4	5.6	13.1	13.7

Source: Modular Logistics Center Traffic Impact Analysis, Urban Crossroads, Inc. March, 2014.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Time Period	Vehicle Type		
	Autos	Medium Trucks	Heavy Trucks
Daytime (7am-7pm)	77.5%	84.8%	86.5%
Evening (7pm-10pm)	12.9%	4.9%	2.7%
Nighttime (10pm-7am)	9.6%	10.3%	10.8%
Total:	100.0%	100.0%	100.0%

Source: County of Riverside Office of Industrial Hygiene Time of Day Vehicle Splits.

TABLE 6-4: DISTRIBUTION OF TRAFFIC FLOW BY VEHICLE TYPE (VEHICLE MIX)

ID	Roadway	Segment	No Project[1]				Existing With Project[2]				Year 2018 With Project[2]			
			Autos	Medium Trucks	Heavy Trucks	Total	Autos	Medium Trucks	Heavy Trucks	Total	Autos	Medium Trucks	Heavy Trucks	Total
1	Patterson Av.	s/o Harley Knox Bl.	90.31%	2.12%	7.57%	100%	90.78%	2.01%	7.21%	100%	90.66%	2.04%	7.30%	100%
2	Indian St.	n/o Grove View Rd.	90.31%	2.12%	7.57%	100%	90.41%	2.09%	7.49%	100%	90.34%	2.11%	7.55%	100%
3	Indian St.	s/o Grove View Rd.	90.31%	2.12%	7.57%	100%	86.15%	2.59%	11.26%	100%	88.73%	2.29%	8.97%	100%
4	Perris Blvd.	n/o San Michele Rd.	90.31%	2.12%	7.57%	100%	90.39%	2.08%	7.54%	100%	90.37%	2.09%	7.55%	100%
5	Perris Blvd.	s/o San Michele Rd.	90.31%	2.12%	7.57%	100%	89.73%	2.16%	8.11%	100%	89.89%	2.15%	7.96%	100%
6	Perris Blvd.	n/o Grove View Rd.	90.31%	2.12%	7.57%	100%	89.78%	2.15%	8.07%	100%	89.99%	2.14%	7.88%	100%
7	Perris Blvd.	s/o Grove View Rd.	90.31%	2.12%	7.57%	100%	89.54%	2.17%	8.29%	100%	89.84%	2.15%	8.02%	100%
8	Perris Blvd.	s/o Harley Knox Bl.	90.31%	2.12%	7.57%	100%	90.52%	2.07%	7.41%	100%	90.44%	2.09%	7.47%	100%
9	Kitching St.	n/o Modular Wy.	90.31%	2.12%	7.57%	100%	77.12%	3.51%	19.38%	100%	74.25%	3.81%	21.94%	100%
10	Kitching St.	s/o Modular Wy.	90.31%	2.12%	7.57%	100%	56.22%	5.75%	38.03%	100%	56.22%	5.75%	38.03%	100%
11	Modular Way	e/o Perris Blvd.	90.31%	2.12%	7.57%	100%	85.05%	2.35%	12.60%	100%	83.16%	2.43%	14.41%	100%
12	Modular Way	w/o Kitching St.	90.31%	2.12%	7.57%	100%	65.79%	4.94%	29.28%	100%	51.74%	6.55%	41.71%	100%
13	Globe St.	w/o Kitching St.	90.31%	2.12%	7.57%	100%	74.20%	3.83%	21.97%	100%	75.61%	3.68%	20.71%	100%
14	Harley Knox Blvd.	e/o I-15 Fwy.	90.31%	2.12%	7.57%	100%	87.91%	2.37%	9.72%	100%	89.25%	2.23%	8.52%	100%
15	Harley Knox Blvd.	w/o Patterson Av.	90.31%	2.12%	7.57%	100%	87.70%	2.39%	9.90%	100%	89.32%	2.22%	8.46%	100%
16	Harley Knox Blvd.	e/o Patterson Av.	90.31%	2.12%	7.57%	100%	87.29%	2.43%	10.27%	100%	89.24%	2.23%	8.54%	100%
17	Harley Knox Blvd.	w/o Perris Blvd.	90.31%	2.12%	7.57%	100%	87.36%	2.41%	10.24%	100%	89.03%	2.24%	8.73%	100%

[1] Based on existing peak hour classification counts by vehicle type on Harley Knox Bl. At Western Wy.
[2] Vehicle mix with the added passenger car and truck project trips shown in the Modular Logistics Center Traffic Impact Analysis prepared by Urban Crossroads, Inc. March, 2014.

6.3 VIBRATION ASSESSMENT

This analysis focuses on the potential ground-borne vibration associated with vehicular traffic and construction activities. Ground-borne vibration levels from automobile traffic are generally overshadowed by vibration generated by heavy trucks that roll over the same uneven roadway surfaces. However, due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity.

However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are summarized on Table 6-5. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the human response (annoyance) using the following vibration assessment methods defined by the FTA. To describe the human response (annoyance) associated with vibration impacts the FTA provides the following equation:

$$L_{VdB}(D) = L_{VdB}(25\text{ ft}) - 30\log(D/25)$$

TABLE 6-5: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	Vibration Decibels (VdB) at 25 feet
Small bulldozer	58
Jackhammer	79
Loaded Trucks	86
Large bulldozer	87

[1] Source::Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.

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7 TRANSPORTATION NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with development of the proposed Project, noise contours were developed based on the *Modular Logistics Center Traffic Impact Analysis*.(1) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway. Traffic noise contour boundaries are typically calculated at distances of 100 feet from a roadway centerline. Noise contours were developed for the following traffic scenarios:

- Existing Without / With Project: This scenario refers to the existing present-day noise conditions, without the Project and with the construction of the proposed Project.
- Year (2018) Without / With Project: This scenario refers to the background noise conditions at future Year 2018 with and without the proposed Project. This scenario corresponds to 2018 conditions, and includes all cumulative projects identified in the Traffic Impact Analysis.

7.1 TRAFFIC NOISE CONTOURS

To quantify the Project's traffic noise impacts on the surrounding areas, the changes in traffic noise levels on 17 roadway segments surrounding the Project were calculated based on the changes in the average daily traffic volumes. The noise contours were used to assess the Project's incremental traffic-related cumulative noise impacts at land uses adjacent to roadways conveying Project traffic. Based on the cumulative noise impact significance criteria described in Section 4.2, a significant off-site traffic noise level impact occurs when, the without Project noise levels:

- are less than 60 dBA and the project creates a “readily perceptible” 5 dBA or greater project related noise level increase, or:
- range from 60 to 65 dBA and the project creates a “barely perceptible” 3 dBA or greater project noise level increase, or;
- already exceed 65 dBA, and the project creates a community noise level impact of greater than 1.5 dBA.

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, 60 and 55 dBA noise levels. The noise contours do not take into account the effect of any existing noise barriers or topography that may affect ambient noise levels. In addition, since the noise contours reflect modeling of vehicular noise along area roadways, they appropriately do not reflect noise contribution from the surrounding commercial and industrial uses or airport activities within the Project study area. Tables 7-1 through 7-4 presents a summary of the unmitigated exterior traffic noise levels for the 17 study area roadway segments analyzed from the without Project to the with Project conditions in each of the two timeframes: Existing; and Year 2018 conditions. Appendix 7.1 includes a summary of the traffic noise level contours for each of the four traffic scenarios.

TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	CNEL at 100 Feet (dBA)	Distance to Contour (Feet)			
				70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
1	Patterson Av.	s/o Harley Knox Bl.	57.7	RW	RW	70	151
2	Indian St.	n/o Grove View Rd.	64.6	44	94	203	436
3	Indian St.	s/o Grove View Rd.	65.5	50	108	232	500
4	Perris Blvd.	n/o San Michele Rd.	70.2	104	224	482	1,039
5	Perris Blvd.	s/o San Michele Rd.	70.0	101	217	467	1,005
6	Perris Blvd.	n/o Grove View Rd.	69.8	97	208	449	968
7	Perris Blvd.	s/o Grove View Rd.	69.9	98	212	456	983
8	Perris Blvd.	s/o Harley Knox Bl.	69.6	94	203	437	941
9	Kitching St.	n/o Modular Wy.	56.4	RW	RW	57	123
10	Kitching St.	s/o Modular Wy.	52.1	RW	RW	RW	64
11	Modular Way	e/o Perris Blvd.	54.0	RW	RW	40	86
12	Modular Way	w/o Kitching St.	54.0	RW	RW	40	86
13	Globe St.	w/o Kitching St.	57.7	RW	RW	70	151
14	Harley Knox Blvd.	e/o I-15 Fwy.	67.8	71	153	329	709
15	Harley Knox Blvd.	w/o Patterson Av.	67.4	67	144	311	670
16	Harley Knox Blvd.	e/o Patterson Av.	66.9	62	133	287	617
17	Harley Knox Blvd.	w/o Perris Blvd.	63.8	39	84	180	389

[1] "RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-2: EXISTING WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	CNEL at 100 Feet (dBA)	Distance to Contour (Feet)			
				70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
1	Patterson Av.	s/o Harley Knox Bl.	57.7	RW	RW	71	152
2	Indian St.	n/o Grove View Rd.	64.6	44	94	203	437
3	Indian St.	s/o Grove View Rd.	67.0	63	136	294	633
4	Perris Blvd.	n/o San Michele Rd.	70.4	106	228	491	1,058
5	Perris Blvd.	s/o San Michele Rd.	70.4	106	228	490	1,057
6	Perris Blvd.	n/o Grove View Rd.	70.1	102	220	474	1,021
7	Perris Blvd.	s/o Grove View Rd.	70.4	106	228	491	1,058
8	Perris Blvd.	s/o Harley Knox Bl.	69.6	94	204	438	945
9	Kitching St.	n/o Modular Wy.	61.0	RW	54	116	250
10	Kitching St.	s/o Modular Wy.	63.0	RW	73	158	341
11	Modular Way	e/o Perris Blvd.	58.4	RW	37	79	170
12	Modular Way	w/o Kitching St.	60.2	RW	48	103	223
13	Globe St.	w/o Kitching St.	63.1	RW	75	162	349
14	Harley Knox Blvd.	e/o I-15 Fwy.	68.8	83	178	385	829
15	Harley Knox Blvd.	w/o Patterson Av.	68.5	79	171	368	792
16	Harley Knox Blvd.	e/o Patterson Av.	68.1	75	162	349	751
17	Harley Knox Blvd.	w/o Perris Blvd.	65.2	48	103	222	479

[1] "RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-3: YEAR 2018 WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	CNEL at 100 Feet (dBA)	Distance to Contour (Feet)			
				70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
1	Patterson Av.	s/o Harley Knox Bl.	59.0	RW	40	86	185
2	Indian St.	n/o Grove View Rd.	70.0	101	217	467	1,006
3	Indian St.	s/o Grove View Rd.	69.8	98	210	453	977
4	Perris Blvd.	n/o San Michele Rd.	71.6	129	277	597	1,286
5	Perris Blvd.	s/o San Michele Rd.	71.4	125	268	578	1,246
6	Perris Blvd.	n/o Grove View Rd.	72.0	136	293	630	1,358
7	Perris Blvd.	s/o Grove View Rd.	72.1	137	296	638	1,374
8	Perris Blvd.	s/o Harley Knox Bl.	71.8	131	283	609	1,313
9	Kitching St.	n/o Modular Wy.	55.1	RW	RW	47	102
10	Kitching St.	s/o Modular Wy.	52.1	RW	RW	RW	64
11	Modular Way	e/o Perris Blvd.	51.0	RW	RW	RW	54
12	Modular Way	w/o Kitching St.	51.0	RW	RW	RW	54
13	Globe St.	w/o Kitching St.	58.3	RW	RW	77	166
14	Harley Knox Blvd.	e/o I-15 Fwy.	71.5	125	269	580	1,249
15	Harley Knox Blvd.	w/o Patterson Av.	71.7	130	281	605	1,302
16	Harley Knox Blvd.	e/o Patterson Av.	71.5	127	273	587	1,265
17	Harley Knox Blvd.	w/o Perris Blvd.	67.7	70	151	326	702

[1] "RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-4: YEAR 2018 WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	CNEL at 100 Feet (dBA)	Distance to Contour (Feet)			
				70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
1	Patterson Av.	s/o Harley Knox Bl.	59.0	RW	40	86	186
2	Indian St.	n/o Grove View Rd.	70.0	101	217	467	1,007
3	Indian St.	s/o Grove View Rd.	70.5	108	232	499	1,076
4	Perris Blvd.	n/o San Michele Rd.	71.7	130	281	605	1,304
5	Perris Blvd.	s/o San Michele Rd.	71.7	129	278	600	1,292
6	Perris Blvd.	n/o Grove View Rd.	72.2	140	302	651	1,404
7	Perris Blvd.	s/o Grove View Rd.	72.4	144	310	667	1,438
8	Perris Blvd.	s/o Harley Knox Bl.	71.8	132	284	611	1,316
9	Kitching St.	n/o Modular Wy.	60.6	RW	51	109	235
10	Kitching St.	s/o Modular Wy.	63.0	RW	73	158	341
11	Modular Way	e/o Perris Blvd.	57.6	RW	RW	69	149
12	Modular Way	w/o Kitching St.	59.7	RW	44	95	205
13	Globe St.	w/o Kitching St.	63.3	RW	77	166	358
14	Harley Knox Blvd.	e/o I-15 Fwy.	71.9	134	289	623	1,341
15	Harley Knox Blvd.	w/o Patterson Av.	72.2	139	300	646	1,392
16	Harley Knox Blvd.	e/o Patterson Av.	72.0	136	293	632	1,362
17	Harley Knox Blvd.	w/o Perris Blvd.	68.3	77	166	358	771

[1] "RW" = Location of the respective noise contour falls within the right-of-way of the road.

7.2 EXISTING PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-5 presents a comparison of the existing without and with Project conditions CNEL noise levels. From this we can see that the unmitigated exterior noise levels are expected to range from 52.1 to 70.2 dBA CNEL. On the other hand, existing with Project noise level contours are expected to range from 57.7 to 70.4 dBA CNEL. Overall the Project is expected to generate an unmitigated exterior noise level increase of up to 10.9 dBA CNEL.

A review of the data on Table 7-5 suggests that the Project's contribution to the existing noise level is less than significant for 13 of the 17 study area roadway segments. Three segments along Kitching Street, Modular Way, and Globe Street are expected to experience a potentially significant noise level increase approaching 10.9 dBA CNEL. Based on the criteria in Section 4.2 when the without Project noise levels are less than 60 dBA CNEL, any increase in community noise of greater than 5.0 dBA is considered a significant impact. One segment along Indian Street is expected to experience a noise level increase of 1.5 dBA which is considered significant for without Project noise levels already exceeding 65 dBA CNEL. According to the existing off-site Project related traffic noise impact analysis shown on Table 7-5, the Project may create a potentially significant off-site traffic noise level impact on four of the study area roadway segments for existing conditions.

TABLE 7-5: EXISTING OFF-SITE PROJECT RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	CNEL at 100 Feet (dBA)			Potential Significant Impact?[1]
			No Project	With Project	Project Addition	
1	Patterson Av.	s/o Harley Knox Bl.	57.7	57.7	0.1	No
2	Indian St.	n/o Grove View Rd.	64.6	64.6	0.0	No
3	Indian St.	s/o Grove View Rd.	65.5	67.0	1.5	Yes
4	Perris Blvd.	n/o San Michele Rd.	70.2	70.4	0.1	No
5	Perris Blvd.	s/o San Michele Rd.	70.0	70.4	0.3	No
6	Perris Blvd.	n/o Grove View Rd.	69.8	70.1	0.4	No
7	Perris Blvd.	s/o Grove View Rd.	69.9	70.4	0.5	No
8	Perris Blvd.	s/o Harley Knox Bl.	69.6	69.6	0.0	No
9	Kitching St.	n/o Modular Wy.	56.4	61.0	4.6	No
10	Kitching St.	s/o Modular Wy.	52.1	63.0	10.9	Yes
11	Modular Way	e/o Perris Blvd.	54.0	58.4	4.4	No
12	Modular Way	w/o Kitching St.	54.0	60.2	6.2	Yes
13	Globe St.	w/o Kitching St.	57.7	63.1	5.4	Yes
14	Harley Knox Blvd.	e/o I-15 Fwy.	67.8	68.8	1.0	No
15	Harley Knox Blvd.	w/o Patterson Av.	67.4	68.5	1.1	No
16	Harley Knox Blvd.	e/o Patterson Av.	66.9	68.1	1.3	No
17	Harley Knox Blvd.	w/o Perris Blvd.	63.8	65.2	1.4	No

[1] Significance of Cumulative Impacts (Table 4-1).

7.3 YEAR 2018 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-6 presents a comparison of the Year 2018 without and with Project conditions CNEL noise levels. Table 7-3 shows that the unmitigated exterior noise levels are expected to range from 51.0 to 72.1 dBA CNEL. Table 7-4 presents the Year 2018 with Project conditions noise level contours that are expected to range from 57.6 to 72.4 dBA CNEL. As shown on Table 7-6 the Project is expected to generate an unmitigated exterior noise level increase of up to 10.9 dBA CNEL. Based on the cumulative noise impact significance criteria described in Section 4.2, for opening Year 2018 conditions, the Project may create a potentially significant off-site traffic noise level impact on five of the study area roadway segments for Year 2018 conditions. Even though the expected noise levels will range from 57.6 to 63.3 dBA CNEL and do not exceed the noise level criteria, the impact along the five roadway segments does create a "readily perceptible" 5 dBA or greater Project related noise level increase. It is important to recognize that Kitching Street provides the primary entry to the Project site and is surrounded by neighboring industrial land use and the Eastern Municipal Water District Moreno Valley Regional Water Reclamation Facility. Since there are no noise-sensitive residential receptors impacted by the off-site traffic noise level impacts on Kitching Street, Modular Way, and Globe Street, the Project will create a less than significant off-site traffic noise level impact on the study area roadway segments for Year 2018 conditions.

TABLE 7-6: YEAR 2018 OFF-SITE PROJECT RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	CNEL at 100 Feet (dBA)			Potential Significant Impact?[1]
			No Project	With Project	Project Addition	
1	Patterson Av.	s/o Harley Knox Bl.	59.0	59.0	0.0	No
2	Indian St.	n/o Grove View Rd.	70.0	70.0	0.0	No
3	Indian St.	s/o Grove View Rd.	69.8	70.5	0.6	No
4	Perris Blvd.	n/o San Michele Rd.	71.6	71.7	0.1	No
5	Perris Blvd.	s/o San Michele Rd.	71.4	71.7	0.2	No
6	Perris Blvd.	n/o Grove View Rd.	72.0	72.2	0.2	No
7	Perris Blvd.	s/o Grove View Rd.	72.1	72.4	0.3	No
8	Perris Blvd.	s/o Harley Knox Bl.	71.8	71.8	0.0	No
9	Kitching St.	n/o Modular Wy.	55.1	60.6	5.5	Yes
10	Kitching St.	s/o Modular Wy.	52.1	63.0	10.9	Yes
11	Modular Way	e/o Perris Blvd.	51.0	57.6	6.6	Yes
12	Modular Way	w/o Kitching St.	51.0	59.7	8.7	Yes
13	Globe St.	w/o Kitching St.	58.3	63.3	5.0	Yes
14	Harley Knox Blvd.	e/o I-15 Fwy.	71.5	71.9	0.5	No
15	Harley Knox Blvd.	w/o Patterson Av.	71.7	72.2	0.4	No
16	Harley Knox Blvd.	e/o Patterson Av.	71.5	72.0	0.5	No
17	Harley Knox Blvd.	w/o Perris Blvd.	67.7	68.3	0.6	No

[1] Significance of Cumulative Impacts (Table 4-1).

7.4 CUMULATIVE PROJECT TRAFFIC NOISE IMPACTS

The cumulative traffic noise analysis indicates that the Project's contributions to roadway noise levels may cause a significant impact to future sensitive noise receptors. This is in part due to the increase in truck traffic from the construction of driveways along Kitching Street and Modular Way, with an increase on Globe Street due to connectivity to Perris Boulevard. However, since there are no noise-sensitive residential receptors impacted by the off-site traffic noise level impacts, the off-site traffic noise level impact will be less than significant. This analysis also shows that the Project may create a substantial permanent increase in traffic-related noise levels along the study area roadway segments, however, they will not exceed the exterior noise level criteria of less than 75 dBA CNEL for *"Normally Acceptable"* industrial land use and therefore, no mitigation is required.

8 OPERATIONAL IMPACTS

This section analyzes the potential stationary source operational noise and vibration impacts at nearby receiver locations resulting from the development of the proposed Modular Logistics Center. Exhibit 8-A identifies the location of the ten noise receiver locations used to assess the operational noise level impacts.

8.1 OPERATIONAL NOISE SOURCES

At the time this noise analysis was prepared, the future tenants of the proposed Project were unknown. For the purpose of this analysis, the future uses on site are assumed to be any of those uses permitted by the Moreno Valley Industrial Area Plan's "Industrial" designation. Furthermore, this analysis assumes the Project would be operational 24 hours per day, seven days per week. The Project Applicant estimates that the building is designed to accommodate a warehouse distribution, e-logistics, fulfillment center, or light-industrial operator(s). Although the proposed building is not necessarily expected to accommodate a tenant(s) that requires cold storage (refrigeration), this analysis assumes that the building could house a tenant that uses cold storage. Business operations would primarily be conducted within the enclosed building, with the exception of traffic movement, parking, and the loading and unloading of trucks at designated loading bays. The operational noise impacts associated with the proposed Project are expected to include idling trucks, delivery truck activities, parking, backup alarms , refrigerated containers or reefers, as well as loading and unloading of dry goods.

8.2 OPERATIONAL NOISE STANDARDS

The Noise Ordinance included in the City of Moreno Valley Municipal Code provides performance standards and noise control guidelines for determining and mitigating non-transportation or stationary noise source impacts from operations at private properties. Section 11.80.030 (C.), Nonimpulsive Sound Decibel Limits states the following: No person shall maintain, create, operate or cause to be operated on private property any source of sound in such a manner as to create any nonimpulsive sound which exceeds the limits set forth for the source land use category in Table 11.80.030-2 when measured at a distance of two hundred (200) feet or more from the real property line of the source of the sound, if the sound occurs on privately owned property, or from the source of the sound, if the sound occurs on public right-of-way, public space or other publicly owned property. Any source of sound in violation of this subsection shall be deemed prima facie to be a noise disturbance. Table 11.80.030-02, Maximum Sound Levels (in dBA) For Source Land Uses, shows that the daytime and nighttime standards for commercial uses the levels are 65 dBA and 60 dBA, respectively.

8.3 REFERENCE NOISE LEVELS

Since the future tenants of the proposed Project are unknown, the Project noise levels were estimated based on reference noise level measurements of a similar logistics warehouse building. The reference noise levels are intended to describe the expected operational noise sources that may include idling trucks, delivery truck activities, parking, backup alarms , refrigerated containers or reefers, as well as loading and unloading of dry goods.

To estimate the Project off-site operational noise impacts associated with the Modular Logistics Center, reference noise level measurements were collected from an existing logistics warehouse operation containing similar operational noise sources. On Tuesday, January 22, 2013, Urban Crossroads, Inc. collected long-term 24-hour operational noise level measurements at the at Veg Fresh Farms and FedEx distribution facility located at 500 East Orangethorpe Avenue in the City of Anaheim. Reference noise source photos are included in Appendx 8.1. The Veg Fresh Farms and FedEx distribution center noise level measurements represent the typical weekday logistics warehouse operation consisting of over 150 loading bays (docks). The reference noise levels account for the typical 24-hour operations at the logistics warehouse operation that includes idling trucks, delivery truck activities, parking, backup alarms , refrigerated containers or reefers, as well as loading and unloading of dry goods.

At a distance of 25 feet from the reference loading bay (docks) noise source and with an estimated noise source height of 8 feet, the 24-hour measurements produced an exterior reference noise level of 69.1 dBA Leq. While the specific noise levels at the Project site will depend on the actual tenant, the intensity and the daytime / nighttime hours of operation, a reference noise level of 69.1 dBA Leq is used in this analysis to describe the Modular Logistics Center operational noise level impacts.

8.4 PROJECT ONLY OPERATIONAL NOISE LEVELS

Using the 69.1 dBA Leq reference noise level to represent the proposed logistics warehouse operations that include idling trucks, delivery truck activities, parking, backup alarms , refrigerated containers or reefers, as well as loading and unloading of dry goods, it is possible to estimate the Project operational source noise levels at a distance of 200 feet (direct project impacts) and at each of the ten noise receiver locations (cumulative project impacts).

The off-site operational noise level calculations shown on Tables 8-2 and 8-3 describe the direct Project impacts. This Project only operational noise level projection accounts 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. With geometric spreading, sound levels attenuate (or decrease) at a rate of 6 dB for each doubling of distance from a point source. At a reference distance of 200 feet the operational noise level impacts are estimated at 51.0 dBA Leq. The direct Project operational noise level impacts associated with the proposed Modular Logistics Center are below the daytime and nighttime exterior noise level standards for source land uses other than residential of 65 dBA Leq and 60 dBA Leq, respectively and, therefore, create a less than significant noise level impact.

Exhibit 8-A: Noise Receiver Locations

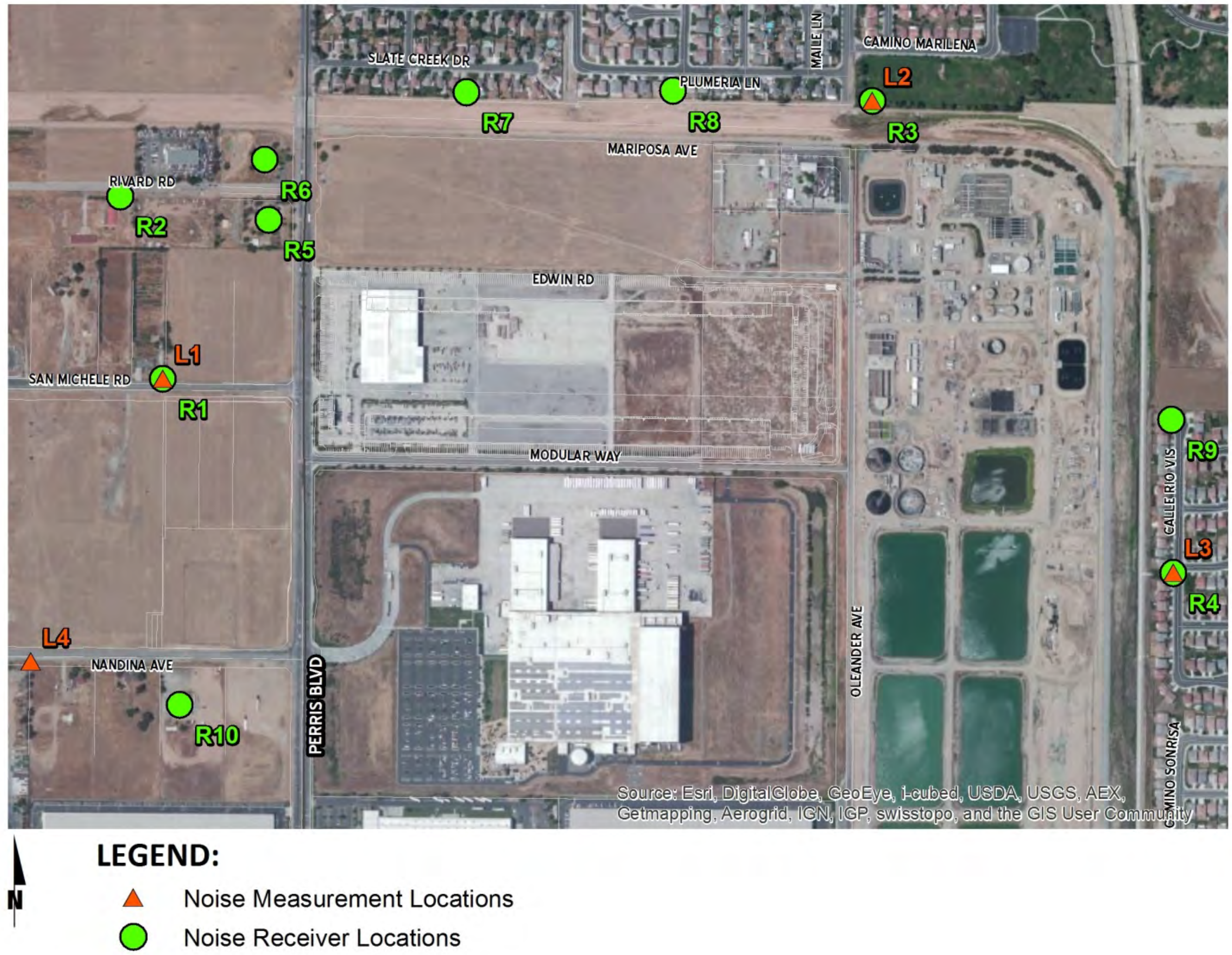

TABLE 8-1: OPERATIONAL NOISE LEVEL PROJECTIONS (DBA LEQ)

Receiver Location[1]	Project Noise[2]	Distance From Source To Receiver (Feet)[3]	Distance Attenuation[4]	Hourly Noise Levels[5]
@200	69.1	200'	-18.1	51.0
R1	69.1	1,080'	-32.7	36.4
R2	69.1	1,034'	-32.3	36.8
R3	69.1	1,077'	-32.7	36.4
R4	69.1	2,100'	-38.5	30.6
R5	69.1	623'	-27.9	41.2
R6	69.1	832'	-30.4	38.7
R7	69.1	922'	-31.3	37.8
R8	69.1	979'	-31.9	37.2
R9	69.1	1,988'	-38.0	31.1
R10	69.1	1,597'	-36.1	33.0

[1] See Exhibit 8-A for the noise receiver locations.
[2] The reference noise level measurements include the daytime and nighttime noise levels associated with idling trucks, delivery truck activities, parking, backup alarms , refrigerated containers or reefers, as well as loading and unloading of dry goods. Reference noise level measurements were collected from the existing 24-hour operations of Veg Fresh Farms and FedEx distribution facility located at 500 East Orangethorpe Avenue in the City of Anaheim. The reference noise level measurements were collected on Tuesday, January 22, 2013.
[3] Estimated distances to nearest loading dock activities.
[4] Noise levels diminish at a rate 6 dBA per doubing of distance and a reference distance of 25 feet.
[5] Estimated project stationary source noise levels.

8.5 PROJECT OPERATIONAL NOISE IMPACTS

To describe the daytime and nighttime cumulative operational noise impacts, the Project only noise levels were compared to the existing ambient noise level measurements shown on Table 5-1. By combining the Project only (direct) noise level projections with the existing ambient noise level measurements, it is possible to identify the future noise levels represented by the combined Project and ambient noise levels. The combined noise levels can then be used to calculate the Project contribution to the cumulative noise conditions.

The expected daytime and nighttime cumulative Project operational noise impacts at the ten receiver locations are presented on Tables 8-2 and 8-3. The difference between the combined Project and ambient noise levels and the existing ambient noise levels were then compared with the cumulative significance criteria. The analysis shows that the Project will contribute an operational noise level impact of up to 0.2 dBA Leq at the nearby receiver locations. The Project contribution at the receiver locations will vary depending on the existing noise levels at each location. The significance criteria presented in Section 4.2 recognizes that the significance of cumulative noise impacts varies depending on the condition of the environment and the Project related noise level increases. The expected noise level increase of up to 0.2 dBA Leq is considered less than significant at all receiver locations. The analysis demonstrates that the operational noise impacts associated with the proposed Project such as idling trucks, delivery truck activities, parking, backup alarms , refrigerated containers or reefers, as well as loading and unloading of dry goods will be less than significant.

TABLE 8-2: DAYTIME (7 A.M. TO 10 P.M.) OPERATION NOISE LEVEL IMPACTS (DBA LEQ)

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Contribution[6]
R1	36.4	L1	62.2	62.2	0.0
R2	36.8	L1	62.2	62.2	0.0
R3	36.4	L2	51.8	51.9	0.1
R4	30.6	L3	56.4	56.4	0.0
R5	41.2	L1	62.2	62.2	0.0
R6	38.7	L1	62.2	62.2	0.0
R7	937.8	L2	51.8	52.0	0.2
R8	37.2	L2	51.8	51.9	0.1
R9	31.1	L3	56.4	56.4	0.0
R10	33.0	L4	62.2	62.2	0.0

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

TABLE 8-3: NIGHTTIME (10 P.M. TO 7 A.M.) OPERATION NOISE LEVEL IMPACTS (DBA LEQ)

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Contribution[6]
R1	36.4	L1	62.7	62.7	0.0
R2	36.8	L1	62.7	62.7	0.0
R3	36.4	L2	50.9	51.1	0.2
R4	30.6	L3	50.3	50.3	0.0
R5	41.2	L1	62.7	62.7	0.0
R6	38.7	L1	62.7	62.7	0.0
R7	37.8	L2	50.9	51.1	0.2
R8	37.2	L2	50.9	51.1	0.2
R9	31.1	L3	50.3	50.4	0.1
R10	33.0	L4	61.0	61.0	0.0

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

8.6 OPERATIONAL NOISE ABATEMENT MEASURES

The normal operation of the Project will not exceed the City's standards for stationary noise impacts. To further reduce potential operational noise levels received at noise receptor locations, it is recommended that the Lead Agency require the following as Project Conditions of Approval:

- All trucks, tractors, and forklifts shall be operated with proper operating and well maintained mufflers.
- Maintain quality pavement conditions that are free of bumps to minimize truck noise.
- The truck access gates and loading docks within the truck court on the project site shall be posted with signs which state:
- Truck drivers shall turn off engines when not in use;
- Diesel trucks servicing the Project shall not idle for more than five (5) minutes; and
- Post telephone numbers of the building facilities manager to report violations.

8.7 OPERATIONAL VIBRATION IMPACTS

Although the human threshold of perception for vibration is around 65 Vdb, human response to vibration is not usually significant unless the vibration exceeds 70 Vdb. Truck vibration levels are dependent on vehicle characteristics, load, speed and pavement condition. Typical vibration levels for heavy trucks on normal traffic speeds can reach levels below 65 VdB. Truck deliveries transiting on site will be travelling at very low speeds so it is expected that delivery truck vibration impacts nearby homes will be less than significant.

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9 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term off-site construction activities associated with the development of the Project.

9.1 CITY OF MORENO VALLEY CONSTRUCTION NOISE STANDARDS

While the City of Moreno Valley Municipal Code does not specifically address construction noise; it does however provide noise level limits for the source land use category when measured at a distance of 200 feet. Since the source land use is other than residential, the 65 dBA Leq at a distance of 200 feet is used as the limit for this analysis to assess the Modular Logistics Center construction noise level impacts.

The City of Moreno Valley has set restrictions to control noise impacts associated with the construction of the proposed Project. According to Section 11.80.030.D.7, Construction and Demolitions: NO person shall operate or cause operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between the hours of eight p.m. and seven a.m. the following day such that the sound there from creates a noise disturbance, except for emergency work by public service utilities or for other work approved by the city manager or designee.

9.2 CONSTRUCTION NOISE LEVELS

Construction noise represents a short-term impact on the ambient noise levels. Noise generated by construction equipment, including trucks, power tools, concrete mixers and portable generators can reach high levels. Construction is expected to commence in December 2014 and will last through September 2015. Project construction is expected to occur in the following stages:

- Demolition
- Grading
- Plumbing
- Electrical
- Structural Concrete
- Fire Protection
- Reinforcing Steel
- Site Utilities
- Structural Steel
- Roof Structure
- Painting (Architectural Coatings)
- Construction Workers Commuting

In January 2006, the Federal Highway Administration (FHWA) published the Roadway Construction Noise Model (RCNM) that includes a national database of construction equipment reference noise emission levels.(17) The RCNM equipment database, as shown in Appendix 9.1, 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. The usage factor is a key input variable of the RCNM noise prediction model that is used to calculate the average Leq noise levels using the Lmax noise levels measured at a distance of 50 feet

Noise levels generated by heavy construction equipment can range from approximately 70 dBA to in excess of 100 dBA when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 78 dBA measured at 50 feet from the noise source to the receptor would be reduced to 72 dBA at 100 feet from the source to the receptor, and would be further reduced to 66 dBA at 200 feet from the source to the receptor. The construction noise levels including the number and mix of construction equipment by construction phase are consistent with the data used to support the construction emissions in the *Modular Logistics Center Air Quality Impact Analysis* prepared by Urban Crossroads Inc. in February 2014. (18)

9.3 CONSTRUCTION NOISE ANALYSIS

Using the stationary-source RCNM noise prediction model, calculations of the Project construction noise level impacts at the ten noise receiver locations were completed. Appendix 9.2 includes the RCNM construction noise level calculations by equipment type for each phase of construction. The analysis shows that the highest construction noise level impacts will occur during the grading phase of construction..

As shown on Table 9-1, at a distance of 200 feet, the construction noise levels are expected to range from 56.0 to 78.4 dBA Leq and will exceed the 65 dBA Leq limit during the daytime hours. A review of the Project study area indicates that majority of the noise sensitive residential noise receptors are located across the wash basin in areas zoned for residential development. These noise sensitive receptors located within planned residential communities are represented by noise receiver locations R3, R4, R7, R8, and R9. The construction related noise level impacts at these noise sensitive receiver locations (R3, R4, R7, R8, and R9) are not expected to exceed the City of Moreno Valley 65 dBA Leq construction noise level limit during the daytime hours with the existing backyard perimeter walls.

Table 9-1 shows that the noise sensitive receivers (R1, R2, R5, R6, and R10) located within areas zoned for industrial land use are expected to range from 61.6 to 76.8 dBA and may exceed the City of Moreno Valley 65 dBA Leq construction noise level limit during the daytime hours. A review of the construction noise analysis indicates that three noise receiver locations R1, R5 and R6 will exceed the City of Moreno Valley 65 dBA Leq construction noise level limit during peak activity.

TABLE 9-1: CONSTRUCTION EQUIPMENT NOISE LEVELS

Noise Receiver[1]	Construction Phase Hourly Noise Level (dBA Leq)[2]																											
	Demolition (Phase 1)	Demolition (Phase 1.1)	Grading (Phase 1)	Grading (Phase 1.1)	Grading (Phase 2)	Grading (Phase 3)	Plumbing Underslab (Phase 1)	Plumbing Underslab (Phase 1.1)	Plumbing-Building	Electrical-Underground	Electrical-Building (Phase 1)	Electrical-Building (Phase 1.1)	Structural Concrete (Phase 1)	Structural Concrete (Phase 2)	Structural Concrete (Phase 3)	Structural Concrete (Phase 4)	Structural Concrete (Phase 5)	Structural Concrete (Phase 6)	Structural Concrete (Phase 7)	Structural Steel	Fire Protection-Site	Fire Protection-Overhead	Reinforcing Steel	Site Utilities- Storm	Site Utilities-Sewer	Site-Utilities-Water	Roof Structure	Peak[3]
@200'	71.9	62.7	78.4	70.5	72.8	72.8	65.0	63.0	56.0	62.0	59.0	62.0	68.0	68.3	59.0	60.0	60.0	62.0	56.0	67.3	66.9	66.9	59.0	70.1	65.5	65.5	72.8	78.4
R1	60.8	51.6	67.3	59.4	61.7	61.7	53.9	51.9	44.9	50.9	47.9	50.9	56.9	57.2	47.9	48.9	48.9	50.9	44.9	56.2	55.9	55.9	47.9	59.0	54.4	54.4	61.7	67.3
R2	57.7	48.6	64.2	56.4	58.7	58.7	50.8	48.8	41.8	47.8	44.8	47.8	53.8	54.1	44.8	45.8	45.8	47.8	41.8	53.1	52.8	52.8	44.8	56.0	51.4	51.4	58.6	64.2
R3	58.7	49.5	65.2	57.3	59.7	59.7	51.8	49.8	42.8	48.8	45.8	48.8	54.8	55.1	45.8	46.8	46.8	48.8	42.8	54.1	53.8	53.8	45.8	56.9	52.3	52.3	59.6	65.2
R4	53.3	44.1	59.7	51.9	54.2	54.2	46.4	44.4	37.4	43.4	40.4	43.4	49.4	49.7	40.4	41.4	41.3	43.4	37.4	48.7	48.3	48.3	40.4	51.5	46.9	46.9	54.2	59.7
R5	70.3	61.1	76.8	68.9	71.2	71.2	63.4	61.4	54.4	60.4	57.4	60.4	66.4	66.7	57.4	58.4	58.4	60.4	54.4	65.7	65.4	65.4	57.4	68.5	63.9	63.9	71.2	76.8
R6	62.1	52.9	68.6	60.7	63.0	63.0	55.2	53.2	46.2	52.2	49.2	52.2	58.2	58.5	49.2	50.2	50.2	52.2	46.2	57.5	57.2	57.2	49.2	60.3	55.7	55.7	63.0	68.6
R7	59.1	49.9	65.5	57.7	60.0	60.0	52.2	50.2	43.1	49.2	46.2	49.2	55.2	55.5	46.2	47.2	47.1	49.1	43.1	54.5	54.1	54.1	46.2	57.3	52.7	52.7	60.0	65.5
R8	58.6	49.5	65.1	57.3	59.6	59.6	51.7	49.7	42.7	48.7	45.7	48.7	54.7	55.0	45.7	46.7	46.7	48.7	42.7	54.0	53.7	53.7	45.7	56.9	52.3	52.3	59.5	65.1
R9	53.8	44.6	60.2	52.4	54.7	54.7	46.9	44.9	37.9	43.9	40.9	43.9	49.9	50.2	40.9	41.9	41.9	43.9	37.9	49.2	48.8	48.8	40.9	52.0	47.4	47.4	54.7	60.2
R10	55.2	46.0	61.6	53.8	56.1	56.1	48.3	46.3	39.3	45.3	42.3	45.3	51.3	51.6	42.3	43.3	43.2	45.3	39.3	50.6	50.2	50.2	42.3	53.4	48.8	48.8	56.1	61.6

[1] Noise receiver locations are shown on Exhibit 8-A.
[2] Construction noise calculations by phase are included in Appendix 9-2.
[3] Estimated construction noise levels during peak operating conditions.

9.4 CONSTRUCTION NOISE ABATEMENT MEASURES

Based on the stages of construction related noise impacts, the noise impacts associated with the proposed Project are expected to create temporary high-level noise impacts at receptors surrounding the Project site when certain activities occur near the Project property line. Though construction noise is temporary, intermittent and of short duration, and will not present any long-term impacts, the following practices would reduce any noise level increases produced by the construction equipment to the nearby noise sensitive residential land uses.

- Prior to approval of grading plans and/or issuance of building permits, plans shall include a note indicating that noise-generating Project construction activities shall not occur between the hours of 8:00 p.m. and 7:00 a.m. The Project construction supervisor shall ensure compliance with the note and the City shall conduct periodic inspection at its discretion.
- During all Project site construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the Project site.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise sensitive receptors nearest the Project site (i.e., to the east and west) during all project construction.
- The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment (between the hours of 8:00 p.m. and 7:00 a.m.) The Project Applicant shall prepare a haul route exhibit for review and approval by the City of Moreno Valley Planning Division prior to commencement of construction activities. The haul route exhibit shall design delivery routes to minimize the exposure of sensitive land uses or residential dwellings to delivery truck-related noise.

9.5 CONSTRUCTION NOISE THRESHOLDS OF SIGNIFICANCE

Provided construction activities take place between the hours of 7:00 a.m. and 8:00 p.m. construction-related noise impacts would be less than significant within planned residential communities represented by noise receiver locations R3, R4, R7, R8, and R9. The noise sensitive receivers (R1, R5, and R6) located within areas zoned for industrial land use are expected to exceed the City of Moreno Valley 65 dBA Leq construction noise level limit during the daytime hours and represent a significant short-term construction noise level impact.

9.6 CONSTRUCTION VIBRATION IMPACTS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. The proposed Project's construction activities most likely to cause vibration impacts are:

- Heavy Construction Equipment: Although all heavy mobile construction equipment has the potential of causing at least some perceptible vibration while operating close to building, the vibration is usually short-term and is not of sufficient magnitude to cause building damage. It is not expected that heavy equipment such as large bulldozers would operate close enough to any residences to cause a vibration impact.
- Trucks: Trucks hauling building materials to construction sites can be sources of vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. Repairing the bumps and potholes generally eliminates the problem.

Ground-borne vibration levels resulting from construction activities occurring within the Project site were estimated by data published by the FTA. Construction activities that would occur within the Project site are expected to include grading and excavation, which would have the potential to generate low levels of ground-borne vibration. Using the vibration source level of construction equipment provided on Table 6-5 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 9-2 presents the expected Project related vibration levels at each of the ten sensitive receiver locations.

TABLE 9-2: CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Noise Receiver[1]	Distance To Property Line (In Feet)	Receiver Vibration Levels (VdB)[2]					Significant Impact[3]
		Small Bulldozer	Jackhammer	Loaded Trucks	Large Bulldozer	Peak Vibration	
@200'	200'	30.9	51.9	58.9	59.9	59.9	No
R1	717'	14.3	35.3	42.3	43.3	43.3	No
R2	1,020'	9.7	30.7	37.7	38.7	38.7	No
R3	911'	11.2	32.2	39.2	40.2	40.2	No
R4	1,705'	3.0	24.0	31.0	32.0	32.0	No
R5	240'	28.5	49.5	56.5	57.5	57.5	No
R6	618'	16.2	37.2	44.2	45.2	45.2	No
R7	875'	11.7	32.7	39.7	40.7	40.7	No
R8	920'	11.0	32.0	39.0	40.0	40.0	No
R9	1,608'	3.7	24.7	31.7	32.7	32.7	No
R10	1,370'	5.8	26.8	33.8	34.8	34.8	No

[1] Noise receiver locations are shown on Exhibit 8-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-4.
[3] Does the Peak Vibration exceed the FTA maximum acceptable vibration standard of 80 (VdB).

Based on the reference vibration levels provided by the FTA, a large bulldozer represents the peak source of vibration with a reference level of 87 VdB at a distance of 25 feet. At distances ranging from 200 to 2,100 feet from the Project site, construction vibration levels are expected to approach 59.9 VdB. Using the construction vibration assessment methods provided by the FTA the proposed Project site will not include nor require equipment, facilities, or activities that would result in a perceptible human response (annoyance).

The Project construction is not expected to generate vibration levels exceeding the FTA maximum acceptable vibration standard of 80 (VdB). Further, impacts at the site of the closest sensitive receptor are unlikely to be sustained during the entire construction period, but will occur rather only during the times that heavy construction equipment is operating proximate to the Project site perimeter. Moreover, construction at the Project site will be restricted to daytime hours consistent with City requirements thereby eliminating potential vibration impact during the sensitive nighttime hours. On this basis the potential for the Project to result in exposure of persons to, or generation of, excessive ground-borne vibration is determined to be less than significant.

10 MARCH AIR RESERVE BASE / INLAND PORT AIRPORT

The March Air Reserve Base / Inland Port Airport is a joint military/civilian use air transport facility that includes air cargo freight traffic. This facility is expected to play an increasingly important role in transportation of goods and cargo for the southern California region. (19)

10.1 AIRPORT COMPATIBILITY

According to the July 2013 March Air Reserve Base / Inland Port Airport Land Use Compatibility Plan (20) prepared by the Riverside County Airport Land Use Commission, the Modular Logistics Center Project site is located within Land Use Compatibility Zone D. According to the basic compatibility criteria, Zone D is considered a flight corridor buffer with a moderate to low noise impact potential.

The Riverside County Airport Land Use Commission is responsible for preparing comprehensive land use plans for airports in an effort to protect and promote the safety and welfare of residents of the airport vicinity and users of the airport while ensuring the continued operation of the airports. Specifically, these plans seek to protect the public from the adverse effects of aircraft noise, to ensure that people and facilities are not concentrated in areas susceptible to aircraft accidents, and to ensure that no structures or activities encroach upon or adversely affect the use of navigable airspace. (21)

10.2 NOISE IMPACT AREA

As part of the July 2013 Land Use Compatibility Plan (20), Exhibit MA-4 outlines the maximum authorized CNEL noise contour boundaries. Based on the information published by the Riverside County Airport Land Use Commission, the proposed Modular Logistics Center is located outside the 60 dBA CNEL airport noise contour boundaries. According to the Land Use Compatibility for Community Noise Exposure (General Plan Guidelines Figure 2) exterior noise levels of up 75 dBA CNEL are considered “normally acceptable” for the proposed Modular Logistics Center industrial land use.

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11 REFERENCES

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18. **Urban Crossroads, Inc.** *First Nandina Logistic Center Air Quality Impact Analysis.* February 2014.
19. **South Coast Air Quality Management District.** *Localized Significance Thresholds Methodology.* s.l. : South Coast Air Quality Managment District, 2003.
20. **Riverside County Airport Land Use Commission.** *March Air Reserve Base / Inland Port Airport Land Use Compatibility Plan.* Santa Rosa, California : Mead and Hunt, June 2013.

21. —. Mission & Background. [Online]

12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Modular Logistics Center 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) 660-1994 ext. 203.

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EDUCATION

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

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

PROFESSIONAL REGISTRATIONS

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

PROFESSIONAL AFFILIATIONS

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

PROFESSIONAL CERTIFICATIONS

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

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APPENDIX 3.1:

CITY OF MORENO VALLEY SAFETY ELEMENT

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also promoted by way of educational programs.

Between July of 2004 and June of 2005, animal services staff responded to 17,077 calls for service. Animal services also returned 1,290 lost pets to their owners and arranged for the adoption of 2,034 pets.

Moreno Valley Animal Shelter

6.3.2 Issues and Opportunities

Irrespective of the efforts of Animal Services and other organizations dedicated to reducing the population of unwanted pets, a large number of unwanted pets are produced every year. Unfortunately, the number of unwanted animals far surpasses the capacity of the shelter and the number of good homes available for adoption.

The need for animal services is expected to grow in proportion to the rate of growth in the local community.

B. ENVIRONMENTAL SAFETY

6.4 NOISE

6.4.1 Background

Noise has long been an accepted part of modern civilization, but excessive noise has become an important environmental concern. Excessive noise can disturb the peace and quiet of neighborhoods. Excessive noise can cause physical and psychological responses. Temporary reactions include, but are not limited to, constriction of blood vessels, secretion of saliva and gastric fluids, changes in heart rate and a feeling of anxiety and discomfort.

Three effects of noise that are of particular concern are interference with speech, interruption of sleep and hearing loss. Sleep interruption can occur when the intruding noise exceeds 45 decibels. Speech interference becomes a problem when the intruding noise is above 60 decibels. Hearing loss can begin to occur with sustained noise levels above 75 decibels.

Section 1092 of Title 25, Chapter 1, Subchapter 1, Article 4, of the California Administrative Code includes noise insulation standards for new multi-family structures (hotels, motels, apartments, condominiums, and other attached dwellings) located within the 60 CNEL contour adjacent to roads, railroads, rapid transit lines, airports or industrial areas. An acoustic analysis is required showing that these multi-family units have been designed to limit interior noise levels with doors and windows closed to 45 CNEL in any habitable room. Title 21 of the California Administration Code (Subchapter 6, Article 2, Section 5014) also specifies that noise levels in all habitable rooms do not exceed 45 CNEL.

6.4.2 Noise Fundamentals

Noise levels are measured on a logarithmic scale in decibels. The measurements are then weighted and added over a specified time period to reflect not only the magnitude of the sound, but also its duration, frequencyand time of occurrence. In this manner, various acoustical scales and units of measurement have been developed such as: equivalent sound levels (Leq), day-night average sound levels (Ldn), Community Noise Equivalent Levels (CNEL's), and

Single Event Noise Exposure Levels (SENEL's).

A-weighted decibels (dBA) approximate the subjective response of the human ear to noise by discriminating against the very low and high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies audible to the human ear. The decibel scale has a value of 1.0 dBA at the threshold of hearing and 140 dBA at the threshold of pain. Each increase of 10 decibels indicates a ten-fold sound energy increase, which is perceived by the human ear as being roughly twice as loud.

Examples of the decibel level of various noise sources are the quiet rustle of leaves (10 dBA), a soft whisper (20 to 30 dBA) and the hum of a small electric clock (40 dBA). Additional examples include the ambient noise in a house kitchen (50dBA), normal conversation at 5 feet (55 dBA) and a busy street at 50 feet (75 dBA).

Day-night average sound levels (Ldn) are a measure of cumulative noise exposure. The Ldn value results from a summation of hourly noise levels over a 24-hour time period with an increased weighting factor applied to the period between 10:00 PM and 7:00 AM. This takes into account the fact that noise that occurs during normal sleeping hours is more annoying. Community Noise Equivalent Levels (CNEL's) is a measure similar to Ldn except it includes an additional penalty for noise that occurs between 7 p.m. and 10 p.m. CNEL values are typically less than one decibel higher than Ldn values.

The Single Event Noise Exposure Level (SENEL) is the appropriate rating scale for a single noise occurrence. The SENEL, given in decibels, is the noise exposure level of a single event measured over the time interval between the initial and final times for which it exceeds the threshold noise level.

For a "line source" of noise such as a heavily traveled roadway, the noise level drops off at a nominal rate of 3.0 decibels for each doubling of distance between the noise source and noise receiver. Environmental factors such as the wind, temperature, the characteristics of the ground (hard or soft) and the air (relative humidity), the presence of grass, shrubs and trees, combine to increase the actual attenuation achieved outside laboratory conditions to 4.5 decibels per doubling of distance. Thus, a noise level of 74.5 decibels at 50 feet from the highway centerline would attenuate to 70.0 decibels at 100 feet, 65.5 decibels at 200 feet, and so forth.

In an area, which is relatively flat and free of barriers, the sound level resulting from a single "point source" drops by 6 decibels for each doubling of distance. This applies to fixed noise sources such as industrial sources and mobile noise sources that are temporarily stationary such as idling trucks.

Important noise sources within the study area include industrial and utility uses, mechanical equipment, loud speakers, aircraft and motor vehicles. Noise levels adjacent to roadways vary with the volume of traffic, the mean vehicular speed, the truck mix and the road cross-section. High traffic volumes and speed along State route 60 and arterial roadways contribute to high noise levels. Noise levels due to air traffic from the joint-use airport at March depend on aircraft characteristics, the number, path, elevation and duration of flights as well as the time of day that flights take place.

The results of the noise analysis prepared for the environmental impact report for the General Plan Update is shown in Figure 6-2. Figure 6-2 can be used as a general guide to determine potential "worst case" future noise levels for planning and design purposes.

6.4.3 Community Responses to Noise

People in general cannot perceive an increase or decrease of 1.0 dBA except in carefully controlled laboratory experiments. A

3.0 dBA increase is considered noticeable outside of the laboratory. An increase of 5.0 dBA is often necessary before any noticeable change in community response (i.e. complaints) would be expected.

Studies have shown that people respond to changes in long-term noise levels. About 10 percent of the people exposed to traffic noise of 60 Ldn will report being highly annoyed with the noise and 2 percent more people become highly annoyed with each unit of Ldn increase in traffic noise. When traffic noise exceeds 60 Ldn or aircraft noise exceeds 55 Ldn, people begin complaining. Group and legal actions to stop the noise may occur at traffic noise levels near 70 Ldn and aircraft noise levels near 65 Ldn.

Approximately 10 percent of the population has such a low tolerance for noise that they object to any noise not of their own making. Consequently, even in the quietest environment, some complaints will occur. Another 25 percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected.

6.4.4. Planning and Design Considerations

There are many mechanisms available to control noise in the community. A noise ordinance can be adopted to control noise sources, but the best way to minimize the adverse effects of noise is through planning and design.

Planning noise compatible land uses near existing or projected high noise levels is an effective technique. Certain land uses are more compatible with noise than others. Schools, hospitals, churches and single-family residences are relatively sensitive to noise. Multiple-family residential uses are less sensitive to noise than single-family residential uses. Commercial, office and industrial uses are relatively noise tolerant. Where possible, the land use plan places noise tolerant uses within areas impacted by noise from State Route 60, arterial streets and aircraft over flights. The historical land use pattern and other community needs made it impractical to avoid all noise conflicts through land use planning.

Acoustic site planning, architectural design, acoustic construction techniques and noise barriers are effective methods for reducing noise impacts. Acoustic site planning involves the arrangement of lots, buildings, berms and walls to minimize noise conflicts and impacts. Sound walls and berming are often used as sound barriers between residential uses and nonresidential noise sources, such as commercial uses, industrial uses, freeways and other major roadways.

Acoustic architectural design involves the incorporation of noise attenuation strategies in the design of individual structures. Building heights, room arrangements, window size and placement, balcony and courtyard design can be adjusted to shield noise sensitive activities from intrusive sound levels.
Acoustic construction is the treatment of various parts of a building to reduce interior noise levels. Acoustic wall design, doors, ceilings and floors, as well as dense building materials and acoustic windows (double-paned, thick, non-openable, or small windows) are all available options.

6.5 GEOLOGIC HAZARDS

6.5.1 Background

Most of the Moreno Valley study area lies at the eastern margin of a block of the earth's crust known as the “Perris Block.” The Perris Block is a mass of granitic rock, generally bounded by the San Jacinto fault, the Elsinore fault, and the Santa Ana River. The Perris Block has had an apparent history of vertical land movements of several thousand feet.

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APPENDIX 3.2:

CALIFORNIA OFFICE OF PLANNING AND RESEARCH GENERAL PLAN GUIDELINES

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APPENDIX C

Guidelines for the Preparation and Content of the Noise Element of the General Plan

The noise element of the general plan provides a basis for comprehensive local programs to control and abate environmental noise and to protect citizens from excessive exposure. The fundamental goals of the noise element are:

- To provide sufficient information concerning the community noise environment so that noise may be effectively considered in the land use planning process. In so doing, the necessary groundwork will have been developed so that a community noise ordinance may be utilized to resolve noise complaints.
- To develop strategies for abating excessive noise exposure through cost-effective mitigating measures in combination with zoning, as appropriate, to avoid incompatible land uses.
- To protect those existing regions of the planning area whose noise environments are deemed acceptable and also those locations throughout the community deemed "noise sensitive."
- To utilize the definition of the community noise environment in the form of CNEL or Ldn noise contours as provided in the noise element for local compliance with the State Noise Insulation Standards. These standards require specified levels of outdoor to indoor noise reduction for new multifamily residential constructions in areas where the outdoor noise exposure exceeds CNEL (or Ldn) 60 dB.

The 1976 edition of the *Noise Element Guidelines*, prepared by the California Department of Health Services (DHS), was a result of SB 860 (Beilenson, 1975), which became effective January 1, 1976. SB 860, among other things, revised and clarified the requirements for the noise element of each city and county general plan and gave DHS the authority to issue guidelines for compliance thereto. Compliance with the 1976 version of these guidelines was mandated only for those noise elements that were not submitted to the Office of Planning and Research by the effective date of SB 860 and to subsequent revisions of previously submitted noise elements.

A comparison between the 1976 *Noise Element Guidelines* and this revised edition will not reveal substantial changes. The basic methodology advanced by that previous edition remains topical. Where necessary, code references have been updated and the text revised to reflect statutory changes.

DEFINITIONS

Decibel, dB: A unit of measurement describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).

A-Weighted Level: The sound level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear and gives good correlation with subjective reactions to noise.

L10: The A-weighted sound level that is exceeded ten percent of the sample time. Similarly, L50, L90, etc.

Leq: Equivalent energy level. The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. Leq is typically computed over 1-, 8-, and 24-hour sample periods.

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

Ldn: Day-Night Average Level. The average equivalent A-weighted sound level during a 24-hour day, obtained after the addition of 10 decibels to sound levels in the night after 10 p.m. and before 7 a.m. (Note: CNEL and Ldn represent daily levels of noise exposure averaged on an annual or daily basis, while Leq represents the equivalent energy noise exposure for a shorter time period, typically one hour.)

Noise Contours: Lines drawn about a noise source indicating equal levels of noise exposure. CNEL and Ldn are the metrics utilized herein to describe annoyance due to noise and to establish land use planning criteria for noise.

Ambient Noise: The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Intrusive Noise: That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence, and tonal or informational content as well as the prevailing noise level.

Noisiness Zones: Defined areas within a community wherein the ambient noise levels are generally similar (within a range of 5 dB, for example). Typically, all other things being equal, sites within any given noise zone will be of comparable proximity to major noise sources. Noise contours define different noisiness zones.

NOISE ELEMENT REQUIREMENTS

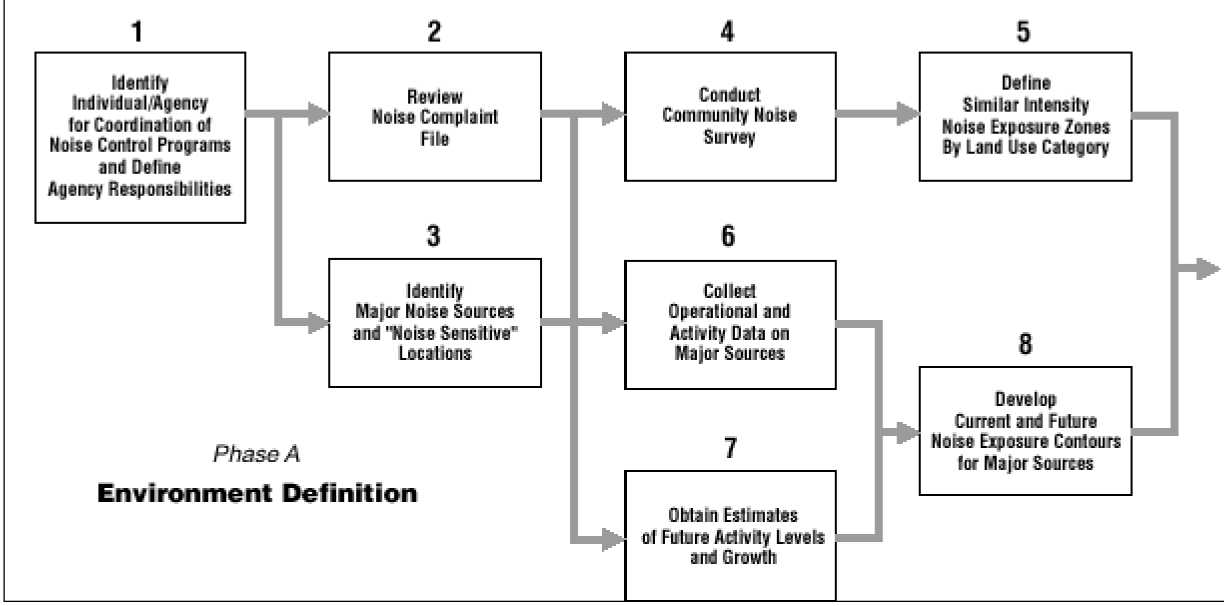
Government Code Section 65302(f): A noise element shall identify and appraise noise problems in the community. The noise element shall recognize the guidelines established by the Office of Noise Control in the State Department of Health Services and shall analyze and quantify, to the extent practicable, as determined by the legislative body, current and projected noise levels for all of the following sources:

1. Highways and freeways.
2. Primary arterials and major local streets.
3. Passenger and freight on-line railroad operations and ground rapid transit systems.
4. Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation.
5. Local industrial plants, including, but not limited to, railroad classification yards.
6. Other ground stationary sources identified by local agencies as contributing to the community noise environment.

Noise contours shall be shown for all of these sources and stated in terms of community noise equivalent level (CNEL) or day-night average level (Ldn). The noise contours shall be prepared on the basis of noise monitoring or following generally accepted noise modeling techniques for the various sources identified in paragraphs (1) to (6), inclusive.

The noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise.

Figure 1A



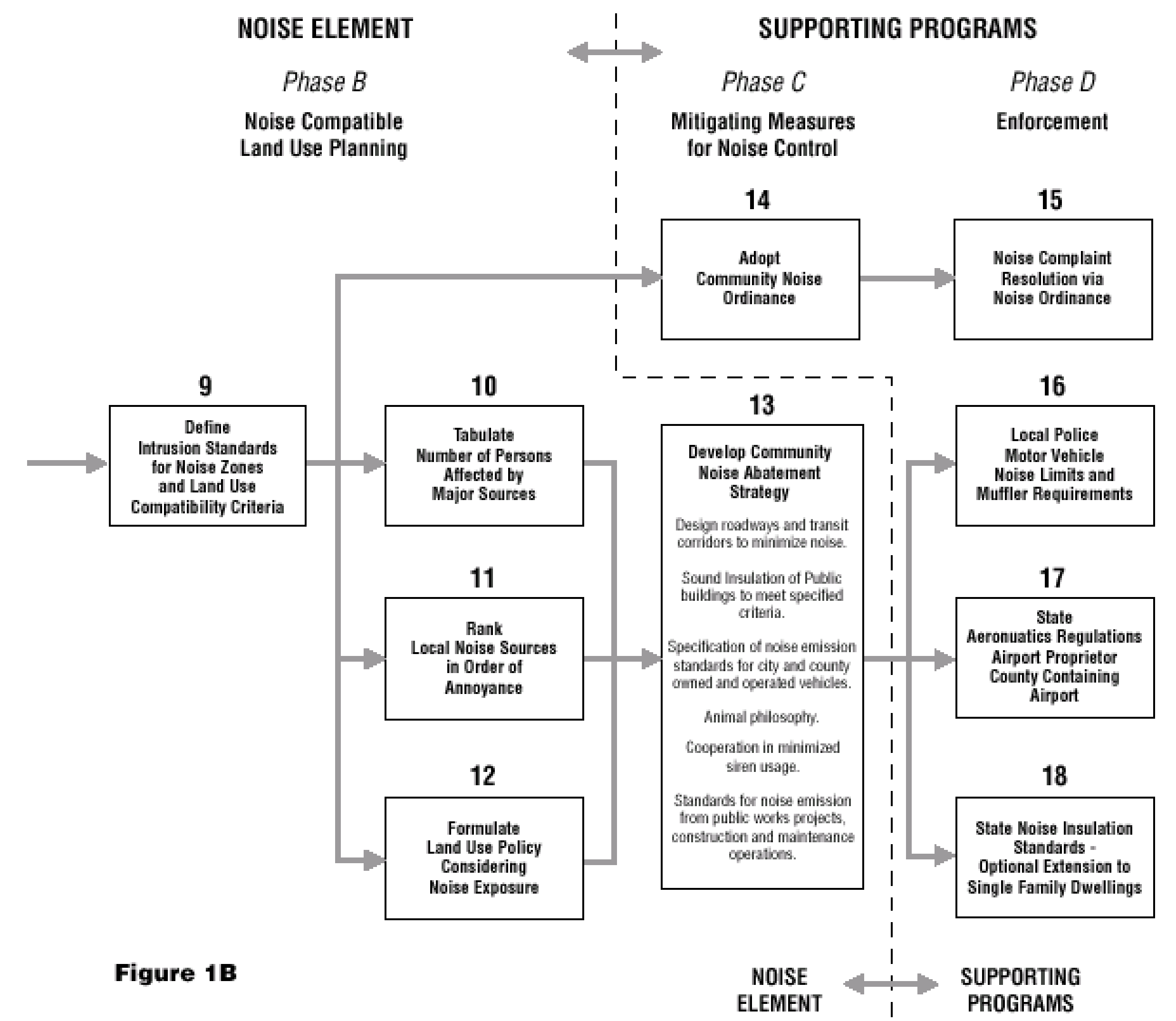


Figure 1B

The noise element shall include implementation measures and possible solutions that address existing and foreseeable noise problems, if any. The adopted noise element shall serve as a guideline for compliance with the state's noise insulation standards.

NOISE ELEMENT DEVELOPMENT PROCESS

The sequential steps for development of a noise element as an integral part of a community's total noise control program are illustrated in the flow diagrams of figures 1A and 1B. The concept presented herein utilizes the noise element as the central focus of the community's program and provides the groundwork for all subsequent enforcement efforts. The process may be described in terms of four phases:

Phase A: Noise Environment Definition

Phase B: Noise-Compatible Land Use Planning

Phase C: Noise Mitigation Measures

Phase D: Enforcement

These phases encompass a total of eighteen defined tasks, the first thirteen of which relate directly to the statutory requirements contained in Government Code §65302(f). The remainder relate to critical supportive programs (noise ordinances, etc.). Citations from §65302(f) are contained within quotation marks.

Phase A: Noise Environment Definition

The purpose of this phase is to adequately identify and appraise the existing and future noise environment of the community in terms of Community Noise Equivalent Level (CNEL) or Day-Night Average Level

(Ldn) noise contours for each major noise source and to divide the city or county into noise zones for subsequent noise ordinance application.

Step 1:

Identify a specific individual or lead agency within the local government to be responsible for coordination of local noise control activities. This individual or agency should be responsible for coordinating all intergovernmental activities and subsequent enforcement efforts.

Step 2:

Review noise complaint files as compiled by all local agencies (police, animal control, health, airport, traffic department, etc.) in order to assess the following:

1. Location and types of major offending noise sources.
2. Noise-sensitive areas and land uses.
3. Community attitudes towards specific sources of noise pollution.
4. Degree of severity of noise problems in the community.
5. Relative significance of noise as a pollutant.

Step 3:

Specifically identify major sources of community noise based upon the review of complaint files and interagency discussion and the following statutory subjects:

1. Highways and freeways.
2. Primary arterials and major local streets.
3. Passenger and freight on-line railroad operations and ground rapid transit systems.
4. Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation.
5. Local industrial plants, including, but not limited to, railroad classification yards.
6. Other ground stationary noise sources identified by local agencies as contributing to the community noise environment. (§65302(f))

In addition, the land uses and areas within the community that are noise sensitive should be identified at the same time.

Step 4:

Given the identification of major noise sources and an indication of the community's attitude toward noise pollution (when available), it is advisable to conduct a community noise survey. The purposes of the survey are threefold:

First and foremost, to define by measurement the current noise levels at those sites deemed noise sources and to establish noise level contours around them. The noise contours must be expressed in terms of CNEL or Ldn.

Second, the collected data will form the basis for an analysis of noise exposure from major sources.

Finally, the survey should define the existing ambient noise level throughout the community. Intrusive noises over and above this general predetermined ambient level may then be controlled through implementation of a noise ordinance.

Step 5:

Given the definition of existing ambient noise levels throughout the community, one may proceed with a classification of the community into broad regions of generally consistent land uses and similar noise environments. Because these regions will be varying distances from identified major noise sources, the relative levels of environmental noise will be different from one another. Therefore, subsequent enforcement efforts and mitigating measures may be oriented towards maintaining quiet areas and improving noisy ones.

Step 6:

Directing attention once again to the major noise sources previously identified, it is essential to gather operations and activity data in order to proceed with the analytical noise exposure prediction. This data is somewhat source-specific but generally should consist of the following information and be supplied by the owner/operator of the source:

1. Average daily level of activity (traffic volume, flights per day, hours of operation, etc.).
2. Distribution of activity over day and night time periods, days of the week, and seasonal variations.
3. Average noise level emitted by the source at various levels of activity.
4. Precise source location and proximity to noise-impacted land uses.
5. Composition of noise sources (percentage of trucks on highway, aircraft fleet mix, industrial machinery type, etc.).

Step 7:

In addition to collecting data on the variables affecting noise-source emission for the existing case, future values for these parameters need to be assessed. This is best accomplished by correlating the noise element with other general plan elements (i.e. land use, circulation, housing, etc.) and regional transportation plans and by coordination with other responsible agencies (Airport Land Use Commission, Caltrans, etc.).

Step 8:

Analytical noise exposure modeling techniques may be utilized to develop source-specific noise contours around major noise sources in the community.

“The noise contours shall be prepared on the basis of noise monitoring or following generally accepted noise modeling techniques...” (§65302(f))

Simplified noise prediction methodologies are available through the Department of Health Services for highway and freeway noise, railroad noise, simple fixed stationary and industrial sites, and general aviation aircraft (with less than twenty percent commercial jet aircraft activity—two engine jet only). Noise contours for larger airport facilities and major industrial sites are sufficiently complex that they must be developed via sophisticated computer techniques available through recognized acoustical consulting firms. (Airport contours generally have already been developed in accordance with requirements promulgated by Caltrans’ Division of Aeronautics: Noise Standards, Title 21, Section 5000, et seq., California Code of Regulations.)

Although considerable effort may go into developing noise contours that, in some instances, utilize rather sophisticated digital programming techniques, the present state of the art is such that their accuracy is usually no better than +/- 3 dB. In fact, the accuracy of the noise exposure prediction decreases with increasing distance from the noise source. In the near vicinity of the source, prediction accuracy may be within the range of +/- 1 dB, while at greater distances this may deteriorate to +/- 5 dB or more. At greater distances, meteorological and topographic effects, typically not totally accounted for in most models, may have significant influence. Thus, while dealing with the concept of noise contours, it is best not to think of them as absolute lines of demarcation on a map (such as topographical contours), but rather as bands of similar noise exposure.

In addition to assessment of the present-day noise environment, it is recommended that the noise exposure data be projected through the time horizon of the general plan. The noise element should be updated and corrected every five years, or sooner as is necessary, and, at that time, the forecasted noise exposure should be projected an additional five years.

Phase B: Noise-Compatible Land Use Planning

A noise planning policy needs to be rather flexible and dynamic to reflect not only technological advances in noise control, but also economic constraints governing application of noise-control technology and anticipated regional growth and demands of the community. In the final analysis, each community must decide the level of noise exposure its residents are willing to tolerate within a limited range of values below the known levels of health impairment.

Step 9:

Given the definition of the existing and forecasted noise environment provided by the Phase A efforts, the locality preparing the noise element must now approach the problem of defining how much noise is too much. Guidelines for noise-compatible land use are presented in Figure 2. The adjustment factors given in Table 1 may be used in order to arrive at noise-acceptability standards that reflect the noise-control goals of the community, the particular community’s sensitivity to noise (as determined in Step 2), and the community’s assessment of the relative importance of noise pollution.

Step 10:

As a prerequisite to establishing an effective noise-control program, it is essential to know, in quantitative terms, the extent of noise problems in the community. This is best accomplished by determining, for each major noise source around which noise contours have been developed, the number of community residents exposed and to what extent. It is also useful to identify those noise-sensitive land uses whose noise exposure exceeds the recommended standards given in Figure 2. The exposure inventory can be accomplished by using recent census data, adjusted for regional growth, and tabulating the population census blocks within given noise contours.

Step 11:

Once the noise exposure inventory is completed, the relative significance of specific noise sources in the community (in terms of population affected) will become apparent. The local agencies involved may wish to use this information to orient their noise-control and abatement efforts to achieve the most good. Clearly, control of certain major offending sources will be beyond the jurisdiction of local agencies; however, recognition of these limitations should prompt more effective land use planning strategies.

Step 12:

A major objective of the noise element is to utilize this information to ensure noise-compatible land use planning:

"The noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise." (§65302(f))

The intent of such planning is to:

(1) Maintain those areas deemed acceptable in terms of noise exposure.

(2) Use zoning or other land use controls in areas with excessive noise exposure to limit uses to those which are noise compatible and to restrict other, less compatible uses.

Phase C: Noise Mitigation Measures

Step 13:

Based upon the relative importance of noise sources in order of community impact and local attitudes towards these sources, "[t]he noise element shall include implementation measures and possible solutions that address existing and foreseeable noise problems, if any" (§65302(f)).

Selection of these noise-mitigating measures should be coordinated through all local agencies in order to be most effective. Minimization of noise emissions from all local government-controlled or sanctioned activities should be a priority item. This includes low noise specifications for new city or county owned and operated vehicles (and noise reduction retrofitting where economically possible) and noise emission limits on public works projects. Local governments should insure that public buildings (especially schools) are sufficiently insulated to allow their intended function to be uninterrupted by exterior noise. Local agencies can work with state and federal bodies to minimize transportation noise, primarily through transitway design, location, or configuration modifications.

Additional measures might include such policies as limitation of siren usage by police, fire, and ambulance units within populated areas. Animal control units may be encouraged to minimize barking dog complaints through use of an improved public relations campaign termed "Animal Philosophy." This involves working with pet owners to determine why the dog barks and attempting solutions rather than just issuing citations. Local zoning and subdivision ordinances may require the use of noise-reducing building materials or the installation of sound-insulating walls along major roads in new construction and subdivisions.

In general, local noise reduction programs need to address the problems specific to each community, with the ultimate goals being the reduction of complaint frequency and the provision of a healthful noise environment for all residents of the community.

The remaining steps are beyond the scope of the noise element requirements, but pertain to coordination with other state noise-control programs and achievement of the goals set forth in the noise element through development of an active local noise-control effort.

Step 14:

While the noise element identifies problem areas and seeks to develop medium- and long-range solutions to them, a community noise ordinance is the only viable instrument for short-term or immediate solutions to intrusive noise. A model noise ordinance that can be tailored to the specific needs of a given community by simply incorporating those sections deemed most applicable has been developed by the Department of Health Services. The model ordinance also suggests a cure for non-stationary or transient types of noise events, for which noise contours are generally meaningless.

Phase D: Enforcement

To adequately carry out the programs identified in the noise element and to comply with state requirements for certain other noise-control programs, specific enforcement programs are recommended at the local level.

Step 15:

Adopt and apply a community noise ordinance for resolution of noise complaints.

Step 16:

Recent studies have shown that the most objectionable feature of traffic noise is the sound produced by vehicles equipped with illegal or faulty exhaust systems. In addition, such hot rod vehicles are often operated in a manner that causes tire squeal and excessively loud exhaust noise. There are a number of statewide vehicle noise regulations that can be enforced by local authorities as well as the California Highway Patrol. Specifically, Sections 23130, 23130.5, 27150, 27151, and 38275 of the California Vehicle Code, as well as excessive speed laws, may be applied to curtail this problem. Both the Highway Patrol and the Department of Health Services (through local health departments) are available to aid local authorities in code enforcement and training pursuant to proper vehicle sound-level measurements.

Step 17:

Commercial and public airports operating under a permit from Caltrans' Aeronautics Program are required to comply with both state aeronautics standards governing aircraft noise and all applicable legislation governing the formation and activities of a local Airport Land Use Commission (ALUC). The function of the ALUC is, among other things, to develop a plan for noise-compatible land use in the immediate proximity of the airport. The local general plan must be reviewed for compatibility with this Airport Land Use Plan and amended if necessary (Public Utilities Code §21676). Therefore, the developers of the noise element will need to coordinate their activities with the local ALUC to

FIGURE 2

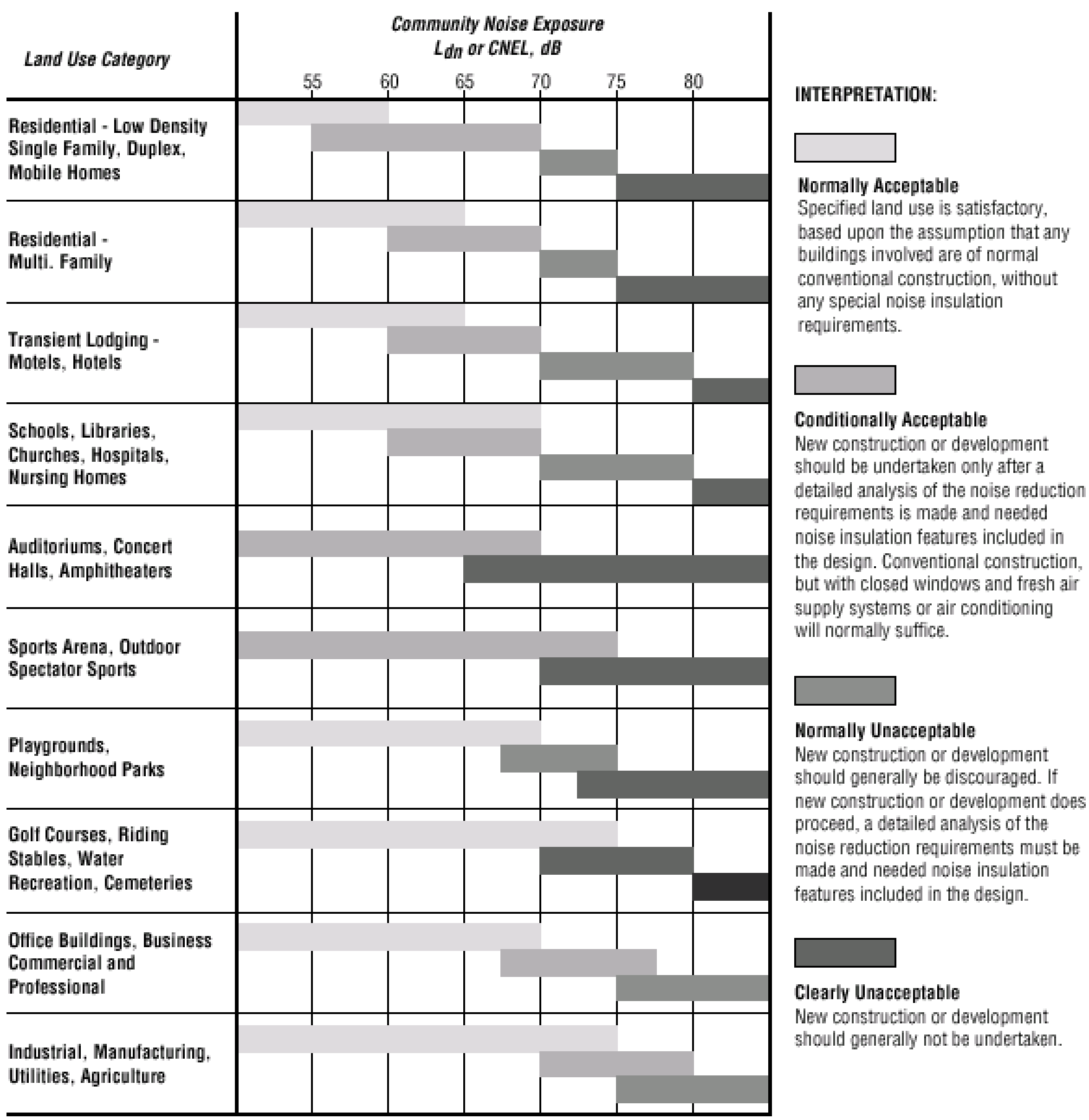


Table 1

Type of Correction	*Description*	*Amount of Correction to be Added to Measured CNEL in dB*
Seasonal Correction	Summer (or year-round operation)	**0**
	Winter only (or windows always closed)	**- 5**
Correction for Outdoor Residual Noise Level	Quiet suburban or rural community (remote from large cities and from industrial activity and trucking).	**+ 10**
	Quiet suburban or rural community (not located near industrial activity).	**+ 5**
	Urban residential community (not immediately adjacent to heavily traveled roads and industrial areas).	**0**
	Noisy urban residential community (near relatively busy roads or industrial areas.	**- 5**
	Very noisy urban residential community.	**- 10**
Correction for Previous Exposure and Community Attitudes	No prior experience with the intruding noise.	**+ 5**
	Community has had some previous exposure to intruding but little effort is being made to control the noise. This correction may also be applied in a situation where the community has not been exposed to the noise previously, but the people are aware that bona fide efforts are being made to control the noise.	**0**
	Community has had considerable previous exposure to the intruding noise and the noise maker's relations with the community are good.	**- 5**
	Community aware that operation causing noise is very necessary and it will not continue indefinitely. This correction can be applied for an operation of limited duration and under emergency circumstances.	**- 10**
Pure Tone or Impulse	No pure tone or impulsive character.	**0**
	Pure Tone or impulsive character present.	**+ 5**

ensure that compatible standards are utilized throughout the community and that the noise element develops as part of a coherent master plan, of which the ALUP forms an integral component.

Step 18:

"The adopted noise element shall serve as a guideline for compliance with the State's noise insulation standards." (§65302(f))

Recognizing the need to provide acceptable habitation environments, state law requires noise insulation of new multifamily dwellings constructed within the 60 dB (CNEL or Ldn) noise exposure contours. It is a function of the noise element to provide noise contour information around all major sources in support of the sound transmission control standards (Appendix, Chapter 2-35, Part 2, Title 24, California Code of Regulations).

RELATIONSHIP OF THE NOISE ELEMENT TO OTHER GENERAL PLAN ELEMENTS

The noise element is related to the land use, housing, circulation, and open-space elements. Recognition of the interrelationship of noise and these four other mandated elements is necessary in order to prepare an integrated general plan. The relationship between noise and these four elements is briefly discussed below.

- **Land Use—**A key objective of the noise element is to provide noise exposure information for use in the land use element. When integrated with the noise element, the land use element will show acceptable land uses in relation to existing and projected noise contours. Section 65302(f) states that: "The noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise."
- **Housing**—The housing element considers the provision of adequate sites for new housing and standards for housing stock. Since residential land use is among the most noise sensitive, the noise exposure information provided in the noise element must be considered when planning the location of new housing. Also, state law requires special noise insulation of new multifamily dwellings constructed within the 60 dB (CNEL or Ldn) noise exposure contour. This requirement may influence the location and cost of this housing type. In some cases, the noise environment may be a constraint on housing opportunities.
- **Circulation—**The circulation system must be correlated with the land use element and is one of the major sources of noise. Noise exposure will thus be a decisive factor in the location and design of new transportation facilities and the possible mitigation of noise from existing facilities in relation to existing and planned land uses. The local planning agency may wish to review the circulation and land use elements simultaneously to assess their compatibility with the noise element.
- **Open Space**—Excessive noise can adversely affect the enjoyment of recreational pursuits in designated open space. Thus, noise exposure levels should be considered when planning for this kind of open-space use. Conversely, open space can be used to buffer sensitive land uses from noise sources through the use of setbacks and landscaping. Open-space designation can also effectively exclude other land uses from excessively noisy areas.

SELECTION OF THE NOISE METRIC

The community noise metrics to be used in noise elements are either CNEL or Ldn (as specified in §65302(f)). A significant factor in the selection of these scales was compatibility with existing quantifications of noise exposure currently in use in California. CNEL is the noise metric currently specified in the State Aeronautics Code for evaluation of noise impacts at specific airports that have been declared to have a noise problem. Local compliance with state airport noise standards necessitates that community noise be specified in CNEL. The Ldn represents a logical simplification of CNEL. It divides the day into two weighted time periods (Day—7 a.m. to 10 p.m. and Night—10 p.m. to 7 a.m.) rather than the three used in the CNEL measure (Day—7 a.m. to 7 p.m., Evening—7 p.m. to 10 p.m., and Night—10 p.m. to 7 a.m.) with no significant loss in accuracy.

CRITERIA FOR NOISE-COMPATIBLE LAND USE

Figure 2 summarizes the suggested use of the CNEL/Ldn metrics for evaluating land use noise compatibility. Such criteria require a rather broad interpretation, as illustrated by the ranges of acceptability for a given land use within a defined range of noise exposures.

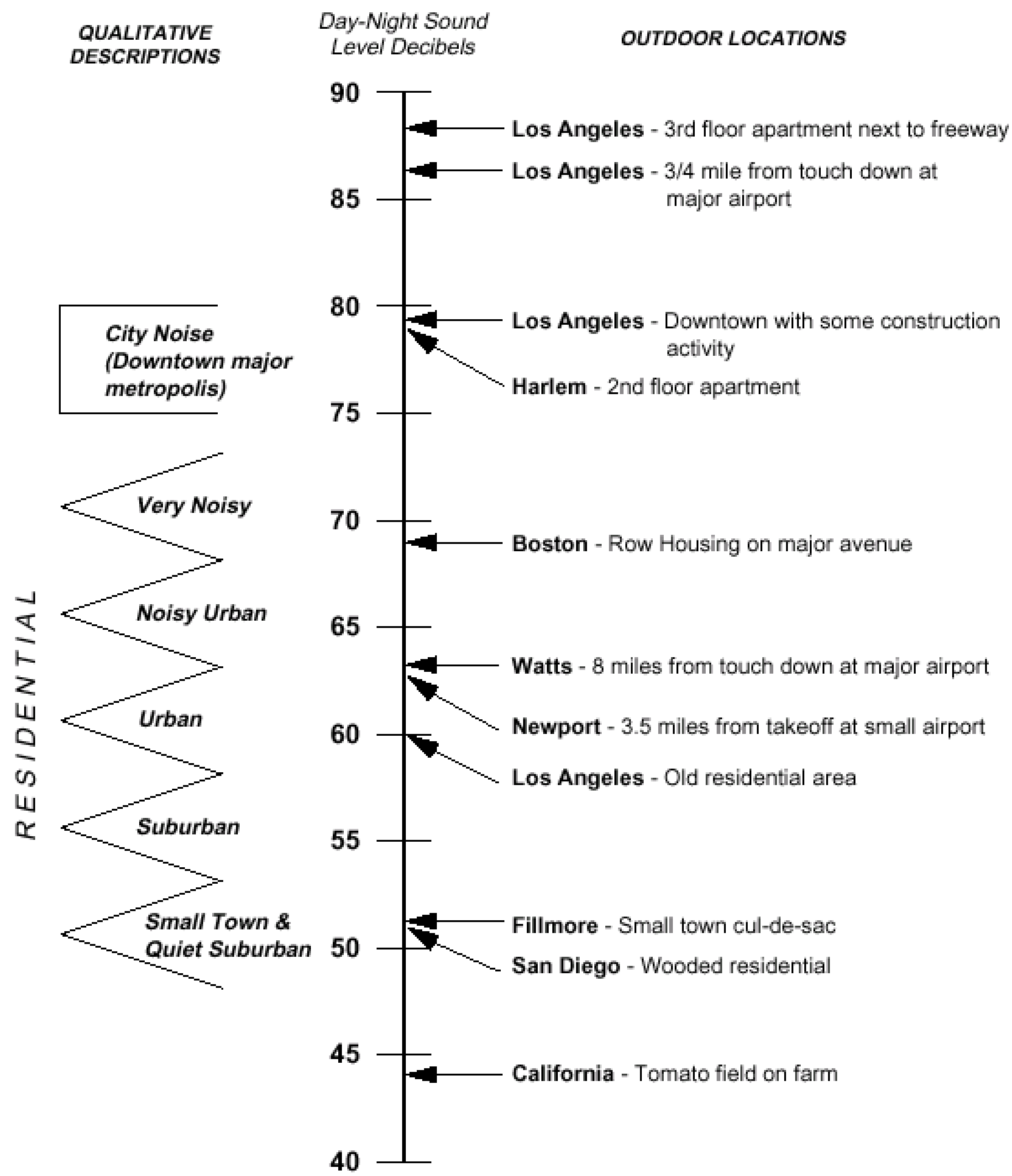
Denotation of a land use as "normally acceptable" on Figure 2 implies that the highest noise level in that band is the maximum desirable for existing or conventional construction that does not incorporate any special acoustic treatment. In general, evaluation of land use that falls into the "normally acceptable" or "normally unacceptable" noise environments should include consideration of the type of noise source, the sensitivity of the noise receptor, the noise reduction likely to be provided by structures, and the degree to which the noise source may interfere with speech, sleep, or other activities characteristic of the land use.

Figure 2 also provides an interpretation as to the suitability of various types of construction with respect to the range of outdoor noise exposure.

The objective of the noise compatibility guidelines in Figure 2 is to provide the community with a means of judging the noise environment it deems to be generally acceptable. Many efforts have been made to account for the variability in perceptions of environmental noise that exist between communities and within a given community.

Beyond the basic CNEL or Ldn quantification of noise exposure, one can apply correction factors to the measured or calculated values of these metrics in order to account for some of the factors that may cause

Figure 3



the noise to be more or less acceptable than the mean response. Significant among these factors are seasonal variations in noise source levels, existing outdoor ambient levels (i.e., relative intrusiveness of the source), general societal attitudes towards the noise source, prior history of the source, and tonal characteristics of the source. When it is possible to evaluate some or all of these factors, the measured or computed noise exposure values may be adjusted by means of the correction factors listed in Table 1 in order to more accurately assess local sentiments towards acceptable noise exposure.

In developing these acceptability recommendations, efforts were made to maintain consistency with the goals defined in the federal EPA's "Levels Document" and the State Sound Transmission Control Standards for multifamily housing. In both of these documents, an interior noise exposure of 45 dB CNEL (or Ldn) is recommended to permit normal residential activity. If one considers the typical range of noise reduction provided by residential dwellings (12 to 18 dB with windows partially open), the 60 dB outdoor value identified as “clearly acceptable” for residential land use would provide the recommended interior environment.

Figure 3 has been included in order to better explain the qualitative nature of community noise environments expressed in terms of Ldn. It is apparent that noise environments cover a broad range and that, in general, it may be observed that the quality of the environment improves as one moves further away from major transportation noise sources.

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APPENDIX 3.3:

CITY OF PERRIS NOISE ELEMENT

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Noise Element

(City Council Adoption – August 30, 2005)

State of California Regulations

California Code of Regulations, Part 2, Title 24, Appendix Chapter 35, Section 3501 establishes the State Noise Insulation Standards, which limit the interior noise level exposure within new hotels, motels, dormitories, long-term care facilities, apartment houses and dwellings. This state standard indicates that interior noise levels attributable to exterior noise sources shall not exceed 45 dB (CNEL or Ldn) in any habitable room.

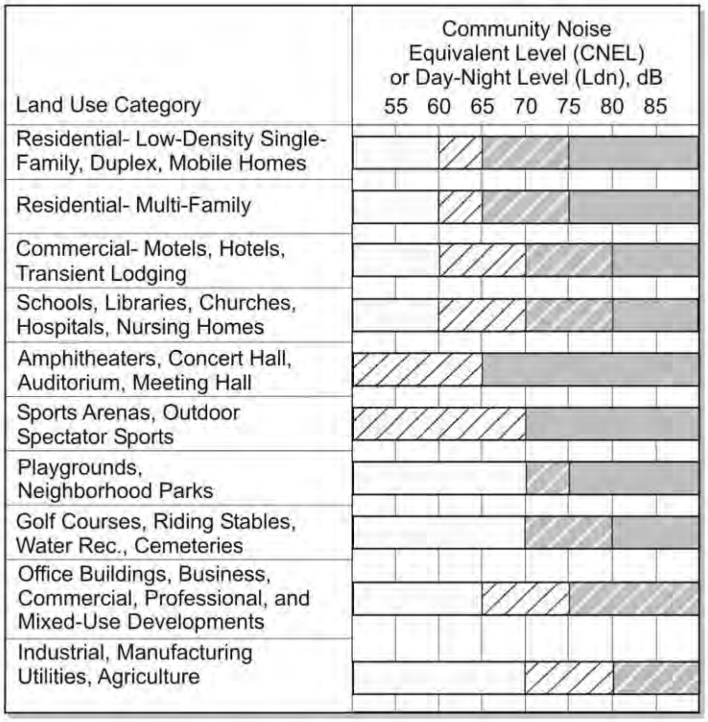
Exhibit N-1 presents a land use compatibility chart for community noise prepared by the State of California, Department of Health. It identifies normally acceptable, conditionally acceptable and clearly unacceptable noise levels for siting various new land uses. A conditionally acceptable designation implies new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use is made and the needed noise insulation features are incorporated in the design. By comparison, a normally acceptable designation indicates that standard construction can occur with no special noise reduction requirements.

Municipal Code

Chapter 16.22 of the Perris Municipal Code regulates new development including "sensitive receptors" located near arterials, railroads and the airport. "Sensitive receptors" refers to types of land uses that are adversely affected by various noise sources. Such land uses are defined in Section 16.22.020 of the Municipal Code to include: residences, schools, libraries, hospitals, churches, offices, hotels, motels, and outdoor recreational areas. Factors used to define sensitive receptors include the potential for interference with speech communication, the need for freedom from noise intrusion, the potential for sleep interference, and subjective judgment.

"Noise impacted projects" are defined as residential projects, or portions thereof, which are exposed to an exterior noise level of 60 dBA CNEL or greater. Such projects must include noise insulation design and construction assemblies that achieve an exterior-to-interior noise reduction sufficient to keep interior noise levels to a maximum of 45 dBA CNEL. This standard applies to any habitable room furnished for normal use with doors and windows closed. Specific construction techniques and materials that will achieve various levels of noise reduction are defined. Specifications for preparation of an acceptable acoustical report are also defined.

Exhibit N-1: Land Use/Noise Compatibility Guidelines



Nature of the noise environment where the CNEL or Ldn level is:

Below 55 dB
Relatively quiet suburban or urban areas, no arterial streets within 1 block, no freeways within 1/4 mile.

55-65 dB
Most somewhat noisy urban areas, near but not directly adjacent to high volumes of traffic.

65-75 dB
Very noisy urban areas near arterials, freeways or airports.

75+ dB
Extremely noisy urban areas adjacent to freeways or under airport traffic patterns. Hearing damage with constant exposure outdoors.

Normally Acceptable
Specific land use is satisfactory, based on the assumption that any building is of normal conventional construction, without any special noise insulation requirements

Conditionally Acceptable
New construction or development should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features included in design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

Normally Unacceptable
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in design.

Clearly Unacceptable
New construction or development should generally not be undertaken.

The Community Noise Equivalent Level (CNEL) and Day-Night Noise Level (Ldn) are measures of the 24-hour noise environment. They represent the constant A-weighted noise level that would be measured if all the sound energy received over the day were averaged. In order to account for the greater sensitivity of people to noise at night, the CNEL weighting includes a 5-decibel penalty on noise between 7:00 p.m. and 10:00 p.m. and a 10-decibel penalty on noise between 10:00 p.m. and 7:00 a.m. of the next day. The Ldn includes only the 10-decibel weighting for late-night noise events. For practical purposes, the two measures are equivalent for typical urban noise environments.

Source: State of California, Department of Health, City of Monterey Park.

Strategy for Action

Goals, Policies and Implementation Measures

Goal I – Land Use Siting

Future land uses compatible with projected noise environments

Policy I.A
The State of California Noise/Land Use Compatibility Criteria shall be used in determining land use compatibility for new development.

Implementation Measures

I.A.1 All new development proposals will be evaluated with respect to the State Noise/Land Use Compatibility Criteria. Placement of noise sensitive uses will be discouraged within any area exposed to exterior noise levels that fall into the "Normally Unacceptable" range and prohibited within areas exposed to "Clearly Unacceptable" noise ranges.

I.A.2 Site plans for new residential development near roadway and train noise sources shall incorporate increased building setbacks and/or provide for sufficient noise barriers for usable exterior yard areas so that the noise exposure in those areas does not exceed the levels considered "Normally Acceptable" in The State of California Noise/Land Use Compatibility Criteria

I.A.3 Acoustical studies shall be prepared for all new development proposals involving noise sensitive land uses, as defined in Section 16.22.020J of the Perris Municipal Code, where such projects are adjacent to roadways and within existing or projected roadway CNEL levels of 60 dBA or greater.

I.A.4 As part of any approvals of noise sensitive projects where reduction of exterior noise to 65 dBA is not reasonably feasible, the City will require the developer to issue disclosure statements to be identified on all real estate transfers associated with the affected property that identifies regular exposure to roadway noise.

I.A.5 No new residential dwellings shall be placed in areas with mitigated or unmitigated exterior noise levels that exceed 70 dBA CNEL.

Goal II – Existing Sensitive Receptors

Roadway improvements compatible with existing with existing noise-sensitive land uses

Policy II.A
Appropriate measures shall be taken in the design phase of future roadway widening projects to minimize impacts on existing sensitive noise receptors.

Implementation Measures

II.A.1 In the design of future roadway widening projects adjacent to existing sensitive land uses, first priority will be given to widening on the opposite side of the street where no sensitive land uses occur.

II.A.2 Use of quieter roadway surface materials, incorporation of solid noise barriers between the sensitive land use and the roadway will be implemented where feasible, to reduce exterior noise levels within adjacent sensitive land uses to a maximum of 60 dBA CNEL.

II.A.3 Where construction of a solid barrier is economically or practically infeasible e.g. along front yards where driveways would prohibit continuation of the wall, retrofitting of homes with noise attenuation features will be implemented to reduce interior noise to 45 dBA CNEL.

II.A.4 Reduction of posted speed limits will be implemented, wherever it can be accomplished without increasing traffic congestion.

II.A.5 Work proactively with Caltrans to facilitate construction of sound barriers and/or retrofit existing noise impacted structures with noise attenuation features, along those segments of I-215 that abut existing noise impacted land uses.

<u>Goal III – Train Noise</u>

Future land uses compatible with noise from rail traffic

Policy III.A
Mitigate existing and future noise impacts resulting from train movement.

Implementation Measures

III.A.1 The City will work proactively with BNSF and Riverside County Transportation Commission to replace aging rail with new continuous welded rail, and to install sound-deadening matting leading to, from, and between the rails where public roads cross tracks in residential areas

III.A.2 Acoustical and vibration studies will be prepared for all new development proposals involving noise sensitive land uses within 500 feet of the BNST railroad tracks. Wherever these studies determine that exterior living areas in the proposed development plan would be exposed to noise levels of 60 dBA or greater, the plans shall incorporate setbacks and/or building design/noise insulation measures to reduce exterior noise levels to no more than 65 dBA and ensure that interior noise levels do not exceed 45 dBA CNEL.

III.A.3 As part of any approvals of noise sensitive projects where reduction of exterior noise to 65 dBA is not reasonably feasible, the City will require the developer to issue disclosure statements that identify regular exposure to train noise. This disclosure shall be issued at the time of initial and all subsequent sales of the affected properties.

III.A.4 No new residential dwellings shall be placed in areas with mitigated or unmitigated exterior exposure to train noise levels in excess of 70 dBA CNEL.

Goal IV – Air Traffic Noise

Future land uses compatible with noise from air traffic

Policy IV.A
Reduce or avoid the existing and potential future impacts from air traffic on new sensitive noise land uses in areas where air traffic noise is 60 dBA CNEL or higher.

Implementation Measures

IV.A.1 As part of any approvals for new sensitive land uses within the 60 dBA CNEL or higher noise contours associated with March Inland Port, and for such new uses within the flight paths associated with the Perris Valley Skydiving Center, the City will require the developer to issue disclosure statements identifying exposure to regular aircraft noise. This disclosure shall be issued at the time of initial and all subsequent sales of the affected properties.

IV.A.2 All new development proposals in the noise contour areas of 60 dBA and above will be evaluated with respect to the State Noise/Land Use Compatibility Criteria.

Goal V – Stationary Source Noise

Future non-residential land uses compatible with noise sensitive land uses

Policy V.A
New large scale commercial or industrial facilities located within 160 feet of sensitive land uses shall mitigate noise impacts to attain an acceptable level as required by the State of California Noise/Land Use Compatibility Criteria.

Implementation Measures

V.A.1 An acoustical impact analysis shall be prepared for new industrial and large scale commercial facilities to be constructed within 160 feet of the property line of any existing noise sensitive land use. This analysis shall document the nature of the commercial or industrial facility as well as all interior or exterior facility operations that would generate exterior noise.
The analysis shall document the placement of any existing or proposed noise-sensitive land uses situated within the 160-foot distance. The analysis shall determine the potential noise levels that could be received at these sensitive land uses and specify specific measures to be employed by the large scale commercial or industrial facility to ensure that these levels do not exceed 60 dBA CNEL at the property line of the adjoining sensitive land use.
No development permits or approval of land use applications shall be issued until the acoustic analysis is received and approved by the City Staff.

APPENDIX 3.4:

CITY OF MORENO VALLEY NOISE ORDINANCE

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Moreno Valley Municipal Code

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Title 9 PLANNING AND ZONING

Chapter 9.10 PERFORMANCE STANDARDS

9.10.140 Noise and sound.

Unless otherwise specified in Chapter 9.08, General Development Standards, or Chapter 9.09, Specific Use Development Standards, all commercial and industrial uses shall be operated so that noise created by any loudspeaker, bells, gongs, buzzers, or other noise attention or attracting devices shall not exceed fifty-five (55) dBA at any one time beyond the boundaries of the property. (Ord. 359 (part), 1992)

Chapter 11.80 NOISE REGULATION

11.80.010 Legislative findings.

It is found and declared that:

A. Excessive sound within the limits of the city is a condition which has existed for some time, and the amount and intensity of such sound is increasing.

B. Such excessive sound is a detriment to the public health, safety, and welfare and quality of life of the residents of the city.

C. The necessity in the public interest for the provisions and prohibitions hereinafter contained and enacted is declared as a matter of legislative determination and public policy, and it is further declared that the provisions and prohibitions hereinafter contained and enacted are in pursuance of and for the purpose of securing and promoting the public health, safety, welfare and quality of life of the city and its inhabitants. (Ord. 740 § 1.2, 2007)

11.80.020 Definitions.

For purposes of this chapter, certain words and phrases used herein are defined as follows:

"A-weighted sound level" means the sound pressure level in decibels as measured with a sound level meter using the A-weighting network. The unit of measurement is the dB(A).

"Commercial" means all uses of land not otherwise classified as residential, as defined in this section.

"Construction" means any site preparation, and/or any assembly, erection, repair, or alteration, excluding demolition, of any structure, or improvements to real property.

"Continuous airborne sound" means sound that is measured by the slow-response setting of a meter manufactured to the specifications of ANSI Section 1.4-1983 (R2006) "Specification for Sound Level Meters," or its successor.

"Daytime" means eight a.m. to ten p.m. the same day.

"Decibel" (dB) means a unit for measuring the amplitude of sound, equal to twenty (20) times the logarithm to the base ten (10) of the ratio of the pressure of the sound measured to the reference pressure, which is twenty (20) micropascals (twenty (20) micronewtons per square meter.)

"Demolition" means any dismantling, intentional destruction or removal of structures or other improvements to real property.

"Disturb" means to interrupt, interfere with, or hinder the enjoyment of peace or quiet or the normal listening activities or the sleep, rest or mental concentration of the hearer.

"Emergency" means any occurrence or set of circumstances involving actual or imminent physical trauma or significant property damage which necessitates immediate action. Economic loss alone shall not constitute an emergency. It shall be the burden of an alleged violator to prove an "emergency."

"Emergency work" means any work made necessary to restore property to a safe condition following an emergency, or to protect persons or property threatened by an imminent emergency, to the extent such work is, in fact, necessary to protect persons or property from exposure to imminent danger or damage.

"Frequency" means the number of complete oscillation cycles per unit of time.

"Impulsive sound" means sound of short duration, usually less than one second, with an abrupt onset and rapid decay. Examples of sources of impulsive sound include explosions, drop forge impacts, and discharge of firearms.

"Nighttime" means 10:01 p.m. to 7:59 a.m. the following day.

"Noise disturbance" means any sound which:

1. Disturbs a reasonable person of normal sensitivities;

2. Exceeds the sound level limits set forth in this chapter; or

3. Is plainly audible as defined in this section. Where no specific distance is set forth for the determination of audibility, references to noise disturbance shall be deemed to mean plainly audible at a distance of two hundred (200) feet from the real property line of the source of the sound, if the sound occurs on privately owned property, or from the source of the sound, if the sound occurs on public right of way, public space or other publicly owned property.

"Person" means any person, person's firm, association, copartnership, joint venture, corporation, or any entity public or private in nature.

"Plainly audible" means that the sound or noise produced or reproduced by any particular source, can be clearly distinguished from ambient noise by a person using his/her normal hearing faculties.

"Public right-of-way" means any street, avenue, boulevard, sidewalk, bike path or alley, or similar place normally accessible to the public which is owned or controlled by a governmental entity.

"Public space" means any park, recreational or community facility, or lot which contains at least one building that is open to the general public during its hours of operation.

"Residential" means all uses of land primarily for dwelling units, as well as hospitals, schools, colleges and universities, and places of religious assembly.

"Sound" means an oscillation in pressure, particle displacement, particle velocity or other physical parameter, in a medium with internal forces that causes compression and rarefaction of that medium capable of producing an auditory impression. The description of sound may include any characteristic of such sound, including duration, intensity and frequency.

"Sound level" means the weighted sound pressure level as measured in dB(A) by a sound level meter and as specified in American National Standards Institute (ANSI) specifications for sound-level meters (ANSI Section 1.4-1971 (R1976)). If the frequency weighting employed is not indicated, the A-weighting shall apply.

"Sound level meter" means an instrument, demonstrably capable of accurately measuring sound levels as defined above.

All technical definitions not defined above shall be in accordance with applicable publications and standards of the American National Standards Institute (ANSI). (Ord. 740 § 1.2, 2007)

11.80.030 Prohibited acts.

A. General Prohibition. It is unlawful and a violation of this chapter to maintain, make, cause, or allow the making of any sound that causes a noise disturbance, as defined in Section 11.80.020.

B. Sound causing permanent hearing loss.

1. Sound level limits. Based on statistics from the Center for Disease Control and Prevention and the National Institute for Occupational Safety and Health, Table 1 and Table 1-A specify sound level limits which, if exceeded, will have a high probability of producing permanent hearing loss in anyone in the area where the

sound levels are being exceeded. No sound shall be permitted within the city which exceeds the parameters set forth in Tables 11.80.030-1 and 11.80.030-1-A of this chapter:

Table 11.80.030-1

MAXIMUM CONTINUOUS SOUND LEVELS*

Duration per Day Continuous Hours	Sound level [db(A)]
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25	115

* When the daily sound exposure is composed of two or more periods of sound exposure at different levels, the combined effect of all such periods shall constitute a violation of this section if the sum of the percent of allowed period of sound exposure at each level exceeds 100 percent

Table 11.80.030-1A

MAXIMUM IMPULSIVE SOUND LEVELS

Number of Repetitions per 24-Hour Period	Sound level [dB (A)]
1	145
10	135
100	125

2. Exemptions. No violation shall exist if the only persons exposed to sound levels in excess of those listed in Tables 11.80.030-1 and 11.80.030-1A are exposed as a result of:

a. Trespass;

b. Invitation upon private property by the person causing or permitting the sound; or

c. Employment by the person or a contractor of the person causing or permitting the sound.

C. Nonimpulsive Sound Decibel Limits. No person shall maintain, create, operate or cause to be operated on private property any source of sound in such a manner as to create any nonimplusive sound which exceeds the limits set forth for the source land use category (as defined in Section 11.80.020) in Table 11.80.030-2 when measured at a distance of two hundred (200) feet or more from the real property line of the source of the sound, if the sound occurs on privately owned property, or from the source of the sound, if the sound occurs on public right-of-way, public space or other publicly owned property. Any source of sound in violation of this subsection shall be deemed prima facie to be a noise disturbance.

Table 11.80.030-2

MAXIMUM SOUND LEVELS (IN dB(A)) FOR SOURCE LAND USES

Residential		Commercial	
Daytime	Nighttime	Daytime	Nighttime
60	55	65	60

D. Specific Prohibitions. In addition to the general prohibitions set out in subsection A of this section, and unless otherwise exempted by this chapter, the following specific acts, or the causing or permitting thereof, are regulated as follows:

1. Motor Vehicles. No person shall operate or cause to be operated a public or private motor vehicle, or combination of vehicles towed by a motor vehicle, that creates a sound exceeding the sound level limits in Table 11.80.030-2 when the vehicle(s) are not otherwise subject to noise regulations provided for by the California Vehicle Code.

2. Radios, Televisions, Electronic Audio Equipment, Musical Instruments or Similar Devices from a Stationary Source. No person shall operate, play or permit the operation or playing of any radio, tape player, television, electronic audio equipment, musical instrument, sound amplifier or other mechanical or electronic sound making device that produces, reproduces or amplifies sound in such a manner as to create a noise disturbance. However, this subsection shall not apply to any use or activity exempted in subsection E of this section and any use or activity for which a special permit has been issued pursuant to Section 11.80.040.

3. Radios, Electronic Audio Equipment, or Similar Devices from a Mobile Source Such as a Motor Vehicle. Sound amplification or reproduction equipment on or in a motor vehicle is subject to regulation in accordance with the California Vehicle Code when upon the public right-of-way. When upon public space or publicly owned property other than the public right-of-way or upon private property open to the public, sound amplification or reproduction equipment shall not be operated in such a manner that it is plainly audible at a distance of fifty (50) feet in any direction from the vehicle.

4. Portable, Hand-Held Music or Sound Amplification or Reproduction Equipment. Such equipment shall not be operated on a public right-of-way, public space or other publicly owned property in such a manner as to be plainly audible at a distance of fifty (50) feet in any direction from the operator.

5. Loudspeakers and Public Address Systems.

a. Except as permitted by Section 11.80.040, no person shall operate, or permit the operation of, any loudspeaker, public address system or similar device, for any commercial purpose:

1. Which produces, reproduces or amplifies sound in such a manner as to create a noise disturbance; or

2. During nighttime hours on a public right-of-way, public space or other publicly owned property.

b. No person shall operate, or permit the operation of, any loudspeaker, public address system or similar device, for any noncommercial purpose, during nighttime hours in such a manner as to create a noise disturbance.

6. Animals. No person shall own, possess or harbor an animal or bird that howls, barks, meows, squawks, or makes other sounds that:

a. Create a noise disturbance;

b. Are of frequent or continued duration for ten (10) or more consecutive minutes and are plainly audible at a distance of fifty (50) feet from the real property line of the source of the sound; or

c. Are intermittent for a period of thirty (30) or more minutes and are plainly audible at a distance of fifty (50) feet from the real property line of the source of the sound.

7. Construction and Demolition. No person shall operate or cause the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between the hours of eight p.m. and seven a.m. the following day such that the sound there from creates a noise disturbance, except for emergency work by public service utilities or for other work approved by the city manager or designee. This section shall not apply to the use of power tools as provided in subsection (D)(9) of this section.

8. Emergency Signaling Devices. No person shall intentionally sound or permit the sounding outdoors of any fire, burglar or civil defense alarm, siren or whistle, or similar stationary emergency signaling device, except for emergency purposes or for testing as follows:

a. Testing of a stationary emergency signaling device shall not occur between seven p.m. and seven a.m. the following day;

b. Testing of a stationary emergency signaling device shall use only the minimum cycle test time, in no case to exceed sixty (60) seconds;

c. Testing of a complete emergency signaling system, including the functioning of the signaling device and the personnel response to the signaling device, shall not occur more than once in each calendar month. Such testing shall only occur only on weekdays between seven a.m. and seven p.m. and shall be exempt from the time limit specified in subsection (D)(8)(2) of this section.

9. Power Tools. No person shall operate or permit the operation of any mechanically, electrically or gasoline motor-driven tool during nighttime hours so as to cause a noise disturbance across a residential real property boundary.

10. Pumps, Air Conditioners, Air-Handling Equipment and Other Continuously Operating Equipment. Notwithstanding the general prohibitions of subsection a of this section, no person shall operate or permit the operation of any pump, air conditioning, air-handling or other continuously operating motorized equipment in a state of disrepair or in a manner which otherwise creates a noise disturbance distinguishable from normal operating sounds.

E. Exemptions. The following uses and activities shall be exempt from the sound level regulations except the maximum sound levels provided in Tables 11.80.030-1 and 11.80.030-1A:

1. Sounds resulting from any authorized emergency vehicle when responding to an emergency call or acting in time of an emergency.

2. Sounds resulting from emergency work as defined in Section 11.80.020

3. Any aircraft operated in conformity with, or pursuant to, federal law, federal air regulations and air traffic control instruction used pursuant to and within the duly adopted federal air regulations; and any aircraft operating under technical difficulties in any kind of distress, under emergency orders of air traffic control, or being operated pursuant to and subsequent to the declaration of an emergency under federal air regulations.

4. All sounds coming from the normal operations of interstate motor and rail carriers, to the extent that local regulation of sound levels of such vehicles has been preempted by the Noise Control Act of 1972 (42 U.S.C. § 4901 et seq.) or other applicable federal laws or regulations

5. Sounds from the operation of motor vehicles, to the extent they are regulated by the California Vehicle Code.

6. Any constitutionally protected noncommercial speech or expression conducted within or upon a any public right-of-way, public space or other publicly owned property constituting an open or a designated public forum in compliance with any applicable reasonable time, place and manner restrictions on such speech or expression or otherwise pursuant to legal authority.

7. Sounds produced at otherwise lawful and permitted city-sponsored events, organized sporting events, school assemblies, school playground activities, by permitted fireworks, and by permitted parades on public right-of-way, public space or other publicly owned property.

8. An event for which a temporary use permit or special event permit has been issued under other provisions of this code, where the provisions of Section 11.80.040 are met, the permit granted expressly grants an exemption from specific standards contained in this chapter, and the permittee and all persons under the permittee's reasonable control actually comply with all conditions of such permit. Violation of any condition of such a permit related to sound or sound equipment shall be a violation of this chapter and punishable as such.

F. Nothing in this chapter shall be construed to limit, modify or repeal any other regulation elsewhere in this code relating to the regulation of noise sources, nor shall any such other regulation be read to permit the emission of noise in violation of any provision of this chapter. (Ord. 740 § 1.2, 2007)

11.80.040 Special provisions for temporary use and special event permits.

The exemption by permit set forth in Section 11.80.030(E)(8) shall be subject to the following requirements and conditions:

A. The permit application shall include the name, address and telephone number of the permit applicant; the date, hours and location for which the permit is requested; and the nature of the event or activity. It shall also specify the types of sounds and/or sound equipment to be permitted, the proposed duration of such sound, the specific standards from which the sound is to be exempted, and the reasons for each requested exemption.

B. The permit shall be issued provided the proposed activity meets the requirements of this section and the issuing official determines that the sound to be emitted at the event as proposed would not be detrimental to the public health, safety or welfare, that the event cannot reasonably achieve its legitimate aims and purposes without the exemption and that the sound levels proposed will not unreasonably damage the peace and quiet enjoyment of the lawful users of surrounding properties, nor constitute a public nuisance.

C. The official issuing the permit may prescribe any reasonable conditions or requirements he/she deems necessary to minimize noise disturbances upon the community or the surrounding neighborhood, and/or to protect the health, safety or welfare of the public, including participants in the permitted event, including use of mufflers, screens or other sound-attenuating devices.

D. Any permit granted must be in writing and shall contain all conditions upon which the permit shall be effective.

E. No more than six events requiring a sound limit exemption may be held at any particular location upon privately owned or controlled property per calendar year, provided further that the number of events shall not exceed the number permitted under the regulations for the type of permit issued. For purposes of this subsection, "location" means a legal parcel of real property or a complete shopping or commercial center or mall sharing common parking and access even if comprised of multiple legal parcels.

F. The exemption from sound limits under such permit shall not exceed maximum period of four hours in one twenty-four (24) hour day.

G. The permit will only be granted for hours between nine a.m. and ten p.m. on all days other than Friday and Saturday; and, on Friday and Saturday, between the hours of nine a.m. and one a.m. of the following day, except in the following circumstances:

1. A permit may be granted for hours between nine a.m. on New Year's Eve and one a.m. the following day (New Year's Day).

2. A permit may be granted for hours between nine a.m. and two a.m. the following day if there are no residences, hospitals, or nursing homes within a 0.5 mile radius of the property where the function is taking

place.

H. Functions for which the permits are issued shall be limited to a continuous airborne sound level not to exceed seventy (70) dB(A), as measured two hundred (200) feet from the real property boundary of the source property if on private property, or from the source if on public right of way, public space or other publicly owned property. (Ord. 740 § 1.2, 2007)

11.80.050 Measurement or assessment of sound.

A. Measurement With Sound Meter.

1. The measurement of sound shall be made with a sound level meter meeting the standards prescribed by ANSI Section 1.4-1983 (R2006). The instruments shall be maintained in calibration and good working order. A calibration check shall be made of the system at the time of any sound level measurement. Measurements recorded shall be taken so as to provide a proper representation of the source of the sound. The microphone during measurement shall be positioned so as not to create any unnatural enhancement or diminution of the measured sound. A windscreen for the microphone shall be used at all times. However, a violation of this chapter may occur without the occasion of the measurements being made as otherwise provided.

2. The slow meter response of the sound level meter shall be used in order to best determine the average amplitude.

3. The measurement shall be made at any point on the property into which the sound is being transmitted and shall be made at least three feet away from any ground, wall, floor, ceiling, roof and other plane surface.

4. In case of multiple occupancy of a property, the measurement may be made at any point inside the premises to which any complainant has right of legal private occupancy; provided that the measurement shall not be made within three feet of any ground, wall, floor, ceiling, roof or other plane surface.

5. All measurements of sound provided for in this chapter will be made by qualified officials of the city who are designated by the city manger or designee to operate the apparatus used to make the measurements.

B. Assessment Without Sound Level Meter. Any police officer, code enforcement officer, or other official designated by the city manager or designee who hears a noise or sound that is plainly audible, as defined in Section 11.80.020, in violation of this chapter, may enforce this chapter and shall assess the noise or sound according to the following standards:

1. The primary means of detection shall be by means of the official's normal hearing faculties, not artificially enhanced.

2. The official shall first attempt to have a direct line of sight and hearing to the vehicle or real property from which the sound or noise emanates so that the official can readily identify the offending source of the sound or noise and the distance involved. If the official is unable to have a direct line of sight and hearing to the vehicle or real property from which the sound or noise emanates, then the official shall confirm the source of the sound or noise by approaching the suspected vehicle or real property until the official is able to obtain a direct line of sight and hearing, and confirm the source of the sound or noise that was heard at the place of the original assessment of the sound or noise.

3. The official need not be required to identify song titles, artists, or lyrics in order to establish a violation. (Ord. 740 § 1.2, 2007)

11.80.060 Violation.

A. Violation of Sound Level Limits. Any person violating any of the provisions of this chapter shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punishable by a fine not to exceed one thousand dollars ($1,000.00) and/or six months in the county jail, or both. Notwithstanding the forgoing, any violation of the provisions of this chapter may, in the discretion of the citing officer or the city attorney, be cited and/or prosecuted as an infraction. Any person found guilty of an infraction hereunder shall be punished by a fine of not less than fifty dollars ($50.00) nor more than one hundred dollars ($100.00) for the first offense; a fine of not less than one hundred dollars ($100.00), nor more than two hundred dollars ($200.00) for the second offense. Any third or subsequent offense shall constitute a misdemeanor. Violations of this chapter may also be subject to civil citation pursuant to Chapter 1.10.

B. Joint and Several Responsibility. In addition to the person causing the offending sound, the owner, tenant or lessee of property, or a manager, overseer or agent, or any other person lawfully entitled to possess the property from which the offending sound is emitted at the time the offending sound is emitted, shall be responsible for compliance with this chapter if the additionally responsible party knows or should have known of the offending noise disturbance. It shall not be a lawful defense to assert that some other person caused the sound. The lawful possessor or operator of the premises shall be responsible for operating or maintaining the premises in compliance with this chapter and may be cited regardless of whether or not the person actually causing the sound is also cited.

C. Violation May Be Declared a Public Nuisance. The operation or maintenance of any device, equipment, instrument, vehicle or machinery in violation of any provisions of this chapter which endangers the public health, safety and quality of life of residents in the area is declared to be a public nuisance, and may be subject to abatement summarily or by a restraining order or injunction issued by a court of competent jurisdiction. (Ord. 740 § 1.2, 2007)

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APPENDIX 5.1:

STUDY AREA PHOTOS

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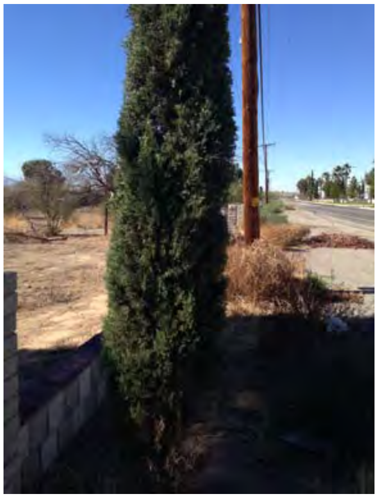

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L4 - IMG_0784.JPG
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33° 53' 57.29"117° 14' 11.11"

L1 - IMG_0865.JPG
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L1 - IMG_0866.JPG
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L1 - IMG_0868.JPG
33° 52' 27.91"117° 13' 5.41"

L2 - IMG_0869.JPG
33° 52' 25.74"117° 13' 2.25"

L2 - IMG_0870.JPG
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L2 - IMG_0871.JPG
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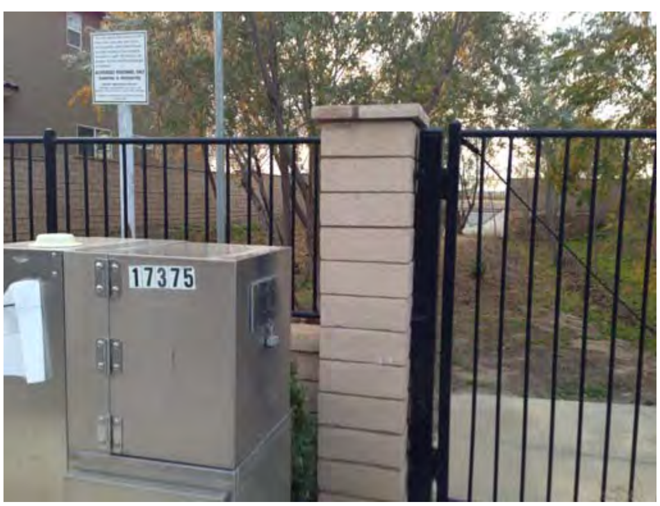

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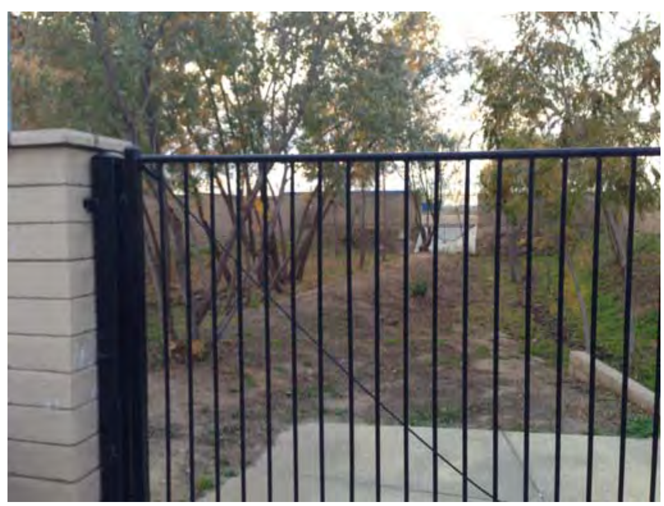

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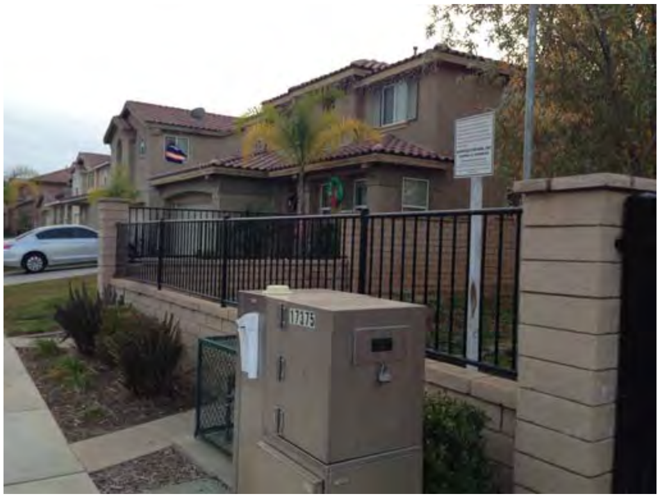

L3 - IMG_0874.JPG
33° 52' 4.15"117° 12' 44.37"

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APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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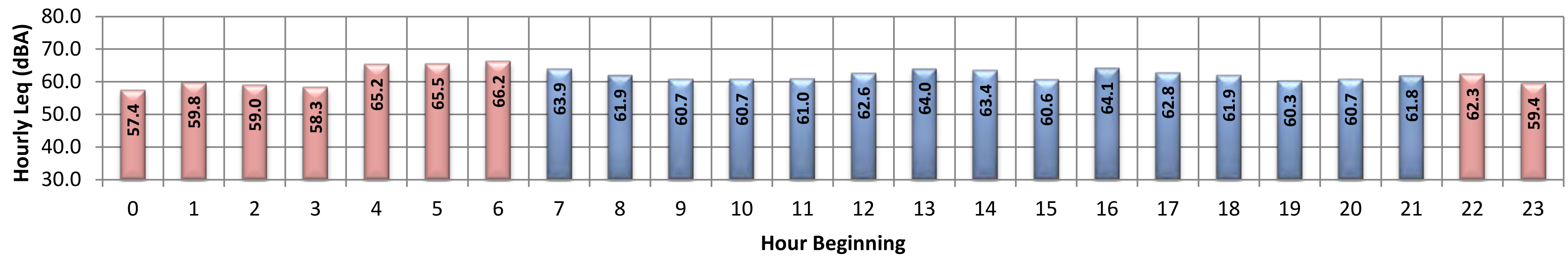
24-Hour Noise Level Measurement Summary

Project Name: Modular Logistics Center
Location: L1 - Southwest of the project site across Perris Boulevard and north of San Michele Road.
JN: 8743
Analyst: B. Lawson
Date: 12/18/2013

Energy Average Leq		24-Hour
Day	*Night*	*CNEL*
62.2	62.7	69.2

Hourly Leq dBA Readings (unadjusted)

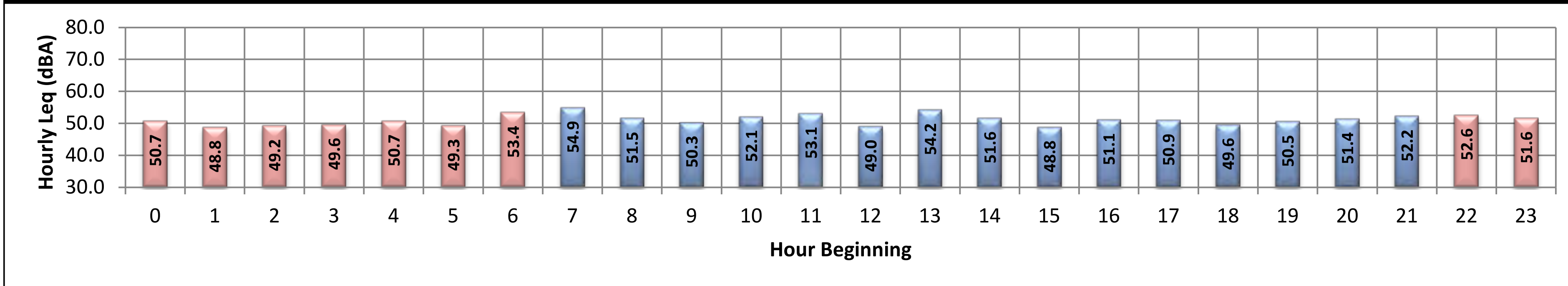


Time Period	Hour	Leq	Lmax	Lmin	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	60.3	75.9	41.3	70.5	69.0	66.5	64.5	56.0	51.5	47.0	46.0	43.5
	Max	64.1	87.3	52.6	74.0	72.0	70.0	68.5	64.0	60.5	56.5	55.5	53.5
Night	Min	57.4	75.9	44.4	70.0	67.5	61.0	56.5	52.0	50.5	47.0	46.0	45.0
	Max	66.2	84.6	47.7	79.5	76.0	72.0	70.5	61.5	57.0	52.0	51.0	49.5
Hourly Summary													
Night	0	57.4	75.9	45.6	70.0	67.5	62.5	58.0	53.5	51.0	48.0	47.5	46.5
	1	59.8	79.3	44.4	72.0	70.0	66.5	62.5	54.5	52.0	48.5	47.5	46.0
	2	59.0	83.8	45.0	72.0	68.0	61.0	56.5	52.0	50.5	47.5	47.0	46.0
	3	58.3	77.2	44.4	71.0	68.5	64.0	60.0	54.0	51.5	47.0	46.0	45.0
	4	65.2	84.6	45.8	76.0	74.5	72.0	70.5	61.5	54.5	48.5	47.5	46.5
	5	65.5	83.5	46.7	78.0	75.0	72.0	70.0	61.0	56.5	51.5	50.0	48.5
	6	66.2	84.2	47.7	79.5	76.0	72.0	69.5	61.5	57.0	52.0	51.0	49.5
Day	7	63.9	77.8	52.6	72.5	71.0	69.5	68.5	63.0	60.5	56.5	55.5	53.5
	8	61.9	80.7	50.8	72.0	70.5	68.0	65.5	59.5	57.0	54.0	53.0	51.5
	9	60.7	79.6	49.1	70.5	69.0	66.5	64.5	58.5	56.0	53.0	51.5	50.0
	10	60.7	77.1	46.6	71.5	70.0	67.5	65.5	58.5	55.5	49.5	48.5	47.5
	11	61.0	76.5	47.5	71.5	70.0	67.5	66.0	59.0	55.0	52.5	50.5	49.0
	12	62.6	80.3	46.9	74.0	72.0	69.0	67.0	60.5	53.5	50.0	49.0	48.0
	13	64.0	81.8	45.9	73.5	72.0	70.0	68.5	64.0	57.0	50.0	49.0	47.5
	14	63.4	83.5	46.6	72.5	71.0	69.0	68.0	63.5	56.0	50.0	49.0	47.5
	15	60.6	76.1	41.3	71.0	70.0	67.5	66.0	58.0	51.5	47.0	46.0	43.5
	16	64.1	87.3	44.2	74.0	72.0	69.5	68.5	60.5	54.5	48.0	47.0	46.0
	17	62.8	82.1	46.9	73.0	71.5	69.0	67.5	59.5	55.0	50.5	49.5	48.0
	18	61.9	82.6	47.3	72.0	71.0	68.5	67.0	58.0	55.0	51.0	50.0	49.0
	19	60.3	75.9	46.4	72.0	70.0	67.5	65.0	56.5	54.0	50.5	49.5	48.0
	20	60.7	80.8	44.9	72.0	70.5	67.5	65.0	56.0	53.0	49.0	48.0	46.0
	21	61.8	83.5	46.6	72.5	70.5	68.0	66.5	58.0	54.5	51.0	50.0	49.0
Night	22	62.3	79.0	47.6	72.0	71.0	69.0	67.5	60.0	56.5	52.0	51.0	49.5
	23	59.4	79.9	45.5	70.5	69.0	66.0	63.5	56.0	52.5	49.0	48.0	46.0

24-Hour Noise Level Measurement Summary

Project Name: Modular Logistics Center	*JN:* 8743	*Energy Average Leq*	*24-Hour*
Location: L2 - Located north of the project across the wash basin at the end of Kitchening Street.	*Analyst:* B. Lawson	*Day* 51.8 / *Night* 50.9	*CNEL* 57.8
	Date: 12/18/2013		

Hourly Leq dBA Readings (unadjusted)



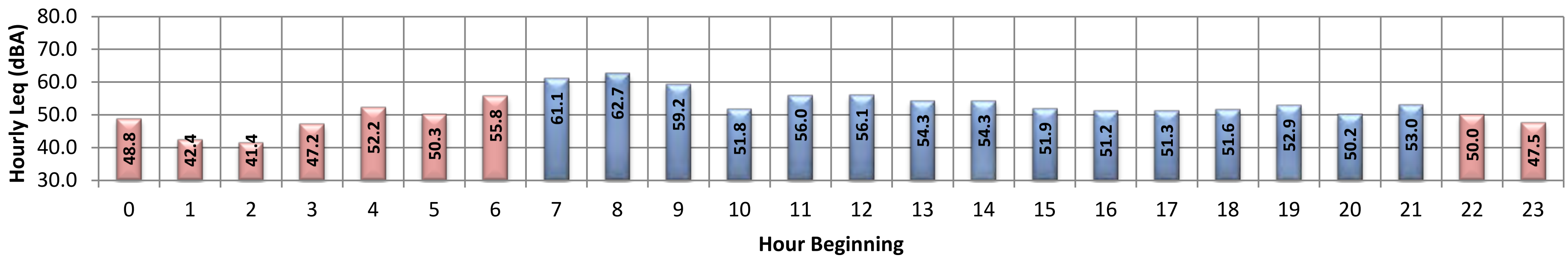
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	48.8	61.3	45.0	53.5	52.0	51.0	50.5	48.5	47.5	46.0	45.5	45.0
	Max	54.9	81.9	49.8	65.0	61.5	57.0	56.0	54.0	53.0	51.0	50.5	50.0
Night	Min	48.8	54.3	45.5	51.5	51.0	50.5	50.0	49.5	48.5	46.5	46.0	45.5
	Max	53.4	69.1	49.2	59.5	59.0	58.0	57.0	53.0	51.5	50.0	49.5	49.5
Hourly Summary													
Night	0	50.7	61.3	48.3	55.5	53.0	51.5	51.5	50.5	50.0	49.0	49.0	48.5
	1	48.8	54.3	45.5	51.5	51.0	50.5	50.5	49.5	48.5	46.5	46.0	45.5
	2	49.2	61.4	46.2	51.5	51.0	50.5	50.0	49.5	49.0	47.5	47.0	46.5
	3	49.6	63.2	46.1	54.5	53.0	51.5	51.0	50.0	49.0	47.4	47.0	46.5
	4	50.7	61.5	46.8	53.5	52.5	52.0	51.5	51.0	50.5	48.5	48.0	47.5
	5	49.3	62.7	45.8	55.0	54.0	51.5	51.0	49.5	48.5	47.0	46.5	46.0
	6	53.4	65.4	48.0	59.5	59.0	58.0	57.0	53.0	51.5	49.0	49.0	48.5
Day	7	54.9	72.7	49.4	64.5	59.0	57.0	56.0	54.0	53.0	51.0	50.5	50.0
	8	51.5	69.9	46.5	57.0	56.5	55.0	54.0	52.0	50.0	47.5	47.5	47.0
	9	50.3	61.3	46.6	55.5	54.0	52.5	52.0	50.5	49.5	48.0	47.5	47.0
	10	52.1	69.8	48.3	61.5	57.5	54.0	53.0	51.0	50.0	49.0	49.0	48.5
	11	53.1	73.2	45.3	65.0	61.5	55.0	52.5	50.0	48.5	47.0	46.5	45.5
	12	49.0	63.6	45.0	56.5	55.5	52.5	51.0	48.5	47.5	46.0	45.5	45.0
	13	54.2	81.9	45.9	61.5	59.0	56.0	54.0	51.0	49.5	47.5	47.0	46.5
	14	51.6	66.3	46.0	59.0	57.5	55.5	54.5	52.0	49.0	47.0	46.5	46.5
	15	48.8	61.9	45.8	54.5	53.0	51.0	50.5	48.5	48.0	47.0	46.5	46.0
	16	51.1	65.5	47.0	59.5	56.5	54.0	53.0	50.5	49.5	48.0	47.5	47.5
	17	50.9	68.8	46.5	58.0	55.5	53.0	52.0	50.0	49.0	47.5	47.5	47.0
	18	49.6	67.8	46.9	53.5	52.0	51.0	50.5	49.5	48.5	47.5	47.5	47.0
	19	50.5	70.6	46.8	58.5	54.5	52.0	51.0	49.5	48.5	47.5	47.5	47.0
	20	51.4	65.3	48.2	56.5	55.0	53.5	53.0	51.5	50.5	49.0	49.0	48.5
	21	52.2	64.0	49.8	57.5	54.5	53.5	53.0	52.0	51.5	50.5	50.5	50.0
Night	22	52.6	69.1	49.0	58.0	56.0	55.0	54.5	53.0	51.0	50.0	49.5	49.5
	23	51.6	63.3	49.2	57.0	55.0	53.0	52.5	51.5	51.0	50.0	49.5	49.5

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name: Modular Logistics Center	*JN:* 8743	*Energy Average Leq*	*24-Hour*
Location: L3 - Located east of the project site an existing residential neighborhood located on Callerio Vista	*Analyst:* B. Lawson	*Day* 56.4 / *Night* 50.3	*CNEL* 58.6
	Date: 12/18/2013		

Hourly Leq dBA Readings (unadjusted)



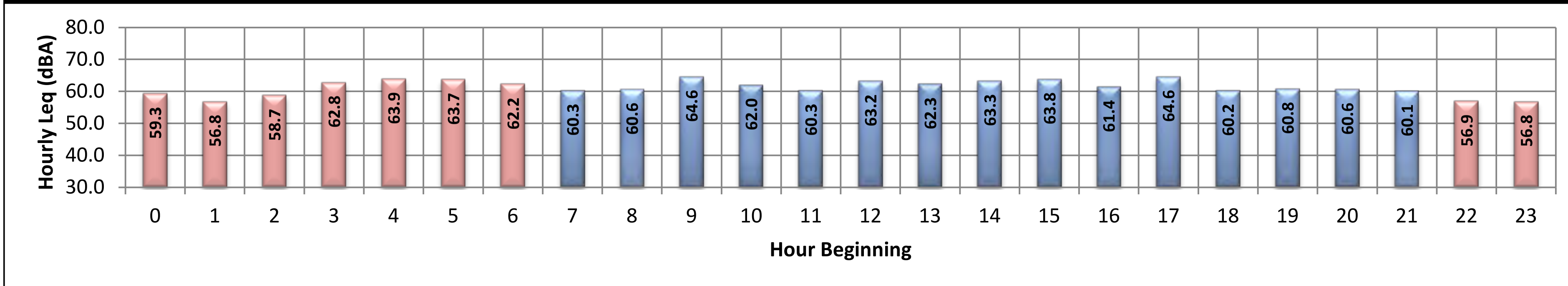
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	50.2	69.7	37.9	61.5	58.0	53.0	50.5	46.5	44.0	41.0	40.5	38.0
	Max	62.7	86.9	43.7	74.5	70.0	64.5	62.0	53.0	50.0	46.5	45.5	44.5
Night	Min	41.4	56.1	37.9	47.0	45.5	43.5	43.0	41.5	40.5	39.0	38.0	38.0
	Max	55.8	80.5	41.5	68.0	64.5	59.5	56.5	50.0	48.0	45.0	44.0	43.0
Hourly Summary													
Night	0	48.8	69.7	37.9	62.5	55.5	48.5	46.0	42.5	41.5	39.5	39.5	38.0
	1	42.4	63.1	37.9	50.5	48.5	45.0	43.5	41.5	40.5	39.0	38.0	38.0
	2	41.4	56.1	37.9	47.0	45.5	43.5	43.0	41.5	40.5	39.0	38.0	38.0
	3	47.2	68.8	37.9	57.0	52.0	48.5	47.5	44.0	42.5	40.0	39.5	39.0
	4	52.2	80.5	39.5	63.5	59.0	53.5	51.5	47.5	45.0	42.5	42.0	40.5
	5	50.3	68.7	39.6	61.5	58.5	54.0	52.5	49.0	46.0	41.5	41.0	39.5
	6	55.8	78.4	41.5	68.0	64.5	59.5	56.5	50.0	48.0	45.0	44.0	43.0
Day	7	61.1	85.5	43.7	72.0	68.5	64.0	60.5	53.0	50.0	46.5	45.5	44.5
	8	62.7	86.9	42.1	74.5	70.0	64.5	62.0	52.5	48.5	45.0	44.0	43.0
	9	59.2	83.4	40.3	71.0	66.5	60.5	57.5	52.0	47.0	42.5	41.5	41.0
	10	51.8	70.7	40.5	62.5	60.0	56.0	54.5	51.0	47.5	43.0	42.5	41.5
	11	56.0	82.0	37.9	67.0	65.0	61.0	58.0	51.5	46.5	42.0	41.0	38.0
	12	56.1	81.6	37.9	68.5	65.5	61.0	58.0	49.5	45.0	41.0	40.5	39.5
	13	54.3	83.1	37.9	65.5	63.0	57.5	55.5	49.0	46.0	41.5	41.0	39.5
	14	54.3	78.4	40.6	67.0	63.0	57.5	53.5	47.5	45.0	42.5	42.0	41.5
	15	51.9	75.5	39.2	63.0	59.5	54.5	52.0	46.5	44.0	41.0	40.5	39.5
	16	51.2	69.7	40.2	62.5	60.5	56.0	54.0	49.0	46.0	43.0	42.5	41.5
	17	51.3	71.2	41.8	62.0	59.0	55.5	54.0	49.5	47.5	44.5	43.5	42.5
	18	51.6	70.3	42.6	62.5	59.0	55.5	54.0	49.5	47.5	45.0	44.5	43.5
	19	52.9	74.6	41.9	64.5	61.0	56.0	54.0	50.0	48.0	45.0	44.0	43.0
	20	50.2	71.2	39.8	61.5	58.0	53.0	50.5	47.5	45.5	42.5	41.5	41.0
	21	53.0	76.4	40.8	65.5	61.5	55.0	52.0	48.5	46.5	43.5	43.0	42.0
Night	22	50.0	71.5	37.9	62.5	58.5	52.0	50.5	46.5	44.5	40.5	39.5	39.0
	23	47.5	68.0	39.4	59.5	57.5	51.5	48.5	44.0	42.0	40.5	40.0	39.5

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name: Modular Logistics Center	*JN:* 8743	*Energy Average Leq*	*24-Hour*
Location: L4 - Located southwest of the project site an existing residential neighborhood south of Nandina Avenue.	*Analyst:* B. Lawson	*Day* / *Night*	*CNEL*
	Date: 11/7/2013	62.2 / 61.0	67.8

Hourly Leq dBA Readings (unadjusted)



Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	60.1	77.8	39.8	72.0	70.5	66.0	63.0	51.5	46.0	42.0	41.5	40.5
	Max	64.6	86.9	49.9	77.5	75.0	70.0	68.5	64.0	60.5	55.0	53.5	52.0
Night	Min	56.8	79.4	39.0	69.5	65.5	57.0	52.5	45.5	43.0	40.5	40.0	39.5
	Max	63.9	84.4	48.3	75.5	72.5	69.5	67.5	61.5	57.0	52.0	51.0	49.5
Hourly Summary													
Night	0	59.3	81.3	42.4	73.0	69.5	63.0	58.5	51.0	48.0	45.0	44.5	43.5
	1	56.8	79.9	40.8	71.0	66.5	58.0	53.0	47.0	45.0	42.5	42.0	41.5
	2	58.7	81.7	39.0	72.5	68.5	61.5	55.0	45.5	43.0	40.5	40.0	39.5
	3	62.8	83.6	41.8	74.0	72.0	69.0	67.5	60.0	54.0	45.0	44.0	42.5
	4	63.9	84.4	48.3	75.5	72.5	69.5	67.5	61.0	57.0	52.0	51.0	49.5
	5	63.7	84.0	44.6	74.5	72.0	69.0	67.5	61.5	55.5	47.5	47.0	45.5
	6	62.2	83.1	47.3	73.5	71.5	68.0	66.0	58.5	55.0	51.5	50.5	48.5
Day	7	60.3	80.2	45.2	73.0	70.5	66.5	64.0	54.5	50.5	47.5	47.0	46.0
	8	60.6	85.2	41.6	73.0	70.5	66.0	63.0	51.5	47.0	44.5	43.5	42.0
	9	64.6	86.8	44.6	77.5	75.0	70.0	67.0	57.0	50.5	46.5	46.0	45.0
	10	62.0	82.3	41.8	74.5	72.0	68.0	65.0	55.0	49.0	44.0	43.5	42.5
	11	60.3	81.4	39.8	73.0	70.5	66.0	63.5	52.5	46.0	42.0	41.5	40.5
	12	63.2	83.6	40.7	75.5	73.0	69.5	67.5	59.5	49.0	42.5	42.0	41.0
	13	62.3	84.8	40.7	75.0	72.0	68.0	65.5	56.0	47.5	43.0	42.0	41.5
	14	63.3	86.9	44.3	74.5	72.0	69.0	67.0	60.5	55.0	48.5	47.5	46.0
	15	63.8	83.1	41.9	75.5	73.5	70.0	67.5	59.5	52.0	46.0	45.0	43.5
	16	61.4	82.5	42.6	72.5	70.5	67.5	65.0	58.0	52.5	47.0	46.0	44.0
	17	64.6	81.1	49.9	75.0	73.0	70.0	68.5	64.0	60.5	55.0	53.5	52.0
	18	60.2	77.8	44.4	72.0	70.5	66.5	64.0	56.5	53.0	48.0	47.5	46.0
	19	60.8	80.3	42.0	73.0	70.5	67.5	65.0	54.5	49.5	45.0	44.0	43.0
	20	60.6	80.8	40.7	73.5	70.5	66.5	64.0	56.0	49.0	43.0	42.0	41.0
	21	60.1	79.4	42.6	73.0	71.0	67.0	64.0	53.0	48.5	44.5	44.0	43.0
Night	22	56.9	82.8	40.0	69.5	66.0	58.0	52.5	46.0	44.0	41.5	41.0	40.5
	23	56.8	79.4	42.9	71.0	65.5	57.0	53.5	48.5	46.0	44.0	43.5	43.0

URBAN CROSSROADS

APPENDIX 7.1:

TRAFFIC NOISE CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Patterson Av.
Road Segment: s/o Harley Knox Bl.

Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	140 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	99.945
Medium Trucks:	99.856
Heavy Trucks:	99.865

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-10.82	-4.62	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-27.12	-4.61	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.58	-4.61	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	51.8	49.9	48.2	42.1	50.7	51.3
Medium Trucks:	46.5	45.0	38.6	37.1	45.6	45.8
Heavy Trucks:	56.9	55.4	46.4	47.7	56.0	56.1
Vehicle Noise:	58.3	56.8	50.7	49.0	57.4	57.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	15	31	67	145
CNEL:	15	32	70	151

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Indian St.
Road Segment: n/o Grove View Rd.

Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	660 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	96.954
Medium Trucks:	96.862
Heavy Trucks:	96.871

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-4.08	-4.42	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-20.39	-4.41	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-14.85	-4.41	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.8	56.9	55.1	49.0	57.7	58.3
Medium Trucks:	53.5	51.9	45.6	44.0	52.5	52.7
Heavy Trucks:	63.8	62.4	53.3	54.6	62.9	63.1
Vehicle Noise:	65.3	63.7	57.6	55.9	64.4	64.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	42	91	195	421
CNEL:	44	94	203	436

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Indian St.
Road Segment: s/o Grove View Rd.

Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	810 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	96.954
Medium Trucks:	96.862
Heavy Trucks:	96.871

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-3.20	-4.42	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-19.50	-4.41	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-13.96	-4.41	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.6	57.7	56.0	49.9	58.6	59.2
Medium Trucks:	54.3	52.8	46.5	44.9	53.4	53.6
Heavy Trucks:	64.7	63.3	54.2	55.5	63.8	64.0
Vehicle Noise:	66.2	64.6	58.5	56.8	65.2	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	48	104	224	482
CNEL:	50	108	232	500

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Perris Blvd.
Road Segment: n/o San Michele Rd.

Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,880 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	73 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	93.235
Medium Trucks:	93.140
Heavy Trucks:	93.149

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	0.00	-4.16	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	81.00	-16.30	-4.16	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-10.76	-4.16	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.8	62.9	61.2	55.1	63.7	64.4
Medium Trucks:	59.3	57.8	51.5	49.9	58.4	58.6
Heavy Trucks:	69.3	67.8	58.8	60.1	68.4	68.5
Vehicle Noise:	70.9	69.4	63.4	61.6	70.0	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	100	215	464	999
CNEL:	104	224	482	1,039

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Perris Blvd.
Road Segment: s/o San Michele Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 17,900 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 1,790 vehicles
Vehicle Speed: 50 mph
Near/Far Lane Distance: 73 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 93.235
Medium Trucks: 93.140
Heavy Trucks: 93.149

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.21	-4.16	-1.20	-4.77	0.000	0.000
Medium Trucks:	81.00	-16.51	-4.16	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-10.97	-4.16	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.6	62.7	61.0	54.9	63.5	64.1
Medium Trucks:	59.1	57.6	51.3	49.7	58.2	58.4
Heavy Trucks:	69.0	67.6	58.6	59.8	68.2	68.3
Vehicle Noise:	70.7	69.2	63.2	61.4	69.8	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	97	208	449	967
CNEL:	101	217	467	1,005

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Perris Blvd.
Road Segment: n/o Grove View Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 16,900 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 1,690 vehicles
Vehicle Speed: 50 mph
Near/Far Lane Distance: 73 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 93.235
Medium Trucks: 93.140
Heavy Trucks: 93.149

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.46	-4.16	-1.20	-4.77	0.000	0.000
Medium Trucks:	81.00	-16.76	-4.16	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-11.22	-4.16	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.4	62.5	60.7	54.7	63.3	63.9
Medium Trucks:	58.9	57.4	51.0	49.5	57.9	58.2
Heavy Trucks:	68.8	67.4	58.3	59.6	67.9	68.1
Vehicle Noise:	70.5	68.9	63.0	61.1	69.5	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	93	201	432	931
CNEL:	97	208	449	968

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Perris Blvd.
Road Segment: s/o Grove View Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 17,300 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 1,730 vehicles
Vehicle Speed: 50 mph
Near/Far Lane Distance: 73 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 93.235
Medium Trucks: 93.140
Heavy Trucks: 93.149

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.36	-4.16	-1.20	-4.77	0.000	0.000
Medium Trucks:	81.00	-16.66	-4.16	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-11.12	-4.16	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.5	62.6	60.8	54.8	63.4	64.0
Medium Trucks:	59.0	57.5	51.1	49.6	58.0	58.3
Heavy Trucks:	68.9	67.5	58.4	59.7	68.0	68.2
Vehicle Noise:	70.6	69.0	63.1	61.2	69.6	69.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	95	204	439	946
CNEL:	98	212	456	983

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Perris Blvd.
Road Segment: s/o Harley Knox Bl.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 16,200 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 1,620 vehicles
Vehicle Speed: 50 mph
Near/Far Lane Distance: 73 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 93.235
Medium Trucks: 93.140
Heavy Trucks: 93.149

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.64	-4.16	-1.20	-4.77	0.000	0.000
Medium Trucks:	81.00	-16.95	-4.16	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-11.41	-4.16	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.2	62.3	60.5	54.5	63.1	63.7
Medium Trucks:	58.7	57.2	50.8	49.3	57.7	58.0
Heavy Trucks:	68.6	67.2	58.2	59.4	67.8	67.9
Vehicle Noise:	70.3	68.7	62.8	60.9	69.3	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	90	195	420	905
CNEL:	94	203	437	941

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Kitching St.
Road Segment: n/o Modular Wy.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 800 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 80 vehicles
Vehicle Speed: 50 mph
Near/Far Lane Distance: 58 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 95.833
Medium Trucks: 95.741
Heavy Trucks: 95.750

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-13.71	-4.34	-1.20	-4.77	0.000	0.000
Medium Trucks:	81.00	-30.01	-4.34	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-24.47	-4.34	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	51.0	49.1	47.3	41.2	49.9	50.5
Medium Trucks:	45.5	43.9	37.6	36.0	44.5	44.7
Heavy Trucks:	55.4	53.9	44.9	46.2	54.5	54.6
Vehicle Noise:	57.0	55.5	49.6	47.7	56.1	56.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	12	26	55	119
CNEL:	12	27	57	123

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Kitching St.
Road Segment: s/o Modular Wy.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 300 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 30 vehicles
Vehicle Speed: 50 mph
Near/Far Lane Distance: 58 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 95.833
Medium Trucks: 95.741
Heavy Trucks: 95.750

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-17.97	-4.34	-1.20	-4.77	0.000	0.000
Medium Trucks:	81.00	-34.27	-4.34	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-28.73	-4.34	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	46.7	44.8	43.0	37.0	45.6	46.2
Medium Trucks:	41.2	39.7	33.3	31.8	40.2	40.5
Heavy Trucks:	51.1	49.7	40.7	41.9	50.3	50.4
Vehicle Noise:	52.8	51.2	45.3	43.4	51.8	52.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	29	62
CNEL:	6	14	30	64

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Modular Way
Road Segment: e/o Perris Blvd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 600 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 60 vehicles
Vehicle Speed: 45 mph
Near/Far Lane Distance: 24 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 99.403
Medium Trucks: 99.314
Heavy Trucks: 99.323

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-14.50	-4.58	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-30.80	-4.57	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-25.26	-4.57	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	48.2	46.3	44.5	38.5	47.1	47.7
Medium Trucks:	42.9	41.4	35.0	33.5	41.9	42.2
Heavy Trucks:	53.2	51.8	42.8	44.0	52.4	52.5
Vehicle Noise:	54.7	53.2	47.0	45.4	53.8	54.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	18	39	83
CNEL:	9	19	40	86

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Modular Way
Road Segment: w/o Kitching St.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 600 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 60 vehicles
Vehicle Speed: 45 mph
Near/Far Lane Distance: 24 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 99.403
Medium Trucks: 99.314
Heavy Trucks: 99.323

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-14.50	-4.58	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-30.80	-4.57	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-25.26	-4.57	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	48.2	46.3	44.5	38.5	47.1	47.7
Medium Trucks:	42.9	41.4	35.0	33.5	41.9	42.2
Heavy Trucks:	53.2	51.8	42.8	44.0	52.4	52.5
Vehicle Noise:	54.7	53.2	47.0	45.4	53.8	54.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	8	18	39	83
CNEL:	9	19	40	86

Tuesday, April 22, 2014

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Globe St.
Road Segment: w/o Kitching St.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 1,400 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 140 vehicles
Vehicle Speed: 45 mph
Near/Far Lane Distance: 24 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 99.403
Medium Trucks: 99.314
Heavy Trucks: 99.323

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-10.82	-4.58	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-27.12	-4.57	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-21.58	-4.57	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	51.9	50.0	48.2	42.1	50.8	51.4
Medium Trucks:	46.6	45.0	38.7	37.1	45.6	45.8
Heavy Trucks:	56.9	55.5	46.4	47.7	56.0	56.2
Vehicle Noise:	58.4	56.8	50.7	49.0	57.5	57.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	15	31	68	146
CNEL:	15	33	70	151

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Harley Knox Blvd.
Road Segment: e/o I-15 Fwy.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 13,300 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 1,330 vehicles
Vehicle Speed: 45 mph
Near/Far Lane Distance: 62 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 95.205
Medium Trucks: 95.112
Heavy Trucks: 95.121

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.04	-4.30	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-17.34	-4.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-11.81	-4.29	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.9	60.0	58.3	52.2	60.8	61.4
Medium Trucks:	56.6	55.1	48.7	47.2	55.7	55.9
Heavy Trucks:	67.0	65.5	56.5	57.7	66.1	66.2
Vehicle Noise:	68.4	66.9	60.8	59.1	67.5	67.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	68	147	317	683
CNEL:	71	153	329	709

Tuesday, April 22, 2014

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Harley Knox Blvd.
Road Segment: w/o Patterson Av.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 12,200 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 1,220 vehicles
Vehicle Speed: 45 mph
Near/Far Lane Distance: 62 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 95.205
Medium Trucks: 95.112
Heavy Trucks: 95.121

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.42	-4.30	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-17.72	-4.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-12.18	-4.29	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.5	59.6	57.9	51.8	60.4	61.1
Medium Trucks:	56.2	54.7	48.4	46.8	55.3	55.5
Heavy Trucks:	66.6	65.2	56.1	57.4	65.7	65.9
Vehicle Noise:	68.1	66.5	60.4	58.7	67.1	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	65	139	299	645
CNEL:	67	144	311	670

Tuesday, April 22, 2014

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Harley Knox Blvd.
Road Segment: e/o Patterson Av.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 10,800 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 1,080 vehicles
Vehicle Speed: 45 mph
Near/Far Lane Distance: 62 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 95.205
Medium Trucks: 95.112
Heavy Trucks: 95.121

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.95	-4.30	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-18.25	-4.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-12.71	-4.29	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.0	59.1	57.4	51.3	59.9	60.5
Medium Trucks:	55.7	54.2	47.8	46.3	54.8	55.0
Heavy Trucks:	66.0	64.6	55.6	56.8	65.2	65.3
Vehicle Noise:	67.5	66.0	59.9	58.2	66.6	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	128	276	595
CNEL:	62	133	287	617

Tuesday, April 22, 2014

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Harley Knox Blvd.
Road Segment: w/o Perris Blvd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	540 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	62 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.205
Medium Trucks:	95.112
Heavy Trucks:	95.121

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.96	-4.30	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-21.26	-4.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-15.72	-4.29	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.0	56.1	54.3	48.3	56.9	57.5
Medium Trucks:	52.7	51.2	44.8	43.3	51.7	52.0
Heavy Trucks:	63.0	61.6	52.6	53.8	62.2	62.3
Vehicle Noise:	64.5	63.0	56.8	55.2	63.6	63.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	37	81	174	375
CNEL:	39	84	180	389

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Patterson Av.
Road Segment: s/o Harley Knox Bl.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,471 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	147 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.78%
Medium Trucks:	84.8%	4.9%	10.3%	2.01%
Heavy Trucks:	86.5%	2.7%	10.8%	7.21%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	99.945
Medium Trucks:	99.856
Heavy Trucks:	99.865

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-10.58	-4.62	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-27.12	-4.61	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-21.58	-4.61	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.1	50.2	48.4	42.3	51.0	51.6
Medium Trucks:	46.5	45.0	38.6	37.1	45.6	45.8
Heavy Trucks:	56.9	55.4	46.4	47.7	56.0	56.1
Vehicle Noise:	58.4	56.9	50.8	49.1	57.5	57.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	15	32	68	146
CNEL:	15	33	71	152

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Indian St.
Road Segment: n/o Grove View Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,671 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	667 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.41%
Medium Trucks:	84.8%	4.9%	10.3%	2.09%
Heavy Trucks:	86.5%	2.7%	10.8%	7.49%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	96.954
Medium Trucks:	96.862
Heavy Trucks:	96.871

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.03	-4.42	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-20.39	-4.41	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-14.85	-4.41	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.8	56.9	55.1	49.1	57.7	58.3
Medium Trucks:	53.5	51.9	45.6	44.0	52.5	52.7
Heavy Trucks:	63.8	62.4	53.3	54.6	62.9	63.1
Vehicle Noise:	65.3	63.8	57.6	56.0	64.4	64.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	91	196	421
CNEL:	44	94	203	437

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Indian St.
Road Segment: s/o Grove View Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,573 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	857 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	86.15%
Medium Trucks:	84.8%	4.9%	10.3%	2.59%
Heavy Trucks:	86.5%	2.7%	10.8%	11.26%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	96.954
Medium Trucks:	96.862
Heavy Trucks:	96.871

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.15	-4.42	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-18.38	-4.41	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-11.99	-4.41	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.7	57.8	56.0	50.0	58.6	59.2
Medium Trucks:	55.5	54.0	47.6	46.0	54.5	54.7
Heavy Trucks:	66.7	65.2	56.2	57.4	65.8	65.9
Vehicle Noise:	67.7	66.2	59.4	58.4	66.8	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	61	132	285	614
CNEL:	63	136	294	633

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Perris Blvd.
Road Segment: n/o San Michele Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,411 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,941 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	73 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.39%
Medium Trucks:	84.8%	4.9%	10.3%	2.08%
Heavy Trucks:	86.5%	2.7%	10.8%	7.54%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	93.235
Medium Trucks:	93.140
Heavy Trucks:	93.149

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.15	-4.16	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	81.00	-16.24	-4.16	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-10.64	-4.16	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.0	63.1	61.3	55.3	63.9	64.5
Medium Trucks:	59.4	57.9	51.5	50.0	58.5	58.7
Heavy Trucks:	69.4	68.0	58.9	60.2	68.5	68.7
Vehicle Noise:	71.0	69.5	63.6	61.7	70.1	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	102	219	472	1,018
CNEL:	106	228	491	1,058

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Perris Blvd.
Road Segment: s/o San Michele Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,411 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,841 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	73 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	89.73%
Medium Trucks:	84.8%	4.9%	10.3%	2.16%
Heavy Trucks:	86.5%	2.7%	10.8%	8.11%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	93.235
Medium Trucks:	93.140
Heavy Trucks:	93.149

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.11	-4.16	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	81.00	-16.29	-4.16	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-10.56	-4.16	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.7	62.8	61.1	55.0	63.6	64.2
Medium Trucks:	59.4	57.8	51.5	49.9	58.4	58.6
Heavy Trucks:	69.5	68.0	59.0	60.3	68.6	68.7
Vehicle Noise:	71.0	69.5	63.5	61.7	70.1	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	102	219	472	1,017
CNEL:	106	228	490	1,057

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Perris Blvd.
Road Segment: n/o Grove View Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,552 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,755 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	73 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	89.78%
Medium Trucks:	84.8%	4.9%	10.3%	2.15%
Heavy Trucks:	86.5%	2.7%	10.8%	8.07%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	93.235
Medium Trucks:	93.140
Heavy Trucks:	93.149

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.32	-4.16	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	81.00	-16.53	-4.16	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-10.78	-4.16	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.5	62.6	60.9	54.8	63.4	64.0
Medium Trucks:	59.1	57.6	51.2	49.7	58.2	58.4
Heavy Trucks:	69.2	67.8	58.8	60.0	68.4	68.5
Vehicle Noise:	70.8	69.3	63.2	61.5	69.9	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	98	212	456	983
CNEL:	102	220	474	1,021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Perris Blvd.
Road Segment: s/o Grove View Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,161 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,816 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	73 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	89.54%
Medium Trucks:	84.8%	4.9%	10.3%	2.17%
Heavy Trucks:	86.5%	2.7%	10.8%	8.29%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	93.235
Medium Trucks:	93.140
Heavy Trucks:	93.149

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.18	-4.16	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	81.00	-16.34	-4.16	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-10.52	-4.16	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.7	62.8	61.0	54.9	63.6	64.2
Medium Trucks:	59.3	57.8	51.4	49.9	58.4	58.6
Heavy Trucks:	69.5	68.1	59.0	60.3	68.7	68.8
Vehicle Noise:	71.0	69.5	63.4	61.7	70.1	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	102	220	473	1,019
CNEL:	106	228	491	1,058

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project | *Project Name:* Modular Logistics Center
Road Name: Perris Blvd. | *Job Number:* 8743
Road Segment: s/o Harley Knox Bl.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,554 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,655 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	73 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	90.52%
Medium Trucks:	84.8%	4.9%	10.3%	2.07%
Heavy Trucks:	86.5%	2.7%	10.8%	7.41%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	93.235
Medium Trucks:	93.140
Heavy Trucks:	93.149

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-0.54	-4.16	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	81.00	-16.95	-4.16	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-11.41	-4.16	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.3	62.4	60.6	54.6	63.2	63.8
Medium Trucks:	58.7	57.2	50.8	49.3	57.7	58.0
Heavy Trucks:	68.6	67.2	58.2	59.4	67.8	67.9
Vehicle Noise:	70.3	68.8	62.9	60.9	69.4	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	91	196	422	908
CNEL:	94	204	438	945

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project | *Project Name:* Modular Logistics Center
Road Name: Kitching St. | *Job Number:* 8743
Road Segment: n/o Modular Wy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,121 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	112 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	77.12%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	19.38%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.833
Medium Trucks:	95.741
Heavy Trucks:	95.750

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-12.93	-4.34	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	81.00	-26.35	-4.34	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-18.93	-4.34	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	51.7	49.8	48.1	42.0	50.6	51.2
Medium Trucks:	49.1	47.6	41.2	39.7	48.2	48.4
Heavy Trucks:	60.9	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	61.7	60.2	52.8	52.4	60.8	61.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	24	52	113	243
CNEL:	25	54	116	250

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project | *Project Name:* Modular Logistics Center
Road Name: Kitching St. | *Job Number:* 8743
Road Segment: s/o Modular Wy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	986 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	99 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	56.22%
Medium Trucks:	84.8%	4.9%	10.3%	5.75%
Heavy Trucks:	86.5%	2.7%	10.8%	38.03%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.833
Medium Trucks:	95.741
Heavy Trucks:	95.750

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-14.86	-4.34	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	81.00	-24.76	-4.34	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-16.56	-4.34	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	49.8	47.9	46.1	40.1	48.7	49.3
Medium Trucks:	50.7	49.2	42.8	41.3	49.8	50.0
Heavy Trucks:	63.3	61.9	52.8	54.1	62.4	62.6
Vehicle Noise:	63.7	62.3	54.0	54.5	62.8	63.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	72	154	333
CNEL:	34	73	158	341

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project | *Project Name:* Modular Logistics Center
Road Name: Modular Way | *Job Number:* 8743
Road Segment: e/o Perris Blvd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,137 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	114 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	85.05%
Medium Trucks:	84.8%	4.9%	10.3%	2.35%
Heavy Trucks:	86.5%	2.7%	10.8%	12.60%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	99.403
Medium Trucks:	99.314
Heavy Trucks:	99.323

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-11.98	-4.58	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-27.58	-4.57	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.28	-4.57	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	50.7	48.8	47.0	41.0	49.6	50.2
Medium Trucks:	46.1	44.6	38.2	36.7	45.1	45.4
Heavy Trucks:	58.2	56.8	47.7	49.0	57.3	57.5
Vehicle Noise:	59.1	57.6	50.7	49.8	58.2	58.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	16	35	76	164
CNEL:	17	37	79	170

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Modular Way
Road Segment: w/o Kitching St.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	824 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	82 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	65.79%
Medium Trucks:	84.8%	4.9%	10.3%	4.94%
Heavy Trucks:	86.5%	2.7%	10.8%	29.28%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	99.403
Medium Trucks:	99.314
Heavy Trucks:	99.323

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-14.50	-4.58	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-25.75	-4.57	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.02	-4.57	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.2	46.3	44.5	38.5	47.1	47.7
Medium Trucks:	47.9	46.4	40.1	38.5	47.0	47.2
Heavy Trucks:	60.5	59.0	50.0	51.3	59.6	59.7
Vehicle Noise:	60.9	59.5	51.4	51.7	60.1	60.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	22	47	101	218
CNEL:	22	48	103	223

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Globe St.
Road Segment: w/o Kitching St.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,086 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	209 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	74.20%
Medium Trucks:	84.8%	4.9%	10.3%	3.83%
Heavy Trucks:	86.5%	2.7%	10.8%	21.97%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	99.403
Medium Trucks:	99.314
Heavy Trucks:	99.323

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-9.94	-4.58	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-22.81	-4.57	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-15.23	-4.57	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.7	50.8	49.1	43.0	51.6	52.2
Medium Trucks:	50.9	49.4	43.0	41.5	49.9	50.1
Heavy Trucks:	63.3	61.8	52.8	54.0	62.4	62.5
Vehicle Noise:	63.8	62.4	54.6	54.6	63.0	63.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	34	73	158	340
CNEL:	35	75	162	349

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Harley Knox Blvd.
Road Segment: e/o I-15 Fwy.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,986 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,399 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	62 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	87.91%
Medium Trucks:	84.8%	4.9%	10.3%	2.37%
Heavy Trucks:	86.5%	2.7%	10.8%	9.72%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.205
Medium Trucks:	95.112
Heavy Trucks:	95.121

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.94	-4.30	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.63	-4.29	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-10.50	-4.29	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	62.0	60.1	58.4	52.3	60.9	61.5
Medium Trucks:	57.3	55.8	49.5	47.9	56.4	56.6
Heavy Trucks:	68.3	66.8	57.8	59.0	67.4	67.5
Vehicle Noise:	69.5	67.9	61.4	60.1	68.6	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	80	173	372	801
CNEL:	83	178	385	829

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project
Road Name: Harley Knox Blvd.
Road Segment: w/o Patterson Av.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,886 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,289 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	62 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	87.70%
Medium Trucks:	84.8%	4.9%	10.3%	2.39%
Heavy Trucks:	86.5%	2.7%	10.8%	9.90%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.205
Medium Trucks:	95.112
Heavy Trucks:	95.121

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.31	-4.30	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.95	-4.29	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-10.78	-4.29	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.7	59.8	58.0	51.9	60.6	61.2
Medium Trucks:	57.0	55.5	49.1	47.6	56.1	56.3
Heavy Trucks:	68.0	66.6	57.5	58.8	67.1	67.3
Vehicle Noise:	69.2	67.7	61.1	59.9	68.3	68.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	77	165	355	766
CNEL:	79	171	368	792

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project — *Project Name:* Modular Logistics Center
Road Name: Harley Knox Blvd. — *Job Number:* 8743
Road Segment: e/o Patterson Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 11,579 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 1,158 vehicles
Vehicle Speed: 45 mph
Near/Far Lane Distance: 62 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	87.29%
Medium Trucks:	84.8%	4.9%	10.3%	2.43%
Heavy Trucks:	86.5%	2.7%	10.8%	10.27%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 95.205
Medium Trucks: 95.112
Heavy Trucks: 95.121

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.79	-4.30	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-17.34	-4.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-11.08	-4.29	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.2	59.3	57.5	51.5	60.1	60.7
Medium Trucks:	56.6	55.1	48.7	47.2	55.7	55.9
Heavy Trucks:	67.7	66.3	57.2	58.5	66.8	66.9
Vehicle Noise:	68.8	67.3	60.7	59.5	67.9	68.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	157	337	727
CNEL:	75	162	349	751

Tuesday, April 22, 2014

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Plus Project — *Project Name:* Modular Logistics Center
Road Name: Harley Knox Blvd. — *Job Number:* 8743
Road Segment: w/o Perris Blvd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 5,907 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 591 vehicles
Vehicle Speed: 45 mph
Near/Far Lane Distance: 62 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	87.36%
Medium Trucks:	84.8%	4.9%	10.3%	2.41%
Heavy Trucks:	86.5%	2.7%	10.8%	10.24%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 95.205
Medium Trucks: 95.112
Heavy Trucks: 95.121

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.71	-4.30	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-20.31	-4.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-14.02	-4.29	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.3	56.4	54.6	48.5	57.2	57.8
Medium Trucks:	53.6	52.1	45.8	44.2	52.7	52.9
Heavy Trucks:	64.7	63.3	54.3	55.5	63.9	64.0
Vehicle Noise:	65.9	64.4	57.7	56.6	65.0	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	46	100	215	463
CNEL:	48	103	222	479

Tuesday, April 22, 2014

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project — *Project Name:* Modular Logistics Center
Road Name: Patterson Av. — *Job Number:* 8743
Road Segment: s/o Harley Knox Bl.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 1,900 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 190 vehicles
Vehicle Speed: 45 mph
Near/Far Lane Distance: 12 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 99.945
Medium Trucks: 99.856
Heavy Trucks: 99.865

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-9.49	-4.62	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-25.80	-4.61	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-20.26	-4.61	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.2	51.3	49.5	43.4	52.1	52.7
Medium Trucks:	47.8	46.3	40.0	38.4	46.9	47.1
Heavy Trucks:	58.2	56.8	47.7	49.0	57.3	57.5
Vehicle Noise:	59.7	58.1	52.0	50.3	58.8	59.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	38	83	178
CNEL:	18	40	86	185

Tuesday, April 22, 2014

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project — *Project Name:* Modular Logistics Center
Road Name: Indian St. — *Job Number:* 8743
Road Segment: n/o Grove View Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 23,100 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 2,310 vehicles
Vehicle Speed: 45 mph
Near/Far Lane Distance: 50 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 96.954
Medium Trucks: 96.862
Heavy Trucks: 96.871

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.36	-4.42	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-14.95	-4.41	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-9.41	-4.41	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.2	62.3	60.5	54.5	63.1	63.7
Medium Trucks:	58.9	57.4	51.0	49.5	57.9	58.2
Heavy Trucks:	69.2	67.8	58.8	60.0	68.4	68.5
Vehicle Noise:	70.7	69.2	63.0	61.4	69.8	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	97	209	450	970
CNEL:	101	217	467	1,006

Tuesday, April 22, 2014

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project
Road Name: Indian St.
Road Segment: s/o Grove View Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 22,100 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 2,210 vehicles
Vehicle Speed: 45 mph
Near/Far Lane Distance: 50 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 96.954
Medium Trucks: 96.862
Heavy Trucks: 96.871

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.16	-4.42	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-15.14	-4.41	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-9.60	-4.41	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.0	62.1	60.3	54.3	62.9	63.5
Medium Trucks:	58.7	57.2	50.8	49.3	57.7	58.0
Heavy Trucks:	69.0	67.6	58.6	59.8	68.2	68.3
Vehicle Noise:	70.5	69.0	62.8	61.2	69.6	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	94	203	437	942
CNEL:	98	210	453	977

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project
Road Name: Perris Blvd.
Road Segment: n/o San Michele Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 25,900 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 2,590 vehicles
Vehicle Speed: 50 mph
Near/Far Lane Distance: 73 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 93.235
Medium Trucks: 93.140
Heavy Trucks: 93.149

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.40	-4.16	-1.20	-4.77	0.000	0.000
Medium Trucks:	81.00	-14.91	-4.16	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-9.37	-4.16	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.2	64.3	62.6	56.5	65.1	65.7
Medium Trucks:	60.7	59.2	52.9	51.3	59.8	60.0
Heavy Trucks:	70.7	69.2	60.2	61.4	69.8	69.9
Vehicle Noise:	72.3	70.8	64.8	63.0	71.4	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	124	267	574	1,237
CNEL:	129	277	597	1,286

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project
Road Name: Perris Blvd.
Road Segment: s/o San Michele Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 24,700 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 2,470 vehicles
Vehicle Speed: 50 mph
Near/Far Lane Distance: 73 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 93.235
Medium Trucks: 93.140
Heavy Trucks: 93.149

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.19	-4.16	-1.20	-4.77	0.000	0.000
Medium Trucks:	81.00	-15.11	-4.16	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-9.58	-4.16	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.0	64.1	62.4	56.3	64.9	65.5
Medium Trucks:	60.5	59.0	52.7	51.1	59.6	59.8
Heavy Trucks:	70.4	69.0	60.0	61.2	69.6	69.7
Vehicle Noise:	72.1	70.6	64.6	62.8	71.2	71.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	120	258	556	1,199
CNEL:	125	268	578	1,246

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project
Road Name: Perris Blvd.
Road Segment: n/o Grove View Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt): 28,100 vehicles
Peak Hour Percentage: 10%
Peak Hour Volume: 2,810 vehicles
Vehicle Speed: 50 mph
Near/Far Lane Distance: 73 feet

Site Data

Barrier Height: **0.0 feet**
Barrier Type (0-Wall, 1-Berm): 0.0
Centerline Dist. to Barrier: 100.0 feet
Centerline Dist. to Observer: 100.0 feet
Barrier Distance to Observer: 0.0 feet
Observer Height (Above Pad): 5.0 feet
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet
Road Grade: 0.0%
Left View: -90.0 degrees
Right View: 90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos: 93.235
Medium Trucks: 93.140
Heavy Trucks: 93.149

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.75	-4.16	-1.20	-4.77	0.000	0.000
Medium Trucks:	81.00	-14.55	-4.16	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-9.02	-4.16	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.6	64.7	62.9	56.9	65.5	66.1
Medium Trucks:	61.1	59.6	53.2	51.7	60.1	60.4
Heavy Trucks:	71.0	69.6	60.5	61.8	70.2	70.3
Vehicle Noise:	72.7	71.1	65.2	63.3	71.7	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	131	281	606	1,306
CNEL:	136	293	630	1,358

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project
Road Name: Perris Blvd.
Road Segment: s/o Grove View Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,860 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	73 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	93.235
Medium Trucks:	93.140
Heavy Trucks:	93.149

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	1.83	-4.16	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	81.00	-14.48	-4.16	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-8.94	-4.16	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.7	64.8	63.0	56.9	65.6	66.2
Medium Trucks:	61.2	59.7	53.3	51.8	60.2	60.4
Heavy Trucks:	71.1	69.7	60.6	61.9	70.2	70.4
Vehicle Noise:	72.7	71.2	65.3	63.4	71.8	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	132	285	614	1,322
CNEL:	137	296	638	1,374

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project
Road Name: Perris Blvd.
Road Segment: s/o Harley Knox Bl.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,670 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	73 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	93.235
Medium Trucks:	93.140
Heavy Trucks:	93.149

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	1.53	-4.16	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	81.00	-14.78	-4.16	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-9.24	-4.16	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.4	64.5	62.7	56.6	65.3	65.9
Medium Trucks:	60.9	59.4	53.0	51.5	59.9	60.1
Heavy Trucks:	70.8	69.4	60.3	61.6	69.9	70.1
Vehicle Noise:	72.4	70.9	65.0	63.1	71.5	71.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	126	272	586	1,263
CNEL:	131	283	609	1,313

Tuesday, April 22, 2014

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project
Road Name: Kitching St.
Road Segment: n/o Modular Wy.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	60 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.833
Medium Trucks:	95.741
Heavy Trucks:	95.750

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-14.96	-4.34	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	81.00	-31.26	-4.34	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-25.72	-4.34	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	49.7	47.8	46.0	40.0	48.6	49.2
Medium Trucks:	44.2	42.7	36.3	34.8	43.3	43.5
Heavy Trucks:	54.1	52.7	43.7	44.9	53.3	53.4
Vehicle Noise:	55.8	54.2	48.3	46.4	54.9	55.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	10	21	45	98
CNEL:	10	22	47	102

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project
Road Name: Kitching St.
Road Segment: s/o Modular Wy.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	30 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.833
Medium Trucks:	95.741
Heavy Trucks:	95.750

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-17.97	-4.34	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	81.00	-34.27	-4.34	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-28.73	-4.34	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	46.7	44.8	43.0	37.0	45.6	46.2
Medium Trucks:	41.2	39.7	33.3	31.8	40.2	40.5
Heavy Trucks:	51.1	49.7	40.7	41.9	50.3	50.4
Vehicle Noise:	52.8	51.2	45.3	43.4	51.8	52.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	6	13	29	62
CNEL:	6	14	30	64

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project
Road Name: Modular Way
Road Segment: e/o Perris Blvd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	30 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	99.403
Medium Trucks:	99.314
Heavy Trucks:	99.323

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-17.51	-4.58	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-33.81	-4.57	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-28.27	-4.57	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	45.2	43.3	41.5	35.5	44.1	44.7
Medium Trucks:	39.9	38.4	32.0	30.4	38.9	39.1
Heavy Trucks:	50.2	48.8	39.7	41.0	49.4	49.5
Vehicle Noise:	51.7	50.2	44.0	42.4	50.8	51.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	5	11	24	52
CNEL:	5	12	25	54

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project
Road Name: Modular Way
Road Segment: w/o Kitching St.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	30 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	99.403
Medium Trucks:	99.314
Heavy Trucks:	99.323

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-17.51	-4.58	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-33.81	-4.57	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-28.27	-4.57	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	45.2	43.3	41.5	35.5	44.1	44.7
Medium Trucks:	39.9	38.4	32.0	30.4	38.9	39.1
Heavy Trucks:	50.2	48.8	39.7	41.0	49.4	49.5
Vehicle Noise:	51.7	50.2	44.0	42.4	50.8	51.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	5	11	24	52
CNEL:	5	12	25	54

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project
Road Name: Globe St.
Road Segment: w/o Kitching St.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,600 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	160 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	99.403
Medium Trucks:	99.314
Heavy Trucks:	99.323

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-10.24	-4.58	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-26.54	-4.57	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.00	-4.57	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.4	50.5	48.8	42.7	51.3	51.9
Medium Trucks:	47.1	45.6	39.3	37.7	46.2	46.4
Heavy Trucks:	57.5	56.1	47.0	48.3	56.6	56.7
Vehicle Noise:	59.0	57.4	51.3	49.6	58.0	58.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	16	34	74	160
CNEL:	17	36	77	166

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project
Road Name: Harley Knox Blvd.
Road Segment: e/o I-15 Fwy.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,110 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	62 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.205
Medium Trucks:	95.112
Heavy Trucks:	95.121

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.65	-4.30	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-13.66	-4.29	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-8.12	-4.29	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.6	63.7	61.9	55.9	64.5	65.1
Medium Trucks:	60.3	58.8	52.4	50.9	59.3	59.6
Heavy Trucks:	70.6	69.2	60.2	61.4	69.8	69.9
Vehicle Noise:	72.1	70.6	64.4	62.8	71.2	71.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	120	259	559	1,204
CNEL:	125	269	580	1,249

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project
Road Name: Harley Knox Blvd.
Road Segment: w/o Patterson Av.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	33,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,310 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	62 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.205
Medium Trucks:	95.112
Heavy Trucks:	95.121

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.92	-4.30	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-13.38	-4.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-7.85	-4.29	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.9	64.0	62.2	56.2	64.8	65.4
Medium Trucks:	60.6	59.1	52.7	51.2	59.6	59.9
Heavy Trucks:	70.9	69.5	60.5	61.7	70.1	70.2
Vehicle Noise:	72.4	70.9	64.7	63.1	71.5	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	126	270	583	1,255
CNEL:	130	281	605	1,302

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project
Road Name: Harley Knox Blvd.
Road Segment: e/o Patterson Av.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,170 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	62 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.205
Medium Trucks:	95.112
Heavy Trucks:	95.121

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.73	-4.30	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-13.57	-4.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-8.03	-4.29	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.7	63.8	62.0	56.0	64.6	65.2
Medium Trucks:	60.4	58.9	52.5	51.0	59.4	59.7
Heavy Trucks:	70.7	69.3	60.3	61.5	69.9	70.0
Vehicle Noise:	72.2	70.7	64.5	62.9	71.3	71.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	122	263	566	1,220
CNEL:	127	273	587	1,265

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 Without Project
Road Name: Harley Knox Blvd.
Road Segment: w/o Perris Blvd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,310 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	62 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.31%
Medium Trucks:	84.8%	4.9%	10.3%	2.12%
Heavy Trucks:	86.5%	2.7%	10.8%	7.57%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.205
Medium Trucks:	95.112
Heavy Trucks:	95.121

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.11	-4.30	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-17.41	-4.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-11.87	-4.29	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.9	60.0	58.2	52.1	60.8	61.4
Medium Trucks:	56.5	55.0	48.7	47.1	55.6	55.8
Heavy Trucks:	66.9	65.5	56.4	57.7	66.0	66.2
Vehicle Noise:	68.4	66.8	60.7	59.0	67.5	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	68	146	314	677
CNEL:	70	151	326	702

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Patterson Av.
Road Segment: s/o Harley Knox Bl.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,971 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	197 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.66%
Medium Trucks:	84.8%	4.9%	10.3%	2.04%
Heavy Trucks:	86.5%	2.7%	10.8%	7.30%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	99.945
Medium Trucks:	99.856
Heavy Trucks:	99.865

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-9.32	-4.62	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-25.80	-4.61	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-20.26	-4.61	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.3	51.4	49.7	43.6	52.2	52.8
Medium Trucks:	47.8	46.3	40.0	38.4	46.9	47.1
Heavy Trucks:	58.2	56.8	47.7	49.0	57.3	57.5
Vehicle Noise:	59.7	58.2	52.1	50.4	58.8	59.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	39	83	179
CNEL:	19	40	86	186

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Indian St.
Road Segment: n/o Grove View Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,171 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,317 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.34%
Medium Trucks:	84.8%	4.9%	10.3%	2.11%
Heavy Trucks:	86.5%	2.7%	10.8%	7.55%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	96.954
Medium Trucks:	96.862
Heavy Trucks:	96.871

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.37	-4.42	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-14.95	-4.41	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-9.41	-4.41	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.2	62.3	60.5	54.5	63.1	63.7
Medium Trucks:	58.9	57.4	51.0	49.5	57.9	58.2
Heavy Trucks:	69.2	67.8	58.8	60.0	68.4	68.5
Vehicle Noise:	70.7	69.2	63.0	61.4	69.8	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	97	209	450	970
CNEL:	101	217	467	1,007

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Indian St.
Road Segment: s/o Grove View Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,573 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,257 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	88.73%
Medium Trucks:	84.8%	4.9%	10.3%	2.29%
Heavy Trucks:	86.5%	2.7%	10.8%	8.97%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	96.954
Medium Trucks:	96.862
Heavy Trucks:	96.871

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.18	-4.42	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-14.69	-4.41	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-8.77	-4.41	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.0	62.1	60.4	54.3	62.9	63.5
Medium Trucks:	59.1	57.6	51.3	49.7	58.2	58.4
Heavy Trucks:	69.9	68.4	59.4	60.7	69.0	69.1
Vehicle Noise:	71.2	69.6	63.2	61.8	70.3	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	104	224	482	1,039
CNEL:	108	232	499	1,076

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Perris Blvd.
Road Segment: n/o San Michele Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,511 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,651 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	73 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.37%
Medium Trucks:	84.8%	4.9%	10.3%	2.09%
Heavy Trucks:	86.5%	2.7%	10.8%	7.55%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	93.235
Medium Trucks:	93.140
Heavy Trucks:	93.149

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.50	-4.16	-1.20	-4.77	0.000	0.000
Medium Trucks:	81.00	-14.86	-4.16	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-9.28	-4.16	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.3	64.4	62.7	56.6	65.2	65.8
Medium Trucks:	60.8	59.3	52.9	51.4	59.8	60.1
Heavy Trucks:	70.7	69.3	60.3	61.5	69.9	70.0
Vehicle Noise:	72.4	70.9	64.9	63.1	71.5	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	125	270	582	1,254
CNEL:	130	281	605	1,304

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Perris Blvd.
Road Segment: s/o San Michele Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,211 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,521 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	73 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	89.89%
Medium Trucks:	84.8%	4.9%	10.3%	2.15%
Heavy Trucks:	86.5%	2.7%	10.8%	7.96%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	93.235
Medium Trucks:	93.140
Heavy Trucks:	93.149

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.26	-4.16	-1.20	-4.77	0.000	0.000
Medium Trucks:	81.00	-14.95	-4.16	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-9.27	-4.16	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.2	62.4	56.4	65.0	65.6
Medium Trucks:	60.7	59.2	52.8	51.3	59.7	60.0
Heavy Trucks:	70.8	69.3	60.3	61.5	69.9	70.0
Vehicle Noise:	72.3	70.8	64.8	63.0	71.4	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	124	268	577	1,244
CNEL:	129	278	600	1,292

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Perris Blvd.
Road Segment: n/o Grove View Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,752 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,875 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	73 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	89.99%
Medium Trucks:	84.8%	4.9%	10.3%	2.14%
Heavy Trucks:	86.5%	2.7%	10.8%	7.88%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	93.235
Medium Trucks:	93.140
Heavy Trucks:	93.149

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.83	-4.16	-1.20	-4.77	0.000	0.000
Medium Trucks:	81.00	-14.41	-4.16	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-8.74	-4.16	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.7	64.8	63.0	57.0	65.6	66.2
Medium Trucks:	61.2	59.7	53.4	51.8	60.3	60.5
Heavy Trucks:	71.3	69.9	60.8	62.1	70.4	70.6
Vehicle Noise:	72.9	71.3	65.3	63.5	72.0	72.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	135	291	627	1,351
CNEL:	140	302	651	1,404

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Perris Blvd.
Road Segment: s/o Grove View Rd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,461 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,946 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	73 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	89.84%
Medium Trucks:	84.8%	4.9%	10.3%	2.15%
Heavy Trucks:	86.5%	2.7%	10.8%	8.02%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	93.235
Medium Trucks:	93.140
Heavy Trucks:	93.149

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.93	-4.16	-1.20	-4.77	0.000	0.000
Medium Trucks:	81.00	-14.28	-4.16	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-8.56	-4.16	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.8	64.9	63.1	57.1	65.7	66.3
Medium Trucks:	61.4	59.9	53.5	52.0	60.4	60.6
Heavy Trucks:	71.5	70.0	61.0	62.3	70.6	70.7
Vehicle Noise:	73.0	71.5	65.5	63.7	72.1	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	138	298	643	1,384
CNEL:	144	310	667	1,438

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Perris Blvd.
Road Segment: s/o Harley Knox Bl.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,054 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,705 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	73 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	90.44%
Medium Trucks:	84.8%	4.9%	10.3%	2.09%
Heavy Trucks:	86.5%	2.7%	10.8%	7.47%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	93.235
Medium Trucks:	93.140
Heavy Trucks:	93.149

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.59	-4.16	-1.20	-4.77	0.000	0.000
Medium Trucks:	81.00	-14.78	-4.16	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-9.24	-4.16	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.4	64.5	62.8	56.7	65.3	65.9
Medium Trucks:	60.9	59.4	53.0	51.5	59.9	60.1
Heavy Trucks:	70.8	69.4	60.3	61.6	69.9	70.1
Vehicle Noise:	72.5	70.9	65.0	63.1	71.5	71.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	127	273	587	1,266
CNEL:	132	284	611	1,316

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Kitching St.
Road Segment: n/o Modular Wy.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	921 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	92 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	74.25%
Medium Trucks:	84.8%	4.9%	10.3%	3.81%
Heavy Trucks:	86.5%	2.7%	10.8%	21.94%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.833
Medium Trucks:	95.741
Heavy Trucks:	95.750

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-13.95	-4.34	-1.20	-4.77	0.000	0.000
Medium Trucks:	81.00	-26.85	-4.34	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-19.24	-4.34	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	50.7	48.8	47.0	41.0	49.6	50.2
Medium Trucks:	48.6	47.1	40.7	39.2	47.7	47.9
Heavy Trucks:	60.6	59.2	50.1	51.4	59.7	59.9
Vehicle Noise:	61.3	59.8	52.2	52.0	60.4	60.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	49	106	229
CNEL:	23	51	109	235

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Kitching St.
Road Segment: s/o Modular Wy.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	986 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	99 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	56.22%
Medium Trucks:	84.8%	4.9%	10.3%	5.75%
Heavy Trucks:	86.5%	2.7%	10.8%	38.03%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.833
Medium Trucks:	95.741
Heavy Trucks:	95.750

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-14.86	-4.34	-1.20	-4.77	0.000	0.000
Medium Trucks:	81.00	-24.76	-4.34	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-16.56	-4.34	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	49.8	47.9	46.1	40.1	48.7	49.3
Medium Trucks:	50.7	49.2	42.8	41.3	49.8	50.0
Heavy Trucks:	63.3	61.9	52.8	54.1	62.4	62.6
Vehicle Noise:	63.7	62.3	54.0	54.5	62.8	63.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	72	154	333
CNEL:	34	73	158	341

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Modular Way
Road Segment: e/o Perris Blvd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	837 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	84 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	83.16%
Medium Trucks:	84.8%	4.9%	10.3%	2.43%
Heavy Trucks:	86.5%	2.7%	10.8%	14.41%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	99.403
Medium Trucks:	99.314
Heavy Trucks:	99.323

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-13.41	-4.58	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-28.76	-4.57	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-21.03	-4.57	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	49.3	47.4	45.6	39.5	48.2	48.8
Medium Trucks:	44.9	43.4	37.0	35.5	44.0	44.2
Heavy Trucks:	57.5	56.0	47.0	48.2	56.6	56.7
Vehicle Noise:	58.3	56.8	49.6	49.0	57.4	57.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	14	31	67	144
CNEL:	15	32	69	149

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Modular Way
Road Segment: w/o Kitching St.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	524 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	52 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	51.74%
Medium Trucks:	84.8%	4.9%	10.3%	6.55%
Heavy Trucks:	86.5%	2.7%	10.8%	41.71%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	99.403
Medium Trucks:	99.314
Heavy Trucks:	99.323

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-17.51	-4.58	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-26.48	-4.57	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-18.44	-4.57	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	45.2	43.3	41.5	35.5	44.1	44.7
Medium Trucks:	47.2	45.7	39.3	37.8	46.2	46.5
Heavy Trucks:	60.0	58.6	49.6	50.8	59.2	59.3
Vehicle Noise:	60.4	58.9	50.5	51.2	59.5	59.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	43	93	200
CNEL:	20	44	95	205

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Globe St.
Road Segment: w/o Kitching St.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,286 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	229 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	75.61%
Medium Trucks:	84.8%	4.9%	10.3%	3.68%
Heavy Trucks:	86.5%	2.7%	10.8%	20.71%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	99.403
Medium Trucks:	99.314
Heavy Trucks:	99.323

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-9.46	-4.58	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-22.59	-4.57	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-15.09	-4.57	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.2	51.3	49.6	43.5	52.1	52.7
Medium Trucks:	51.1	49.6	43.2	41.7	50.1	50.4
Heavy Trucks:	63.4	62.0	52.9	54.2	62.5	62.7
Vehicle Noise:	64.0	62.6	54.9	54.8	63.1	63.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	75	162	349
CNEL:	36	77	166	358

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Harley Knox Blvd.
Road Segment: e/o I-15 Fwy.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,786 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,179 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	62 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	89.25%
Medium Trucks:	84.8%	4.9%	10.3%	2.23%
Heavy Trucks:	86.5%	2.7%	10.8%	8.52%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.205
Medium Trucks:	95.112
Heavy Trucks:	95.121

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.69	-4.30	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-13.34	-4.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-7.51	-4.29	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.7	63.8	62.0	55.9	64.6	65.2
Medium Trucks:	60.6	59.1	52.8	51.2	59.7	59.9
Heavy Trucks:	71.2	69.8	60.8	62.0	70.4	70.5
Vehicle Noise:	72.6	71.1	64.7	63.3	71.7	71.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	129	279	601	1,295
CNEL:	134	289	623	1,341

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Harley Knox Blvd.
Road Segment: w/o Patterson Av.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	33,786 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,379 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	62 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	89.32%
Medium Trucks:	84.8%	4.9%	10.3%	2.22%
Heavy Trucks:	86.5%	2.7%	10.8%	8.46%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.205
Medium Trucks:	95.112
Heavy Trucks:	95.121

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.96	-4.30	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-13.08	-4.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-7.28	-4.29	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.9	64.0	62.3	56.2	64.8	65.4
Medium Trucks:	60.9	59.4	53.0	51.5	59.9	60.2
Heavy Trucks:	71.5	70.1	61.0	62.3	70.6	70.8
Vehicle Noise:	72.8	71.3	65.0	63.5	71.9	72.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	134	290	624	1,344
CNEL:	139	300	646	1,392

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Harley Knox Blvd.
Road Segment: e/o Patterson Av.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,479 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,248 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	62 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	89.24%
Medium Trucks:	84.8%	4.9%	10.3%	2.23%
Heavy Trucks:	86.5%	2.7%	10.8%	8.54%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.205
Medium Trucks:	95.112
Heavy Trucks:	95.121

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.78	-4.30	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-13.24	-4.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-7.41	-4.29	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.7	63.8	62.1	56.0	64.6	65.3
Medium Trucks:	60.7	59.2	52.8	51.3	59.8	60.0
Heavy Trucks:	71.4	69.9	60.9	62.1	70.5	70.6
Vehicle Noise:	72.7	71.2	64.8	63.4	71.8	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	131	283	610	1,315
CNEL:	136	293	632	1,362

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Year 2018 With Project
Road Name: Harley Knox Blvd.
Road Segment: w/o Perris Blvd.
Project Name: Modular Logistics Center
Job Number: 8743

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,607 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,361 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	62 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	100.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	89.03%
Medium Trucks:	84.8%	4.9%	10.3%	2.24%
Heavy Trucks:	86.5%	2.7%	10.8%	8.73%

Noise Source Elevations (in feet)

Autos:	0.000
Medium Trucks:	2.297
Heavy Trucks:	8.004

Grade Adjustment: 0.0

Lane Equivalent Distance (in feet)

Autos:	95.205
Medium Trucks:	95.112
Heavy Trucks:	95.121

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.00	-4.30	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-16.99	-4.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-11.09	-4.29	-1.20	-5.16	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.0	60.1	58.3	52.2	60.9	61.5
Medium Trucks:	57.0	55.5	49.1	47.6	56.0	56.2
Heavy Trucks:	67.7	66.2	57.2	58.5	66.8	66.9
Vehicle Noise:	69.0	67.5	61.1	59.7	68.1	68.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	74	160	345	744
CNEL:	77	166	358	771

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APPENDIX 8.1:

REFERENCE NOISE SOURCE PHOTOS

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Reference Noise Source Photos

- IMG_0872.JPG

- IMG_0857.JPG

- IMG_0862.JPG

- IMG_0863.JPG

1 of 1

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APPENDIX 9.1:

RCNM EQUIPMENT DATABASE

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U.S. Department
of Transportation

**Federal Highway
Administration**

FHWA
Roadway Construction Noise Model
User's Guide

FHWA-HEP-05-054
DOT-VNTSC-FHWA-05-01

Final Report
January 2006

Prepared for
U.S. Department of Transportation
Federal Highway Administration
Office of Natural and Human Environment
Washington, DC 20590

Prepared by
U.S. Department of Transportation
Research and Innovative Technology Administration
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Cambridge, MA 02142

Table 1. CA/T equipment noise emissions and acoustical usage factors database.

CA/T Noise Emission Reference Levels and Usage Factors					
filename: EQUIPLST.xls					
revised: 7/26/05	Impact	Acoustical Use Factor	Spec 721.560 Lmax @ 50ft	Actual Measured Lmax @ 50ft	No. of Actual Data Samples
Equipment Description	Device ?	(%)	(dBA, slow)	(dBA, slow)	(Count)
				(samples averaged)	
All Other Equipment > 5 HP	No	50	85	-- N/A --	0
Auger Drill Rig	No	20	85	84	36
Backhoe	No	40	80	78	372
Bar Bender	No	20	80	-- N/A --	0
Blasting	Yes	-- N/A --	94	-- N/A --	0
Boring Jack Power Unit	No	50	80	83	1
Chain Saw	No	20	85	84	46
Clam Shovel (dropping)	Yes	20	93	87	4
Compactor (ground)	No	20	80	83	57
Compressor (air)	No	40	80	78	18
Concrete Batch Plant	No	15	83	-- N/A --	0
Concrete Mixer Truck	No	40	85	79	40
Concrete Pump Truck	No	20	82	81	30
Concrete Saw	No	20	90	90	55
Crane	No	16	85	81	405
Dozer	No	40	85	82	55
Drill Rig Truck	No	20	84	79	22
Drum Mixer	No	50	80	80	1
Dump Truck	No	40	84	76	31
Excavator	No	40	85	81	170
Flat Bed Truck	No	40	84	74	4
Front End Loader	No	40	80	79	96
Generator	No	50	82	81	19
Generator (<25KVA, VMS signs)	No	50	70	73	74
Gradall	No	40	85	83	70
Grader	No	40	85	-- N/A --	0
Grapple (on backhoe)	No	40	85	87	1
Horizontal Boring Hydr. Jack	No	25	80	82	6
Hydra Break Ram	Yes	10	90	-- N/A --	0
Impact Pile Driver	Yes	20	95	101	11
Jackhammer	Yes	20	85	89	133
Man Lift	No	20	85	75	23
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	212
Pavement Scarafier	No	20	85	90	2
Paver	No	50	85	77	9
Pickup Truck	No	40	55	75	1
Pneumatic Tools	No	50	85	85	90
Pumps	No	50	77	81	17
Refrigerator Unit	No	100	82	73	3
Rivit Buster/chipping gun	Yes	20	85	79	19
Rock Drill	No	20	85	81	3
Roller	No	20	85	80	16
Sand Blasting (Single Nozzle)	No	20	85	96	9
Scraper	No	40	85	84	12
Shears (on backhoe)	No	40	85	96	5
Slurry Plant	No	100	78	78	1
Slurry Trenching Machine	No	50	82	80	75
Soil Mix Drill Rig	No	50	80	-- N/A --	0
Tractor	No	40	84	-- N/A --	0
Vacuum Excavator (Vac-truck)	No	40	85	85	149
Vacuum Street Sweeper	No	10	80	82	19
Ventilation Fan	No	100	85	79	13
Vibrating Hopper	No	50	85	87	1
Vibratory Concrete Mixer	No	20	80	80	1
Vibratory Pile Driver	No	20	95	101	44
Warning Horn	No	5	85	83	12
Welder / Torch	No	40	73	74	5

APPENDIX 9.2:

PROJECT CONSTRUCTION NOISE ANALYSIS WORKSHEETS

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Table 1

Demolition (Phase 1) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Water Truck	2	40%	3.2	76.0	63.0
Tractor/Loader/Backhoe	2	40%	3.2	78.0	65.0
Rubber Tired Dozer	2	40%	3.2	79.0	66.0
Excavator	2	40%	3.2	81.0	68.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					71.9
Distance to 65 dBA Leq Contour (Feet)					442

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		60.8
R2	1,020'	-14.2		57.7
R3	911'	-13.2		58.7
R4	1,705'	-18.6		53.3
R5	240'	-1.6		70.3
R6	618'	-9.8		62.1
R7	875'	-12.8		59.1
R8	920'	-13.3		58.6
R9	1,608'	-18.1		53.8
R10	1,370'	-16.7		55.2

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 2

Demolition (Phase 1.1) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Crusher	1	15%	1.2	83.0	62.7
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					62.7
Distance to 65 dBA Leq Contour (Feet)					154

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		51.6
R2	1,020'	-14.2		48.6
R3	911'	-13.2		49.5
R4	1,705'	-18.6		44.1
R5	240'	-1.6		61.1
R6	618'	-9.8		52.9
R7	875'	-12.8		49.9
R8	920'	-13.3		49.5
R9	1,608'	-18.1		44.6
R10	1,370'	-16.7		46.0

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 3

Grading (Phase 1) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Water Truck	2	40%	3.2	76.0	63.0
Scraper	9	40%	3.2	84.0	77.5
Motor Grader	1	40%	3.2	85.0	69.0
Rubber Tired Dozer	1	40%	3.2	79.0	63.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					78.4
Distance to 65 dBA Leq Contour (Feet)					930

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		67.3
R2	1,020'	-14.2		64.2
R3	911'	-13.2		65.2
R4	1,705'	-18.6		59.7
R5	240'	-1.6		76.8
R6	618'	-9.8		68.6
R7	875'	-12.8		65.5
R8	920'	-13.3		65.1
R9	1,608'	-18.1		60.2
R10	1,370'	-16.7		61.6

1 Source: FHWA's Roadway Construction Noise Model, January 2006.

2 Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

3 Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

4 Receiver locations are presented on Exhibit 8-A.

5 Distance from the nearest point of construction activity to the nearest receiver.

6 Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 4

Grading (Phase 1.1) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Dozer	1	40%	3.2	82.0	66.0
Water Truck	1	40%	3.2	76.0	60.0
Scraper	1	40%	3.2	84.0	68.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					70.5
Distance to 65 dBA Leq Contour (Feet)					377

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		59.4
R2	1,020'	-14.2		56.4
R3	911'	-13.2		57.3
R4	1,705'	-18.6		51.9
R5	240'	-1.6		68.9
R6	618'	-9.8		60.7
R7	875'	-12.8		57.7
R8	920'	-13.3		57.3
R9	1,608'	-18.1		52.4
R10	1,370'	-16.7		53.8

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 5

Grading (Phase 2) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Water Truck	1	40%	3.2	76.0	60.0
Scraper	1	40%	3.2	84.0	68.0
Motor Grader	1	40%	3.2	85.0	69.0
Rubber Tired Dozer	2	40%	3.2	79.0	66.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					72.8
Distance to 65 dBA Leq Contour (Feet)					492

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		61.7
R2	1,020'	-14.2		58.7
R3	911'	-13.2		59.7
R4	1,705'	-18.6		54.2
R5	240'	-1.6		71.2
R6	618'	-9.8		63.0
R7	875'	-12.8		60.0
R8	920'	-13.3		59.6
R9	1,608'	-18.1		54.7
R10	1,370'	-16.7		56.1

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 6

Grading (Phase 3) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Water Truck	1	40%	3.2	76.0	60.0
Scraper	1	40%	3.2	84.0	68.0
Motor Grader	1	40%	3.2	85.0	69.0
Rubber Tired Dozer	2	40%	3.2	79.0	66.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					72.8
Distance to 65 dBA Leq Contour (Feet)					492

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		61.7
R2	1,020'	-14.2		58.7
R3	911'	-13.2		59.7
R4	1,705'	-18.6		54.2
R5	240'	-1.6		71.2
R6	618'	-9.8		63.0
R7	875'	-12.8		60.0
R8	920'	-13.3		59.6
R9	1,608'	-18.1		54.7
R10	1,370'	-16.7		56.1

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 7

Plumbing Underslab (Phase 1) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Excavator	1	40%	3.2	81.0	65.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					65.0
Distance to 65 dBA Leq Contour (Feet)					200

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		53.9
R2	1,020'	-14.2		50.8
R3	911'	-13.2		51.8
R4	1,705'	-18.6		46.4
R5	240'	-1.6		63.4
R6	618'	-9.8		55.2
R7	875'	-12.8		52.2
R8	920'	-13.3		51.7
R9	1,608'	-18.1		46.9
R10	1,370'	-16.7		48.3

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 8

Plumbing Underslab (Phase 1.1) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Rubber Tired Dozer	1	40%	3.2	79.0	63.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					63.0
Distance to 65 dBA Leq Contour (Feet)					158

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		51.9
R2	1,020'	-14.2		48.8
R3	911'	-13.2		49.8
R4	1,705'	-18.6		44.4
R5	240'	-1.6		61.4
R6	618'	-9.8		53.2
R7	875'	-12.8		50.2
R8	920'	-13.3		49.7
R9	1,608'	-18.1		44.9
R10	1,370'	-16.7		46.3

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 9

Plumbing-Building Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Forklift	1	20%	1.6	75.0	56.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					56.0
Distance to 65 dBA Leq Contour (Feet)					71

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		44.9
R2	1,020'	-14.2		41.8
R3	911'	-13.2		42.8
R4	1,705'	-18.6		37.4
R5	240'	-1.6		54.4
R6	618'	-9.8		46.2
R7	875'	-12.8		43.1
R8	920'	-13.3		42.7
R9	1,608'	-18.1		37.9
R10	1,370'	-16.7		39.3

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 10

Electrical-Underground Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Tractor/Loader/Backhoe	1	40%	3.2	78.0	62.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					62.0
Distance to 65 dBA Leq Contour (Feet)					141

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		50.9
R2	1,020'	-14.2		47.8
R3	911'	-13.2		48.8
R4	1,705'	-18.6		43.4
R5	240'	-1.6		60.4
R6	618'	-9.8		52.2
R7	875'	-12.8		49.2
R8	920'	-13.3		48.7
R9	1,608'	-18.1		43.9
R10	1,370'	-16.7		45.3

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 11

Electrical-Building (Phase 1) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Forklift	2	20%	1.6	75.0	59.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					59.0
Distance to 65 dBA Leq Contour (Feet)					100

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		47.9
R2	1,020'	-14.2		44.8
R3	911'	-13.2		45.8
R4	1,705'	-18.6		40.4
R5	240'	-1.6		57.4
R6	618'	-9.8		49.2
R7	875'	-12.8		46.2
R8	920'	-13.3		45.7
R9	1,608'	-18.1		40.9
R10	1,370'	-16.7		42.3

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 12

Electrical-Building (Phase 1.1) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Air Compressor	1	40%	3.2	78.0	62.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					62.0
Distance to 65 dBA Leq Contour (Feet)					141

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		50.9
R2	1,020'	-14.2		47.8
R3	911'	-13.2		48.8
R4	1,705'	-18.6		43.4
R5	240'	-1.6		60.4
R6	618'	-9.8		52.2
R7	875'	-12.8		49.2
R8	920'	-13.3		48.7
R9	1,608'	-18.1		43.9
R10	1,370'	-16.7		45.3

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 13

Structural Concrete (Phase 1) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Scraper	1	40%	3.2	84.0	68.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					68.0
Distance to 65 dBA Leq Contour (Feet)					282

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		56.9
R2	1,020'	-14.2		53.8
R3	911'	-13.2		54.8
R4	1,705'	-18.6		49.4
R5	240'	-1.6		66.4
R6	618'	-9.8		58.2
R7	875'	-12.8		55.2
R8	920'	-13.3		54.7
R9	1,608'	-18.1		49.9
R10	1,370'	-16.7		51.3

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 14

Structural Concrete (Phase 2) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Dump Truck	2	40%	3.2	76.0	63.0
Tractor/Loader/Backhoe	3	40%	3.2	78.0	66.8
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					68.3
Distance to 65 dBA Leq Contour (Feet)					292

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		57.2
R2	1,020'	-14.2		54.1
R3	911'	-13.2		55.1
R4	1,705'	-18.6		49.7
R5	240'	-1.6		66.7
R6	618'	-9.8		58.5
R7	875'	-12.8		55.5
R8	920'	-13.3		55.0
R9	1,608'	-18.1		50.2
R10	1,370'	-16.7		51.6

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 15

Structural Concrete (Phase 3) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Forklift	2	20%	1.6	75.0	59.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					59.0
Distance to 65 dBA Leq Contour (Feet)					100

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		47.9
R2	1,020'	-14.2		44.8
R3	911'	-13.2		45.8
R4	1,705'	-18.6		40.4
R5	240'	-1.6		57.4
R6	618'	-9.8		49.2
R7	875'	-12.8		46.2
R8	920'	-13.3		45.7
R9	1,608'	-18.1		40.9
R10	1,370'	-16.7		42.3

1 Source: FHWA's Roadway Construction Noise Model, January 2006.

2 Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

3 Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

4 Receiver locations are presented on Exhibit 8-A.

5 Distance from the nearest point of construction activity to the nearest receiver.

6 Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 16

Structural Concrete (Phase 4) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Water Truck	1	40%	3.2	76.0	60.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					60.0
Distance to 65 dBA Leq Contour (Feet)					112

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		48.9
R2	1,020'	-14.2		45.8
R3	911'	-13.2		46.8
R4	1,705'	-18.6		41.4
R5	240'	-1.6		58.4
R6	618'	-9.8		50.2
R7	875'	-12.8		47.2
R8	920'	-13.3		46.7
R9	1,608'	-18.1		41.9
R10	1,370'	-16.7		43.3

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 17

Structural Concrete (Phase 5) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Sweeper	1	10%	0.8	82.0	60.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					60.0
Distance to 65 dBA Leq Contour (Feet)					112

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		48.9
R2	1,020'	-14.2		45.8
R3	911'	-13.2		46.8
R4	1,705'	-18.6		41.3
R5	240'	-1.6		58.4
R6	618'	-9.8		50.2
R7	875'	-12.8		47.1
R8	920'	-13.3		46.7
R9	1,608'	-18.1		41.9
R10	1,370'	-16.7		43.2

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 18

Structural Concrete (Phase 6) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Concrete Pump Truck	1	20%	1.6	81.0	62.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					62.0
Distance to 65 dBA Leq Contour (Feet)					141

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		50.9
R2	1,020'	-14.2		47.8
R3	911'	-13.2		48.8
R4	1,705'	-18.6		43.4
R5	240'	-1.6		60.4
R6	618'	-9.8		52.2
R7	875'	-12.8		49.1
R8	920'	-13.3		48.7
R9	1,608'	-18.1		43.9
R10	1,370'	-16.7		45.3

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 19

Structural Concrete (Phase 6) Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Forklift	1	20%	1.6	75.0	56.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					56.0
Distance to 65 dBA Leq Contour (Feet)					71

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		44.9
R2	1,020'	-14.2		41.8
R3	911'	-13.2		42.8
R4	1,705'	-18.6		37.4
R5	240'	-1.6		54.4
R6	618'	-9.8		46.2
R7	875'	-12.8		43.1
R8	920'	-13.3		42.7
R9	1,608'	-18.1		37.9
R10	1,370'	-16.7		39.3

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 20

Structural Concrete Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Forklift	3	20%	1.6	75.0	60.7
Forklift	1	20%	1.6	75.0	56.0
Cranes	1	16%	1.3	81.0	61.0
Welder	4	40%	3.2	74.0	64.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					67.3
Distance to 65 dBA Leq Contour (Feet)					260

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		56.2
R2	1,020'	-14.2		53.1
R3	911'	-13.2		54.1
R4	1,705'	-18.6		48.7
R5	240'	-1.6		65.7
R6	618'	-9.8		57.5
R7	875'	-12.8		54.5
R8	920'	-13.3		54.0
R9	1,608'	-18.1		49.2
R10	1,370'	-16.7		50.6

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 21

Fire Protection Site Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Water Truck	1	40%	3.2	76.0	60.0
Tractor/Loader/Backhoe	1	40%	3.2	78.0	62.0
Rubber Tired Dozer	1	40%	3.2	79.0	63.0
Forklift	1	20%	1.6	75.0	56.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					66.9
Distance to 65 dBA Leq Contour (Feet)					250

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		55.9
R2	1,020'	-14.2		52.8
R3	911'	-13.2		53.8
R4	1,705'	-18.6		48.3
R5	240'	-1.6		65.4
R6	618'	-9.8		57.2
R7	875'	-12.8		54.1
R8	920'	-13.3		53.7
R9	1,608'	-18.1		48.8
R10	1,370'	-16.7		50.2

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 22

Fire Protection Overhead Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Water Truck	1	40%	3.2	76.0	60.0
Tractor/Loader/Backhoe	1	40%	3.2	78.0	62.0
Rubber Tired Dozer	1	40%	3.2	79.0	63.0
Forklift	1	20%	1.6	75.0	56.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					66.9
Distance to 65 dBA Leq Contour (Feet)					250

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		55.9
R2	1,020'	-14.2		52.8
R3	911'	-13.2		53.8
R4	1,705'	-18.6		48.3
R5	240'	-1.6		65.4
R6	618'	-9.8		57.2
R7	875'	-12.8		54.1
R8	920'	-13.3		53.7
R9	1,608'	-18.1		48.8
R10	1,370'	-16.7		50.2

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 23

Reinforcing Steel Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Forklift	2	20%	1.6	75.0	59.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					59.0
Distance to 65 dBA Leq Contour (Feet)					100

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		47.9
R2	1,020'	-14.2		44.8
R3	911'	-13.2		45.8
R4	1,705'	-18.6		40.4
R5	240'	-1.6		57.4
R6	618'	-9.8		49.2
R7	875'	-12.8		46.2
R8	920'	-13.3		45.7
R9	1,608'	-18.1		40.9
R10	1,370'	-16.7		42.3

1 Source: FHWA's Roadway Construction Noise Model, January 2006.

2 Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

3 Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

4 Receiver locations are presented on Exhibit 8-A.

5 Distance from the nearest point of construction activity to the nearest receiver.

6 Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 24

Site Utilities - Storm Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Rubber Tired Dozer	2	40%	3.2	79.0	66.0
Excavator	2	40%	3.2	81.0	68.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					70.1
Distance to 65 dBA Leq Contour (Feet)					360

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		59.0
R2	1,020'	-14.2		56.0
R3	911'	-13.2		56.9
R4	1,705'	-18.6		51.5
R5	240'	-1.6		68.5
R6	618'	-9.8		60.3
R7	875'	-12.8		57.3
R8	920'	-13.3		56.9
R9	1,608'	-18.1		52.0
R10	1,370'	-16.7		53.4

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 25

Site Utilities - Sewer Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Tractor/Loader/Backhoe	1	40%	3.2	78.0	62.0
Rubber Tired Dozer	1	40%	3.2	79.0	63.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					65.5
Distance to 65 dBA Leq Contour (Feet)					212

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		54.4
R2	1,020'	-14.2		51.4
R3	911'	-13.2		52.3
R4	1,705'	-18.6		46.9
R5	240'	-1.6		63.9
R6	618'	-9.8		55.7
R7	875'	-12.8		52.7
R8	920'	-13.3		52.3
R9	1,608'	-18.1		47.4
R10	1,370'	-16.7		48.8

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 26

Site Utilities - Water Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Tractor/Loader/Backhoe	1	40%	3.2	78.0	62.0
Rubber Tired Dozer	1	40%	3.2	79.0	63.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					65.5
Distance to 65 dBA Leq Contour (Feet)					212

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		54.4
R2	1,020'	-14.2		51.4
R3	911'	-13.2		52.3
R4	1,705'	-18.6		46.9
R5	240'	-1.6		63.9
R6	618'	-9.8		55.7
R7	875'	-12.8		52.7
R8	920'	-13.3		52.3
R9	1,608'	-18.1		47.4
R10	1,370'	-16.7		48.8

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 8-A.

[5] Distance from the nearest point of construction activity to the nearest receiver.

[6] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Table 27

Roof Structure Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (Lmax dBA)	Cumulative Level @ 200 Feet (Leq dBA)
Forklift	2	20%	1.6	75.0	59.0
Forklift	4	20%	1.6	75.0	62.0
Forklift	2	20%	1.6	75.0	59.0
Motor Grader	2	40%	3.2	85.0	72.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Null	0	20%	1.6	45.0	0.0
Cumulative Hourly Noise Levels 200 Feet (Leq dBA)					72.8
Distance to 65 dBA Leq Contour (Feet)					490

Construction Noise Receiver Location[4]	Distance To Property Line (In Feet)[5]	Distance Attenuation	Estimated Noise Barrier Attenuation (Leq dBA)	Construction Noise Level (Leq dBA)
R1	717'	-11.1		61.7
R2	1,020'	-14.2		58.6
R3	911'	-13.2		59.6
R4	1,705'	-18.6		54.2
R5	240'	-1.6		71.2
R6	618'	-9.8		63.0
R7	875'	-12.8		60.0
R8	920'	-13.3		59.5
R9	1,608'	-18.1		54.7
R10	1,370'	-16.7		56.1

1 Source: FHWA's Roadway Construction Noise Model, January 2006.

2 Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

3 Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

4 Receiver locations are presented on Exhibit 8-A.

5 Distance from the nearest point of construction activity to the nearest receiver.

6 Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.